

ENVIRONMENTAL ASSESSMENT FOR THE YOUNGS CANYON ALLOTMENT

**United State Department of Agriculture
Forest Service, Southwestern Region**

**Coconino National Forest
Peaks Ranger District
Coconino County**

CHAPTER ONE

PROJECT SCOPE

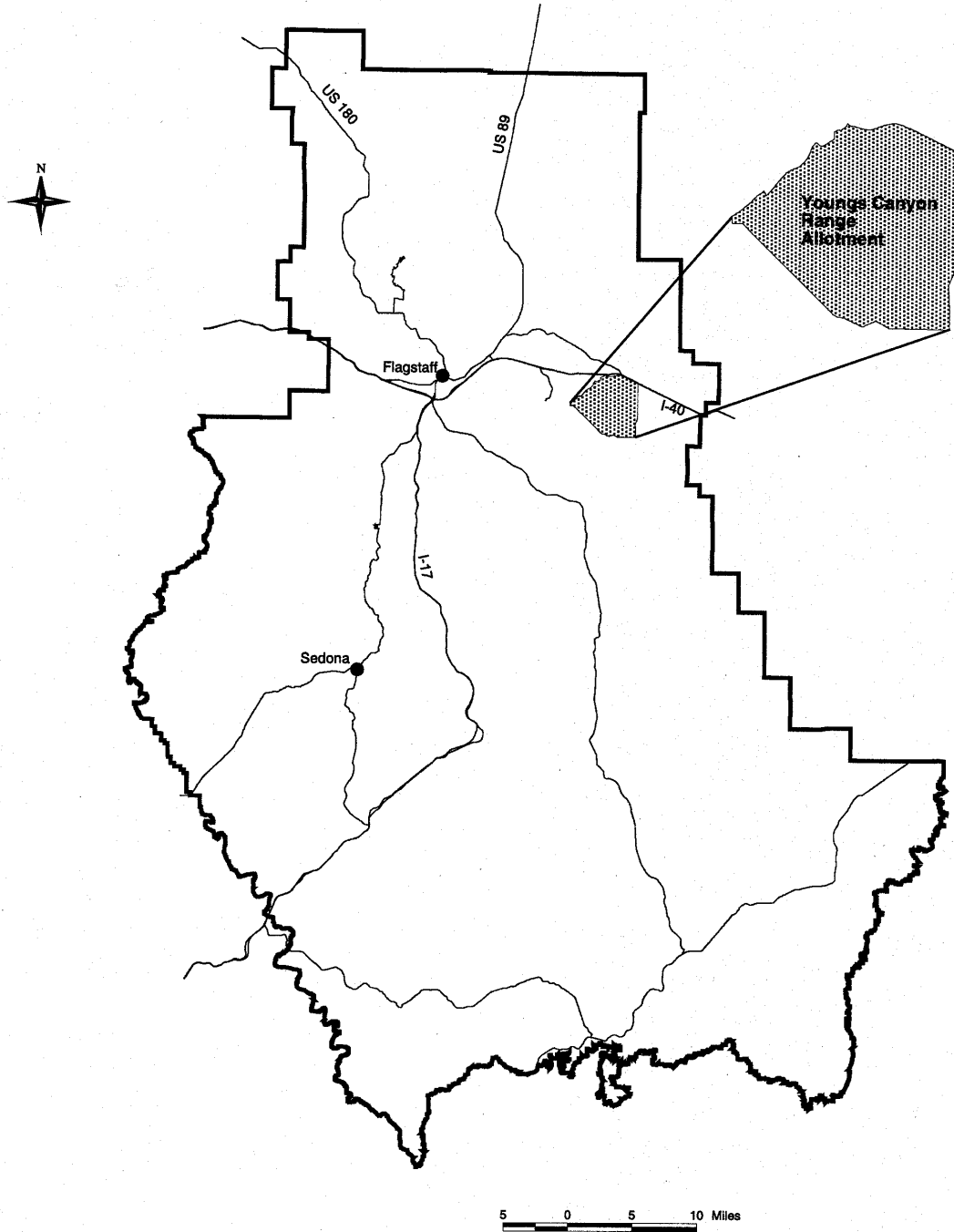
An Interdisciplinary Team (Team) of Forest Service resource specialists was selected and formally initialized by the Peaks and Mormon Lake District Ranger on July 1, 1999. The Team members were selected based on anticipated issues and resource concerns for the Youngs Canyon Allotment and the rangeland use specifically. The Purpose and Need section of this Environmental Assessment (EA) describes why the Forest Service wants to take action in the Youngs Canyon Allotment area at this time. This (EA) also summarizes the team's evaluation of existing uses and resource conditions and comparison to desired conditions set forth in the Forest Plan. Where differences were seen, the Team set objectives for moving toward desired conditions and listed appropriate actions for meeting the objectives. A group of actions was presented to the public as the Proposed Action. The Proposed Action was retained as Alternative A, and subsequent alternatives were developed in response to issues raised in response to the Proposed Action. A comparison of alternatives based on the issues and a summary of environmental effects of the alternatives are displayed here. All the information brought forth during this analysis process was used to choose a preferred alternative. Actions beyond the scope of this project will be listed in our files and be provided to future planning teams for consideration.

The proposed action and alternatives are consistent with desired conditions listed in the Coconino National Forest Plan (as amended) for Management Areas (MA) 7 Pinyon-juniper on less than 40% slopes, MA 8 Pinyon-juniper on greater than 40% slopes and MA 10 Transition Grassland, and reflect known ecological and social needs of the area.

The Youngs Canyon Allotment consists of 10,365 acres southeast of Flagstaff, Arizona. These acres lie in the southeastern portion of the Peaks Ranger District of the Coconino National Forest, see Map 1. The allotment lies south of Interstate 40 just south of Winona, Arizona. The grazing system is a four pasture rest rotation system. The Youngs Canyon Allotment now permits grazing of 42 head of cattle yearlong.

The livestock grazing permittees and Arizona Game and Fish Department were contacted directly for their initial concerns.

Coconino National Forest
Youngs Canyon Range Allotment
Map 1



Purpose for the Proposed Action

The proposed action was developed to address specific resource and social concerns related directly to livestock use, watershed function, and understory plant diversity and abundance, on the Youngs Canyon Allotment. Actions presented here will allow for continued livestock use under specific conditions and directions that consider watershed conditions, vegetative conditions, wildlife needs, heritage resource concerns and recreation use on the Youngs Canyon Allotment. Selection of the proposed action, or an alternative to the proposed action that includes livestock grazing use, will authorize livestock grazing on the Youngs Canyon Allotment for the next ten years. In addition, actions presented here will allow for continued presence of open grassland and understory vegetation on the landscape, mimicking fire's natural role in the ecosystem. Selection of the proposed action or an alternative to the proposed action may result in treatments of vegetation such as thinning and prescribed fire.

The proposed action is consistent with:

- Congressional intent to allow grazing on suitable lands (Multiple Use Sustained Yield Act of 1960, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976),
- Forest Service policy on rangeland management (FSM 2202.1, FSM 2203.1),
- Federal regulation (36 CFR 222.2 (c)) which states that National Forest System lands will be allocated for livestock grazing and the allotment management plans will be prepared consistent with land management plans, and the
- Clean Water Act of 1948, Clean Air Act of 1955, Endangered Species Act of 1973, and National Historic Preservation Act.
- Authorization of livestock grazing permits for a ten year period is required by law (FLPMA Sec. 402 (a)&(b) (3) and 36 CFR 222.3), unless there is pending disposal, or it will be devoted to other uses prior to the end of ten years, or it will be in best interest of sound land management to specify a shorter term.
- Overall management direction provided in the Coconino National Forest Land Management Plan (Forest Plan as Amended 1987),

Need for the Proposed Action

The Youngs Canyon Allotment is scheduled for environmental analysis of grazing use on the Coconino National Forest, as required by the Burns Amendment (1995). This proposed action initiates public participation in the analysis process as required by the National Environmental Policy Act of 1970.

In Management Areas 7 and 10 the Management Emphasis stated in the Forest Plan is to emphasize firewood production, watershed condition, wildlife habitat, and livestock grazing. In the Youngs Allotment, there are areas where watershed conditions and wildlife habitat are less than satisfactory. The current livestock grazing system does not fit well within this ecosystem.

In some portions of the Allotment, pinyon and juniper trees have increased in density and number at the expense of herbaceous and shrub understory. Through year-round photosynthesis, evergreen pinyon and juniper trees are able to capture nutrients and moisture more efficiently than associated herbs and shrubs. In semiarid conditions, much of the limited precipitation is used by the extensive root system of trees and transpired through their canopies. The resulting lack of water and nutrient availability can result in mortality of understory plants (Roundy and Vernon 1999). The absence of plants in the tree interspaces often leads to surface erosion from wind and water, loss of under story production potential, and impact to archeological values.

Within previously cleared pinyon and juniper areas, small pinyon and juniper trees and rubber rabbitbrush (*Chrysothamnus nauseosus*) are increasing and limiting forage production. The Coconino National Forest Plan states, “Some acres have been mechanically treated by using heavy equipment to remove individual trees, or “pushing,” “chaining” or “cabling” as the practice is called. Portions of these lands have very low potential for revegetation and are allowed to proceed towards climax stage. In some areas, other low-density canopy lands with a higher potential for revegetation are rotated into management as seral grasslands if an environmental analysis indicates. There are approximately 1,140 acres of previously cleared areas where soils will support grasslands.

Within areas that were previously seral grassland. The eastern side of the allotment pinyon and juniper trees is invading grassland vegetation. For MA7 the Forest Plan states that “pinyon-juniper woodlands that have not been previously treated, but are in the 0-10 percent canopy cover class as a result of past fire and subsequent successional development, are evaluated through the environmental process to determine if they are included among lands maintained as seral grasslands. The criteria used for physical/biological suitability are the rating of soil potential for revegetation and the erosion potential as outlined in the Terrestrial Ecosystems Survey Handbook (TESH, January 7, 1985).” For MA 10 the Forest Plan directs us to maintain a seral grassland state on pinyon-juniper lands where type conversions have occurred in the past, with the exception that corridors of cover for wildlife habitat, determined through environmental analysis, maybe allowed to develop through regrowth of pinyon-juniper.

There is a need in these areas of the allotment to increase grass, forb and shrub abundance, diversity and production by reducing pinyon and juniper trees and rubber rabbitbrush to move toward desired plant communities. There are approximately 2,240 acres where maintaining open savanna like grassland would benefit antelope, and other species adapted to grasslands. The small herds of antelope that use the area focus on previously fuelwooded areas and the east side of the allotment. Due to increasing abundance of rabbitbrush, juniper and pinyon, antelope habitat quality is declining.

Within dense forests, where understory vegetation is lacking, small pinyon and juniper trees have filled the interspaces between larger, older trees limiting understory vegetation. There is a need to restore understory ground cover to help limit erosion. This need exists throughout the densely forested areas of the Allotment. Maintaining dense pinyon/juniper forests for wildlife cover is also desirable. Previous fire regimes probably left a mosaic of very dense and moderately dense pinyon juniper forests throughout the Allotment. It is desirable to choose some areas to for density reduction by removing smaller, younger trees.

Winter browse vegetation – Elk concentrate within the alluvial bottoms, cleared pinyon and juniper areas and near waters. Mule deer are year-round residents and there is good winter range for deer near the canyons. An important winter browse is cliffrose, which is in good to fair condition. It is important to maintain or improve winter browse.

Impaired Soils - Within the Allotment, there are approximately 570 acres of impaired soils. These alluvial bottoms lack vegetative and litter ground cover and exhibit surface and small gully erosion. Ground cover in these areas is low and should be improved. An area of specific concern is the Youngs Canyon Dam holding pasture. This area is impaired because of past and current cattle grazing, elk grazing, poor road locations, flooding during snow melt and heavy thunderstorms.

Grazing System - There are several problems with yearlong livestock grazing on the Youngs Canyon Allotment with a four-pasture rest rotation grazing system. This type of grazing system requires graze periods of up to 120 days. This allotment is dominantly a pinyon and juniper/blue grama vegetation type. This type of vegetation is not conducive to yearlong grazing because it lacks a significant cool season grass or browse community. In addition, this allotment can receive significant snow in most winters.

In 1998, Walnut Canyon National Monument expanded its boundary to include the majority of Walnut Canyon within this allotment (approximately 510 acres). The National Park Service is planning the construction of a barbed wire fence on this new boundary in the summer of 2001. This fence will prohibit livestock grazing within the Monument. This boundary adjustment will reduce grazing capacity on the Youngs Canyon Allotment.

Forage production varies considerably from site to site; depending on soils, water availability and overstory density. Cleared pinyon and juniper areas with blue grama, squirreltail and western wheatgrass should be producing an average of 900 pounds of forage per acre and are producing 200-350 pounds per acre. Closed pinyon and juniper areas produce very little forage (>100 pounds per acre). The remainder of the allotment should be producing between 200 and 900 pounds per acre, but is producing 100-350 pounds per acre.

Water Availability for wildlife and livestock - There are currently nine earthen dam stock tanks and five trick tanks on the allotment. The Youngs Canyon Dam was breached in the early 1970's after floodwaters damaged the dam. Before this dam was breached, Youngs Canyon tank watered every pasture on the allotment. The majority of the water sources on the allotment go dry during most years. The permittee hauls water to this allotment. In dry years, the Game and Fish Department hauls waters to trick tanks. An additional water source near Youngs Canyon Dam would improve water distribution for cattle and wildlife on the entire allotment. The Forest Plan directs us to "Provide water where needed on key wildlife winter ranges. Use bubblers or other means to prevent freezing, where needed."

Noxious Weeds - Dalmation toadflax, diffuse knapweed and scotch thistle exist in small-scattered populations throughout the allotment. These weed species are the only known noxious weed on the Youngs Canyon Allotment. These species are of concern because of their potential to aggressively colonize an area and compete with native vegetation. Control and eradication efforts are most effective when populations are small.

Conclusion: The Forest Service is charged with managing ecosystems that function for future generations. There is adequate research and knowledge available to show us what actions should be tried in reversing deleterious trends.

Any proposed increases in understory vegetation quality and quantity is done for watershed and wildlife habitat reasons. It is not our purpose to increase capacity for grazing livestock through vegetation treatments. Rather a combination of changing grazing practices, along with vegetative treatments can restore and maintain healthy watershed conditions in the Allotment.

Project Location and Analysis Area

The Youngs Canyon Allotment consists of 10,365 acres southeast of Flagstaff, Arizona. These acres lie in the southeastern portion of the Peaks Ranger District of the Coconino National Forest. The allotment lies south of Interstate 40 just south of Winona, Arizona. The Youngs Canyon Allotment is located within all or portions of T21N, R9E, Sections 13-15,21-36; and T20N, R9E, Sections 1-4,10-12.

The majority of the allotment is a pinyon and juniper community at an elevation of approximately 6400'. Pinyon and juniper cover the majority of the allotment. Old growth pinyon and juniper exists in small patches within the canyons and some steeper sloped areas. However, the majority of the allotment contains pinyon and juniper that are less than 100 years old. Much of the area in the eastern portion of the allotment was recently grassland and is being filled in with pinyon and juniper trees. Throughout the allotment there are scattered areas of deeper soils on which pinyon and juniper trees have been removed since the 1960's. These treatments have created productive grasslands. Rabbitbrush, pinyon and juniper are increasing in abundance in these created grasslands.

Two major canyons run through the allotment. Walnut Canyon runs through the northwestern portion of the allotment. The majority of the Walnut Canyon portion of the allotment lies within the expansion area of Walnut Canyon National Monument. This will be fenced in 2001. The only riparian area on the allotment is a 1/2-mile long riparian community of narrowleaf cottonwood, boxelder and walnut trees within the Walnut Canyon expansion area. No permanent water exists in this area. Youngs Canyon runs through the south central portion of the allotment. It has diverse vegetation, including a small pine stringer, but contains no riparian values.

Blue grama is the dominant grass species found throughout the allotment. Rubber rabbitbrush is dense throughout much of the cleared pinyon and juniper areas. Cliffrose (*Cowania mexicana stansburniana*) and fernbush (*Chamaebatiaria millifolium*) are two other abundant shrub species and provide important structure and food for wildlife.

The allotment contains the following Land Management Plan Management Areas:

- MA 7-Pinyon-juniper on less than 40% slopes
- MA 8-Pinyon-juniper on greater than 40% slopes
- MA 10-Transition Grassland

The Young's Canyon Allotment occurs in two 5th code watersheds. The following table is a summary of number of total acres within each 5th code watershed and acres of the allotment, which occur within each watershed.

5th Code Watershed (Acres)	Allotment (Acres)	% Of Allotment Within Watershed
Canyon Diablo (223,788)	6161	2.6
Lake Mary (97,207)	4204	4.3

The following table is a summary of the water quality status of stream courses affected by this allotment. This information is taken from the 1998 Arizona Water Quality Assessment published by the Arizona Department of Environmental Quality.

Water Quality Status of Watersheds Affected by the Youngs Canyon Allotment.						
WATERBODY NAME LOCATION REACH OR LAKE NUMBER	WATERBODY SIZE-miles	DESIGNATED USES	ASSESSMENT CATEGORY	WATER QUALITY LIMITED	USE SUPPORT	ASSESSMENT COMMENTS
Little Colorado River 15020016 Dinnebito Wash (Canyon Diablo and Lake Mary Watersheds)	4	A&Ww, FBC, FC, DWS, AgI, AgL	Monitored	Yes	-	USGS monitoring site at Grand Falls, 12 samples 1992-1994: coper impairing uses and very high levels of total suspended solids (TSS) in water column.

ADEQ = Arizona Department of Environmental Quality, AGFD = Arizona Game and Fish Department, A&Ww = Aquatic and Wildlife Warmwater Fishery, FBC = Full Body Contact, DWS = Domestic Water Source, AgI = Agricultural Irrigation, AgL = Agricultural Livestock Watering.

Desired Conditions

A detailed summary of existing conditions is located in the project file. The Purpose for the Project section above describes the places where existing conditions need improvement to meet desired conditions. The following description of desired future conditions are based upon broad management direction (Forest Land Management Plan, all applicable laws, Forest Service Regional direction) and the site-specific conditions of the area.

In the future, the desired conditions for this area will include the following:

Watershed / Soils - Satisfactory soil conditions remain satisfactory. Improve impaired soils on the allotment within alluvial bottom by increasing ground cover (plants and litter). Ensure cattle management maintains or improves watershed conditions. Ensure pinyon and juniper expansion does not bring soils to an impaired condition.

Air Quality - Airsheds continue to meet State Implementation Plan (SIP) attainment levels. Broadcast burning within this allotment will stay within these attainment levels. Proper burning permits and smoke monitoring will insure air quality standards are met.

Wildlife Habitat - Wildlife habitat meets the needs of game and non-game species including threatened, endangered and sensitive species. Where wildlife habitat needs improvement (mainly within alluvial bottom, cleared pinyon and juniper areas and some increasing juniper areas), increase forage and cover species (production, diversity and vigor). In cleared areas and the east side of allotment, decrease

rabbitbrush, pinyon and juniper to maintain open habitat. Ensure cattle management and juniper expansion maintains or improves wildlife habitat.

Heritage Resources - Heritage resources are located, documented and avoided by ground disturbing activities. There will be no effects to heritage resources. Contemporary American Indian medicinal plant populations are healthy and stable.

Recreation Use - A variety of low to moderate impact, dispersed recreation opportunities exist on the Youngs Canyon Allotment. Activity levels continue to be moderate. Reduce or eliminate conflicts between recreationists and cattle when possible.

Rangeland Condition - Maintain or move toward the desired natural community type of a pinyon and juniper grassland that has a diverse and productive grass, forb and shrub understory. This desired community is near the potential natural community except in some alluvial bottoms, cleared pinyon and juniper areas, and some areas of increasing pinyon and juniper. All these sites need an improvement in ground cover species diversity and production. Improvements within these areas would maintain and/or move this allotment towards satisfactory rangeland management status. Maintain full capacity rangelands. In the potential capacity area of the allotment, which has impaired soils, increase ground cover to bring the soils into a satisfactory condition. Throughout the allotment, insure vegetation species are diverse, vigorous and productive. Maintain forage production at current levels or higher. Maintain or improve trend at static to upward. Where possible from other resource projects such as further prescribed burning or tree thinning, reduce pinyon and juniper to increase forage. Cattle grazing is managed to use the forage capacity produced, with consideration for wildlife forage and cover needs and watershed stability and water quality (35% use standard by cattle and elk throughout the allotment). In addition, grasses are available as fuel to carry fires needed to meet landscape goals. Noxious weeds are absent or controlled as a minor component of the vegetation.

Social / Economic Conditions - Maintain or improve native vegetation for Forest visitors to use and enjoy. Move toward these desired conditions and where possible maintain ranching life-styles from the ranching operation for up to ten years. In the next ten years within the Youngs Canyon Allotment, reduce or eliminate conflicts, when possible, between cattle, expanding tourism and the community of Flagstaff.

Project Objectives

The Team developed the following list of project objectives, or goals, to move toward the desired conditions for the rangeland ecosystem on the Youngs Canyon Allotment.

Maintain or improve watershed and soil condition by maintaining or increasing effective ground cover vegetation and implementing Best Management Practices (BMP's) for proper grazing use and livestock distribution.

Move toward or maintain a desired plant community, near the potential natural community, of pinyon and juniper grassland with a productive grass, forb and shrub understory. The desired plant community differs from the potential natural community by less pinyon and juniper in some areas to produce a more diverse and productive ground cover.

Improve forage production in some of the more densely treed sites and sites of current low forage production.

Where possible, allow livestock grazing use for up to ten years with consideration of identified resource and social needs for the Youngs Canyon Allotment and the surrounding communities.

Assure 35% current forage cattle and elk meet use standards. At key habitat areas, monitoring points will be established or maintained within the allotment. Reduce cattle numbers or season of use to meet these use standards, if needed.

Other Projects Identified

The Team identified the following need for the Youngs Canyon Allotment to meet landscape goals for stable watersheds and restoration of the historic landscape. Road closures are not part of this proposal. Additional planning and clearances would need to take place if these were to occur.

Road closures

PROPOSED ACTION

The Proposed Action, developed by the Team and sent to cooperating agencies and interested individuals and groups in September 1999, addresses specific resource and social needs related to livestock grazing use on the Youngs Canyon Allotment. Livestock grazing is allowed to continue for the next 10 years, with some modifications to the existing management plan to further our land management goals. Additional structural and non-structural improvement projects are proposed to address concerns about watershed and soil conditions, rangeland conditions and wildlife habitat. The details of the proposed action are given in Chapter 2.

PUBLIC RESPONSE TO THE PROPOSED ACTION

The Proposed Action was distributed for review and comment to over 120 individuals, organizations, or agencies in September 1999 (Consultation/Public Involvement). The Team received eight written responses to the Proposed Action. The following issues and concerns were raised in response to the Proposed Action, and were used to develop alternatives for managing the Youngs Canyon Allotment.

Issues

Issue 1: The proposed action manipulates this ecosystem by pinyon and juniper cutting and burning for the benefit of livestock grazing, which may not be appropriate for the environment.

Discussion and disposition: Two alternatives were developed with no pinyon and juniper cutting and burning (Alternatives B and C), in part, to address this issue. These alternatives are fully developed and analyzed in this environmental analysis. The Coconino National Forest Plan gives us direction to treat pinyon and juniper trees in this area. Areas to be maintained as open grasslands have soil types suitable for maintaining grasslands. The purpose for vegetation treatments is to improve watershed conditions and wildlife habitat. Livestock numbers are not proposed to increase as a result of vegetation treatments.

Issue 2: The proposed action includes livestock grazing that is a public nuisance and a destruction of natural resources.

Discussion and disposition: A “no livestock grazing” alternative (Alternative B) was developed, in part, to address this issue. This alternative is fully developed and analyzed in this environmental analysis. The impacts of implementing this alternative are given in this document. The Coconino National Forest Plan gives us direction to graze livestock in this area.

Issue 3: The cost of implementing and mitigating the proposed action is too expensive for the perceived benefits.

Discussion and disposition: The economic analysis is given in this document to compare the costs of all the alternatives. Alternatives vary from no implementing and mitigation costs, to current management costs, to the proposed actions implementation and mitigation costs.

Issue 4: The proposed action does not adequately protect archeological sites from cattle grazing and the proposed treatments.

Discussion and disposition: An archeological clearance was completed for the Youngs Canyon Range Allotment Management Plan in August 1999 and concurred with by the State Historic Preservation Officer (SPHO). This clearance documents compliance with Section 106 requirements of the National Historic Preservation Act. Each alternative requires that site specific archeological clearances be complete for ground disturbing activities prior to project implementation.

Issue 5: The proposed action is using hauled and unnatural water for cattle, which is creating an artificial environment that is affecting the biological balance in the area.

Discussion and disposition: A “no livestock grazing” alternative (Alternative B) was developed, in part, to address this issue. No water will be hauled into this area for livestock. Earthen tanks in this area will not be maintained for at least 10 years. This alternative is fully developed and analyzed in this environmental analysis. Throughout the southwest, big game wildlife populations and livestock use waters developed either by the Forest Service, permittees or Arizona Game and Fish. This is a different scenario then pre-European settlement when few man-made waters existed. There have been man-made waters in this area for almost 100 years and wildlife have adapted to them. Overall goals for big game management require water sources. Current waters go dry intermittently, mimicking natural water cycles. The amount of water hauled in the permittee and Game and Fish is minimal and less water is available in dry months than in rainy or snowy months throughout the allotment. Winter use of the area by wildlife is probably similar to historical use.

Issue 6: The proposed action does not include yearlong rest for any pastures.

Discussion and disposition: Alternative D was developed to address this issue. Alternative D has a four-pasture rest rotation grazing system. One pasture has yearlong rest each year. This alternative is fully developed and analyzed in this environmental analysis.

Concerns

Several responses raised questions and concerns about noxious weeds, effect on wells in the area, air quality, diversity of wildlife habitat, effects on recreation, recreations effects on environment and effects on natural and human environment. These concerns were noted and are addressed in Chapter 3 - Affected Environment and Environmental Consequences and Chapter 4 - Monitoring. These concerns were not issues that generated different alternatives.

Decision To Be Made

This Environmental Assessment documents the results of analyses of the proposed action and alternatives. Gene Waldrip, Peaks District Ranger of the Coconino National Forest, is the Forest Service official responsible for deciding what lands on the Youngs Canyon Allotment that are currently grazed, are going to be grazed and in what manner. The decision will be based on a consideration of the area's existing resource conditions, desired conditions, public concerns, public concerns and the environmental effects of implementing the various alternatives. The selected strategy will comply with the Coconino National Forest Plan. The District Ranger may select any of the alternatives analyzed in detail, or may modify and select an alternative, as long as the resulting effects are within the range of effects displayed in the document.

This document is not a decision document. Rather, it discloses the environmental consequences for implementation of the proposed action and alternatives to that action.

A decision notice, signed by the District Ranger after completion of the assessment, will document the decisions made as a result of this analysis. Should the decision result in livestock grazing, any and all grazing practices adopted will be further detailed in the terms and conditions of new allotment management plan and grazing permit.

CHAPTER 2

ALTERNATIVES

Alternative Development

The Youngs Canyon Allotment proposed action (Alternative A) was developed by the Team to bring existing conditions on the allotment toward the desired conditions. The District Ranger sent out the proposed action (described as Alternative A) to about 125 addresses on September 24, 1999. The mailing list included individuals, organizations and agencies.

Alternatives were created from NEPA process requirements and from issues developed in response to the proposed action.

The NEPA process requirements for livestock grazing management are a no cattle grazing alternative (Alternative B) and a current cattle management alternative (Alternative C). Both these alternatives were carried forward in this analysis.

In November 1999, the Team evaluated public and Forest Service comments on the proposed action. Issues were developed from this evaluation. Three letters were written opposing the proposed action because they believe cattle grazing are inappropriate in this area. Alternative B (no cattle grazing or pinyon juniper treatments) covers this issue. Three letters were opposed to pinyon and juniper cutting and burning because they believe pinyon and juniper should left to grow naturally. Alternative B also covers this issue. Another person felt that an alternative should be developed using a rest rotation grazing system. Alternative D was developed using this grazing system and stocking rate. No other alternatives were developed from public comments to the proposed action.

There were no alternatives considered but eliminated from detailed study.

Alternatives Considered In Detail

The alternatives described here are the final four alternatives considered for implementation for the Youngs Canyon Allotment over the next 10 years.

Items Common to All Action Alternatives

The following is a list of items that are common to all action alternatives.

Old Growth: The Forest Plans directs that stand size for old-growth pinyon/juniper on slopes less than 40% should be maintained between 100 and 300 acres and greater than or equal to 5 chains wide, or closely grouped stands that provide contiguous habitat for interior-dwelling species. Old growth contains large trees, snags and downed logs.

Alligator Juniper: In areas where alligator juniper trees comprise less than 50 percent of the total basal area, retain live alligator juniper trees greater than or equal to 12 inches. Since tree thinning will only remove trees less than 12 inches in diameter at the base of all larger alligator juniper will be maintained.

Pine Stringers: At least 20 percent of the area within a 20 chain zone adjacent to pine stringers is managed for dense mature or over-mature stands of pinyon/juniper.

Wildlife Cover: Cover corridors are laid out to connect treated areas or breaks in terrain to provide interconnecting cover corridors. Known or suspected routes of game travel are used to lie out cover corridors. Emphasize cover management in travel ways, bedding areas, reproductive areas, and adjacent to dependable waters and key openings. Manage for hiding and thermal cover in known fawning and calving areas. Cover is managed to provide at least 60% crown cover and at least 8 chains wide. Leave untreated areas adjacent to deep, steep canyons or bluffs. Manage for small game and non-game by leaving an average of one slash pile per three acres in the woodland type and/or leave lopped and scattered slash on 30 percent of areas harvested.

Annual Operating Plans: Annual operating plans make adjustments to cattle numbers, and time and duration of pasture use based on current climatic and range conditions. Making these plans each year and adjusting throughout the season as conditions change adds needed flexibility to the action alternatives.

Roads and Cattle Guards: Common to all alternatives is the need to keep forest users from leaving gates open. Where roads are maintained as open, cattle guards will be put in place. Where roads are identified for closure, in past and future road decisions, no cattle guard is necessary.

Cattle Guard Maintenance: Cattle guard maintenance is shared between the Forest Service and the permittee for level 3 roads (main surfaced roads). Cattle guard maintenance on level 2 roads (secondary smaller roads) is the responsibility of the permittee.

Implementation of Structural Improvements and Vegetation Treatments: Common to all alternatives is the need for cultural, wildlife and recreation coordination when implementing the grazing system and vegetation treatments. Structural improvements such as fencing, stock tanks and cattle guards will be used to implement the grazing plan. During the life of the permit, there may be additional or fewer improvements needed based on adapting to changes and meeting the goals of the new system. The following parameters need to be followed when implementing structural improvements and vegetative treatments.

Cultural Resource Coordination: A programmatic cultural report has been completed and approved by the State Historic Preservation Office (SHPO). Using the parameters described in the programmatic report, conduct survey and obtain clearance prior to any ground disturbing activities related to structural improvements.

Threatened, Endangered and Sensitive Species Coordination: Additional very site-specific biological assessments and evaluations will be written for chosen actions. Refer to and follow any mitigation measures or implementation parameters described in the biological assessments and evaluations written for the selected alternative. Location of improvements may be altered somewhat

in response to species considerations. Involve a wildlife biologist prior to final planning of any new improvements.

Recreation and Special Use Guidelines: Timing of the construction of new range structures must be coordinated with the recreation specialists and special use permit holders.

Fencing: All new fencing will contain a smooth bottom wire and **18 inch minimum bottom wire** height for wildlife. Conduct cultural resources and threatened, endangered and sensitive species coordination as described above. Where possible, locate fences within tree lines to limit impact to visual quality. Elk jumps may be constructed along new fences and along existing fences as appropriate.

Monitoring: Common to all alternatives are monitoring items chosen by the team to answer questions and check progress of improvement. The following is a list of the main items that will be monitored in the action alternatives: compliance, allotment inspections, range readiness, forage production, rangeland utilization, condition and trend, precipitation, noxious weeds and soil condition (see Monitoring section (chapter 4) for more specific information).

Mitigating Measures: In addition to implementation of Best Management Practices, the following mitigating measures are to be followed. Follow utilization guidelines to provide for favorable growth of forage species. If utilization guidelines are exceeded, stocking and management may need to be adjusted to maintain productivity of the pasture for the future. Livestock distribution techniques, such as intensified salting and herding should be used, to provide for better use of a pasture. Slash will avoid cliffrose where possible and slash with cliffrose in it will not be burned. Existing snags will not be cut and will be protected during burning. Cuts in deer habitat will be no greater than ¼ mile wide where possible. Tires and boots will be cleaned prior to leaving noxious weed areas. Revegetation will occur within thinned and burned sites to promote competition with noxious weeds. Burning and re-cutting of the 1,140 acre and 2,240 acre parcels will occur outside fawning season of April 15-June 15.

Research Coordination: A 300-foot buffer will be put in around all research study plots in pinyon and juniper treatment areas.

Other Management Items: Salting occurs throughout the allotment, but is not used in northern goshawk PFAs, meadows, burn areas or locations closer than 1/4 mile from water. Grazing systems are alternately rested and grazed in a planned sequence. Rotate livestock in a planned grazing system that alternates rest and graze period throughout a given year and from year to year. No new livestock tank construction, pipeline construction, and water lot development is planned for any alternatives. Livestock and wildlife use is well distributed by water sources throughout the allotment.

Project Design: Layout projects to appear as natural configurations of the woodland.

Alternative A (Proposed Action)

Alternative A is the proposed action developed by the Youngs Canyon Allotment Team to bring existing conditions towards desired conditions by doing the following:

- Permit grazing for up to a ten-year period. The exact length of the permit will depend on the permittees ability to properly manage the allotment.
- Remove the Walnut Canyon National Monument portion of the Youngs Canyon Allotment (approximately 510 acres) from the carrying capacity of allotment. Grazing of this area will continue through 2001 when the National Park Service plans to build their boundary fence.
- Maximum cattle numbers is 90 to 110 head of steers or 51 to 63 head of cows/calf's, from 5/15-10/31, using a four pasture deferred rotation grazing system. These cattle numbers are based on past stocking rates and carrying capacity estimates. Graze periods in each pasture is approximately 46 days each year.
- Assure 35% forage use standard is met for cattle and elk. Key areas monitoring points will be established within the allotment. Reduce cattle numbers or season of use to meet these use standards, if needed.
- Rehabilitate the Youngs Canyon holding pasture. Change cattle use from continuous use to 15 days per year. Shape sheer channel banks. Plant western wheatgrass. This project will cost approximately \$2000. The Forest Service will shape the banks and provide the grass seed.
- The Parker Three Step Clusters, frequency and canopy cover plots were done at existing Parker Three-Step Clusters sites in December 1999. Additional frequency plots will be established in areas of concern or in areas where changes in trend is expected or needed. At least two additional frequencies, canopy cover and ground cover plots will be established within impaired soil sites.
- Cut and broadcast burn approximately 5,322 acres of the allotment, see Map 2. Cliffrose will be avoided during burning. Burning will occur when fuel loading exceeds 10#/acre and in high-density rabbitbrush areas.

Previous cleared pinyon and juniper areas (approximately 1,140 acres) will be cut and burned to reduce young (less than 30 years old) pinyon and juniper trees and to reduce rabbitbrush. These previously cleared areas exist in the central and western portions of the allotment and vary from 20 to 300 acres in size. These sites are mostly irregularly shaped and linear. The desired conditions for these alluvial bottoms are managed for a diverse grass and shrub community. This will maintain and improve forage conditions for cattle, elk and antelope.

Young pinyon and juniper trees (less than 80 years old) will be cut and burned from approximately 2,240 acres on the northeast corner of the allotment. We will be avoiding cinder hills, Youngs Canyon, an electric substation and 100-acre patch of old trees. This will create two approximately 1100 acre irregularly shaped patches of open savanna like grassland. Scattered individual and clumps of trees (the largest trees available) will be scattered across this landscape to create this open savanna like grassland. This treatment will maintain and improve forage conditions for cattle, elk and antelope.

On old fuelwood cuts, pinyon and juniper trees will be cut and burned from the southeast corner of the allotment on approximately 880 acres. These cuts will be patches ranging from six to 600

acres in size and irregularly shaped. No trees will be cut over 12 inches in diameter. Openings will not exceed four acres. The residual condition will be a moderately forested pinyon and juniper woodland with emphasis on improving conditions for cliffrose, with all age classes of pinyon and juniper present. This will maintain and enhance habitat for wintering deer herds.

On previously untreated areas, young pinyon and juniper trees will be cut and burned from the southeast corner of the allotment on approximately 1,062 acres. These cuts will be patches ranging from seven to 20 acres in size and irregularly shaped. No trees will be cut over 12 inches in diameter. Canyons and steeper slopes will be avoided. Openings will not exceed four acres. This will create a moderately forested pinyon and juniper woodland with all age classes of pinyon and juniper present. Treated areas will retain the majority of larger and older trees. This will look different from the surrounding areas because there are older trees in these areas. The emphasis for this treatment will be to improve conditions for cliffrose. This will maintain and enhance habitat for wintering deer herds.

In all treatment areas, approximately 3-5 tons of tree slash will be left on the ground for nutrient cycling, soil stability, small mammals and birds. Burning would be designed to remove only the trees or rabbitbrush without removing ground litter below 3-5 tons per acre. The cost of cutting and burning in the areas of young trees will be approximately \$30 per acre of a total of approximately \$160,000. An estimated additional cost of \$44,800 will be needed to complete archeological surveys in these areas. The Forest Service will conduct these projects.

- A trick tank drinker system will be built near Youngs Canyon Dam. This system will provide water to all four pastures. This project will cost approximately \$13,000, roughly half by the Forest Service and half by the permittee. The fence around the trick tank will have a minimum bottom wire height of 18" above the ground to facilitate antelope use.
- If road funding becomes available, build a low water crossing where Forest Road 128 crosses Youngs Canyon at the old Youngs Canyon Dam site. This crossing would stop erosion at the dam site. This project will cost approximately \$10,000 and will be done by the Forest Service.
- Noxious weed inventories and treatments will be needed on the allotment over the next 10 years. Populations of scotch thistle, diffuse knapweed and other potential noxious weeds will be pulled, cut, mowed, dug or burned before seed set to reduce future spread of these species. Competitive species will be seeded around disturbed sites where needed. Special attention will give to all new disturbance areas including burning. Noxious weed inventories and treatments will cost approximately \$100 per year and will be done by the Forest Service.
- Monitoring costs: continue on-going elk/cattle monitoring effort at \$300/year (half Forest Service, half permittee), additional condition and trend monitoring at \$200/year and administrative costs.
- Maintenance will be done on all new and existing structural improvements including barbed wire fences, trick tanks, stock tanks and drinkers, as needed by the permittee. The bottom wire of new fences will be smooth and be a minimum height of 18 inches to facilitate pronghorn passage.

Alternative B

Alternative B eliminates scheduled cattle grazing on the Youngs Canyon Allotment and includes no other treatments (including pinyon and juniper cutting or burning) or livestock management (including water hauling or tank maintenance). This is the No Action Alternative required under NEPA. This alternative addresses the no cattle grazing issue in this area. This alternative also addresses the pinyon and juniper cutting and burning issue. It also addresses the issue that cattle hauled and unnatural water is creating an unnatural environment. This alternative does not preclude cattle grazing, pinyon and juniper cutting or burning, or livestock management on the Allotment in the future if a decision is made through another comprehensive analysis to resume these actions. To meet objectives no money will be spent on structural improvements. No maintenance of existing improvements will be done.

Alternative C

Alternative C is the cattle grazing management system currently in place with no additional improvements.

- Maximum cattle numbers is 42 head yearlong using a four pasture rest rotation grazing system. Graze periods in each pasture is approximately 120 days each year.
- 35% forage use standard by cattle and elk is used.
- No new structural improvement costs.
- Maintenance will be done on all new and existing structural improvements including barbed wire fences, trick tanks, stock tanks and drinkers, as needed by the permittee.
- Continue on-going elk/cattle monitoring effort at \$300/year (half Forest Service, half permittee) and administrative costs.

Alternative D

Alternative D uses a four-pasture rest rotation grazing system to meet management objectives. Each year, one pasture will receive yearlong rest from cattle grazing.

- Permit grazing for up to a ten-year period. The exact length of the permit will depend on the permittees ability to properly manage the allotment.
- Remove the Walnut Canyon National Monument portion of the Youngs Canyon Allotment (approximately 510 acres) from the carrying capacity of allotment. Grazing of this area will continue through 2001 when the National Park Service plans to build their boundary fence.
- Maximum cattle numbers is 70 to 83 head of steers or 38 to 47 head of cows/calf's, from 5/15-10/31, using a four pasture deferred rotation grazing system. One pasture will receive yearlong rest each year. This rest will be rotated through each pasture in a four-year period. Cattle numbers are based on past stocking rates and carrying capacity estimates. Graze periods in each pasture is approximately 56 days each year.

- Assure 35% forage use standard is met for cattle and elk. Key areas monitoring points will be established within the allotment. Reduce cattle numbers or season of use to meet these use standards, if needed.
- Rehabilitate the Youngs Canyon holding pasture. Change cattle use from continuous use to 15 days per year. Shape sheer channel banks. Western wheatgrass will be planted at the site. This project will cost approximately \$2000. The Forest Service will shape the banks and provide the grass seed.
- The Parker Three Step Clusters, frequency and canopy cover plots were done at existing Parker Three-Step Clusters sites in December 1999. Additional frequency plots will be established in areas of concern or in areas where changes in trend is expected or needed. At least two additional frequencies, canopy cover and ground cover plots will be established within impaired soil sites.
- Cut and broadcast burn approximately 5,322 acres of the allotment, see Map 2. Cliffrose will be avoided during burning. Burning will occur when fuel loading exceeds 10#/acre and in high-density rabbitbrush areas.

Previous cleared pinyon and juniper areas (approximately 1,140 acres) will be cut and burned to reduce young (less than 30 years old) pinyon and juniper trees and to reduce rabbitbrush. These previously cleared areas exist in the central and western portions of the allotment and vary from 20 to 300 acres in size. These sites are mostly irregularly shaped and linear. The desired conditions for these alluvial bottoms are managed for a diverse grass and shrub community. This will maintain and improve forage conditions for cattle, elk and antelope.

Young pinyon and juniper trees (less than 80 years old) will be cut and burned from approximately 2,240 acres on the northeast corner of the allotment. We will be avoiding cinder hills, Youngs Canyon, an electric substation and 100-acre patch of old trees. This will create two approximately 1100 acre irregularly shaped patches of open savanna like grassland. Scattered individual and clumps of trees (the largest trees available) will be scattered across this landscape to create this open savanna like grassland. This treatment will maintain and improve forage conditions for cattle, elk and antelope.

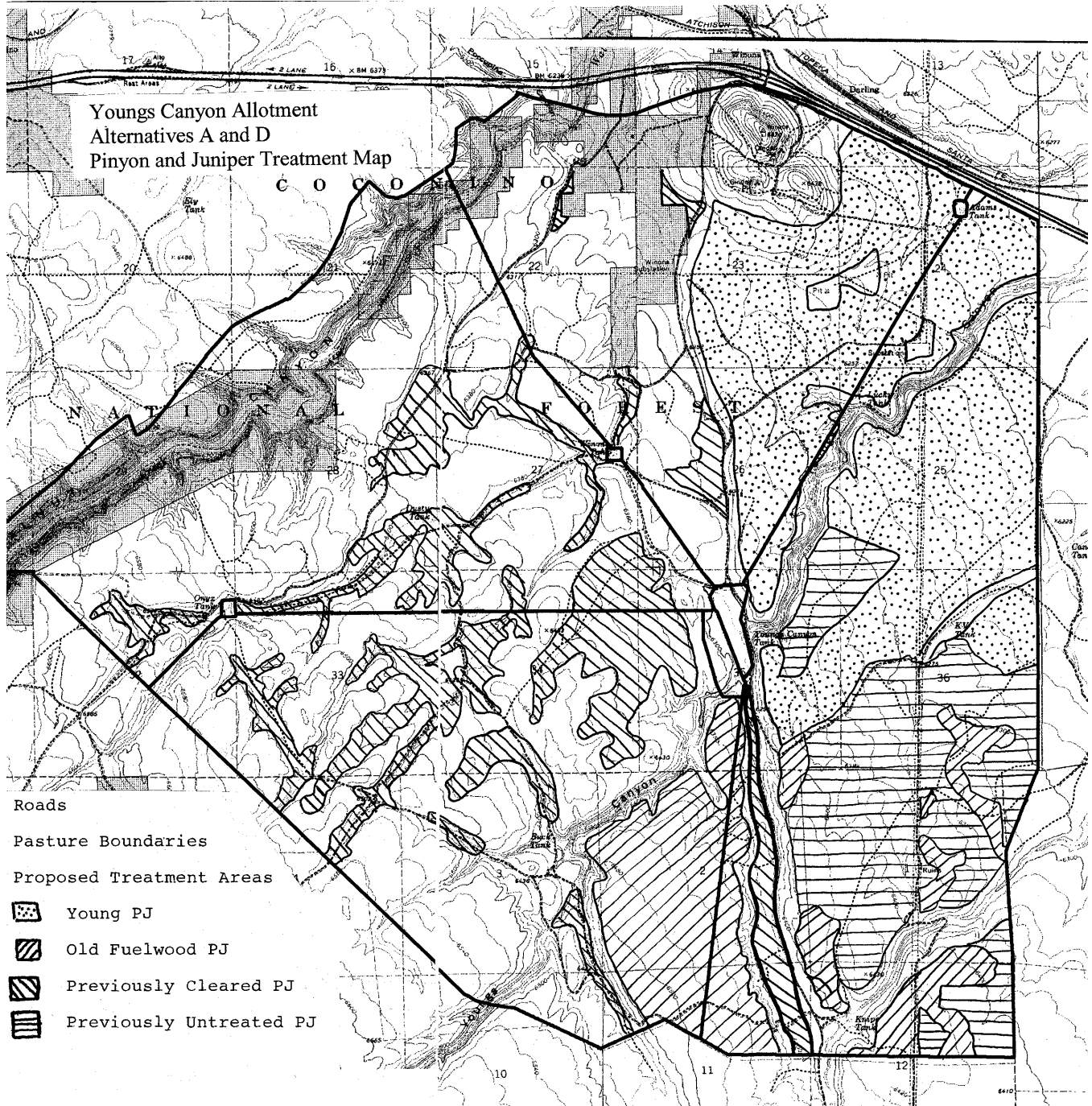
On old fuelwood cuts, pinyon and juniper trees will be cut and burned from the southeast corner of the allotment on approximately 880 acres. These cuts will be patches ranging from six to 600 acres in size and irregularly shaped. No trees will be cut over 12 inches in diameter. Openings will not exceed four acres. The residual condition will be a moderately forested pinyon and juniper woodland with emphasis on improving conditions for cliffrose, with all age classes of pinyon and juniper present. We will create a moderately forested pinyon and juniper woodland with emphasis on improving conditions for cliffrose. This will maintain and enhance habitat for wintering deer herds.

On previously untreated areas, young pinyon and juniper trees will be cut and burned from the southeast corner of the allotment on approximately 1,062 acres. These cuts will be patches ranging from seven to 20 acres in size and irregularly shaped. No trees will be cut over 12 inches

in diameter. Canyons and steeper slopes will be avoided. Openings will not exceed four acres. This will create a moderately forested pinyon and juniper woodland with all age classes of pinyon and juniper present. Treated areas will retain the majority of larger and older trees. This will create a moderately forested pinyon and juniper woodland leaving the majority of larger and older trees. This will look different from the surrounding areas because there are older trees in these areas. The emphasis for this treatment will be to improve conditions for cliffrose. This will maintain and enhance habitat for wintering deer herds.

In all treatment areas, approximately 3-5 tons of tree slash will be left on the ground for nutrient cycling, soil stability, small mammals and birds. Burning would be designed to remove only the trees or rabbitbrush without removing ground litter below 3-5 tons per acre. The cost of cutting and burning in the areas of young trees will be approximately \$30 per acre of a total of approximately \$160,000. An estimated additional cost of \$44,800 will be needed to complete archeological surveys in these areas. The Forest Service will conduct these projects.

- A trick tank drinker system will be built near Youngs Canyon Dam. This system will provide water to all four pastures. This project will cost approximately \$13,000, roughly half by the Forest Service and half by the permittee. The fence around the trick tank will have a minimum bottom wire height of 18” above the ground to facilitate antelope use.
- If road funding becomes available, build a low water crossing where Forest Road 128 crosses Youngs Canyon at the old Youngs Canyon Dam site. This crossing would stop erosion at the dam site. This project will cost approximately \$10,000 and will be done by the Forest Service.
- Noxious weed inventories and treatments will be needed on the allotment over the next 10 years. Populations of scotch thistle, diffuse knapweed and other potential noxious weeds will be pulled, cut, mowed, dug or burned before seed set to reduce future spread of these species. Competitive species will be seeded around disturbed sites where needed. Special attention will give to all new disturbance areas including burning. Noxious weed inventories and treatments will cost approximately \$100 per year and will be done by the Forest Service.
- Monitoring costs: continue on-going elk/cattle monitoring effort at \$300/year (half Forest Service, half permittee), additional condition and trend monitoring at \$200/year and administrative costs.
- Maintenance will be done on all new and existing structural improvements including barbed wire fences, trick tanks, stock tanks and drinkers, as needed by the permittee. The bottom wire of new fences will be smooth and be a minimum height of 18 inches to facilitate pronghorn passage.



Alternative Comparison

This section summarizes the differences between the alternatives. Table 1 gives an alternative comparison for permitted cattle numbers (maximum), structural improvement cost and other major alternative differences. Table 2 compares alternatives by the number of pastures, maximum graze periods, forage conditions and trends. Table 3 compares how each alternative addresses the proposed actions issues.

Table 1. Alternative comparison, which includes, permitted cattle numbers (maximum), improvements and other major alternative differences.

Alternative	Permitted Cattle Number (Max.)	Improvements	Other Differences
A	90 to 110 Yearlings Or 51 to 63 Cow/calf 5/15 to 10/31	1 trick tank (\$13,000) And 5,322 acres of Pinyon and Juniper Cutting and Burning (\$160,000)	31% reduction in livestock over current grazing permit. Four pasture deferred rotation grazing system with 42-day graze periods. Fifteen-day graze period in Youngs Canyon Holding Pasture compared to season-long use.
B	0	None	No cattle permitted.
C	42 Yearlong	\$0	Current management with its four-pasture rest rotation system. Graze periods of 120 days. One pasture each year receives yearlong rest.
D	70 to 83 Yearlings Or 38 to 47 Cow/calf 5/15 to 10/31	\$13,000 (Trick tank) And 5,322 acres of Pinyon and Juniper Cutting and Burning (\$160,000)	48% reduction in livestock over current grazing system. Four pasture rest rotation system with graze periods of 56 days. One pasture each year receives yearlong rest. Fifteen-day graze period in Youngs Canyon Holding Pasture compared to season-long use.

Table 2. Alternative comparison including vegetative trends and vegetative similarity to desired plant communities over the next 10 years.

Alternative	Vegetative Trends	Vegetative Similarity to Desired Plant Communities
A	Vegetative trends will have static to upward trends. Pinyon and juniper treatment areas will improve through increases in species diversity and abundance. In the remainder of allotment, pinyon and juniper trees will continue to expand. This expansion will slowly continue to reduce plant species diversity and abundance.	Similarity indexes will be moderate to high within most of the allotment. Big improvements will be seen with a reduction in pinyon and juniper in the treatment areas, with more ground cover, plant species diversity and species abundance. Youngs Canyon dam area will greatly improve with additional ground cover, plant species diversity and abundance. Untreated areas will remain low to moderate.
B	Vegetative trends will mainly have static trends. Pinyon and juniper trees will continue to expand which will slowly reduce species diversity and abundance. In localized areas without trees, trends will increase slightly for the next five years, than slowly tapering off as grass species become decadent.	Similarity will remain low to moderate as pinyon and juniper trees will continue grow and slowly reduce ground cover, plant species diversity and species abundance. In localized areas without trees, similarity will improve with increases in plant species diversity and abundance without cattle grazing for the first five years before tapering off.

Alternative	Vegetative Trends	Vegetative Similarity to Desired Plant Communities
C	Vegetative trends will mainly have static trends. Pinyon and juniper trees will continue to expand which will slowly reduce species diversity and abundance.	Similarity will remain low to moderate as pinyon and juniper trees will continue grow and slowly reduce ground cover, plant species diversity and species abundance. In localized areas without trees, similarity will remain low to moderate with year-round livestock use.
D	Very similar to Alternative A because yearlong pastures rest is off set by the increase in graze periods. Shorter graze periods in A will show slightly quicker results.	Very similar to Alternative A because yearlong pastures rest is off set by the increase in graze periods. Shorter grazed periods in A will show slightly quicker similarities.

Table 3. Alternative issue comparison from the proposed action.

Issue	Alternative A	Alternative B	Alternative C	Alternative D
Issue 1: The proposed action manipulates this ecosystem by pinyon and juniper cutting and burning for the benefit of livestock grazing, which may not be appropriate for the environment.	This is the proposed action. Pinyon and juniper cutting and burning 5,322 acres for watershed, wildlife and livestock improvement.	No pinyon and juniper cutting or burning.	No pinyon and juniper cutting or burning.	Same as Alternative A.
Issue 2: The proposed action includes livestock grazing that is a public nuisance and a destruction of natural resources.	This is the proposed action. Livestock grazing 5/15-10/31 each year in a four pasture deferred grazing system designed to maintain or improve area.	No livestock grazing for the next 10 years.	Livestock grazing yearlong with 42 head of cattle under a four pasture rest rotation grazing system. Grazing is above carrying capacity of area.	Livestock grazing 5/15-10/31 each year in a four-pasture rest rotation grazing system designed to maintain or improve area.
Issue 3: The cost of implementing and mitigating the proposed action is too expensive for the perceived benefits.	This is the proposed action. There is a cost for needed for watershed, wildlife and livestock improvements.	No costs.	No additional costs.	Same as Alternative A.
Issue 4: The proposed action does not adequately protect archeological sites from cattle grazing and the proposed treatments.	This is the proposed action. Clearance reports and surveys are completed before any ground disturbance activities. Clearance report completed for cattle grazing and management.	No disturbance from livestock or other treatment activities.	Clearance reports completed for cattle grazing and management.	Same as Alternative A.
Issue 5: The proposed action is using hauled and unnatural water for cattle, which is creating an artificial environment that is affecting the biological balance in the area.	This is the proposed action. Water is hauled in, new trick tank built, and earthen tanks are maintained. Limited soil impacts immediately around water only.	No water hauling. No new trick tank. Earthen tanks are not maintained for the next 10 years. Limited soil impacts around remaining water sources by wildlife. Eventually,	Water hauling continues. Limited soil impacts immediately around water only.	Same as Alternative A.

Issue	Alternative A	Alternative B	Alternative C	Alternative D
		existing earthen tanks would not hold water.		
Issue 6: The proposed action does not include yearlong rest for any pastures.	This is the proposed action. No yearlong pasture rest, but shorter graze periods for each pasture.	Yearlong pasture rest from livestock for the next 10 years.	Yearlong pasture rest in one pasture each year. This rest is rotated in a four-year cycle.	Same as Alternative C.

Preferred Alternative

In this environmental assessment the Forest Service's preferred alternative is Alternative A. Alternative A will best meet our purpose and need and project objectives. See Map 2 for Alternative A map. Alternative A reduces graze periods in each pasture from approximately 120 days each year to 46 days. This graze period reduction will improve ecological conditions throughout the allotment more quickly than the other alternatives.

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter shows the present condition (i.e. affected environment) within the project area and the changes that can be expected from implementing the action alternatives or taking no action at this time. The no action alternative sets the environmental base line for comparing effects of the action alternatives.

The major issues define the scope of environmental concern for this analysis. The environmental effects (changes from present base line condition) that are described in this chapter reflect the identified major issues. Some of the environmental effects are confined to this action and the project area. Others are cumulative with environmental effects from other actions and cover an issue area beyond the project area. Cumulative effects are discussed for each major issue when they occur.

We are including history of this area to set the stage for the affected environment and environmental consequences.

HISTORY

Prior to Euro-American settlement, periodic wildfires occurred moderately often on the allotment creating some park-like landscapes dominated by pinyon and juniper trees or pinyon/juniper stands with a variety of tree sizes and ages. Historically, wildfires, combined with climatic changes, created conditions necessary for good grass, forb and shrub production and some tree regeneration.

Archaeological evidence indicates that the area has been inhabited by prehistoric people beginning around 5000 B.C. and continuing until approximately A.D. 1250. The Archaic inhabitants subsisted by hunting and gathering wild plant foods on a seasonal basis. Subsequent prehistoric people, the Sinagua, occupied this area on a permanent basis, and used a variety of agricultural strategies to grow crops. Proto-historic, historic, and contemporary Indian people have and continue to use this area for plant and wood gathering, pinyon nut gathering and hunting.

The earliest Euro-Americans in the Youngs Canyon Allotment arrived in the mid to late 1800's and included Basque shepherders, itinerant trappers and mountaineers. The first homesteaders arrived in the 1880's and began harvesting the region's timber resources as firewood and building materials.

Cattle grazing started in the late 1870's with small cattle operations. In 1881, John Young started the first large scale cattle ranch (A-1 Ranch) in the Flagstaff area. The Atlantic and Pacific Railroad completion to Flagstaff in 1882 brought the next major influx of cattle into this region. Cattle numbers increased from this time and peaked in the late 1890's. The industry was brought down at the turn of the century by a drought, low cattle prices and poor range conditions. During this time, continual grazing and overstocking caused some gully erosion and soil loss. These actions also reduced grass and litter on the forest floor that served as fuel for forest fires.

Prior to Euro-American settlement some ungulates ranged throughout the region. These ungulates were mule deer, antelope, bighorn sheep and Merriam's elk. A few springs, ephemeral drainages and marshy bogs provided water. Wildlife moved according to climatic changes and water availability, ranging long distances between water sources during dry periods.

Grazing has continued on the Youngs Canyon Allotment since the mid-1880. However, over time the Forest Service reduced cattle numbers and controlled cattle grazing periods more strictly. Livestock grazing management has been improved over time by the construction of fences and waters by the Forest Service and permittees. Over the last 10 years cattle numbers have varied from 55 cows/calf's yearlong in 1989 to non-use in 1992 and 1999. In 1993, permitted numbers were reduced to 42 cows/calf's yearlong, which grazed the area from 1993 through 1995. Since 1996, 80 to 115 yearlings have grazed on the allotment during the summer season only (May-October).

Merriam's elk were extirpated in the early 1900's and Rocky Mountain elk were introduced to repopulate the area. Rocky Mountain elk numbers peaked in the mid-1980's and are now on a slow decline.

Currently, small elk herds graze throughout this allotment throughout the year. The Arizona Game and Fish Department manages the health and well being of the elk herds and controls their numbers through hunting. Viewing and hunting elk are popular activities for Arizonans and some people come from other states to hunt elk. Elk populations are low to moderate on the allotment. Elk concentrate, however, within alluvial bottoms, old pinyon and juniper treatment areas and water areas result in some high-localized use. Due to the increasing abundance of rabbitbrush, juniper and pinyon, elk habitat quality is declining.

Deer are attracted to the shrubs, grass and forbs throughout the allotment. Deer are year-round residence and there is good winter range for deer near the canyons. Deer numbers are near average on the allotment compared to surrounding areas. Due to the increases in pinyon and juniper and decreases in cliffrose deer habitat quality is declining.

Antelope and other species adapted to open grasslands have not increased and have probably decreased since the early 1900's on the allotment. Small herds of antelope that currently use the area focus on previously cleared areas and the more open eastern portion of the allotment. Due to the increasing abundance of rabbitbrush, juniper and pinyon, antelope habitat quality is declining.

Cumulative Actions

The actions listed below have occurred in the recent past, are currently underway, or have been described in the Schedule of Proposed Actions for this year. The Project Record File contains a copy of the SOPA and notes as to whether projects are considered connected to this project or not. The projects listed here are considered in the following effects sections for cumulative effects.

Youngs Canyon Soil and Water Improvement Project – This project is located within the Youngs Canyon Allotment. The project thins young pinyon and juniper trees 3 to 9 inches in diameter, using a combination of hand treatment and a shear attachment for a Bobcat. The 300 project acres fall within the Youngs Canyon Allotment. This project will reduce some of the pinyon and

juniper trees that are encroaching on grassland soils and limiting herbaceous production and diversity.

The areas chosen for the Youngs Canyon Soil Condition Improvement project were selected because they contain many small diameter trees, are relatively accessible via forest road and are part of the acres proposed for thinning under the Youngs Canyon Allotment Proposed Action. These areas have been previously chained or pushed to remove all trees. The proposed treatment will result in little ground disturbance and was selected for this reason.

Thinning these acres now, will not have a negative cumulative effect when considered with the surrounding projects proposed under the Youngs Canyon Allotment. Rather, this thinning project will allow us to adapt our implementation techniques for the larger area.

Vegetation

Affected Environment

Vegetation on Youngs Canyon Allotment is dominantly by a pinyon and juniper community at an elevation of approximately 6400'. Pinyon and juniper cover the majority of the allotment. Old growth pinyon and juniper exists in small patches within the canyons and some steeper sloped areas. However, the majority of the allotment contains pinyon and juniper that are less than 100 years old. Much of the area in the eastern portion of the allotment was recently grassland and is being filled in with pinyon and juniper trees. Throughout the allotment there are scattered areas of deeper soils on which pinyon and juniper trees have been removed since the 1960's. These treatments have created productive grasslands. Rabbitbrush, pinyon and juniper are increasing in abundance in these created grasslands.

Two major canyons run through the allotment. Walnut Canyon runs through the northwestern portion of the allotment. The majority of the Walnut Canyon portion of the allotment lies within the expansion area of Walnut Canyon National Monument. This will be fenced in 2001. The only riparian area on the allotment is a 1/2-mile long riparian community of narrowleaf cottonwood, boxelder and walnut trees within the Walnut Canyon expansion area. No permanent water exists in this area. Youngs Canyon runs through the south central portion of the allotment. It has diverse vegetation, including a small pine stringer, but contains no riparian values.

Blue grama is the dominant grass species found throughout the allotment. Rubber rabbitbrush is dense throughout much of the cleared pinyon and juniper areas. Cliffrose (*Cowania mexicana stansburniana*) and fernbush (*Chamaebatiaria millifolium*) are two other abundant shrub species and provide important structure and food for wildlife.

Dalmation toadflax, scotch thistle and diffuse knapweed exist in small-scattered populations throughout the allotment. These weed species are the only known noxious weed on the Youngs Canyon Allotment. These species are of concern because of their potential to aggressively colonize an area and compete with native vegetation. Control and eradication efforts are most effect when populations are small.

Forage production varies considerably from site to site; depending on soils, water availability and overstory density. Cleared pinyon and juniper areas with blue grama, squirreltail and western wheatgrass should be producing an average of 900 pounds of forage per acre and are producing 200-350

pounds per acre. Closed pinyon and juniper areas produce very little forage (<100 pounds per acre). The remainder of the allotment should be producing between 200 and 900 pounds per acre, but is producing 100-350 pounds per acre. The density of trees is the main determining factor for the amount of forage throughout the allotment. The main forage ground cover species are blue grama, squirreltail, western wheatgrass, three-awn, sand dropseed and needle-and-thread.

Full capacity rating for livestock is given to 8,951 acres of the allotment. The only portions of the allotment that are in potential capacity classification are found within alluvial soil bottomlands throughout the allotment (approximately 570 acres). No capacity classification is given to approximately 420 acres of the allotment where slopes are over 40 percent and/or where forage production is less than 100 pounds per acre, mainly on the sides of the canyons and in dense pinyon and juniper stands.

The narrative below describes the overall ecological condition and trend, and is based on professional judgment and field-collected data. Condition and trend are long-term measures of the health of vegetation. The estimates below give an overview of conditions and trends for large areas and do not necessarily apply uniformly to all areas. In fact, within each vegetation type on the allotment every condition exists.

Ecological and rangeland management status is satisfactory throughout the allotment except within portions of the alluvial bottom lands, portions of the cleared pinyon and juniper areas and some areas of increasing pinyon and juniper. Unsatisfactory conditions exist in these areas because of the low similarity and static trend of these areas to the potential natural community listed in our Terrestrial Ecosystem Survey. Potential natural community is the biotic community that would be established under present environmental conditions if all successional sequences were completed without additional human caused disturbance. Unsatisfactory conditions within these alluvial bottoms and cleared pinyon and juniper areas are a result of historic and current use by cattle and elk, high rabbitbrush density and roads. In alluvial soil areas flooding during snowmelt and heavy thunderstorms contributes to the unsatisfactory conditions. In some of the pinyon and juniper areas, tree densities are increasing enough to increase bare soil and reduce ground cover by out-competing understory vegetation for water.

Trend for the allotment is mainly static. Cattle management has changed over the last three years by using this area only during the summer season and reducing grazed periods from 120 days to 46 days. The utilization standard for the allotment has been 35%. A change in trend has not been observed. Increases in rabbitbrush, pinyon and juniper are slowing an improvement in trend. Historic and current use by cattle, use by elk, poorly located roads and flooding during snowmelt and heavy thunderstorms may also slowly improvements in trend.

Effects of the Alternatives

Common to All Alternatives: The following is a list of effects to pinyon and juniper vegetation common to all alternatives. Pinyon and juniper tree density and cover will increase slightly over the next 10 years where no pinyon and juniper treatments are proposed. These trees will continue to increase unless this area is thinned in the future. Ecological and rangeland management conditions will remain satisfactory on the majority of the allotment under all the alternatives, except for Alternative C, which is above the carrying capacity (mainly because of winter use). Unsatisfactory conditions areas of the allotment will move towards satisfactory under all the alternatives except for Alternative C. Rehabilitation of the

Youngs Canyon holding pasture (impaired soils) occurs under all the alternative except for Alternative C. The impaired acres (approximately 570 acres) will be improved except in Alternative C.

Alternative A: Alternative A would cut and prescribe burn approximately 5,322 acres of pinyon and juniper on the allotment, mainly removing young trees. This burning would help meet the long-term desired condition objectives by an increase in grass, forb and shrub abundance, diversity and production.

Alternative A permits livestock grazing in a four pasture deferred rotation grazing system with 90 to 110 yearlings or 51 to 63 cow/calf's. Cattle would graze grasses, forbs and shrubs in each pasture approximately 46 days each year. Ecological and rangeland management conditions would most likely move towards desired conditions by an increase in grass, forb and shrub abundance, diversity and production through this grazing system with its proper carrying capacity for the area.

Alternative B: Alternative B has no pinyon and juniper cutting or burning and would not permit livestock grazing for the next 10 years. In the first five years, ecological and rangeland management conditions in tree-less areas would most likely move towards desired conditions by an increase in grass, forb and shrub abundance, diversity and production because of rest from livestock grazing. After five years, ecological and rangeland management conditions would likely move away from desired conditions by a decrease in grass, forb and shrub abundance, diversity and production because of a build up of grass litter. Pinyon and juniper trees throughout the allotment would continue to expand and slowly reduce grass, forb, shrubs and ground cover throughout the allotment reducing rangeland management conditions.

Alternative C: Alternative C does not include pinyon and juniper cutting and burning and includes yearlong cattle grazing. Pinyon and juniper trees throughout the allotment would continue to expand and slowly reduce grass, forb, shrubs and ground cover throughout the allotment. Yearlong grazing does not fit with this four-pasture rest rotation grazing system or this area. Graze periods for this grazing system is 120 days, which greatly increases regrazing of grass plants during the growing season. The allotment is dominated by pinyon and juniper/blue grama vegetation which is not conducive to winter grazing. In addition, this allotment can receive significant snow in most years. Ecological and rangeland management conditions would most likely move away from desired conditions by an decrease in grass, forb and shrub abundance, diversity and production.

Alternative C permits livestock grazing in a four-pasture rest rotation grazing system with cattle numbers over the capacity for the allotment area. Cattle would graze grasses, forbs and shrubs in each pasture approximately 120 days each year. This length of graze would permit regrazing of plants by cattle.

Alternative D: Alternative D would cut and prescribe burn approximately 5,322 acres of pinyon and juniper on the allotment, mainly removing young trees. This burning would help meet the long-term desired condition objectives by an increase in grass, forb and shrub abundance, diversity and production.

Alternative D permits livestock grazing in a four pasture rest rotation grazing system with 70 to 83 yearlings or 38 to 47 cow/calf's. Cattle would graze grasses, forbs and shrubs in each pasture approximately 56 days each year. This length of graze will permit some regrazing of plants by cattle. In this rest rotation grazing system one pasture receives yearlong rest. This allows plants to go through a full years cycle without being grazed by livestock. Ecological and rangeland management conditions would most likely move closer towards desired conditions by an increase in grass, forb and shrub

abundance, diversity and production through this grazing system. Conditions over time would be very similar to Alternative A because of Alternative D's longer graze periods but has yearlong rest. Shorter graze periods are better for the overall area conditions, however slightly, over yearlong pasture rest. Elk use in pastures rested by cattle can significantly reduce the benefits of yearlong cattle rest.

Soil And Watershed

Affected Environment

Soil condition is an evaluation of soil quality based on an interpretation of factors, which effect soil function. Primary soil functions are the ability of the soil to: 1) accept, hold and release water, 2) accept, hold and release nutrients (recycle nutrients) and 3) resist erosion.

Watershed condition is a description of the health of a watershed or portions thereof in terms of the factors, which affect hydrologic function and soil productivity.

Domestic cattle grazing have the potential to affect soil and hydrologic functions that are important in the maintenance of long-term productivity and favorable conditions of water flow. Specifically, changes in the soil's surface structure and it's ability to accept, hold and release water may be affected by compaction caused by trampling. The nutrient recycling function of the soil may be interrupted by removal of vegetation that impacts above ground nutrient inputs into the system. Finally, the soil's resistance to erosion is affected by changes in plant density, composition and protective vegetative ground cover that are part of the organic components in the soil.

Several soil characteristics have been selected to evaluate the differences between alternatives on hydrologic function and soil productivity. These characteristics include: soil surface structure, bulk density, organic matter (litter), plant diversity and ground cover.

Table 3 displays current soil condition ratings by watershed within the Youngs Canyon Allotment. The table reflects estimates of soil condition on portions of larger watersheds affected by the allotment. Explanations of unsatisfactory soil conditions follow this table.

Table 3. Satisfactory and unsatisfactory soil conditions within the Coconino National Forests currently and under each alternative within the Youngs Canyon Allotment. Watershed conditions are given in acres and percent based on the entire watershed and allotment area.

Watershed	Condition Class	Acres and % of Watershed	Acres and % of Allotment
Canyon Diablo Total Acres 223,788	Satisfactory	177,071 acres, 79%	6161 acres, 100%
	Unsatisfactory	46,717 acres, 21%	0 acres, 0%
Lake Mary Total Acres 97,207	Satisfactory	91,972 acres, 95%	4,204 acres, 100%
	Unsatisfactory	5,235 acres, 5%	0 acres, 0%

The Universal Soil Loss Equation, where the current rate of soil erosion exceeds tolerable or the rate at which soil formation occurs, models unsatisfactory soil condition. Based on TES predictions and field surveys, no soils in the Youngs Canyon Allotment are considered to be in unsatisfactory condition. However, impaired soils do exist on map unit 41 due to compaction and limited ground cover

Erosion hazard (sheet and rill erosion) is slight to moderate for TES map units 41, 436, 437, 473 and 491. Potential as well as current soil loss rates as predicted by the Universal Soil Loss Equation (USLE), do not exceed tolerable soil loss rates. Average slope gradient for this map unit is five percent. Steep slopes (>40%) exist on the allotment on Youngs Canyon, Walnut Canyon (TES map units 435 and 455) and Winona cinder cone (TES map unit 441), all of which are in satisfactory condition. Erosion hazard is moderate for the Winona cinder cone and severe for the canyon slopes. Total acres for the severe erosion hazard is 1352 acres.

Generally the Forest Service lands on the Youngs Canyon Allotment are in satisfactory watershed condition, with the exception of a portion of Terrestrial Ecosystem Soil (TES) unit 41 (approximately 570 acres, five percent of the allotment). These 570 acres are impaired because of a lack of ground cover, mainly from the lack of litter and vegetation. TES unit 41 is the alluvial bottom land soil type that have been disturbed through past and current cattle grazing, elk grazing, poor road locations and flooding during snow melt and heavy thunderstorms. The largest impaired soil site is the Youngs Canyon Dam area, which was breached in the early 1970's, leaving behind a large eroding sediment filled basin. Satisfactory soil condition indicates that the productivity of the soil resource is being maintained with respect to all soil functions.

Soil conditions over the majority of the Youngs Canyon Allotment are stable, but may shortly decline because of the increase pinyon and juniper trees. Roughly 40% of the Youngs Canyon Allotment is densely forested with pinyon and juniper. As these trees get denser, ground cover decline and soil conditions will decrease over time. Soil conditions will decline in Alternative B and C where no pinyon and juniper treatments will be completed. In Alternatives A and D there are areas that will not have pinyon and juniper treatments. Soils of these untreated areas will decline as tree cover increases and herbaceous ground cover declines.

Soil conditions of more open grassland are stable with a combination of litter and vegetation providing ground cover. Generally, the more open the canopy the greater the forage production (with differences due to soil type and moisture availability). Grazing animals will tend to utilize forage in the areas favoring the higher forage production areas.

Because of elevation and soil texture, no cryptogamic soils are found within the Youngs Canyon allotment. There is no impact to cryptogamic soil for any alternative.

Effects of the Alternatives:

Common to All Alternatives: Soil conditions over the majority of the Youngs Canyon Allotment are stable, but may shortly decline because of the increase pinyon and juniper trees. Nearly half of the allotment in all alternatives will not have pinyon and juniper treatments. Soil conditions in these areas will slowly decline with the increase in pinyon and juniper canopy cover and a decrease in ground cover.

The nearest perennial water in the Lake Mary and Canyon Diablo Watersheds is located roughly 25 miles downstream of the allotment at the Little Colorado River. Because of soil condition within the allotment and proximity to perennial water, none of the alternatives are expected to have a significant direct effect on water quality.

Alternatives A, B, C and D: Table 4 compares the alternatives for soil and watershed conditions for all ponderosa pine and meadow vegetation types.

Table 4. Alternative comparison for soil and water conditions for the next 10 years.

Alluvial Soil Areas	Alternative A	Alternative B	Alternative C	Alternative D
570 acres, these soils are impaired because of past and current cattle grazing, elk grazing, roads heavy storm events, and tree encroachment.	Impaired soil acres decrease by an increasing in ground cover and plant abundance summer cattle grazing and a decrease in pinyon and juniper.	Similar to Alternative A except impaired soil conditions improve slightly faster with no cattle grazing where pinyon and juniper are not present. With dense stands of pinyon and juniper, soil conditions slowly decline.	Soil conditions remain the same with winter cattle use and slowly decline as pinyon and juniper trees reduce ground cover.	Similar to Alternative A for impaired soil conditions because yearlong pasture rest is offset by an increase in graze periods. Reduced graze periods in Alternative A does improve soil conditions slightly faster.

Youngs Canyon Tank Area	Alternative A	Alternative B	Alternative C	Alternative D
Part of impaired soil conditions above, but has had additional impacts of a breached dam. The dam created an alluvial deposit that is now eroding. This area is also a holding pasture.	Reducing cattle graze periods to 15 days per year, bank shaping, grass seeding and a road crossing will improve soil conditions in the area.	Eliminating cattle grazing will improve ground cover conditions in the area. However, soil stability will still be a problem with no bank shaping, grass seeding or a road crossing.	Yearlong grazing in this area will keep ground cover conditions low in this area. Soil stability will also continue to be a problem with no bank shaping, grass seeding or a road crossing	Same as Alternative A.

Untreated Pinyon Juniper Areas	Alternative A	Alternative B	Alternative C	Alternative D
	No pinyon and juniper treatment will be done on 5,043 acres of the allotment. Pinyon and juniper will continue to slowly increase, reducing ground cover and increasing erosion.	No pinyon and juniper treatment will be done on any of the allotment area, 10,365 acres. Pinyon and juniper will continue to slowly increase, reducing ground cover and increasing erosion.	No pinyon and juniper treatment will be done on any of the allotment area, 10,365 acres. Pinyon and juniper will continue to slowly increase, reducing ground cover and increasing erosion.	Same as Alternative A.

Treated Pinyon and Juniper Areas	Alternative A	Alternative B	Alternative C	Alternative D
	Pinyon and juniper treatments on 5,322 acres. After treatments, ground cover will increase in the form of litter and vegetation.	No pinyon and juniper treatments.	No pinyon and juniper treatments.	Same as Alternative A.

Water Quality

Affected Environment

The Department of Environmental Quality water quality assessment report referred to as the "1998 305(b) Report" is a description of the status of water quality in Arizona. The report was prepared to fulfill biennial reporting requirements contained in the Clean Water Act. Table 5 summarizes the water quality status within those watersheds that occur within the Youngs Canyon Allotment.

Table 5. Summary of the water quality status of stream courses affected by this allotment. This information is taken from the 1998 Arizona Water Quality Assessment published by the Arizona Department of Environmental Quality

Water Quality Status of Watersheds Affected by the Youngs Canyon Allotment.						
WATERBODY NAME LOCATION REACH OR LAKE NUMBER	WATERBODY SIZE-miles	DESIGNATED USES	ASSESSMENT CATEGORY	WATER QUALITY LIMITED	USE SUPPORT	ASSESSMENT COMMENTS
Little Colorado River 15020016 Dinnebito Wash (Canyon Diablo and Lake Mary Watersheds)	4	A&Ww, FBC, FC, DWS, AgI, AgL	Monitored	Yes	-	USGS monitoring site at Grand Falls, 12 samples 1992-1994: coper impairing uses and very high levels of total suspended solids (TSS) in water column.

ADEQ = Arizona Department of Environmental Quality, AGFD = Arizona Game and Fish Department, A&Ww = Aquatic and Wildlife Warmwater Fishery, FBC = Full Body Contact, DWS = Domestic Water Source, AgI = Agricultural Irrigation, AgL = Agricultural Livestock Watering.

Any above background sources of sediment within the Youngs Canyon Allotment area come from the cumulative effects of a variety of sources. Activities within the watersheds are displayed in the cumulative effects section. All of the action alternatives are designed to improve grazing practices and result in maintenance or improvement of soil conditions.

The Nonpoint Source Intergovernmental Agreement signed by the Forest Service (Region 3) and the Arizona Department of Environmental Quality states that the Forest Service will endeavor to minimize and mitigate all potential nonpoint source pollution activities. As agreed upon by the State of Arizona and the Forest Service, the most practical and effective means of controlling potential nonpoint pollution sources from forests and rangelands is through the development of preventative or mitigating land management practices, generally referred to as Best Management Practices (BMP), or in the case of Arizona's process, Guidance Practices (GP). The purpose of this agreement is to meet objectives defined

by the United States Congress in the Federal Water Pollution Control Act (as amended in 1987). These objectives are to restore and maintain the chemical, physical and biological integrity of the nation's waters in Arizona by complying with water quality standards identified for designated uses in downstream perennial waters.

The following GPs were developed for the Youngs Canyon Allotment through the Integrated Resource Management process and will apply to all livestock grazing alternatives. These GPs should protect soil and water quality on the allotment under the management alternatives. Other BMPs or GPs have been adopted from the "Draft Best Management Practices and Rangeland Guidance Practices for Grazing Activities in Arizona, 1991." These practices include:

Planned Grazing System - Grazing systems are alternately rested and grazed in a planned sequence. Rotate livestock in a planned grazing system that alternates rest and graze period throughout a given year and from year to year. See each alternative for specifics on how this practice is now displayed.

Proper Grazing Use - Grazing at an intensity that will maintain enough cover to protect the soils and maintain or improve the quantity and quality of desired vegetation. See each alternative for specifics on how this practice is adopted.

Trough or Tank - To provide watering facilities for animals at selected locations. No new tank construction, pipeline construction, and water lot development is planned for any alternatives. Livestock and wildlife use is well distributed by water sources throughout the allotment.

Fencing - Fencing is intended to improve livestock and wildlife management, control access, prevent soil loss, and improve water quality. See each alternative for fencing specifics.

Monitor and enforce permittee compliance - Monitor and enforce permittee compliance with terms and conditions of the grazing permit.

Wildlife

The affected environment and environmental consequences for wildlife are divided into the following sections: 1) Management Indicator Species, 2) Special Status Species, 3) Other Wildlife Species.

Affected Environment for Management Indicator Species

(Elk, Deer, Antelope and Juniper titmouse)

Three big game species, mule deer, elk and antelope use the Youngs Canyon Allotment with deer being the most common. These species consume some of the same type of vegetation as cattle, may change their distribution relative to cattle, and their movements may be impeded by cattle fences. Elk use on Youngs Canyon Allotment is low to moderate year-round, with some concentration in the old pinyon and juniper treatment areas and around waters. Deer tend to have a diet of browse and forbs, with green grass utilized mainly in the spring. Cattle tend to have a diet of grass with browse occasionally. The diets of deer and cattle are most similar during the spring and fall. Elk diets have the greatest amount of similarity with cattle. Elk will travel large distances to meet their nutritional needs, shifting their foraging patterns to move into areas of fresh feed. Elk will return to areas that have been previously grazed if there is plant regrowth to consume. Antelope are adapted to open landscapes and commonly

observed within grasslands, however their diet is primarily forbs rather than grasses. Small herds of antelope that use the Young's Canyon area focus on old pinyon and juniper treatment areas and the east side of the allotment. More expansive areas for antelope occur to the east, off the allotment. The primary habitat for pronghorn in this Game Management Unit (5BN) is the top of Anderson Mesa during the summer. Pronghorn seasonally migrate off the Anderson Mesa rim to their winter range to the east and northeast. Between the lower slopes of the Anderson Mesa rim and the winter range is habitat that can be used between seasons. This transition habitat can be occupied by small herds of pronghorn (10 or so) during the summer. Competition for food, and disturbance between antelope and cattle is minimal on Young's Canyon Allotment due to lack of diet overlap and relatively few numbers of antelope. Because of the juxtaposition of canyons/dense pinyon juniper trees (good cover/loafing) and open areas on and adjacent to allotment, big game movements occur throughout.

Thirty five percent is an appropriate utilization by wildlife and cattle for forage in this allotment. This will allow the residual 65 percent of the plant to be available to reproduce, produce seed heads, produce litter important for nutrient recycling, and provide for the needs of wildlife.

The Arizona Game and Fish Department (AGFD) is responsible for managing wildlife populations in Arizona and the Forest Service is responsible for managing habitat on Forest Service lands. The Forest Service coordinates with AGFD. The Youngs Canyon Allotment is a part of AGFD Game Management Unit 5BN (GMU). The current populations of elk in this unit are expected to remain the same for the next few years. Elk populations on the forest are stable, slightly increasing and slightly decreasing depending on management goals for a particular GMU. Deer populations on the Forest are declining apparently in response to recent drought conditions, juniper encroachment and limited browse. Pronghorn populations on the Forest are stable in some areas and declining in others. They are declining in this Game Management Unit and there remains considerable concern about this population, primarily focused around fawn recruitment.

The Juniper Titmouse is a small bird and a management indicator species of pinyon-juniper woodland. It forages from limbs, twigs, bark and on the ground for a variety of insects and plants including leaf galls, aphids, ants, grasshoppers, weed seeds and pinyon and oak mast. It is an obligate cavity nester and roosts in cavities, sometimes in pines. It is considered relatively common on the allotment.

Effects of Alternatives for Management Indicator Species

The effects to these species are intended to represent the effects to the habitats, and other dependent species, for which they are indicators of ecosystem health.

- MA 7-Pinyon-juniper on less than 40% slopes. Plain titmouse, mule deer and elk.
- MA 8-Pinyon-juniper on greater than 40% slopes. Plain titmouse, mule deer and elk.
- MA 10-Transition Grassland. Antelope.

Population viability on the Forest for all management indicator species is expected to be maintained over the life of this decision.

Table 6. Comparison of alternatives for Management Indicator Species.

Species	Alternative A	Alternative B	Alternative C	Alternative D
Elk	Rest up to 74 day/pasture will increase vigor & seed production of forage plants. Young's Canyon holding pasture rehabilitation will improve habitat combined with reduction from continuous use to 15 days. Burning and re-cutting of trees are positive due to opening maintenance. Low water crossing will lessen soil erosion, improving habitat. Trick tank construction will provide more reliable water, though still climate dependent. Weed treatments will maintain native diversity. Some elk may be disturbed with thinning and burning. Slightly better than D due to reduced graze periods.	Year round rest will increase vigor & seed production of forage plants. Young's Canyon holding pasture will continue to decline. Openings will continue to infill with small trees. Lack of low water crossing will continue soil erosion and meadow degradation. Water will continue to be unreliable. Weed populations will expand. No cattle related disturbance.	Year round use will decrease vigor & seed production of forage plants. Young's Canyon holding pasture will continue to decline. Openings will continue to infill with small trees. Lack of low water crossing will continue soil erosion and meadow degradation. Water will continue to be unreliable. Weed populations will expand. Cattle related disturbance at maximum.	Rest up to 74 day/pasture will increase vigor & seed production of forage plants. Young's Canyon rehabilitation will improve habitat combined with reduction from continuous use to 15 days. Burning & re-cutting of trees are positive due to opening maintenance. Low water crossing will lessen soil erosion, improving habitat. Trick tank construction will provide more reliable water though still climate dependent. Weed treatments will maintain native diversity. Some elk may be disturbed with thinning and burning

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Species	Alternative A	Alternative B	Alternative C	Alternative D
Deer	<p>Rest up to 74 day/pasture will increase vigor & seed production of forage plants. Winter range conditions enhanced. Young's Canyon holding pasture rehabilitation will improve habitat combined with reduction from continuous to 15-day use. Burning & re-cutting of trees are positive due to opening maintenance with small openings emphasized in w and se portions. Low water crossing will lessen soil erosion, improving habitat. Trick tank construction will provide more reliable water, though still climate dependent. Weed treatments will maintain native diversity. Deer may be disturbed with thinning and burning. Slightly better than D due to reduced graze periods.</p>	<p>Year round rest will increase vigor & seed production of forage plants. Cliff rose vigor on decline in portions of allotment. Young's Canyon holding pasture continues to decline. Openings continue to infill with small trees. Lack of low water crossing will continue soil erosion and meadow degradation. Water continues to be unreliable. Weed populations will expand. No cattle related disturbance.</p>	<p>Year round use will decrease vigor & seed production of forage plants. Heaviest use on browse and highest impact to winter range. Young's Canyon holding pasture will continue to decline. Openings will continue to infill with small trees. Lack of low water crossing will continue soil erosion and meadow degradation. Water will continue to be unreliable. Weed populations will expand. Cattle related disturbance at maximum.</p>	<p>Rest up to 74 day/pasture will increase vigor & seed production of forage plants. Winter range conditions enhanced. Young's Canyon holding pasture rehabilitation will improve habitat combined with reduction from continuous to 15-day use. Burning & re-cutting of trees are positive due to opening maintenance with small openings emphasized in w and se portions. Low water crossing will lessen soil erosion, improving habitat. Trick tank construction will provide more reliable water, though still climate dependent. Weed treatments will maintain native diversity. Deer may be disturbed with thinning and burning.</p>

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Species	Alternative A	Alternative B	Alternative C	Alternative D
Antelope	Habitat quality improves due to reduced grazing length/pasture, decreasing canopy cover and small tree growth within & near openings. This increases amount of available habitat, reduces fragmentation, improves vigor and diversity of understory vegetation & may reduce predator success due to decreasing hiding cover. Impaired soils improve due to low water crossing, channel re-shaping and reduction of cattle from continuous to 15 days use in Young's holding pasture. Water reliability is more dependable.	Habitat quality improves with lack of grazing yet declines with increasing canopy cover and small tree growth within & near openings. This reduces amount of available habitat, fragments habitat, reduces understory vegetation & facilitates predator success due to increasing hiding cover. Impaired soils continue to decline due to lack of low water crossing, channel re-shaping but lack of cattle will help. Water reliability is variable. Second worst alternative for pronghorn.	Habitat quality declines due to year round grazing, increasing canopy cover and small tree growth within & near openings. This reduces amount of available habitat, fragments habitat, reduces understory vegetation & facilitates predator success due to increasing hiding cover. Impaired soils continue to decline due to lack of low water crossing, channel re-shaping but lack of cattle will help. Water reliability is variable. Worst alternative for pronghorn.	Habitat quality improves due to reduced grazing length/pasture, decreasing canopy cover and small tree growth within & near openings. This increases amount of available habitat, reduces fragmentation, improves vigor and diversity of understory vegetation & may reduce predator success due to decreasing hiding cover. Impaired soils improve due to low water crossing, channel re-shaping and reduction of cattle from continuous to 15 days use in Young's holding pasture. Water reliability is more dependable. Increased rest in one pasture is beneficial and is offset by increased number of days/pasture.
Juniper Titmouse	Change in grazing schedule will improve understory health with a positive indirect effect to invertebrates. None of the cuts anticipated to impact roost or nest cavities. Habitat improvement likely by retaining moderate canopy, larger trees & creating irregularly shaped openings. Foraging habitat will be cut. Titmice can use edges of larger openings but opening maintenance not beneficial. Disturbance likely with thinning and/or burning. Weeds could be food source.	Lack of grazing improves understory health with a positive indirect effect to invertebrates. Although some prey may thrive in high disturbance. Roost or nest cavities un-impacted. Habitat structure remains constant over life of permit. Soil erosion continues. No disturbance due to weed treatment. Weeds could be food source.	Year round grazing degrades understory health with a negative indirect effect to invertebrates. Some prey may thrive in high disturbance. Roost or nest cavities un-impacted. Habitat structure remains constant over life of permit. Soil erosion continues. No disturbance due to weed treatment. Weeds could be food source.	Change in grazing schedule will improve understory health with a positive indirect effect to invertebrates. None of the cuts anticipated to impact roost or nest cavities. Habitat improvement likely by retaining moderate canopy, larger trees & creating irregularly shaped openings. Foraging habitat will be cut. Titmice can use edges of larger openings but opening maintenance not beneficial. Disturbance likely due to thinning and/or burning. Weeds could be food source. Rest beneficial & is offset by higher # of days/pasture.

Cumulative Effects on Management Indicator Species

For elk, current and future impacts from cattle management include ongoing competition, water development and range improvement projects. Overall they are impacted by loss of habitat from urbanization, increasing human use, encroachment by woody vegetation, and threat of catastrophic fire. Deer have same cumulative impacts as elk. In addition, they compete with both cattle and elk for food and are impacted by drought, juniper encroachment, years of fire suppression, which has suppressed cover, and browse production, in some areas. Cumulatively, juniper titmouse is negatively affected by fuel wooding that removes cavity-bearing trees in their habitat and canopy cover increases to the extent that under story vegetation and prey habitat are impacted.

For antelope, current and future impacts from cattle management include existing fences, water development and impacts to vegetation used as fawn cover. In Northern Arizona, other impacts to antelope include loss of habitat from urbanization, indirect loss of use of habitat due to roads and human use, encroachment by woody vegetation, height reduction of cover from grazing and predation. Fencing can create various barriers to antelope and can significantly impede their ability to use habitat, particularly near highways. Current efforts are underway to standardize fence inventory forms for use by agency and non-agency personnel and prioritize areas for fence inventory and maintenance. The Forest Service will spend \$13,000 this year toward fence inventory and maintenance on Anderson Mesa with additional time allocated by Arizona Game and Fish Department for the same purpose.

The area on top of Anderson Mesa is pronghorn summer range (260,666 acres), and includes key fawning habitat. The habitat consists of natural and pushed openings, thick and sparse pinyon-juniper and scattered ponderosa pine. There are lakes, ephemeral wetlands, reservoirs and tanks on top of Anderson Mesa. The top includes the following grazing allotments: Walnut Canyon (approximately 1/3 of the allotment is summer range), Deep Lake (also approximately 1/3), Pickett Lake (all pastures east of Forest Highway 3), Anderson Springs (most of allotment) and the portion of Bar T Bar north of Jack's Canyon.

Winter range consists of desert scrub habitat, pushed and natural openings and scattered junipers, primarily on state and private lands to the east. Most of the winter range is not on Coconino National Forest although movement corridors and transition range are on Forest lands. Transition range includes portions of Deep Lake and Walnut Canyon Allotments, and all of Padre and Young's Canyon Allotments. These latter two link Cosnino and Angell Allotments that in turn connect with open areas east and north of the San Francisco Peaks, also used by pronghorn.

Pickett Lake, Anderson Springs and Bar T Bar Allotments have the highest quality and quantity of summer range and fawning habitat for pronghorn on Anderson Mesa. Even though these areas have relatively large openings, quantity of habitat is declining due to fragmentation and infilling by young ponderosa pine, pinyon and juniper trees. They have the shortest distances (1.5-3 miles) between summer and winter range and connect high quality habitat, and thus may be most important for seasonal movements. All three allotments are currently under analysis and include treatments of beneficial to pronghorn. These include establishment of at least five movement corridors, connected openings, maintenance and enhancement of existing openings, fence modification to favor pronghorn where needed and creation of new openings.

Deep Lake Allotment physically connects the summer range portions of the Walnut Canyon and Pickett Lake Allotments on the Anderson Mesa. This summer range portion is narrow and rapidly filling in with

junipers, pinyon and ponderosa pine resulting in smaller and more fragmented openings. The portion of Deep Lake below the Anderson Mesa rim connects Padre Canyon, Young's Canyon and Angell Allotments. It is moderately to densely forested with juniper and pinyon-juniper, with pine in places. The pronghorn habitat below the rim is largely transition range, although meadows and created openings function as summer range for small herds. It has high potential for pronghorn habitat and currently is low quality due to the fragmented nature and its small size. According to the Burns Amendment Schedule, this allotment is scheduled for NEPA analysis in 2002. This analysis will evaluate current grazing and habitat conditions and may consider treatments that could benefit pronghorn.

Walnut Canyon Allotment is the northwestern extremity of Anderson Mesa and joins higher elevation ponderosa pine habitat and Walnut Canyon to the north. There are approximately eight sections of summer range between Horse and Marshall Lakes. The summer range is about 8-9 miles from the winter habitat off the Forest and is not considered to have primary seasonal movement corridors although pronghorn could certainly use the area in this manner. The summer range is fragmented and declining in quantity due to young trees. The majority of the allotment is moderately to densely forested and much of it is not considered pronghorn habitat, being better suited for turkeys, goshawks and deer. According to the Burns Amendment Schedule, this allotment is scheduled for NEPA analysis in 2004. This analysis will evaluate current grazing and habitat conditions and may consider treatments that could benefit pronghorn.

The Padre Canyon Allotment, northeast of Pickett, has the highest potential for being a viable link between summer and winter range outside of Bar T Bar, Anderson Springs and Pickett Lake Allotments. The distances between summer and winter range tend to be longer than on allotments to the south, e.g. 3-4 miles in length and greater. At this time, most of Padre Canyon consists of moderate to densely forested pinyon juniper or juniper woodland. Due to few, small, and scattered openings, it is currently low quality pronghorn habitat and thus does not lend itself to movement corridors or more than occasional use by small herds. This allotment is currently under analysis and will consider treatments of benefit to pronghorn including connecting and maintaining existing openings, creating new openings and fence modifications to favor pronghorn where needed.

In summary, three out of five allotments on top of Anderson Mesa (Pickett Lake, Anderson Springs and Bar T Bar) (268,617 acres) are currently undergoing NEPA analysis. These three allotments contain approximately 70% of the summer range for pronghorn on Anderson Mesa. NEPA analysis includes evaluation of projects designed to improvement habitat for pronghorn. The other two allotments on Anderson Mesa (Walnut Canyon and Deep Lake) are scheduled for analysis in 2004 and 2002. Two additional allotments below the Anderson Mesa rim (Young's Canyon and Padre Canyon) are currently undergoing analysis. These allotments contain transition range for pronghorn and support small summer herds. Analysis on these two allotments (32,336 acres) includes projects of benefit to pronghorn. Decisions on the five allotments currently under analysis are expected by September 2001.

Proposed and historical treatments are displayed in the following section. Effects to MIS species are indicated by a (+) if beneficial, usually for forage for browse enhancement. A (-) sign indicates a generally negative effect. A '0' indicates no or a neutral effect and (+/-) indicates both positive and negative effects. The creation of openings, for example, benefit grassland dependent species like pronghorn; allow more sunlight to reach the ground to benefit forage for elk; could enhance browse and forage production, and vigor of large trees along the edges for deer and or titmice (edge); yet remove mast producing and/or nest trees for forest dwelling species like juniper titmice, a negative effect. A

grassland maintenance treatment is considered neutral for titmice because grasslands aren't habitat for this species. The following treatments are proposed as part of ongoing NEPA analysis and, if selected as part of the decisions, will result in about 64,002 acres of treatments designed to benefit pronghorn and other grassland dependent species.

	Effects to MIS species	Anderson Springs Allotment	Bar T Bar Allotment	Youngs Canyon Allotment	Pickett Lake Padre Canyon Allotments
Movement corridors		4	1	0	2
Grassland restoration in pinyon-juniper woodland	Pronghorn + Elk + Deer + (edges only) Juniper titmouse -	3,623	4,585	0	0
Grassland maintenance in pinyon-juniper woodland	Pronghorn + Elk + Deer +(edges only) Juniper titmouse 0	11,061	28,412	0	6,537
Grassland restoration in young pine/pinyon-juniper	Pronghorn + Elk + Deer +(edges only) Juniper titmouse +/-	2,133	0	0	0
Maintenance between pinyon-juniper and ponderosa pine	Pronghorn + Elk + Deer + Juniper titmouse -	0	684	0	0
Maintenance of previously treated openings	Pronghorn + Elk + Deer + Juniper titmouse 0	0	0	1,140	0
Treatment of young pinyon and juniper	Pronghorn + Elk + Deer + Titmouse +/-	0	0	2,240	0
Spring enhancement cuts	Pronghorn + Elk + Deer + Titmouse -	0	0	0	640
Pinyon juniper and ponderosa pine to grassland	Pronghorn + Elk + Deer + Juniper titmouse -	0	0	0	123
Pinyon juniper forage and browse cuts	Pronghorn + Elk + Deer + Juniper titmouse -	0	0	0	2,333
Pinyon juniper forage and browse cuts	Pronghorn 0/+ Elk + Deer + Juniper titmouse 0/+	0	0	0	4159

Partial list of projects affecting MIS species in this area

Youngs Canyon Allotment Environmental Assessment

Project	Acres	Year	Prong -horn	Elk	Deer	Juniper Titmouse
Grapevine Allotment livestock exclusion		1950	+	+	+	+
Juniper chain/push – Anderson Springs Allot	10300	1956	+	+	edge	-
Juniper chain/push – Anderson Springs Allot	150	1957	+	+	edge	-
Juniper chaining/push, Walnut Canyon Allot	300	1959	+	+	edge	-
Juniper chaining/push, Padre Canyon Allot	2671	1959	+	+	edge	-
Juniper chaining/push, Youngs Canyon Allot	1140	'50-60's	+	+	edge	-
Padre water catchment		1960	+	+	+	+
Grapevine juniper opening	100	1960	+	+	+	edge
Grapevine juniper opening	120	1960	+	+	+	edge
Juniper chain/push, Anderson Springs Allot	880	1960	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	2175	1960	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	4200	1965	+	+	edge	-
Juniper chaining/push, Walnut Canyon Allot	1630	1965	+	+	edge	-
Juniper chaining/push, Walnut Canyon Allot	850	1966	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	800	1966	+	+	edge	-
Juniper chain/push, Pickett Lake Allotment	1500	1966	+	+	edge	-
Young's Lake Wildlife Openings	180	1967	+	+	+	edge
Juniper chaining/push, Walnut Canyon Allot	475	1967	+	+	edge	-
Juniper chaining/push, Walnut Canyon Allot	780	1967	+	+	edge	-
Juniper chain/push, Pickett Lake Allotment	400	1967	+	+	edge	-
Juniper chain/push, Anderson Spring Allot	525	1968	+	+	edge	-
Mormon Canyon seeding	53	1968	+	+	+	+
Seeding	95	1968	+	+	+	+
Deep Lake seeding	30	1968	+	+	+	+
Padre Canyon Wildlife Openings	180	1968	+	+	+	edge
Vail Lake seeding	60	1968	+	+	+	+
Juniper chain/push, Bar T Bar Allot	1000s	'60-70's	+	+	edge	-
Opening mtnce burn – Walnut Canyon Allot	300	1970	+	+	+	edge
Padre Canyon Wildlife Openings	100	1970	+	+	+	edge
Padre Canyon Wildlife Openings	100	1971	+	+	+	edge
Juniper opening mtnce burn, Padre Canyon	814	1972	+	+	+	edge
Juniper chain/push, Anderson Springs Allot	3500	1974	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	1000	1978	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	1000	1979	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	200	1981	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	450	1982	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	450	1983	+	+	edge	-
Juniper chain/push, Pickett Lake Allotment	2000	1983	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	100	1984	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	1060	1985	+	+	edge	-
Juniper chain/push, Anderson Springs Allot	500	1986	+	+	edge	-
Pine Hill vehicle closure		1989	+	+	+	0
Fuelwood cuts - Young's Canyon Allot area	880	80-90's	+	+	+	edge
Fuelwood cuts – Angell Allot area	500	1989-94	+	+	+	edge

Project	Acres	Year	Prong -horn	Elk	Deer	Juniper Titmouse
Boundary fence mod.- Blue Ridge RD	1.5mi	1999	+	+	+	0
Hay Lake purchase Fence Removal	4 mi	2000	+	+	+	0

Partial list of other projects benefiting pronghorn on Coconino National Forest

- Forest wide water developments have been constructed, many in pronghorn habitat.
- Kendrick Park fence modification for pronghorn – Peaks RD - late 1980’s.
- North end (Peaks District) winter range improvement – 400 acres – late 1990’s.
- Highway 89A antelope project: 1 travel corridor – 2000.
- Slate Mountain pronghorn project – 200 acres of opening maintenance, ongoing.
- Burning to benefit pronghorn habitat – Sedona District – ongoing.
- Wilkins Watershed Project – Blue Ridge RD: 430 acres of pinyon-juniper thinning with the objective of improving soil and watershed conditions and improving wildlife habitat. Ongoing.
- Verde Valley Antelope Movement Study – Beaver Creek/Sedona RD, 2000: cooperating with AGFD on an antelope movement study where radio collars have been placed on various individual animals and routinely tracked from the ground and the air.
- Observatory Mesa Prescribed Burning – Peaks RD, 500 acres burned. Thinning 2001.
- Bellemont Shooting Range – Peaks RD. Mitigation measures in place to improve water sources and restore grassland habitat in areas adjacent to the proposed shooting range. Ongoing.
- Thirteen-Mile Rock AMP – Beaver Creek and Long Valley RD: proposal to cut, lop, and scatter immature juniper trees on approximately 3,000 acres of pinyon-juniper grassland to maintain savannah-like grasslands, replace the bottom barbed wire of non-conforming barbed-wire fences with smooth wire, raising the height of the bottom wire to 21” above ground in antelope habitat areas, prescribed burn approximately 2,000 acres on Wingfield Mesa, and use Christmas tree cutting to harvest juniper trees on 400 acres in the Winter and Tanque Aloma Pastures. Ongoing.
- Hay Lake Purchase Fence Removal – Blue Ridge RD, 2001: 8 miles of fence to be removed.

Affected Environment for Special Status Species

The District threatened, endangered or Forest Service sensitive (TES) list was reviewed. Threatened, endangered and sensitive species and their habitat within or adjacent to the Young’s Canyon Allotment include: **black footed ferret** (*Mustela nigripes*), Navajo Mountain Mexican vole (*Microtus mexicanus navaho*), bald eagles (*Haliaeetus leucocephalus*), American peregrine falcons (*Falco peregrinus anatum*), northern goshawk (*Accipiter gentilis*), **Rusby's** milk vetch (*Astragalus rusbyi*), Flagstaff beardtongue (*Penstemon nudiflorus*), Mt. Dellenbaugh sandwort (*Arenaria aberrans*) and the **early elfin** (*Incisalia fotis*).

Black-footed ferret: The range of the historical black-footed ferret is coincident with prairie dogs, their primary food source. There is one prairie dog colony on private land within the allotment boundaries and cattle permitted on this allotment do not graze it. Historical prairie dog colonies were visited in June 1999 and none were found active. Prairie dog control is not part of the livestock management program.

Bald eagle: There are no known nest territories or potential nesting habitat on or near the allotment, including riparian habitat. The nearest nest is 40 air miles from the allotment. There are no known

winter roosts on the allotment with the nearest about 4 miles away. Occasional use on the allotment is likely to occur as eagles forage widely for carrion when they winter between November and March. Some overlap between cattle and eagles may occur in October.

American peregrine falcon: The allotment does not contain any eyries or suitable eyrie habitat. The nearest eyries are over 3 miles away and there is no nesting habitat within 3400 meters of the allotment boundary. There is no riparian habitat that would support concentrations of waterfowl or other prey. The allotment supports habitat for mourning doves, a peregrine food item, as well as other birds. This species was removed from the Federal List of Threatened and Endangered species on August 25, 1999.

Northern goshawk: There is one goshawk PFA just outside the allotment in a pine stringer. The allotment is considered foraging habitat particularly pine stringers and pinyon juniper habitat in the western and southeast portions of the allotment.

Their habitat often includes small meadows (up to six acres in size) and riparian areas. Goshawks prey on medium-sized birds and mammals, which in turn rely on snags, downed logs, rocks, oaks and forbs, grasses and shrubs for their food and cover. Goshawks hunt primarily in forested conditions where forage production is usually low to moderate and cattle utilization of the forage is low. Cattle concentrate their foraging activities in meadows and more open areas where their nutritional needs can be met with minimal energy expenditure. The differing foraging strategies result in minimal overlap of goshawk hunting areas with key cattle utilization areas.

Cumulatively, northern goshawks have been affected by and in the foreseeable future, are likely to be affected by timber sales, recreation and lands activities, managed or wildfire or the lack thereof, and grazing by wildlife. Effects to this species are documented in biological evaluations prepared for federally funded projects permitted on Coconino National Forest lands.

Navajo Mountain Mexican Vole: No known populations of Navajo Mountain Mexican voles (*Microtus mexicanus navaho*) exist within the allotment, but there is potential habitat on the allotment for this species. Voles occupy meadows and riparian areas above the Mogollon Rim and within forested areas where tree densities are low. They rely on grasses and herbaceous vegetation for food and cover. Cattle tend to concentrate in this species habitat and forage on its main food and cover. Grazing may disturb the reproduction, foraging, or other life requirements of this species.

Cumulative effects to vole habitat occur from timber sales, wildlife grazing in wet meadows and spring areas, invasion of openings by woody vegetation and by recreational activities on the allotment. Vole habitat has declined in quality and quantity due to lack of natural fire, which maintained herbaceous vegetation in the ponderosa pine type.

Rusby's milk vetch: This is known only from northern Arizona in the vicinity of the San Francisco Peaks and north of Williams, and Mount Trumbell. Found from 6,500 to 9000 feet, it blooms from May to September. This is the largest genus of flowering plants in Arizona. The plants in this family are also known as milk vetch and some of them as locoweed. Some of the members of this genus cause the well-known and often fatal loco disease of livestock, especially of horses. Other species prefer soils rich in selenium, taking up sufficient quantities of this toxic element to make them poisonous to animals. It is not known if Rusby's milk vetch falls in this category. There are no known occurrences on the allotment but there is potential habitat.

Flagstaff beardtongue: This lavender plant is known only from north-central Arizona. It is found from mountainous regions south of the Grand Canyon, 4,500 to 7,000 feet on dry slopes in ponderosa pine forest. It is uncommon, blooming in the summer. It may be expected on light, dry neutral soils in eroded or mountainous areas. Many of the species of this genus are browsed. There are no known occurrences on the allotment but there is potential habitat.

Mt. Dellenbaugh sandwort: This plant is known to occur mainly in oak and pine forests between 5,500-9,000 feet in elevation. Where sufficiently abundant, these tiny plants are thought to furnish excellent forage but do not withstand heavy grazing. There are no known plants within the allotment. Potential habitat is along the Walnut Canyon rim and pine stringers.

Early elfin: This butterfly favors roadsides with flowers and dry areas in mountains. It's larval host plant is cliff rose, an abundant shrub on the allotment. They have a single brood with adults present from March-April. This species was added to the Regional Forester's Sensitive species list in 1999.

Effects of Alternatives for Special Status Species

Common to All Alternatives: The goal for utilization in the preferred alternative will be 35 percent or less by cattle and elk throughout the year. This is intended to maintain a condition, which assures recovery, and continued existence of threatened, endangered and sensitive species. Thirty five percent is an appropriate utilization by grazing ungulates for forage in this allotment because it will allow the residual 65 percent of the plant to be available to reproduce, produce seed heads, produce litter important for nutrient recycling, and provide for the needs of wildlife.

Table 1 compares the alternatives for all special status species.

Table 1: Comparison of alternatives for black-footed ferret, Navajo Mountain Mexican vole, bald eagle, American peregrine falcon, northern goshawk, Rusby's milk vetch, Flagstaff beardtongue, Mt. Dellenbaugh sandwort, and early elfin.

Species	Alternative A	Alternative B	Alternative C	Alternative D
Black-footed ferret	No effect due to lack of permitted grazing on colonies on private land & lack of prairie dog control measures for this permit.	No effect due to lack of permitted grazing on colonies on private land & lack of prairie dog control measures for this permit.	No effect due to lack of permitted grazing on colonies on private land & lack of prairie dog control measures for this permit.	No effect due to lack of permitted grazing on colonies on private land & lack of prairie dog control measures for this permit.

Youngs Canyon Allotment Environmental Assessment

Species	Alternative A	Alternative B	Alternative C	Alternative D
Navajo Mountain. Mexican vole	May impact individuals* due to thinning and grazing. Less impact than Alternative C and equivalent to Alternative D. Fewer days graze resulting in more cover and seed heads annually. Survival of young influenced by timing of under story removal with vole life cycle. Thinning and burning indirectly beneficial by opening canopy. Vegetation removal with burning could be negative if voles present. Weed treatments expected to have positive indirect effect due to maintaining native diversity and abundance.	No impact due to lack of grazing so cover & seed head production will increase. Improvement offset by lack of thinning, no weed treatments and no mechanism to maintain openness in forest. Most favorable alternative over short term. Wildlife grazing will continue in all alternatives to remove cover and food.	May impact individuals* due to grazing. Most impact due to year round grazing and longer graze periods per pasture, no treatment of the over story and no noxious weed treatments. Similar effects as A.	May impact individuals* due to thinning, and grazing. Fewer days graze resulting in more cover and seed heads annually. Similar effects as A and slightly more favorable due to rested pasture.
American peregrine falcon	May impact individuals* Nearest eyrie 3 miles away. No potential eyries on allotment. No direct effects. Indirect: grazing, thinning, burning & weed treatment modifies prey habitat & expected to be maintained. Impaired soils in foraging habitat will improve with Young's Canyon holding pasture rehabilitation, reduction of use from continuous to 15 days and construction of low water crossing, budget permitting.	No impact. No disturbance or habitat modification near eyries or to prey or prey habitat. Favorable due to least modification to seed heads and food for prey yet not favorable due to lack of fire.	May impact individuals* Nearest eyrie 3 miles away. No potential eyries on allotment. No direct effects. Indirect: grazing modifies prey habitat to greater extent due to year round use & long length of time in pastures. Impaired soils in foraging habitat will not improve due to continuous use.	May impact individuals* Nearest eyrie 3 miles away. No potential eyries on allotment. No direct effects. Indirect: grazing, thinning, burning & weed treatment modifies prey habitat & expected to be maintained. Impaired soils in foraging habitat will improve with Young's Canyon holding pasture rehabilitation, reduction of use from continuous to 15 days and construction of low water crossing, budget permitting. Rested pasture beneficial for prey habitat.
Bald eagle	No effects from grazing, thinning, burning, weed treatment. Nearest roost 4 miles from allotment. Nearest nest nearly 40 miles distant. No riparian on allotment. No impacts to primary prey: carrion, waterfowl, fish.	No effect. No roosts or nests affected. No impacts to primary prey: carrion, waterfowl, fish.	No effect. No roosts or nests affected. Nearest roost 4 miles from allotment. Nearest nest nearly 40 miles distant. No riparian on allotment. No impacts to primary prey: carrion, waterfowl, fish.	No effect from grazing, thinning, burning and weed treatments. Nearest roost 4 miles from allotment. Nearest nest nearly 40 miles distant. No riparian on allotment. No impacts to primary prey: carrion, waterfowl, fish.

Youngs Canyon Allotment Environmental Assessment

Species	Alternative A	Alternative B	Alternative C	Alternative D
Northern goshawk	<p>May impact individuals*. Grazing will impact localized areas but not expected to significantly affect overall prey availability because goshawks cover large areas when foraging, have a broad diet, hunt opportunistically and some goshawk prey species find food or shelter or both in habitat components unaffected such as logs, rock outcrops, snags and live trees. Thinning/ burning in previously cleared P-J will maintain some openings that exceed optimum size or shape for goshawks. Habitat will be enhanced for competitors like red-tailed hawks & great horned owls. Burning: opening habitat allowing more herbaceous response. Minimal loss of logs and snags. Equivalent impacts as Alternative D. Noxious weed treatments indirectly beneficial. 35% utilization will allow for nutrient recycling and prey food and cover.</p>	<p>May impact*. Cattle grazing and related actions will not impact prey habitat or goshawks and their habitat. Canopy cover expected to increase over time resulting in net loss of herbaceous under story for prey. Indirect negative effects to prey habitat due to lack of noxious weed treatments and future soil & vegetation loss due to increasing canopy cover.</p>	<p>May impact individuals*. Abundance or diversity of some prey lowered within part of foraging area. Expected: lower diversity of goshawk prey as indirect effect of year long grazing and long length of time in pastures. Expected: goshawk switch to other prey items or shift foraging patterns. Indirect negative effects to prey habitat due to lack of noxious weed treatments and future soil & vegetation loss due to increasing canopy cover.</p>	<p>May impact individuals*. Grazing not expected to significantly affect overall prey availability because goshawks cover large areas when foraging, have a broad diet, hunt opportunistically and some goshawk prey species find food or shelter or both in habitat components unaffected such as logs, rock outcrops, snags and live trees. Thinning/ burning in previously cleared P-J will maintain some openings that exceed optimum size or shape for goshawks. Habitat will be enhanced for competitors like red-tailed hawks & great horned owls. Burning: opening habitat facilitates herbaceous response. Minimal loss of logs and snags. Equivalent impacts as Alternative A but rested pasture slightly more indirect benefit for prey. Noxious weed treatments indirectly beneficial. 35% utilization allows for nutrient recycling and prey food and cover.</p>
Rusby's milk vetch	<p>May impact individuals* due to grazing, thinning or burning in potential habitat. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients or light.</p>	<p>No impact due to lack of grazing.</p>	<p>May impact individuals* due to grazing in habitat for this species. Higher grazing impact than A or D due to year round graze and higher number of days/pasture.</p>	<p>May impact individuals* due to grazing, thinning and burning in potential habitat for this species. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients or light.</p>

Species	Alternative A	Alternative B	Alternative C	Alternative D
Flagstaff penstemon	May impact individuals* due to grazing, thinning or burning in potential habitat. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients or light.	No impact due to lack of grazing.	May impact individuals due to grazing in potential habitat. Higher grazing impact than A or D due to year round graze and higher number of days/pasture. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients or light.	May impact individuals* due to grazing, thinning or burning in potential habitat. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients or light.
Mt. Dellenbaugh sandwort	May impact individuals* due to grazing, thinning or burning in potential habitat. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions due to increased nutrients and light.	No impact due to lack of grazing.	May impact individuals due to grazing in potential habitat. Higher grazing impact than A or D due to year round graze and higher number of days/pasture. Grazing would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients or light.	May impact individuals* due to grazing, thinning or burning in potential habitat. These activities would remove foliage or flowers yet opening canopy or burning could improve growing conditions with increased nutrients and light.
Early elfin	May impact individuals* due to grazing, thinning or burning in or around cliff rose, larval host plant. These activities remove foliage or flowers yet opening canopy or burning could improve growing conditions due to increased nutrients and light. Cliff rose continued to be grazed by wildlife.	No impact by livestock due to lack of grazing. Cliff rose continued to be grazed by wildlife.	May impact individuals* due to grazing in or around cliff rose, larval host plant. Grazing removes foliage or flowers. Higher impact than A or D due to year round grazing and longer times/pasture. Cliff rose continued to be grazed by wildlife.	May impact individuals* due to grazing, thinning or burning in or around cliff rose, larval host plant. These activities remove foliage or flowers yet opening canopy or burning could improve growing conditions due to increased nutrients and light. Cliff rose continued to be grazed by wildlife.

* The determination of effect for these Forest Service sensitive species is: 'may impact individuals but is not likely to result in a trend toward federal listing or loss of viability'. The scope and magnitude of this effect can vary by alternative and species.

Affected Environment of other Wildlife Species

Mice, voles, pocket gophers, rabbits, other small mammals and a variety of birds (including neotropical migrants and turkeys) rely on herbaceous and woody understory for food and cover. Most are year-round residents although some birds migrate seasonally to areas both on and off the allotment. They affect or rely on species composition, vigor, seed head production, relative density and regeneration at various scales and at different times and likewise interact with each other.

The interaction between these species and cattle varies and is a likely series of trade-offs. Positive effects of Alternatives A & D include succulent vegetative regrowth following grazing; preparation of suitable seedbeds for disturbance species in meadows and other areas of concentration; maintenance or increase of existing populations of some mice and rabbit populations. Selection pressure will favor unpalatable (to cattle) species, which may provide cover and food for some small mammals. Thinning is expected to improve vigor of residual vegetation. There will be no selection pressure from cattle in Alternative B, enhancing herbaceous cover and food. There is no vegetative rest in Alternative C and declining vigor and health of the under story is anticipated.

Western bluebirds (*Sialia mexicana*) are common residents and represent a portion of the small bird community. Loss of vegetative cover due to grazing or burning will be detrimental to the extent that seed heads or mast are lacking. Loss of vegetative cover is detrimental to most small birds because they are more vulnerable to raptors. Nests or nestlings may be vulnerable if burning occurs during the breeding season. Burning may create or consume snags. Existing snags will not be cut and will be protected during burning although some may be lost in spite of protective measures. A beneficial effect to the small bird community is expected where there is a sufficient seed bank or sufficient pre-burn under story to result in increased post-burn vegetative production.

Effects of the Alternatives for Other Wildlife Species

Alternatives A & D are the best alternatives due to pinyon and juniper cutting and burning to enhance understory production and fewest cattle days/pasture annually. Alternative B is next best due to no grazing and Alternative C offers least food and cover for small mammals with no burning or noxious weed treatments and year round grazing. Woodland conditions for small mammals remain fairly good in all but the densest stands where there is little food. Any species that relies on vegetative height in meadows or riparian areas, such as voles, will be negatively affected due to cumulative effect of livestock and wildlife grazing in any action alternative.

Air Quality

Affected Environment

Youngs Canyon Allotment and adjacent lands are within the Little Colorado Airshed. This airshed is a non-sensitive airshed. Burning activities are regulated and administered by Article 15, Forest and Range Management Burn Rules (10/8/96).

The resource value most affected by air pollution is visibility. The effect or potential for significant deterioration to visibility is from smoke and dust.

Effects of Alternatives

Livestock grazing on the Coconino National Forest does not impact air quality over the long-term. Under Alternatives A, C and D, short-term, isolated effects on air quality in the Youngs Canyon Allotment may occur from dust when cattle are herded and transported and from odor in the immediate vicinity of the animals. Alternative B (No Grazing) will not affect air quality on the allotment on Forest Service lands. Alternatives A, and D will also have short-term effects on air quality during managed

burning. Approximately 5,000 acres of this area may be burned over the next 10-year under these alternatives, depending on ground litter after pinyon and juniper cutting. No more than 1000 acres will be burned in any one-year. Burning activities are regulated and administered by Article 15, Forest and Range Management Burn Rules (10/8/96). Managed burning on the Coconino National Forest is regulated by Arizona Department of Environmental Quality to meet Arizona air quality standards. The Forest Service will receive daily authorization from Arizona Department of Environmental Quality to prescribe burn a set number of acres.

Livestock Management

Affected Environment

Livestock management within the analysis area has improved over the past several decades. Livestock numbers and pasture sizes have decreased and the number of pastures has increased. However, cattle tend to congregate in open grassland areas and this can contribute to impaired soil conditions and loss of vegetative ground cover if the cattle remain too long.

Effects of Alternatives:

Common to All Alternatives: The following is a list of effects to livestock management common to all alternatives. Pinyon and juniper trees will continue to increase in untreated pinyon juniper areas over the next 10 years under all the alternatives. These trees will continue to increase unless future environmental analysis is done to thin these areas, which is outside of the scope of this project. Species diversity, abundance and forage production will decrease in these areas. All the new alternatives fall within our carrying capacity estimates. Alternative C, current management, was set above these estimates. Carrying capacity was based on forage production estimates, past stocking rates, past livestock use patterns, wildlife and trend determinations.

Alternative A: Alternative A permits livestock grazing in a four pasture deferred rotation grazing system with 90 to 110 head of steers or 51 to 63 head of cows/calf's from 5/15 to 10/31. A four pasture grazing system would require one more pasture moves as current management. Cattle would graze grasses, forbs and shrubs in each pasture approximately 46 days in each year. This length of graze would permit some regrowth of plants by cattle. Four pasture deferred allows each pasture to be rested for a longer time each year than Alternatives C and D. Ecological and rangeland management conditions would most likely move towards desired conditions by an increase in grass, forb and shrub abundance, diversity and production through this grazing system and cattle numbers below the carrying capacity of the area.

Alternative A would cut and burn approximately 5,322 acres of pinyon and juniper on the allotment. Approximately 1,140 acres of these treatments would be within previously cleared areas. This cutting and burning would increase in grass, forb and shrub abundance, diversity and production. Approximately 2,240 acres of young pinyon and juniper trees would be cut and burned on the northeast corner of the allotment. This cutting and burning would maintain this area as an open savanna like grassland instead of gradually turning into a dense pinyon and juniper forest with little forage production. Approximately 880 acres of old fuelwood cuts and approximately 1,062 acres of untreated areas on the southeast corner of the allotment would be selectively cut and burned to create a moderately dense forest. Again cutting young trees, less than 12 inches in diameter only. These treatments would

maintain or slightly increase some forage values, plant species diversity and abundance in the area but are designed to increase cliffrose in the area for wintering deer herds.

Alternative A would build a trick tank system near the old Youngs Canyon Dam. This system will provide water to all four pastures. This trick tank will help with the water hauling costs for the permittee and provide water for wildlife in the area. It will also eliminate the need to use the Youngs Canyon Holding Pasture as a waterlot, reducing graze periods from year-round to 15 days per year.

Alternative B: Alternative B would not permit livestock grazing for the next 10 years. The permittees would need to find new grazing land for their current livestock or sell them.

Ecological and rangeland management conditions would move away from desired conditions within pinyon and juniper areas. These trees will increase and slowly reduce grass, forb and shrub abundance, diversity and production in the area. Areas with out trees would most likely move closer towards desired conditions by an increase in grass, forb and shrub abundance, diversity and production because of yearlong allotment rest. However, long-term rest may cause grass plant decadence (a build up of grass litter and reduction in grass production) and possible reduction in species abundance. .

Alternative C: Alternative C permits livestock grazing in a four-pasture rest rotation grazing system with 42 head year-round. The permittee would continue with their current grazing system. Cattle would graze grasses, forbs and shrubs in three out of four pasture approximately 120 days each year. This length of graze would permit regrazing of plants by cattle. This type of grazing system allows one pasture to get complete pasture rest each year. Cattle numbers are above the carrying capacity of this allotment area because of the winter grazing. This allotment is not conducive to winter grazing because of vegetation in the area, being mainly a pinyon and juniper/blue grama community. Under this alternative, ecological and rangeland management conditions would move away from desired conditions by an decrease in grass, forb and shrub abundance, diversity and production within the allotment because of overgrazing.

Alternative C includes to additional improvements including: pinyon and juniper cutting and burning or trick tank installation. Without cutting and burning pinyon and juniper trees will increase and slowly reduce grass, forb and shrub abundance, diversity and production in the area. Without the trick tank system the Young Canyon Holding Pasture would continue to be overgrazed.

Alternative D: Alternative D permits livestock grazing in a four-pasture rest rotation grazing system with 70 to 83 head of steers or 38 to 47 head of cows/calf's from 5/15 to 10/31. Cattle will graze grasses, forbs and shrubs in three out of the four pasture for approximately 56 days each year. This length of graze will permit some regrazing of plants by cattle. In this rest rotation grazing system one pasture receives yearlong rest. This allows plants to go through a full years cycle without being grazed by livestock. Ecological and rangeland management conditions would most likely move closer towards desired conditions by an increase in grass, forb and shrub abundance, diversity and production through this grazing system. Conditions over time would be very similar to Alternative A because of Alternative A's shorter graze periods are offset by no yearlong rest. Alternative A shorter graze periods will show slightly quicker results.

Alternative D is the same as Alternative A for pinyon and juniper treatments and the trick tank system.

Fire Management

Affected Environment

Wildfires on the Youngs Canyon Allotment are common but rarely exceed one acre in size because the area is dominated by pinyon and juniper/blue grama vegetation. Ponderosa pine stringers and dense pinyon and juniper slopes within the canyons do have more a chance to have a larger stand replacement fire with the right weather conditions. There is no history of a wildfire exceeding five acres in this area.

Effects of Alternatives

Managed burns in Alternatives A and D will have very little effect on water or air quality because these burns will be cool spring or fall burns that will consume fine fuels. Cool burns don't expose much bare soil nor do they produce much smoke. The Arizona Department of Environmental Quality will manage the smoke so it doesn't exceed airshed limits. Grasses, forbs and shrubs species will be improved by the burns because of the nutrient flush to these species and the removal of litter layer. Wildlife impacts from these burns will be positive because of the increase in grass, forb and shrubs. Alternative B and C will have no managed burning.

Recreation Management

Affected Environment

The entire allotment area is used moderately by recreationists for general dispersed recreation activities such as hiking, biking, sight-seeing, hunting, 4X4 driving, picnicking, fuelwooding and camping because of its location around Flagstaff. No wilderness area exists on or near the allotment. Walnut Canyon National Monument runs on the north and northwest portions of this allotment. As this park boundary expands, more recreationists may use the allotment.

Effects of Alternatives

No alternatives will negatively affect recreation activities in the allotment or people's overall enjoyment of the area. Some forest visitors will not like livestock grazing near their favorite picnic area or campsite. While other forest visitors enjoy seeing livestock on the range. Alternative B removes any conflict between the forest visitor and livestock by removing livestock from the Youngs Canyon Allotment area. Alternatives A, C and D provides the forest visitor with views of livestock on the Forest.

Pinyon and juniper treatments in Alternatives A and D could negatively affect recreationists. Alternatives A and D will: keep 1,140 acres of previously cleared pinyon and juniper open grassland; change 2,240 acres of young trees into open savanna grassland; create 880 acres of old fuelwood cuts into moderately dense forest; and create 1,062 acres of dense woodland into moderately dense woodland. Recreationists would be displaced during cutting and burning activities, but this affect would be minimal because of the low use of these areas. If people were displaced by these activities, they could easily find a similar location close by that was not being treated. Some recreationists may like dense pinyon and juniper forest. 5,043 acres of pinyon and juniper forest will not be affected by the pinyon and juniper treatments. Recreationists looking for dense forest could find these areas within the allotment.

Wilderness Values

No wilderness areas exist on or adjacent to the Youngs Canyon Allotment.

Social Impacts

Affected Environment

The social impacts of cattle use and management on the Youngs Canyon Allotment relate to public perceptions of the appropriate use of public lands, customs and traditions of the area and community and permittee life-styles in relation to forest resources. These impacts are closely related to the urbanization of Northern Arizona in general, and specifically of Flagstaff. Also, an ever increasing number of people from around the world are coming to visit National Monuments, Forests and Parks, State parks and cultural, historic and spiritual sites (Walnut Canyon and San Francisco Peaks).

Northern Arizona has long been a rural area in the State with a rich history of social and economic ties to agricultural land uses. Many new residents are coming from larger urban areas in search of a rural life-style and what they perceive as a better quality of life. This migration reflects a reversal of the typical rural to urban migration pattern that occurred in most of the United States before the 1970's and is changing the long-term economic base of Northern Arizona from agriculture to recreation and tourism (USDI Bureau of Land Management and USDA Forest Service 1994). With urbanization come changes in values and beliefs. These changes usually challenge existing ways of life and often cause conflicts between natives of rural areas and ex-urbanites. New residents usually have no historical ties to the rural areas they move into, yet many of these people soon ask local residents and governments to make changes to accommodate their urban values, over the long-term, rural natives may feel they are losing control of their communities and then may consider those communities less desirable places to live.

Another important trend is the increasing popularity of Northern Arizona for recreation, especially for people from the urban centers of Phoenix, Tucson and Southern California. Recreational use throughout the Youngs Canyon Allotment is moderate now and is expected to increase in the future.

Ranching has been a way of life in Northern Arizona since the late 1800's when large numbers of cattle and sheep grazed the area. The values, attitudes and beliefs of the ranchers and other people trying to make a living in this rural area were incorporated into the social structure and self-image of Northern Arizona.

The current permittees of the Youngs Canyon Allotment are native to Arizona and ranching has been part of their family for a long time. Ranching is not their main source of income. The permittees contribute to the social structures of communities around the allotment by providing some direct and indirect jobs for residents of those communities, revenues for county, city and federal governments, and the life-style associated with ranching for their family, their employees and other people associated with ranching in the area.

The number of people involved in ranching today in the Flagstaff area is very low compared to the rest of the population. There are 28 different permittees on the Coconino National Forest. Each of these permittees has a varying number of family members and ranch hands working with them.

Forest visitors vary widely in their reactions to seeing cattle on National Forests or other federal lands. Reactions depend on viewers' personal values, opinions and whether they are accustomed to seeing cattle. Tourists traveling through the allotment may stop to take pictures of a cow because to them this is a pleasant pastoral scene. But to wilderness buffs who dislike any kind of "unnatural" structures or

animals on landscapes, the presence of cattle, which indicates the presence of humans, disrupts their perception of National Forests as truly wild places.

To campers or picnickers who like to go to the same places in which cattle congregate, the presence or leavings of cattle in those areas may detract from recreationists experiences there or even cause them to move to different sites. The actual presence of cattle may not disturb horseback riders or hikers, but encountering several fences while traveling across an area is often inconvenient for them. People on foot generally climb over fences and horse rider's travel along fences until they find gates. The growing number of people using forests, especially near urban communities, may increase the potential for conflicts between cattle and people on allotments.

Several tracts of private lands lie within and near the Youngs Canyon Allotment. Most of the people living on these lands like the open space and rural feeling the Coconino National Forest provides and accept cattle grazing as a use of the forest as long as cattle do not damage their private lands or the forest's resources. However, the Forest Service does occasionally receive complaints about cattle wandering onto unfenced private lands or outside allotment boundaries when fences are cut or gates are left open.

Native Americans who visit traditional shrines and gather plants, pine boughs, or tree poles for use in spiritual ceremonies have not expressed concern about cattle use on the allotment as long as the items they need are not destroyed or disturbed by cattle.

Increasing numbers of people in the community and throughout the country believe rangeland management should emphasize protecting resources rather than just managing cattle. Many of these people also believe cattle grazing, if properly managed, can be compatible with resource protection. These people generally support multiple-use of forests as long as uses do not damage basic resources and are in the interest of the American people. However, some people strongly object to cattle grazing anywhere on National Forest lands under any type of management.

Effects of Alternatives

Not permitting cattle grazing on the Youngs Canyon Allotment (Alternative B) will resolve direct conflicts between recreationists and homeowners and will satisfy the visual concerns of those who do not wish to see any cattle on the Coconino National Forest. However, for those who enjoy the pastoral sense and ambiance of the western life-style, removing cattle may detract from their experiences and enjoyment of rural National Forest lands.

Those who feel cattle grazing are an appropriate use of public lands may not approve of removing cattle from the allotment. These people may not only express concerns about the impacts of not permitting cattle grazing on this allotment, but may also question the legitimacy of mutually beneficial land management goals. The uncertainty of short-term grazing permits may also be unacceptable to these people.

Alternative B will also eliminate a source of income and possibly a way of life for the permittees of the Youngs Canyon Allotment and their employees. These changes may cause conflicts within the communities and will cause conflicts within families of the permittees and their employees.

Alternatives A, C and D will keep the ranch operating, thereby maintaining the incomes of the permittees and their employees. As long as the ranch continues to operate, however, the permittees and their employees will help perpetuate the customs, traditions and life-style long associated with cattle grazing. This, in turn, will contribute to the lessening, though still important, rural sense of the community in areas around the allotment.

Economic Concerns

Domestic cattle grazing contribute to the livelihood of permittees as well as to the economies of local communities and counties. Individual allotments provide incremental contributions to local economies, so changes in several allotments could cumulatively impact those economies. The Youngs Canyon Allotment lies in Coconino County. The allotment currently runs only 42 head of livestock, so the economic affect is small.

The economy of Coconino County gain revenues from several sources: county sales taxes, state-shared sales taxes, highway user revenues (gasoline taxes), property taxes and National Forest fees. The greatest revenues come from the county and state-shared sales taxes. National Forest fees, which include payments from timber harvesting, mining and recreational and cattle grazing uses, are an important part of county revenues but provide only a fraction of available funds.

National Forest fees paid to Coconino County dropped from \$4.2 million in 1989 to \$1.5 million in 1994. Most of this decline came from timber harvesting revenues. Less than 4 percent, or \$46,000, came from cattle grazing fees on the Coconino National Forest In 1994. Coconino County also receives fees from uses on the Kaibab and Apache-Sitgreaves National Forests. Coconino County uses National Forest fees for highway maintenance and schools.

The decrease in total National Forest fees to Coconino County over the past few years is beginning to substantially impact the operating budget for county roads and schools. This county's highway department receives funding only from the highway users fund and forest fees. The county will continue to receive funds from National Forest lands as available, but budget forecasts predict that revenues for road maintenance from these sources will decrease in the future.

The budgets for schools in Coconino County have been extremely constrained over the last several years even though school populations are increasing. One likely reason for these constrained budgets is the sharp decline in forest fees as an available revenue source. As for county road funds, the contribution from cattle grazing fees to school funds is small in comparison to timber harvesting revenues. Nevertheless, the loss of some grazing fee revenues has contributed to the overall decrease in school funding. School districts in many area communities recently presented bond-funding options to voters in an effort to increase funding for schools.

The permittee of the Youngs Canyon Allotment directly contributes revenues to Coconino County through property taxes on range structural improvements. They also pay taxes to the State for using Federal and State lands for a commercial purpose. These State taxes equal a percent of the assessed value of the permit based on grazing fees.

Evaluation of Alternatives

Estimates of direct and indirect jobs and payments to Coconino County from federal receipts provide a relative comparison of economic effects that could occur because of changes in cattle grazing. Table 6

estimates effects expected on these indicators in Coconino County from implementing Alternatives A through D on the Youngs Canyon Allotment.

Quantifiable factors such as economic costs and outputs, along with projected animal months (AMs) or animal unit months (AUMs) have been used to help describe the economic effects of grazing on the Youngs Canyon Allotment. A model called "Quicksilver" was used to calculate these factors.

It is important to recognize that although the projections from the Quicksilver model are very precise in measurement, there are a variety of assumptions under which these calculations are performed, thus they serve best as an indicator of change rather than a precise measurement. Additionally, identifying some of these effects are difficult, it not impossible, as economic effects tend to deal with very personal issues.

Permittee: Gross revenue estimates are created by estimating the amount of calves produced and gains on steers each year for each alternative. For calves, the following figures are used in the calculation (although these figures may vary widely): 90 percent cow to calf ratio, 500 pounds per calf at \$0.80 per pound. The estimated gross revenue for Alternatives C is \$15,200 per year. Alternative A estimated gross revenue is \$18,400 to \$22,800. Alternative B's estimated gross revenue is \$0. The estimated gross revenue for Alternatives D is \$13,600 to \$16,800. For steers, the following figures are used in the calculation (although these figures may vary widely): 300 pound weight gain per steer at \$0.65 per pound. The estimated gross revenue for Alternatives A is \$17,550 to \$21,450 per year. Alternative D estimated gross revenue is \$13,650 to \$16,185.

Under Alternative B, the permit for grazing livestock on the allotment would be cancelled. The permittee would lose future revenue derived from the sale of livestock that would have been produced on the allotment. Private land owned by the permittee could also be affected. When the public land permit associated with the ranch operation is lost, the permittees economic ability to maintain a ranch operation may be greatly diminished or eliminated. Without the public land permit, the base property controlled by the permittee would be too small to maintain a viable operation. No projections are made for the permittees actual costs, the ability to cover costs, or any supplemental income that may be available.

Local and Federal Economy: Under Alternative B, the loss of the Youngs Canyon Allotment permit will eliminate \$170.10 (at the 1999 fee rate) from the treasuries of Coconino County. This loss, by itself, is not substantial. However, if a larger portion of the ranching industry were lost in these counties, their budgets would be substantially impacted. The county will also lose revenues from taxes on structural improvements and the State will lose tax revenues based on the permittees use of federal lands.

The loss of jobs shown for Alternative B in Table 8 below can be misleading because not all jobs associated with the permit will be eliminated if no grazing is allowed on the allotment. That is, all jobs directly associated with and some jobs indirectly associated with the permit will be eliminated. However, some jobs indirectly associated with the permit will still exist because other ranches and portions of communities that use ranching supplies and services on the Youngs Canyon Allotment support them.

Table 8. Economic effects on Coconino County from implementing each alternative.

Economic Effects	Alternative A	Alternative B	Alternative C	Alternative D
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Youngs Canyon Allotment Environmental Assessment

Direct and Indirect Jobs (#) (About 1.14 jobs per 100 cattle)	1.0-1.25	0	.48	0.8-0.95
Federal Payments to Counties (\$)*	\$167.74-\$205.20	0	\$170.10	\$130.61-\$154.58

*The amount shown under the alternatives is a projection of 25% of all grazing fees to Coconino County at the 1999 grazing fee rate of \$1.35. Not shown in this amount are the taxes that counties collect on range structural improvements. These taxes are based on a percentage of the assessed values of those improvements.

Under Alternatives A, C and D, ranching on the Youngs Canyon Allotment may help maintain current jobs within communities around the allotment and revenues for Coconino County and the State. If changes are made in the use of the Youngs Canyon Allotment in the future, contributions to State, county and local economies from fees, taxes and jobs associated with cattle grazing on the allotment will change accordingly.

Under Alternatives A and D, jobs and revenues will be reduced, theoretically, with reduction in the numbers of cattle.

Investment Analysis: The following efficiency analysis anticipates the rate of return for the projected expenditures by the permittee and Forest Service on the Youngs Canyon Allotment. Measures used to conduct an investment analysis include: present value of benefits, present value of costs, present net value and the benefit/cost ratio.

Present value of benefits represents the present value of grazing on the Youngs Canyon Allotment over the next 10 years (permittee), along with the present value of the grazing fees over the next 10 years (Forest Service).

Present value of costs represents the present value of maintenance and range improvements (permittee), along with the present value of the costs of range inspections, permit administration, monitoring and materials for range improvements (Forest Service).

Present net value represents value of benefits minus present value of costs.

The benefit/cost ratio represents the present value of benefits divided by the present value of costs.

Table 9 displays the results of an investment analysis, by alternative, for the Youngs Canyon Allotment (Quicksilver model). These figures have been rounded to the nearest dollar.

Table 9. Investment analysis by alternative.

Forest Service	Alternative A	Alternative B	Alternative C	Alternative D
Present Value of Benefit	\$3,986	\$0	\$5,739	\$2,631
Present Value of Cost	\$-214,803	\$0	\$-14,762	\$-214,803
Present Net Value	\$-210,818	\$0	\$-9,022	\$-212,173
Benefit/Cost Ratio	0.02	0	0.39	0.01
Permittee	Alternative A	Alternative B	Alternative C	Alternative D
Present Value of Benefits	\$29,189	\$0	\$42,015	\$21,797
Present Value of Costs	\$-39,844	\$0	\$-35,347	\$-38,830
Present Net Value	\$-10,654	\$0	\$6,668	\$-17,033
Benefit/Cost Ratio	0.73	0	1.19	0.56
All Partners	Alternative A	Alternative B	Alternative C	Alternative D
Present Value of Benefits	\$33,175	\$0	\$47,755	\$24,428
Present Value of Costs	\$-254,647	\$0	\$-50,109	\$-253,634
Present Net Value	\$-221,472	\$0	\$-2,355	\$-229,206
Benefit/Cost Ratio	0.13	0	0.95	0.10

The investment analysis displays that for every dollar the Forest Service spends on the Youngs Canyon Allotment; there would be a return of \$0.02 Alternative A, \$0.39 for Alternative C, and \$ 0.01 Alternative D. Conversely, for every dollar the permittee spends on management of the Youngs Canyon Allotment, there would be a return of \$ 0.73 for Alternative A, \$1.19 for Alternative C, and \$.56 for Alternative D. When the benefit/cost ratio of both the permittee and Forest Service are combined, for every dollar spent would be an average return of \$.13 for Alternative A, \$0.95 for Alternative C, and \$ 0.10 for Alternative D.

Forest Service costs can be misleading because grants from outside the Forest Service are expected to cover much of improvements costs, especially the pinyon and juniper treatments. One example, antelope habitat improvements funds from the Arizona Game and Fish are expected to treat pinyon and juniper on the northeast corner of the allotment. We decided to include these costs in the Forest Service section because these funds have not yet been secured. When these funds are secured, the Forest Service would administer them.

Environmental Justice and Americans with Disabilities Act (ADA)

The Forest Service looked at the social, economic, and environmental impacts of this project and determined that none of the alternatives considered in this analysis would have a disproportionate impact on any minority population in the immediate area, within surrounding counties, or in the Northern Arizona region. In addition, there are not impacts to Americans with disabilities from implementation of the livestock grazing alternatives or from removing livestock grazing from the area for 10 years.

Scenery

Affected Environment

The Youngs Canyon Allotment is located just south of Interstate Highway 40, just south Winona, Arizona. Approximately one mile of the allotment can be seen from the Interstate. The majority of allotment is not immediately visible from this busy corridor. Most people view the allotment area by driving on dirt Forest roads in the area.

People generally like to see grass covered ranges with little bare dirt visible within the grass. In range management this is measured as ground cover and consists of green grasses that have some seed heads and a healthy look; dead logs, sticks and needles that appear natural; full, green shrubs; and wildflowers. Rangelands with good mixtures of these ground cover components tend to be healthy and healthy rangelands tend to be scenic. However, more wildflowers, considered scenic by most people, tend to grow in areas with poorer range conditions because many wildflowers are invader species (plants that out-compete overgrazed forage species).

Fences can decrease the beauty of areas. Although the existing old fences may be accepted as part of scenery of areas, new fences, especially across meadows, may not be. Other structures such as dirt tanks, water pipelines, cattle guards, drinkers and water storage tanks also affect visual aspects of landscapes. For example, a large metal trick tank located in the middle of a large opening may reduce scenic qualities in that opening. Most structures built in the past do not blend with natural landscapes and these structures will remain on the allotment under any alternative.

Effects of Alternatives

Presently, ranges on the Youngs Canyon Allotment lack some ground cover components in some areas. For example, the alluvial soil bottoms on the allotment portion have impaired soil conditions with too much bare soil and not enough plant cover. The vegetation section of this chapter describes how each alternative will affect overall range health on the allotment. Areas in which range health will decrease will probably become less scenic, those in which range health will be unaffected will retain their current scenic conditions, and those in which, and range health will improve will probably become more scenic.

The structural improvements that will be constructed under all action alternatives may affect the scenery of these areas. The trick tank system will be designed to blend into the natural landscapes, where possible. The pinyon and juniper treatments will be designed with irregular edges and sizes to blend in with the surrounding areas. Portions of the pinyon and juniper treatments will be burned to remove excessive tree litter after cutting. This will improve the visual appearance of the area after treatment. Some people believe that any vegetation disturbance looks bad and they would rather see a monoculture of mature pinyon and juniper trees (Alternatives B and C). Other people would rather see a variety of vegetation from dense pinyon and juniper forests to open grasslands (Alternatives A and D).

Heritage Resources/Traditional Cultural Properties

Current grazing and range improvements are considered to have no effect on cultural resources and this determination has been concurred with by the SHPO. In addition, current inventories and knowledge indicate that continued cattle grazing in the area will have no effect to cultural resources on the allotment. However, all ground disturbing actions will meet archeological clearance requirements before implementation.

Prior to implementing any of the range improvement measures specified in this EA, the appropriate level of Section 106 compliance with the National Historic Preservation Act will be completed. Some implementation techniques are less ground disturbing than others, and each year's activities will be monitored to understand the potential for site disturbance. Through site avoidance where necessary, archaeological sites in the area will be protected.

Cumulative Effects

This section summarizes cumulative effects for the Youngs Canyon Allotment and surrounding landscape. Additional cumulative effects are listed in the Wildlife section, the Air Quality section and the Water Quality section of this EA.

The Youngs Canyon Allotment occurs in the Canyon Diablo and Lake Mary 5th code watersheds. At this time, specific data is only available for that portion of these watersheds that occurred on the Coconino National Forest. The Coconino National Forest manages much of the upper portion of the Canyon Diablo and Lake Mary watersheds. How the Forest Service manages these lands, therefore, can have a great influence on watershed condition.

The Arizona Department of Environmental Quality's Arizona Water Quality Assessment Report (1998) was consulted for water quality statuses of all watersheds within the allotment. The report lists assessment information concerning the Little Colorado River (Canyon Diablo and Lake Mary) that could potentially be impacted by activities on the Youngs Canyon Allotment. Both stream reaches were evaluated and determined to be in full compliance with their designated uses.

Most cumulative effects to the Canyon Diablo and Lake Mary Watersheds can be traced to increases in and the timing of runoff that affects peak flows or to above background sediment production from impaired soils. The accelerated soil erosion caused by these increased flows can harm the physical and biological integrity of stream systems. For example, flooding has strongly influenced stream channel morphology, water quality and the numbers and locations of human developments in the watershed. Recent flooding, however, locally and across the western states, was caused by extended periods of heavy precipitation on saturated soils. Vegetative and soil conditions, urban developments and transportation systems are other factors that affect the levels and timing of stream flows.

Various activities occurring in a watershed may have a cumulative effect on water quality or water yield. A cumulative effects analysis considers all these activities in addition to the proposed action. The areas of resource concern that are identified are water quality in the Little Colorado River (Canyon Diablo and Lake Mary), and change in watershed condition and runoff rates.

All vegetation and soil disturbing land uses that reduce water infiltration rates or remove excessive amounts of vegetative cover from sites can increase runoff during peak storm flows. Land uses such as building sites, paved parking lots and roads most directly impact peak flows. Specifically, these uses eliminate infiltration and cause all precipitation to become runoff. In areas where animals tend to congregate, excessive trampling and over utilization of vegetation can substantially reduce infiltration rates and increase runoff. Proper cattle grazing management minimizes these impacts from cattle.

Timber harvest activities also affect infiltration rates and runoff amounts. These effects vary with the intensities of activities.

Actions and their anticipated effects within or adjacent to the allotment are described below. There is little difference between the alternatives related to cumulative effects.

Timber Activities: Pinyon and juniper fuelwood projects are the only timber harvest found within the Youngs Canyon Allotment. These commercial fuelwood projects occurred from 1994 to 1996 on approximately 880 acres. Legal and illegal individual tree harvest has occurred throughout the allotment. No commercial fuelwood sales are planned for this area in the near future.

Roads: The goal for managing the road system on the Coconino National Forest within the allotment is to limit overall road densities to two miles per square mile. There are no roads in Wilderness lands within the Allotment. Several roads have been closed or obliterated recently and additional closures and obliterations are expected in the future. Existing open forest system roads will be maintained at levels suited to their uses and locations. Future road closures, obliterations and maintenance activities will not substantially change the amount of forage available for livestock or wildlife in these divisions. Funding appropriated for maintenance of forest system roads is declining. Some funds will be invested in road closures and obliterations, but funding will be poor for the maintenance of many existing forest roads. Consequently, roads will continue to be a source of sediment in the Canyon Diablo and Lake Mary Watersheds.

Livestock Grazing: Livestock and big game grazing within the Canyon Diablo and Lake Mary Watersheds occur on portions of the following Coconino National Forest allotments:

Table 10. Allotments within Canyon Diablo Watershed by acres and percent of watershed.

Allotment Name	Acres	Percent of Watershed
Angell	38,104	17
Deep Lake	10,973	5
Padre Canyon	20,992	9
Walnut Canyon	7,487	3
Pickett Lake	24,559	11
Mud-Tinny Springs	7,388	3
Anderson Springs	47,073	21
Apache Maid	15,292	7
Bar T Bar	38,523	17
Excluded Area	7,105	3
Youngs Canyon	6,342	3
Totals	223,838	100

Table 11. Allotments within Canyon Diablo Watershed by acres and percent of watershed.

Allotment Name	Acres	Percent of Watershed
Angell	38,104	17
Deep Lake	10,973	5
Padre Canyon	20,992	9
Walnut Canyon	7,487	3
Pickett Lake	24,559	11
Mud-Tinny Springs	7,388	3
Anderson Springs	47,073	21
Apache Maid	15,292	7
Bar T Bar	38,523	17
Excluded Area	7,105	3
Youngs Canyon	6,342	3
Totals	223,838	100

Livestock grazing on these allotments contributes to cumulative impacts on the watershed. These cumulative impacts include loss of vegetative ground cover, soil compaction, localized erosion, increased runoff and biological pollution, and loss of plant diversity, abundance and vigor. However, grazing on these allotments in conjunction with grazing on the Youngs Canyon Allotment during the 10-year period will probably not cause any long-term negative impacts on resources in the watershed given current cattle and elk numbers.

Wildfire: Wildfires on the Youngs Canyon Allotment are common but rarely exceed one acre in size because the area is dominated by pinyon and juniper/blue grama vegetation. Ponderosa pine stringers and dense pinyon and juniper slopes within the canyons do have more a chance to have a larger stand replacement fire with the right weather conditions. There is no history of a wildfire exceeding five acres in this area. Soil and watershed conditions are currently satisfactory in dense pine stands in the Canyon Diablo and Lake Mary Watersheds (in the ponderosa pine above this allotment), but an intense wildfire could easily impair the watershed's hydrologic functions by burning soils and vegetation.

Recreation: Recreational use of the Canyon Diablo and Lake Mary Watersheds is moderate to high and will probably increase over the 10-year permit period. Individuals and groups use the area and activities include hiking, horseback riding, bicycling, jeep driving, off-highway vehicle driving, dispersed camping, and camping in developed campgrounds. Most use occurs along major highway corridors and in developed recreation sites. In some places throughout the watershed, recreation uses cause one or more of the following effects: loss of vegetative ground cover, soil compaction, localized erosion, increased runoff and biological pollution. There are no developed facilities or Forest Service system trails within the Youngs Canyon allotment and dispersed recreation use is moderate.

State Lands: State administered lands in the Canyon Diablo and Lake Mary Watersheds are managed in a similar manner and many of the same laws and regulations apply to both Forest Service and State agencies. The Arizona State Land Department is developing a nonpoint source/Best Management Practices agreement with the Arizona Department of Environmental Quality that will further emphasize protection for and help reduce sedimentation and turbidity in the Canyon Diablo and Lake Mary Watersheds.

AZ Department of Transportation: The Arizona Department of Transportation (ADOT) is required by the National Environmental Policy Act and the Forest Service to develop a road management plan for highways on Forest Service administered lands and the plan must address watershed and water quality concerns. ADOT is currently assessing impacts of snow and ice removal on State highways.

Private Lands: Private inholdings located within and adjacent to the Allotment are currently well developed. Further development of these lands is possible but most of the area is filled with home sites. There are cumulative effects from private land development to Forest resources, like the increase of recreation around the development. The Forest Service and other cooperating land and resource management agencies will continue to work together to limit impacts from urban development on the Canyon Diablo and Lake Mary Watersheds.

Biological Pollution: Biological pollution in water is measured by the amount of bacteria and nutrients in a water supply, both naturally occurring and human caused. Increases in biological pollution can result from livestock and wildlife grazing, full body contact activities, pets and other animals near or in the water, subsurface seepage from campground toilet and shower facilities, urban development and septic tanks, runoff from campgrounds and populated areas where people and animals congregate, and materials naturally present in watersheds. The current biological pollution from the Youngs Canyon Allotment is very small and has little contribution to biological pollution to the Canyon Diablo and Lake Mary Watersheds.

In conclusion, all alternatives will not contribute to any adverse cumulative impacts on the Canyon Diablo and Lake Mary Watersheds during the 10-year permit period because of any proposed changes in cattle management or measures to mitigate adverse effects from grazing. Because Alternative B (No Grazing) will not permit cattle grazing on the allotment, it also will not contribute to any adverse cumulative effects on the Canyon Diablo and Lake Mary Watersheds.

CHAPTER 4

MONITORING

Monitoring on this allotment over this year and up to the next 10 years will include: compliance, allotment inspections, range readiness, forage production, rangeland utilization, condition and trend, soil condition, noxious weeds and threatened and endangered species.

Compliance: Throughout each grazing season Forest Service personnel to determine accomplishments of terms and conditions of this permit, Allotment Management Plan, and annual operating instructions will do compliance monitoring.

Allotment Inspections: Allotment inspections are a written summary done each fall by Forest Service personnel to document compliance monitoring and to provide an overall history of that year's grazing. This document may include weather history, the year's success, problems, improvement suggestions for the future, and monitoring summary.

Range Readiness: Each spring, Forest Service personnel will determine range readiness by assessing vegetative conditions. The range is generally ready for grazing when cool season grasses are leafed out, forbs are in bloom, and brush and aspen are leafed out. These characteristics indicate the growing season has progressed far enough to replenish root reserves so that grazing will not seriously impact these forage plants.

Forage Production: Production surveys for the allotment will be done every nine to 13 years. Cattle numbers could be adjusted as a result of evaluating these figures.

Rangeland Utilization: Utilization monitoring is an estimate of the available forage by weight consumed or trampled through grazing and is expressed as a percent of current years biomass removed. Utilization monitoring is designed to assess key forage utilization levels by cattle and elk during the year and from year to year. Key forage species for this allotment include blue grama, squirreltail and western wheatgrass. Utilization monitoring will be conducted by the permittee and spot checked by Forest Service personnel throughout the year in every grazed pasture. This monitoring will calculate an overall utilization value for a pasture 1) before cattle go into a pasture, 2) within five days after cattle leave a pasture, and 3) at the end of the growing season in the fall. Utilization will be averaged into the following five categories: no-use (0-10%), light (11-20%), moderate (21-50%), high (51-70%) and extreme (71%+). The goal for utilization will be 35% or less by cattle and elk throughout the year with this intensive livestock grazing system. Key areas will be setup, at a minimum, within an impaired alluvial soil bottom.

Key areas will normally be 1/4 to one mile from water, located on productive soils on level to intermediate slopes and be readily accessible for grazing. Size of the key forage monitoring areas could be 20 to 500 acres. In some situations such as high mountain meadows with perennial streams, key areas may be closer than 1/4 mile from water and less than 20 acres (Coconino National Forest Plan 1987, as amended).

Condition and Trend: Ecological condition and trend monitoring will help determine the effectiveness of the Allotment Management Plan and long-term trend. In the past we have used Parker 3-step and paced transects to determine condition and trend. We now have better monitoring techniques for ecological condition and trend.

The Region 3 Terrestrial Ecosystem Survey (TES) has mapped and described the potential vegetation and soils for this allotment. TES presents a benchmark against which we can measure our current condition, and assess the impacts of our proposed management. This enables us to quantify the benefits or trade-offs of different alternatives, helping us to determine which plant community(s) maximize our management objectives.

Ecological Condition: Estimated plant community canopy cover, similar to TES plant community descriptions, will be used to assess current vegetation conditions. We will analyze the data using a similarity index that meets our objectives. We will determine ecological similarity of the plant communities and a species by species similarity calculation. We will look at herbaceous canopy cover for our assessment purposes and calculate similarity of total canopy cover of herbaceous species. For species richness we will compare species presence or absence. Southwestern Region, Rangeland Analysis and Management Training Guide (6/97) describes similarity calculations.

To make our assessments more consistent across northern Arizona forests, a basic set of standard methods will be used. Data will be collected in three parts:

1. General Information: location, plot size, aspect, slope, elevation, geology, erosion, ground cover, fuel model information, evidence of disturbance(s), canopy cover by life form, basal area, RMRIS cover type, VSS class, and production.
2. Ocular Plant Composition: All plants will be identified to species (if possible). Estimates of canopy cover by percent categories and height will be recorded for each species. Percent canopy cover categories are those used by TES. For woody species, live and dead may be separated, and additional estimates may be recorded: diameter, crown base height, maturity, age and vigor.
3. Soil Condition Rating Guide: see FSH 2509.18. Information will be recorded on hydrologic function, stability and nutrient cycling of the soil.

Trend: Ecological trend will be measured using plant frequency methods. *Some Methods for Monitoring Rangelands and other Natural Area Vegetation*, 1997, edited by G.B. Ruyle; Cooperative Extension, College of Agriculture, University of Arizona, Tucson; Extension Report 9043; Chapter 2 - Plant Frequency Sampling for Monitoring Rangelands is the specific reference guide.

Plot Location and Sampling Intensity: Plot location and sampling intensity are important considerations when determining ecological condition and setting up long term trend monitoring. It is important the plots be located in areas that best monitor the impacts of our management practices.

Factors to be considered in determining sampling intensity are: complexity of sensitivity of known or anticipated resource use conflicts or controversy, diversity of vegetation types, ecological status, trend, and the desired level of precision. Sampling intensity is dependent on the kind, quality, and quantity of data needed. In determining the sampling intensity, the examiner should weigh the desired level of inventory against funding and personnel capabilities.

Canopy cover plots should be read within TES map units that are affected by alternatives in an environmental assessment. The exact number of plots within each map unit is determined by factors listed in the previous paragraph.

Four Parker 3 Step plots exist on the Youngs Canyon Allotment. New monitoring plots were located over these old existing Parker sites. At a minimum, one new plot will be located within another impaired soil alluvial bottom site on the allotment.

Precipitation: Precipitation is currently recorded within or near this allotment at Flagstaff National Weather Service Office at Bellemont and Flagstaff Airport. We suggest that additional rain gauges be established at the Youngs Canyon Allotment headquarters or other convenient location on the allotment for a more accurate record of local precipitation. This data could be recorded throughout the year and summarized in the annual inspection.

Soil Condition: The Intergovernmental Agreement between the Forest Service and the State of Arizona that controls water quality and the Clean Water Act requires implementation and effectiveness monitoring. The objectives of monitoring are to: 1) collect data sufficient to assist line officers and resource managers in evaluating effects of management activities on soil and water resources; 2) support changes in management activities to protect soil and water quality. Monitoring will help determine how successfully managers are implementing Guidance Practices and how effectively those practices are protecting soil and water quality. Arizona Department of Water Quality (ADEQ) will continue to monitor water quality in the area (see-attached table "Water Quality Status of Watersheds Affected").

Evaluating watershed condition can be assessed using information from the monitoring schemes above. Monitoring of plant abundance, ground cover, species diversity and estimates of overall soil condition (using the methods throughout this monitoring section) will indicate whether or not management practices are effectively meeting management goals. Trends toward improvements in species abundance and diversity should indicate that management practices are effectively improving soil condition and by inference, maintaining or improving downstream water quality and complying with water quality standards. Conversely, decreases in plant abundance and species diversity may indicate that management practices are not effective and need to be changed. Environmental factors, especially precipitation, will be considered when evaluating monitoring results.

At the end of 10 years, all planned improvements will be in place. Overall effectiveness will be evaluated on a yearly basis and intensively again at the end of the 10-year permit period. The annual operating plans will make adjustments to pasture graze periods, pasture rest periods and cattle numbers to respond to results of the previous year's annual monitoring, weather conditions, and as improvements are implemented.

A Fixed Station (Biocriteria Program) is located in the Little Colorado River (Canyon Diablo and Lake Mary) watershed several miles from the Youngs Canyon Allotment. These sites, like others throughout the Forest, have and are being used to track long-term conditions and trends at critical points in a watershed and to develop biological criteria for stream segments. Information from these sites will be considered in evaluating the effectiveness of management practices, but may be of limited value considering the multitude of influences affecting each monitoring site.

Noxious Weeds: Noxious weed inventories and will be needed on the allotment over the next 10 years. These surveys will be done during normal monitoring visits to the area. Special attention will given to all new disturbance areas (including burning), as well as known noxious weed sites.

Threatened, Endangered and Sensitive Species: Threatened, endangered and sensitive species monitoring is covered by the preceding monitoring schemes.

Rationale: This monitoring program gives this alternative the best data possible to monitor the effectiveness of this new management strategy while staying within the projected Forest Service budget. Forest Service, Youngs Canyon permittee(s) and Arizona Game and Fish Department will work together to collect this information.

CHAPTER 5

PREPARERS/CONSULTATION

Preparers

Doug Epperly, Recreation Specialist
Peaks and Mormon Lake Ranger Districts

Allen Farnsworth, Fuels Technician
Peaks Ranger District

Heather Green, District Wildlife Biologist
Peaks and Mormon Lake Ranger Districts

Mike Hannemann, Range Conservationist
Peaks, Sedona and Mormon Lake Ranger Districts

Jeff Hink, Watershed Specialist
Peaks and Mormon Lake Ranger Districts

Debbie Kill, NEPA Coordinator
Peaks and Mormon Lake Ranger Districts

Buck Wickham, Range Technician
Peaks, Sedona and Mormon Lake Ranger Districts

Other Contributors

Roger Esplin
Youngs Canyon Allotment Permittees

Gene Waldrip, District Ranger
Peaks Ranger District

Bruce Greco, District Ranger
Mormon Lake Ranger District

Linda Farnsworth, Archeologist
Peaks and Mormon Lake Ranger Districts

Sandy Nagiller, Wildlife Biologist
Peaks and Mormon Lake Ranger Districts

Barb Phillips, Botanist
Supervisors Office

Randy Smith, Habitat Specialist

Youngs Canyon Allotment Environmental Assessment

Arizona Game and Fish Department, District 3

LIST OF AGENCIES AND INDIVIDUALS CONSULTED

Acoma Tribe
Animal and Plant Health Inspector
Arboretum at Flagstaff
Arizona Cattlemen's Association
Arizona Department of Environmental Quality (ADEQ)
Arizona Game and Fish Department
Arizona Game and Fish Commission
Arizona Public Service
Arizona State Association of 4WD Clubs
Arizona State Land Department
Arizona Wildlife Federation
City of Flagstaff
City of Flagstaff City Council
CO Bar Livestock LTD
Coconino County
Coconino County Sheriffs Department
Cocopai CR&D
Coconino Sportsman
Colorado Plateau Forum
Flagstaff Hiking Club
Flagstaff KOA
Flagstaff Public Library
Flagstaff RMRS
Forest Conservation Council
Forest Guardians
Friends of Walnut Canyon
GFEC
Grand Canyon Trust
Havasupai Tribe
Hopi Tribe
Horse Trails Coalition
Hualapai Tribe
Kampground Owners Association
Kaibab National Forest
National Park Service
Native Plant and Seed
Nature Conservancy
Navajo Nation
Northern Arizona Audubon Society
Northern Arizona Cattle Growers
NAHB
Northern Arizona University
NAU School of Forestry
People for the West
RMRS

Youngs Canyon Allotment Environmental Assessment

Sierra Club, Plateau Group
Southwest Center of Biological Diversity
Southwest Forest Alliance
Total Timber
USDA Animal Damage Control
USDA NRCS-SCS
US Fish and Wildlife Service
Wildlife Society, Arizona Chapter
Wilson Foundation
Yavapai-Apache Tribe
Yavapai-Prescott Tribe
Zuni Tribe

During the planning and analysis process for this assessment, the Forest Service contacted over 60 additional individuals interested in or concerned about cattle grazing on the Youngs Canyon Allotment.