



United States
Department of
Agriculture

Forest
Service

Southwestern
Region



Environmental Assessment for the Pickett Lake and Padre Canyon Allotments

Coconino National Forest

July 2003

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CHAPTER 1 – PURPOSE AND NEED

Location and Background Information

The Pickett Lake and Padre Canyon Allotments are adjacent allotments located approximately nine miles southeast of Flagstaff, Arizona (see Maps 1A & 1B). The Pickett Lake Allotment runs from the eastern boundary of the Coconino National Forest below the Anderson Mesa Rim, up the Anderson Mesa Rim, and approximately three miles west of Forest Highway 3 (Lake Mary Road) between Upper Lake Mary and Mormon Lake. The Padre Canyon Allotment runs along the eastern edge of the Coconino National Forest boundary from the Pickett Lake Allotment on the south end to three miles south of the Twin Arrows/I-40 Highway junction on the north end.

The Pickett Lake and Padre Canyon Allotments consist of 34,814 and 20,993 acres, respectively. These acres lie in the eastern portion of the Mormon Lake Ranger District of the Coconino National Forest. The Pickett Lake and Padre Canyon Allotments are located within all or portions of T20N, R10E, Sections 7-10, 15-22, 27-35; T19N, R10E, Sections 1-36; T19N, R9E, Sections 1-36; T19N, R8E, Sections 12-14, 23, 24; and T18N, R10E, Sections 1-3; T18N, R9E, Sections 4-5, (see map three).

The Padre Canyon inventoried roadless area is located in part within the Padre Canyon Allotment. No changes to the inventoried roadless status will occur as a result of this analysis and decision. There are no Wild and Scenic Rivers within or near the Pickett Lake and Padre Canyon Allotments. There are no designated wilderness areas within or near the allotments. A Roads Analysis Process is not required for this project, because there is no change to the existing road system.

The Pickett Lake Allotment permit is for 758 cattle from 6/1 to 10/31. The Padre Canyon Allotment permit is for 87 cattle from 6/1 to 10/31. Both Pickett Lake and Padre Canyon grazing permits are issued to the same permittee. This joint ownership makes management coordination between the two allotments possible. In order to look at options for combined herds the two allotments are analyzed together in one allotment management plan. However, no permanent combination of these allotments is proposed in this analysis.

Grazing has occurred continuously on the Pickett Lake and Padre Canyon Allotments since the mid-1880's. 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. On the Pickett Lake Allotment over the last 10 years cattle numbers have varied from a high of 758 cattle (5/20-10/20) in 1994 to a low of 300 cattle (7/9 - 9/18) in 2002. On the Padre Canyon Allotment over the last 10 years cattle numbers have varied from a high of 87 (6/1-10/31) in 1995 to non-use in 1990, 1996 and 2000.

The Pickett Lake and Padre Canyon Allotments combined consist of 55,807 acres. Of these, full capacity rating for livestock is given to approximately 44,426 acres where soils are stable and are producing more than 100 pounds of forage per acre. Potential capacity rating for livestock is given to approximately 5,181 acres where soils are impaired mainly due to dense pinyon and juniper trees. No capacity classification is given to approximately 6,200 acres where slopes are over 40 percent and/or where forage production is less than 100 pounds per acre.¹

Purpose and Need for Action

The Pickett Lake and Padre Canyon Allotments are scheduled for environmental analysis of grazing use on the Coconino National Forest, as required by the Burns Amendment (1995). This project is being completed in order to ensure cattle grazing is consistent with goals, objectives, standards and guidelines of the Coconino National Forest Plan (as amended, 1987).

The purpose and need for this analysis is to set grazing levels within the carrying capacity for the allotments. Carrying capacity refers to the average number of livestock and/or wildlife that may be sustained on a management unit compatible with management objectives for the unit. Carrying capacity is a function of site characteristics, management goals and management intensity (1997 Region 3 USFS Rangeland Analysis and Management Training Guide).

Maintaining and/or improving rangeland condition on the Pickett Lake and Padre Canyon Allotments is also part of purpose and need. Recent monitoring indicates that current cattle grazing management is maintaining and/or improving rangeland conditions where cattle grazing occurs. This analysis will ensure the continued maintenance and/or improvement of rangeland condition through proper management.

In addition, new fencing and water installation is needed for better livestock control and distribution on these allotments. Fence improvements will keep cattle from leaving the north side of Elliot Pasture and walking down the Anderson Mesa Rim to unscheduled pastures. These fences will also keep cattle from grazing Billy Back and Boot Springs. Water improvements will provide water to cattle and wildlife on Padre Canyon Allotment where there is no reliable water source. This water will provide for better cattle distribution on this allotment.

This analysis for this project is consistent with the following:

- 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 these allotment management plans will be prepared

¹ Capacity is set at the Forest Plan level; this analysis has not resulted in a need to amend the Forest Plan.

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 1966, as amended.

- 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.

Proposed Action

The Proposed Action brings existing conditions towards desired conditions on the allotments. The Proposed Action is described under Alternative A. A list of actions, such as specific design and monitoring, are also described in Alternative A.

Actions presented in this alternative will allow for continued livestock use under specific conditions and management directions that consider watershed conditions, vegetative conditions, and wildlife needs on the Pickett Lake and Padre Canyon Allotments.

Decision Framework

This Environmental Assessment documents the results of analyses of the Proposed Action and Alternatives. The District Ranger of the Mormon Lake Ranger District is the Forest Service official responsible for deciding whether or not lands on the Pickett Lake and Padre Canyon Allotments currently authorized for grazing will be authorized in the future and in what manner. Items in this decision include cattle numbers, season of use, grazing system, and improvements such as pipelines and drinkers. The decision will be based on a consideration of the area's existing resource conditions, desired conditions, environmental issues, and the environmental effects of implementing the various alternatives. 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 this 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 and Finding of No Significant Impact, signed by the Mormon Lake District Ranger will document the decisions made as a result of this analysis. Should the decision result in livestock grazing, any and all grazing practices adopted in the decision will be further detailed in the terms and conditions of a new allotment management plan and grazing permit.

Public Involvement

This project was listed in the Schedule of Proposed Actions on 12/15/00 and all subsequent issues. One Proposed Action Scoping Letter was mailed in January of 2001 to a mailing list of people who expressed interest in the project, or who were otherwise determined to be interested or affected (adjacent landowners, organizations, and agencies). The first Proposed Action included cattle grazing changes and pinyon and juniper tree cutting and broadcast burning. After further consideration, it was decided to change the scope of the analysis to cattle grazing only.

A new Proposed Action Scoping Letter was mailed on 8/10/02 with the project narrowly defined to cattle grazing. Comments related to cattle grazing proposals from either proposed action were considered in this analysis. The comments were reviewed and significant issues were identified and are described below. Comment analysis for both scoping letters is located in the project files (PRD#33 and PRD#55A).

Issues

Issue #1 – The proposed action (cattle grazing system and utilization levels) may not improve wetland habitat enough for ground nesting birds, and riparian vegetative health within wetlands and closed basins.

Evaluating wetland habitat within the allotments and describing the relationship between cattle use and those habitats will assess this issue. This discussion will include descriptions of effects to plant height.

Issue #2 – The utilization level of 35% as proposed, may inhibit grass plants' growth, reduce vertical height and remove too many seed heads. The 35% utilization level may also lessen the plants' ability to grow to maturity and build necessary root mass. This level of use may lessen the plants' ability to propagate.

Evaluating differences in cattle distribution between the action alternatives will show subsequent effects to species composition, plant canopy cover, plant production and ground cover.

CHAPTER 2 - ALTERNATIVES

Alternative Development

This section describes how the alternatives were developed. Detailed descriptions of each alternative follow in the Alternatives Considered in Detail section.

Four alternatives are considered in this analysis: Alternative A-Proposed Action based on the 8/10/2002 Scoping Letter; Alternative B-No Grazing; Alternative C-Current Grazing Management; Alternative D-Reduction in Utilization and Cattle.

In addressing Issue #1, the hardstem bulrush plant community in Post Lake will be fenced under Alternatives A and D. Post Lake is the only semi-permanent wetland with hardstem bulrush on these two allotments. Fencing will improve the hardstem bulrush plant community at Post Lake. Cattle grazing impacts the hardstem bulrush community because cattle prefer it to other plants in the area and therefore graze it heavily. Excluding cattle could increase the number of hardstem bulrush plants in the area, even with continued elk grazing. Deep Lake has hardstem bulrush but the Pickett Lake Allotment cattle are excluded from these plants.

Spike rush and annual riparian species exists on many of the other wetlands and closed basins in this area. This wetland vegetation is dependent on water being in the basin long enough to create hydric soils. Both cattle and elk affect other wetlands and closed basins and removing cattle may create little improvement. At this time, action on Post Lake will occur.

In addressing Issue #2, Alternative D was developed. Alternative D is the same as Alternative A except for a reduction in utilization from 35% to 20%, which also changes the total number of cattle by 15%. This allows for comparison of forage use that allows the residual 80 percent of the plant to be available to reproduce, produce seed heads, produce litter important for nutrient recycling, and provide for the needs of other wildlife species.

Alternatives Considered and Eliminated from Detailed Study

There were no alternatives considered and eliminated from detailed study.

Alternatives Considered In Detail

The alternatives described here are the final four alternatives considered for implementation for the Pickett Lake and Padre Canyon Allotments 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.

2002 Arizona Game and Fish Pronghorn Plan: The Plan was developed for the larger area of Anderson Mesa and only items specific to the Pickett Lake and Padre Canyon Allotments will be included. All of these items were started in 2002.

- Boot pasture is rested from cattle grazing for years 2002, 2003 and 2004 under the current Annual Operating Instructions.
- Ducknest pasture is deferred from cattle grazing August 15 to June 15 for years 2002, 2003, and 2004 under the current Annual Operating Instructions.
- Breezy pasture will be grazed as scheduled for the next three years.
- Modify fences to the 18” smooth bottom wire recommendation in key pronghorn habitat.
- Adaptive management through a team comprised of interested members of the Anderson Mesa Pronghorn Mediation group, and open to the public, will annually evaluate the results of the previous year’s treatments and management in January or February. This group makes recommendations for the following year. The Annual Operating Instructions for the Pickett and Padre Canyon Allotments may be changed to reflect new information based on studies, on-going field experiences and conclusions. If changes are suggested that fall outside of the parameters of this decision they would be analyzed in a new environmental analysis and decision. The Forest Service will make the determination whether or not to undertake a new NEPA decision at the time the recommendation is brought forward.

Grazing Schedules: Each action alternative contains proposed grazing schedules for each allotment and the schedules are described in the Range Specialist’s Report (PRD#65). Alternatives A and D each have schedules for one or two herd management. These grazing schedules are given as a guide to future use; however, they may be adjusted as a result of monitoring, weather, etc. throughout the 10-year planned period. The Annual Operating Instructions are the means by which adjustments of livestock numbers, change of season of use, and pasture rest periods are adjusted in response to monitoring information such as frequency, canopy cover, Parker 3-Step plots and inspections of the Allotments. Livestock numbers may go up or down annually but will not exceed the number set by the decision. The minimum livestock number is zero.

Stock Tanks: There are no new stock tanks in any alternative. There is also no removal of the existing stock tanks in any alternative.

Annual Operating Instructions: Annual Operating Instructions make adjustments to cattle numbers, and time and duration of pasture use based on current climatic and range conditions. Annual Operating Instructions may be adjusted throughout the season as conditions change.

Roads and Cattle Guards: Common to all action alternatives is the need to keep cattle contained to pastures and Forest users from leaving pasture gates open. Where roads are open for public use, cattle guards will be installed and maintained. Where roads are identified for closure, in past and future road decisions, no cattle guards are 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: Common to all action alternatives is the need for cultural, wildlife and recreation coordination when implementing the grazing system. Structural improvements such as fencing, a pipeline 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. If the “No Grazing” Alternative is selected each resource area will be consulted to determine if the allotment improvements will be kept and/or maintained.

Threatened, Endangered and Sensitive Species Coordination: Mitigation measures or implementation parameters described in the biological assessments and biological evaluations will be reviewed and selected as part of the decision. Locate improvements specific to the selected alternative in response to species considerations.

Range Structure Implementation: Timing of new range structure construction will be coordinated with the wildlife biologists, recreation specialists and affected special use permit holders.

Fencing: All new fencing will contain a smooth bottom wire at an 18-inch height for wildlife. Where possible, locate fences within tree lines to limit impact to visual quality. Elk jumps and goat bars may be constructed along new fences and along existing fences on game trails.

Monitoring: The following is a list of the main items that will be monitored in the action alternatives: permittee permit compliance, allotment inspections, range readiness, forage production, rangeland utilization, condition and trend, precipitation, noxious weeds and soil condition (see Chapter 4-Monitoring for more specific information).

Mitigating Measures: The following mitigation measures will be required to minimize the impacts from actions proposed in all action alternatives on bald eagles and Mexican spotted owl habitat.

Bald Eagle

- Livestock management activities such as salting, herding and construction actions associated with grazing operations within the analysis area will not occur within 0.25 miles of a bald eagle roost or nest site during any time of occupation by bald eagles.

Mexican Spotted Owl

- Seven acres of one Mexican spotted owl Protected Activities Centers (PAC) occur within the Pickett Lake and Padre Canyon Allotments. No human disturbance or construction activities associated with livestock grazing operations would occur within this PAC during the breeding season (March 1 through August 31).
- Continue to monitor grazing use by livestock and wildlife in the ponderosa pine type. Utilization for cattle and/or elk is 35% in these key areas. Monitoring will be completed to ensure utilization is below this level. Cattle will be moved to the next pasture in the rotation before utilization is exceeded.
- The following guidelines will be used for placing salt, mineral blocks, or food supplements:

- a) Do not place these items in riparian areas, mountain meadows, or non-riparian drainages in ponderosa pine.
 - b) Do not place these items in spotted owl PAC's.
 - c) Rotate salt and mineral supplement sites regularly, at least every two weeks, within spotted owl restricted habitat.
- Follow Best Management Practices as listed in Chapter 3, Soil and Watershed section.
 - 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.

Alternative A (Proposed Action)

Alternative A is the Proposed Action and the action scoped with the public. Alternative A meets the purpose and need by: continuing grazing within the carrying capacity established for the allotments, maintaining and/or improving rangeland conditions where cattle grazing occurs, implementing an overall reduction in cattle use, reducing graze periods, increasing rest periods, constructing one-mile of fence along the Anderson Mesa Rim to keep cattle from moving down below the rim and this fence will exclude Boot and Billy Back Springs from cattle grazing, and improving water distribution below the Anderson Mesa Rim.

Alternative A addresses the issue of improving riparian health and ground nesting bird habitat in wetlands by: implementing an overall reduction in cattle use, reducing graze periods, increasing rest periods, excluding the hardstem bulrush plant community at Post Lake and excluding Boot and Billy Back Springs from cattle grazing.

Alternative A addresses the issue of utilization by establishing a 35% limit by cattle and/or elk. This is an appropriate utilization level, by these grazing ungulates, for forage because it allows 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 other wildlife species. When pasture use approaches 35% by cattle and/or elk, cattle will move to the next pasture in the rotation. If elk use exceeds 35% before cattle enter a pasture, cattle will skip this pasture and move to the next pasture in the rotation. Adjustments in the Annual Operating Instructions would need to be made if graze periods are adjusted more than one week. As the new Allotment Management Plan is implemented, cattle numbers will be adjusted annually to meet this utilization standard.

Maintenance will be done on all new and existing structural improvements including barbed wire fences, cattle guards, trick tanks, stock tanks and drinkers, by the permittee. In pronghorn habitat, the bottom wire of new and reconstructed fences will be smooth and be a minimum height of 18 inches to facilitate pronghorn passage.

In addition to maintaining current range structures, approximately \$25,600 will be spent on one mile of barbwire fence, four miles of pipeline and five drinkers. The one-mile of fence will be

constructed along the Anderson Mesa Rim to keep cattle from moving down below the rim, and to exclude cattle grazing from Billy Back and Boot Springs. The Forest Service will spend approximately \$13,700 primarily for materials and the permittee will spend approximately \$11,900 primarily for installation of these improvements.

This analysis permits grazing for up to a ten-year period. The exact length of the permit will depend on the permittee's ability to manage these two allotments. Each year, it will be decided whether to run two separate systems or run the combined system, as described below. These cattle numbers are based on past and present stocking rates and carrying capacity estimates.

Pickett Lake Allotment Proposed Grazing Schedule. The Pickett Lake herd will consist of a maximum number of 850 head of cattle from 6/1 through 9/30. The cattle run in an eight-pasture rest rotation grazing system with one or two of the main pastures receiving yearlong rest each year². The cows start below the Anderson Mesa Rim in June and rotate through six to seven of the eight pastures until the end of September. Each large pasture is rested at least once every five years. Cattle rotate clockwise and counter-clockwise through the pastures every other year. Graze periods vary for any one pasture from three to 34 days. *Major differences from current management: a 10% reduction in cattle use with a reduction in the grazing season from five months to four months. Maximum pasture graze periods are reduced from 44 days to 34 days.*

Padre Canyon Allotment Proposed Grazing Schedule. The Padre Canyon herd will consist of a maximum number of 125 head of cattle from 8/1 through 9/30. The cattle run in a four-pasture deferred rotation grazing system. Only two fenced pastures exist on the allotment, however, Mormon and Padre Canyons work as pasture divisions to realistically divide the allotment into four pastures. The cattle are rotated through all four pastures during the grazing season and this use is deferred annually. Graze periods vary for any one pasture from 15 to 30 days. *Major differences from current management: A 43% reduction in cattle use with a reduction in the grazing season from five to two months. Maximum pasture graze periods are reduced from 39 days to 30 days.*

Combining Pickett and Padre Allotments Proposed Grazing Schedule. The two allotments areas could be combined along with each cattle herd. Cattle numbers would consist of a maximum of 913 head from 6/1 through 9/30 (850 cattle for four months on Pickett Lake and 63 head for four months on Padre Canyon). The cattle would run in a 10-pasture rest rotation grazing system. Cattle will run for approximately 30 days below the Anderson Mesa Rim either in June or September, every other year, with up to 20-day pasture graze periods. Pastures above Anderson Mesa Rim will graze the same as the Pickett Lake schedule but with graze periods from three to 24 days. Two to three pastures each year would be rested from cattle grazing.

This grazing system could only be used after the pipeline system is in place and enough pinyon and juniper trees are removed, through future environmental analyses, to make pasture gathering possible and practical below the Anderson Mesa Rim. Monitoring forest and cattle utilization will determine if combining herds is feasible over the long-term. *Major differences from current management: a 14% reduction in cattle use for the combined allotment area from current use. The grazing season above the Anderson Mesa Rim is reduced from five months to three months.*

² Large pastures include Ashurst, Railroad, Ducknest, Boot and Breezy.

The grazing season below the Anderson Mesa Rim is reduced from five months to one month. Maximum pasture graze periods above the Anderson Mesa Rim are reduced from 44 days to 24 days. Maximum pasture graze periods below the Anderson Mesa Rim are reduced from 39 days to 20 days. In addition, one pasture below the rim is rested each year where no yearlong rest is currently done.

The following areas on Forest Service lands will not be used by Pickett Lake and Padre Canyon cattle in the next 10 years: Ashurst Lake enclosure, Ashurst Spring enclosure and Long Lake enclosure.

The Parker-Three-Step Clusters, frequency and canopy cover plots were done at existing Parker Three-Step Clusters sites in the summer of 1999. At least two additional frequencies, canopy cover and ground cover plots will be established within impaired or unsatisfactory soil sites.

Alternative B

Alternative B is the no cattle grazing alternative, and is one of the No Action Alternatives required under NEPA. Alternative B does not meet the purpose and need in providing for cattle grazing within the carrying capacity established for the allotments because the cattle grazing system would be discontinued for a 10-year period. This alternative does not preclude cattle grazing, or livestock management on these allotments in the future if a decision is made through another comprehensive analysis to resume these actions.

With no cattle use, the graze periods and rest periods are not applicable to this alternative.

Rangeland management conditions in tree-less areas is expected to move towards desired conditions by an increase in grass, forb and shrub plant species composition, plant canopy cover, plant production and ground cover because of rest from livestock grazing in the first five years. After five years rangeland management conditions would likely move away from desired conditions by a decrease in grass, forb and shrub abundance, diversity and production due to a build up of grass litter.

Alternative B addresses the issue of improving riparian health and ground nesting bird habitat in wetlands by: implementing an overall removal of cattle.

Alternative B addresses the issue of utilization by discontinuing cattle grazing so the utilization would be from wildlife alone.

If this alternative were selected, the structural range improvements would need to be evaluated by the Forest Service district staff for removal and/or maintenance by either the Forest Service, other agencies or groups.

Monitoring would be done to evaluate rangeland conditions without cattle grazing.

Alternative C

Alternative C is the current, rest-rotation cattle grazing management system on the Pickett Lake and Padre Canyon Allotments. Alternative C meets the purpose and need by: continuing grazing within the carrying capacity established for the allotments; and maintaining and/or improving rangeland conditions where cattle grazing occurs; implementing current cattle use graze periods and rest periods.

Alternative C does not address the issue of improving riparian health and ground nesting bird habitat in wetlands. This Alternative only maintains these conditions where cattle grazing occurs.

Alternative C addresses the issue of utilization by maintaining the 35% limit by cattle and/or elk. This is an appropriate utilization level, by these grazing ungulates, for forage because it allows 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 other wildlife species. When pasture use approaches 35% by cattle and/or elk, cattle will move to the next pasture in the rotation. If elk use exceeds 35% before cattle enter a pasture, cattle will skip this pasture and move to the next pasture in the rotation. Adjustments in the Annual Operating Instructions would need to be made if graze periods are adjusted more than one week. As the new Allotment Management Plan is implemented, cattle numbers will be adjusted annually to meet this utilization standard.

Maintenance will be done on all existing structural improvements including barbed wire fences, trick tanks, stock tanks and drinkers, and cattle guards as needed by the permittee.

Pickett Lake Allotment Proposed Grazing Schedule. The Pickett Lake herd will graze a maximum number of 758 head of cattle from 6/1 through 10/31. The cattle run in an eight-pasture rest rotation grazing system. One to two pastures receive yearlong rest each year. The cattle start below the Anderson Mesa Rim in June and rotate through six to seven of the eight pastures until the end of September. Each large pasture is rested at least once every five years. Cattle rotate clockwise and counter-clockwise through the pastures every other year. Graze periods vary from three to 44 days.

Padre Canyon Allotment Proposed Grazing Schedule. The Padre Canyon herd will graze a maximum number of 87 head of cattle from 6/1 through 10/31. The cattle run in a four-pasture deferred rotation grazing system. Only two fenced pastures exist on the allotment, however, Mormon and Padre Canyons work as divisions to realistically divide the allotment into four grazing pastures. The cattle are rotated through all four pastures during the grazing season and this use is deferred annually. Graze periods vary from 15 to 39 days.

Alternative D

Alternative D meets the purpose and need by: reducing cattle numbers and utilization by 15%; continuing grazing within the carrying capacity established for the allotments; maintaining and/or improving rangeland conditions where cattle grazing occurs; reducing graze periods;

increasing rest periods; constructing one-mile of fence along the Anderson Mesa Rim to keep cattle from moving down below the rim and this fence will exclude Boot and Billy Back Springs from cattle grazing; and improving water distribution below the Anderson Mesa Rim.

Alternative D addresses the issue of improving riparian health and ground nesting bird habitat in wetlands by: implementing an overall reduction in cattle use; reducing graze periods; increasing rest periods; excluding the hardstem bulrush plant community at Post Lake and excluding Boot and Billy Back Springs from livestock grazing.

Alternative D addresses the issue of utilization by establishing a 20% limit by cattle and/or elk. This is an appropriate utilization level, by these grazing ungulates, for forage because it allows the residual 80 percent of the plant to be available to reproduce, produce seed heads, produce litter important for nutrient recycling, and provide for the needs of other wildlife species. When pasture use approaches 20% by cattle and/or elk, cattle will move to the next pasture in the rotation. If elk use exceeds 20% before cattle enter a pasture, cattle will skip this pasture and move to the next pasture in the rotation. Adjustments in the Annual Operating Instructions would need to be made if graze periods are adjusted more than one week. As the new Allotment Management Plan is implemented, cattle numbers will be adjusted annually to meet this utilization standard.

Maintenance will be done on all new and existing structural improvements including barbed wire fences, cattle guards, trick tanks, stock tanks and drinkers, by the permittee. In pronghorn habitat, the bottom wire of new and reconstructed fences will be smooth and be a minimum height of 18 inches to facilitate pronghorn passage.

In addition to maintaining current range structures, approximately \$25,600 will be spent on one mile of barbwire fence, four miles of pipeline and five drinkers. The one-mile of fence will be constructed along the Anderson Mesa Rim to keep cattle from moving down below the rim, and to exclude cattle grazing from Billy Back and Boot Springs. The Forest Service will spend approximately \$13,700 primarily for materials and the permittee will spend approximately \$11,900 primarily for installation of these improvements.

This analysis permits grazing for up to a ten-year period. The exact length of the permit will depend on the permittee's ability to manage these two allotments. Each year, it will be decided whether to run two separate systems or run the combined system, as described below. These cattle numbers are based on past and present stocking rates and carrying capacity estimates.

Pickett Lake Allotment Proposed Grazing Schedule. The Pickett Lake herd will consist of a maximum number of 722 head of cattle from 6/1 through 9/30. The cattle would run in an eight-pasture rest rotation grazing system with one or two of the main pastures receiving yearlong rest each year³. The cattle start below the Anderson Mesa Rim in June and rotate through six to seven of the eight pastures until the end of September. Each large pasture is rested at least once every five years. Cattle rotate clockwise and counter-clockwise through the pastures every other year. Graze periods vary for any one pasture from three to 34 days. *Major differences from current management: a 24% reduction in cattle use with a reduction in the grazing season from*

³ Large pastures include Ashurst, Railroad, Ducknest, Boot and Breezy.

five months to four months. Maximum pasture graze periods are reduced from 44 days to 34 days.

Padre Canyon Allotment Proposed Grazing Schedule. The Padre Canyon herd will consist of a maximum number of 106 head of cattle from 8/1 through 9/30. The cattle run in a four-pasture deferred rotation grazing system. Only two fenced pastures exist on the allotment, however, Mormon and Padre Canyons work as pasture divisions to realistically divide the allotment into four pastures. The cattle are rotated through all four pastures during the grazing season and this use is deferred annually. Graze periods vary for any one pasture from 15 to 30 days. *Major differences from current management: A 51% reduction in cattle use with a reduction in the grazing season from five to two months. Maximum pasture graze periods are reduced from 39 days to 30 days.*

Combining Pickett and Padre Allotments Proposed Grazing Schedule. The two allotments areas could be combined along with each cattle herd. Cattle numbers would consist of a maximum of 775 head from 6/1 through 9/30 (722 cattle for four months on Pickett Lake and 53 head for four months on Padre Canyon). The cattle would run in a 10-pasture rest rotation grazing system. Cattle will run for approximately 30 days below the Anderson Mesa Rim either in June or September, every other year, with up to 20-day pasture graze periods. Pastures above Anderson Mesa Rim will graze the same as the Pickett Lake schedule but with graze periods from three to 24 days. Two to three pastures each year would be rested from cattle grazing.

This grazing system could only be used after the pipeline system is in place and enough pinyon and juniper trees are removed, through future environmental analyses, to make pasture gathering possible and practical below the Anderson Mesa Rim. Monitoring forest and cattle utilization will determine if combining herds is feasible over the long-term. *Major differences from current management: A 27% reduction in cattle use for the combined allotment area from current use. The grazing season above the Anderson Mesa Rim is reduced from five months to three months. The grazing season below the Anderson Mesa Rim is reduced from five months to one month. Maximum pasture graze periods above the Anderson Mesa Rim are reduced from 44 days to 24 days. Maximum pasture graze periods below the Anderson Mesa Rim are reduced from 39 days to 20 days. In addition, one pasture below the rim is rested each year where no yearlong rest is currently done.*

The following areas on Forest Service lands will not be used by Pickett Lake and Padre Canyon cattle in the next 10 years: Ashurst Lake enclosure, Ashurst Spring enclosure and Long Lake enclosure.

The Parker-Three-Step Clusters, frequency and canopy cover plots were done at existing Parker Three-Step Clusters sites in the summer of 1999. At least two additional frequencies, canopy cover and ground cover plots will be established within impaired or unsatisfactory soil sites.

Comparison of Alternatives

The following tables are a quick reference for comparing the alternatives. Complete descriptions of the alternative comparison are given in Chapter 2-Alternatives and Chapter 3-Affected Environment and Environmental Consequences.

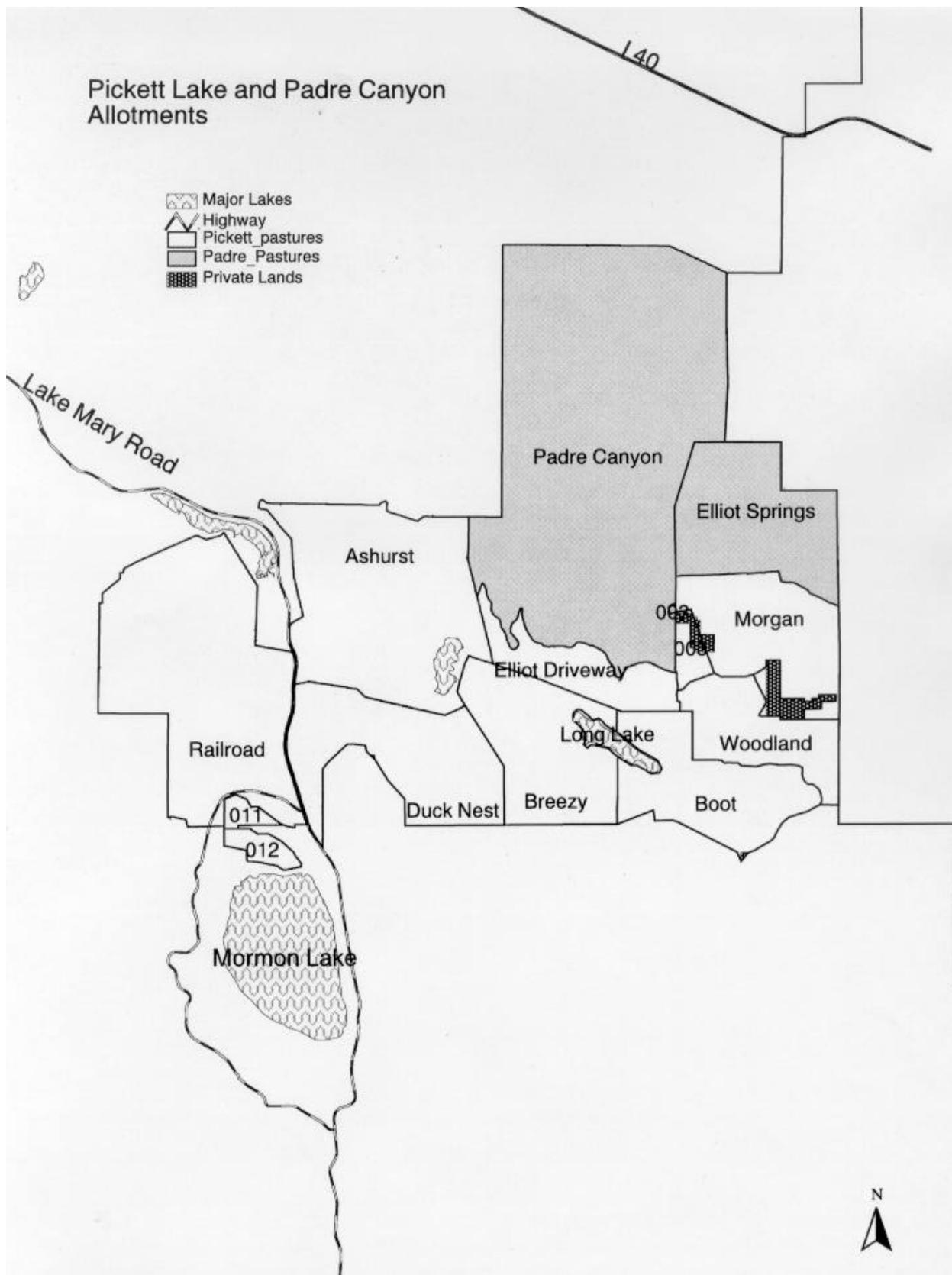
Table 1 Alternative Comparison – Season of Use, Number of Cattle, Pasture Graze Period Days, Number of Pastures Rested Yearly, Reduction in Cattle Numbers From Current Numbers.

ALTERNATIVE	A		B	C		D
Season of Use	Pickett	6/1-9/30	0	6/1-10/31		Same as A
	Padre	8/1-9/30				
	One Herd	6/1-9/30				
Number of Cattle	Pickett	850	0	Pickett	758	Pickett 722
	Padre	125		Padre	87	Padre 106
	One Herd	913		One Herd	N/A	One Herd 775
Pasture Graze Period Days	Pickett	3-34	0	Pickett	3-44	Same as A.
	Padre	30		Padre	38-39	
	One Herd	3-24		One Herd	N/A	
Number of Pastures Rested Yearly	Pickett	1-2	All	Pickett	1-2	Same as A.
	Padre	0		Padre	0	
	One Herd	2-3		One Herd	N/A	
Reduction in Cattle Numbers From Current Numbers	Pickett	10%	100%	N/A		Pickett 24%
	Padre	43%				Padre 51%
	One herd	14%				One Herd 27%

Pickett = Pickett Lake Herd, **Padre** = Padre Canyon Herd, **One Herd** = The Combined Use of Both Allotments With One Herd of Cattle.

Table 2. Alternative Comparison for Purpose and Need, Issues and the Integration of the 2002 Arizona Game and Fish Department Pronghorn Plan.

Purpose and Need	Alternatives			
	A	B	C	D
Provides for a Grazing Strategy Within Carrying Capacity	Yes	No	Yes	Yes
Maintains and/or Improves Rangeland Conditions	Yes	Yes	Yes	Yes
Keeps Cattle from Descending Anderson Mesa Rim	Yes	Yes	No	Yes
Keeps Cattle from Grazing Boot and Billy Back Springs	Yes	Yes	No	Yes
Provides Reliable Water Below the Anderson Mesa Rim	Yes	No	No	Yes
Issues				
Improves Riparian Health and Ground Nesting Bird Habitat	Yes	Yes	No	Yes
Establishes Proper Utilization Limits to Sustain Rangeland Health	Yes	Yes	Yes	Yes
Integration of the 2002 AZGF Pronghorn Plan	Yes	Yes	Yes	Yes



CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter describes the environment being affected or created by the four alternatives discussed in Chapter 2 and documents the scientific and analytical basis for the comparisons made between these alternatives. How the alternatives meet the purpose and need for this project is described. The impacts for each alternative are discussed for the significant issues. The impacts for each alternative on other aspects of the human environment are also described. The Response to Comments document (PRD #55A), provides additional information related to non-significant issues that may not be addressed in this chapter. Additional information may be found in the project file. Where specific documents within the file are referenced, these are noted in the text of this chapter.

Applicability of the Forest Plan, Laws, Regulations, Policies and Other Direction

Plans of Other Agencies

The Council for Environmental Quality regulations implementing NEPA require a determination of possible conflicts between the Proposed Action and the objectives of federal, state, and local land use plans, policies, and controls for the area. The Pickett Lake and Padre Canyon Allotment Plans do not conflict with objectives of other Federal, State, and local land use plans, policies and controls for the area.

Forest Plan Management Direction and Consistency

This document tiers to the Final Environmental Impact Statement and Land and Resource Management Plan (Forest Plan) for the Coconino National Forest (Record of Decision, 1987) and all subsequent amendments. The Forest Plan provides direction for all resource management programs, practices, uses, and protection measures for the Coconino National Forest. The alternatives are consistent with the direction listed in the Forest wide standards and guidelines, and in the standards and guidelines for Management Areas (MA) 3 Ponderosa Pine and Mixed Conifer On Slopes Less Than 40%, MA 4 Ponderosa Pine and Mixed Conifer On Slopes Greater Than 40%, MA 6 Unsuitable Timber Land, MA 7 Pinyon Juniper On Less Than 40% Slopes, MA 8 Pinyon Juniper On Greater Than 40% Slopes, MA 9 Mountain Grassland, MA 10 Transition Grassland and MA 12 Riparian, and reflect known ecological and social needs of the area (Forest Plan Consistency Check PRD #36).

Consistency with the Forest Plan applies only to the specific activities described in the alternatives. Not all desired conditions in the Forest Plan can be achieved with a single, on the ground action. Often many actions are necessary in order to meet the desired conditions identified by the management direction.

Region Three, Forest Service, Sensitive species have been evaluated. Within the project area, there are 14 species that are found or have potential habitat. Findings include “no impact” for four of these species and “may impact individuals but not likely to trend toward Federal listing” for the remaining 10 species.

Within the project area there are 16 MIS species that are found or have potential habitat. For all species, the implementation of any alternative will not result in effects that change the population’s trend on the forest.

Applicable Laws and Regulations to All Alternatives

Shown below is a partial list of federal laws and executive orders pertaining to project-specific planning and environmental analysis on federal lands. While most pertain to all federal lands, some of the laws are specific to Arizona.

- Multiple-Use Sustained-Yield Act of 1960 – This law is followed by this project because it is consistent with the Forest Plan.
- National Historic Preservation Act of 1966 (as amended) – This law is followed by this project and the appropriate documentation is located in the project file (Cultural Resources Report PRD#41).
- National Environmental Policy Act (NEPA) of 1969 (as amended) – The effects of the project have been analyzed and are disclosed in this Environmental Assessment.
- Endangered Species Act (ESA) of 1973 (as amended) – Analysis and disclosure of effects is complete, documentation meets standards of this law and consultation with US Fish and Wildlife Service is underway and will be completed prior to a decision.
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended) – This law is met because this project is consistent with the Forest Plan.
- National Forest Management Act (NFMA) of 1976 (as amended) – See the Forest Plan Direction and Consistency section above. This project meets the intent of this law by consistency with the Forest Plan.
- American Indian Religious Freedom Act of 1978 – This site-specific project has no affect on American Indian Religious Freedom.
- Archeological Resource Protection Act of 1980 – The effects on archaeological sites are analyzed and disclosed in the Cultural Resources report (PRD#41).
- Executive Order 11593 (cultural resources) – See NHPA above.
- Executive Order 12898 (environmental justice) – See the Environmental Justice section of this chapter.
- Executive Order 13186 Migratory Birds – See Chapter 3 – Migratory Bird Species and the Wildlife Specialist’s Report.

Other Guidance

Where other guiding documents exist, they are specifically described for the resource where they apply; examples are the Mexican spotted owl recovery plan and the bald eagle management plan.

Analysis of Purpose and Need

This section summarizes the findings of the analysis that relate to the items described in the purpose and need section for the project.

Purpose and Need Statement: The Pickett Lake and Padre Canyon Allotments are scheduled for environmental analysis of grazing use on the Coconino National Forest, as required by the Burns Amendment (1995). These Allotment Management Plans are expiring and are reviewed through this analysis. This project is being completed in order to ensure cattle grazing is consistent with goals, objectives, standards and guidelines of the Coconino National Forest Plan (as amended, 1987).

Conclusion: The environmental analysis and associated Allotment Management Plans will be completed for the final decision of this project. A review of the Coconino National Forest Plan was completed for this analysis. The Analysis is consistent with the Forest Plan.

Purpose and Need Statement: The purpose and need for this analysis is to set grazing levels within the carrying capacity for the allotments. Carrying capacity refers to the average number of livestock and/or wildlife that may be sustained on a management unit compatible with management objectives for the unit. In addition to site characteristics, it is a function of management goals and management intensity (Region 3 USFS Rangeland Analysis and Management Training Guide, 1997).

Conclusion: All the action alternatives fall within the carrying capacity for the Pickett Lake and Padre Canyon Allotments. Past and current monitoring has shown that the current management strategy meets the carrying capacity. The rest of the alternatives reduce the stocking rate, decrease graze periods and/or increase rest periods compared to current management.

Purpose and Need Statement: Maintaining and/or improving rangeland condition on the Pickett Lake and Padre Canyon Allotments.

Conclusions: Recent monitoring indicates that current cattle grazing management is maintaining and/or improving rangeland conditions where cattle grazing occurs. Alternatives A, B and D reduce or eliminate grazing, reduce graze periods, or increase rest periods which would lead to future maintenance and/or improvements in rangeland conditions. Alternative C maintains and/or improves rangeland conditions where cattle grazing occurs.

Purpose and Need Statement: In addition, new fencing and water installation is needed to improve livestock management and distribution on these allotments. Fence improvements will keep cattle from leaving the north side of Elliot Pasture and walking down the Anderson Mesa Rim to unscheduled pastures. These fences will also keep cattle from grazing Billy Back and Boot Springs. Water improvements will provide water to cattle and wildlife on the Padre Canyon Allotment where there is no reliable water source. This water will improve cattle distribution on this allotment.

Conclusions: Alternatives A and D are designed to add these fences and the water system. Alternative B and C do not include these improvements. Alternative B does not have cattle so

the fence is not necessary to keep the cows within Elliot Pasture or out of Boot and Billy Back Springs.

Analysis of Significant Issues

This section summarizes the findings related to the significant issues and should be considered in conjunction with the analysis of purpose and need section above.

Issue #1 Wetlands

Due to the dynamic nature of wetlands on Anderson Mesa, the changes in the cattle grazing systems and utilization levels in the proposed action may only slightly improve wetland habitat for ground nesting birds, or the riparian vegetative health within wetland areas.

This issue will be discussed in terms of general wetland ecosystem health and in relation to cinnamon teal, a ground nesting bird.

General Wetland Ecosystem Health

Affected Environment

The Vegetation, Soil and Water Report, in the project file (PRD#66), describes how wetlands were inventoried and evaluated to determine current conditions. The following table summarizes this report.

Table 2 Wetland Inventory by Pasture, Waterbody Name, Waterbody Type, Emergent Vegetation and Grazing in Alternatives A, C and D.

PASTURE	WATERBODY NAME	WATERBODY TYPE	EMERGENT VEGETATION PRESENT	GRAZING IN ALTS A, C, D
Railroad	Pine Grove Tank 1	Wetland, stock tank	Yes	Grazed
Breezy	Breezy	Wetland, temporary	No	Grazed
	Indian Lake	Wetland seasonal	Yes	Grazed
	West Breezy	Closed basin	No	Grazed
	Long Lake	Wetland, seasonal	Yes	Excluded
Elliot Driveway	Ashurst Tank	Closed basin	No	Grazed
	Billy Back Spring	Spring	Yes	Grazed in C, excluded in A & D
	Elliot Tank	Closed basin	No	Grazed
	Elliot Spring	Spring	Yes	Inaccessible
	Yellow jacket Spring	Spring	No	Grazed, no riparian
Ashurst	Al's Lake	Wetland seasonal	Yes	Grazed
	Antelope North	Wetland, seasonal	Yes	Grazed
	Antelope Tank	Wetland, seasonal	Yes	Grazed

PASTURE	WATERBODY NAME	WATERBODY TYPE	EMERGENT VEGETATION PRESENT	GRAZING IN ALTS A, C, D
	Ashurst Lake	Reservoir	Yes, spikerush mostly excluded	Mostly excluded
	Ashurst Spring	Spring	Yes	Excluded
	Deep Lake	Closed Basin within Pickett Lake Allotment side of the fence.	No	Grazed
	Mormon Spring	Spring	No	Inaccessible
	Horse Tank	Wetland, temporary	No	Grazed
	Pickett Lake	Wetland seasonal	Yes	Grazed
	Post Lake	Wetland, semi permanent	Yes	Grazed in C, excluded in A & D
	Potato Lake	Wetland, seasonal	Yes	Grazed
Boot	Boot Lake	Wetland, seasonal	Yes	Grazed
	Boot Spring	Spring	Yes	Grazed in C, excluded in A & D
	East Tank	Closed basin	No	Grazed
	Far East Tank	Closed basin	No	Grazed
	McDermott	Wetland, temporary	No	Grazed
	Replacement	Closed basin	No	Grazed
Ducknest	Coconino Dam	Permanent reservoir	No	Grazed
	Ducknest	Ephemeral wetland	No	Grazed
	Indian Tank	Wetland, seasonal	Yes	Grazed
	Perry	Closed basin	No	Grazed

There are seven types of wetlands on these allotments; Permanent Wetland (Reservoir), Semi-permanent wetland, Seasonal Wetland, Temporary Wetland, Ephemeral Wetland, Closed Basin, Stock Tank Wetland. Thirty-three wetlands were inventoried on the two allotments. These wetlands, except for the permanent wetland reservoir, are very dynamic due to large fluctuations in water.

During an extended wet period, some wetlands and closed basins may produce more hydrophytic species. During an extended dry period, some wetlands and closed basins may lose indications of hydrophytic vegetation and upland species may become more prevalent. Most of the wetlands currently affected by cattle grazing occur in the Ashurst, Boot, Breezy and Ducknest pastures.

The productivity, distribution and size of wetlands are profoundly affected by the amount and timing of precipitation, influencing whether the basins have water or not; how long they hold water within and between years; and consequently the type of vegetation and wildlife species that can be supported and when. All wetland types have some value to wildlife although this may differ depending on individual needs of the species. In general, basins that are larger, hold water longer, and have a combination of vegetation types will retain wildlife values longer.

Some stock tanks are located in the bottom of the wetlands or closed basins, while others are located in the water drainages associated with the wetlands or closed basins. Whether years are wet or dry, wetlands and closed basins with or without stock tanks show little difference in water levels and associated vegetation. The location of the stock tank may affect where water will go.

Depending on the amount and timing of precipitation, water may collect in a tank, reducing the amount in the rest of the closed basin. Stock tanks provide more dependable water because they hold water longer. It does not appear the construction of stock tanks has broken the seals of these closed basins and allowed them to drain. No additional stock tanks are planned for in any alternative and there is no proposal to remove stock tanks in the any alternative.

Spike rush and annual riparian species exist on many of the other wetlands and closed basins in this area. This wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. Where livestock use occurs, this use may affect the potential of these plants. Cattle do not graze within water, so cattle do not generally affect emergent vegetation. As the water recedes, cattle graze the vegetation at the edge of the pool. Different timing and levels of precipitation and different grazing rotations cause this effect to be greater in some years and less in others.

The only semi-permanent wetland with hardstem bulrush is Post Lake. Part of Deep Lake has hardstem bulrush but this is only on the Deep Lake Allotment side of the fence. Livestock use at Post Lake is limiting bulrush potential.

Environmental Consequences – Direct and Indirect Effects

Alternative B:

By removing cattle in Alternative B there will be no direct and indirect effects from cattle grazing in wetlands, closed basins, reservoirs and springs. However, conditions may not improve due to elk use and the natural water regime.

Cattle utilization, condition and trend, and general plant health monitoring would not occur under Alternative B.

Alternatives A, C and D:

In Alternatives A, C and D the height of the vegetation associated with closed basins, wetlands, reservoirs and springs will be affected by cattle in pastures where they graze. Whether or not cattle grazing affects vegetation cover depends on the morphology of different plant species. When height is reduced, some species will have reduced cover, while other species grow vertically and cover is not reduced when height is lessened. Both types of plants occur in these wetlands, closed basins, reservoirs, and springs.

In Alternatives A and D the vegetation in Post Lake and Boot and Billy Back Springs where cattle are excluded will improve overall, although elk would continue to graze these areas. In

Alternative C the vegetation in Post Lake and Boot and Billy Back Springs will not be excluded from cattle grazing and will be maintained in its current condition.

The Coconino Forest Plan states that at least 80% of the potential emergent vegetation cover from May 1st to July 15th in key wetlands must be maintained. The only key wetland on the Pickett Lake and Padre Canyon Allotments is Post Lake, which is also the only semi-permanent wetland on the allotments. The hardstem bulrush community within the lake will be excluded from livestock grazing in Alternatives A and D and is expected to improve as much as two fold. In Alternative C impacts from cattle continue, which has resulted in the hardstem bulrush population maintaining itself, but at less than its full potential.

Most of the seasonal wetlands occur in the Ashurst, Boot and Breezy pastures. Under Alternatives A, C and D cattle would graze from May 1st to July 15th in Ashurst pasture every other year and in Boot and Breezy pastures every fourth year. The Forest Plan uses May 1st to July 15th as a time period to minimize impacts to nesting waterfowl. When these pastures are not grazed from May 1st to July 15th, livestock do not affect emergent vegetative cover. If emergent vegetation is present and available to livestock then cover will be reduced along the water's edge, as it fluctuates. Due to the dynamic nature of these wetlands and grazing pressure from elk, emergent vegetation may not be present or available when livestock enter these pastures. Data collected at exclosures will provide information on the specific effects cattle and/or elk grazing has on cover in these wetlands.

The longer periods of rest for grazed pastures would provide more opportunities for the vegetation to grow when water is present under Alternatives A and D, then would occur under Alternative C. Site-specific instances of bare soil in these areas could be improved slightly as a result of additional rest under Alternatives A and D versus Alternative C. Each wetland has yearlong rest from cattle grazing every fourth year under all action alternatives.

Common to all action alternatives, monitoring will provide future information that may lead to adaptive management changes in the grazing system. Elk exclosures were built on the edge of wetlands as part of the AZ Game and Fish Pronghorn Plan. The exclosures are located as follows: Boot Lake, Breezy Lake and Ducknest Lake. Under Alternatives A and D an exclosure will be built at Post Lake. In 2003 two additional elk exclosures will be built in the bottoms of Post Lake and Ducknest Lake. These will only be established if/when the wetlands dry out enough to place an exclosure in these bottoms. Temporary cattle exclosures will be built next to each elk exclosure before cattle graze any pasture with an elk exclosure. This would allow changes to be tracked in these elk exclosures, cattle exclosures and non-exclosure areas.

Cumulative Effects

The area used to describe cumulative effects is Anderson Mesa, which is generally described as the area on top of the Mesa that lies south of Walnut Canyon, east of Lake Mary Road, north of Highway 87 and west of Anderson Mesa Rim (near the Coconino National Forest boundary).

Cattle use in wetlands and closed basins is additive to elk use which also effects wetland plant height and cover. Cattle are limited to 35% utilization for the pasture, although they may eat

more than 35% of wetland vegetation before moving to the rest of the pasture. Elk may continue to graze plants beyond the 35% level in these wetlands, and/or closed basins.

Vegetation associated with closed basins, wetlands, reservoirs and springs will not change with any alternative, except at Post Lake, Billy Back spring and Boot spring. There will be some change to vegetation height and canopy cover as described in the direct and indirect effects section. Cattle effect wetland vegetation in combination with elk and the natural water regime. Bare soil patches in wetlands and closed basins are expected to continue. The combined effect of cattle use, elk use and the natural water regimes will cause heavy impacts to certain locations at certain times.

Adjacent allotments also have the combined elk and cattle use similar to levels occurring on the Pickett and Padre Canyon Allotments. An inventory of wetlands and closed basins on Anderson Mesa (PRD#66) shows that most are functioning, though some are functioning at less than potential. Current efforts are underway to understand and manage the cumulative effects of wildlife, climate and other factors on wetlands and closed basins. This decision takes steps to lessen effects from cattle on key wetlands. Overall, wetlands are still functioning and irretrievable impacts are not expected to occur.

After Post Lake is fenced in Alternatives A and D, there will be no effect from cattle grazing and therefore no cumulative effect. The expected increase in the bulrush plant community will add to the overall amount of bulrush on Anderson Mesa. A list of wetlands with bulrush plant communities is listed in the Vegetation, Soil and Water report (PRD#66). In Alternative C, Post Lake will not be fenced and would continue to have a combined affect from cattle and elk grazing.

Described below are several activities and natural events within the vicinity of the project area that already have or will likely occur in on near the project area. Actions listed below occur on Anderson Mesa during the summer season and overlap with the time that cattle graze the Pickett Lake and Padre Canyon Allotments (6/1 thru 10/30). These activities may produce environmental effects on issues or resources relevant to the action alternatives. Therefore, these activities and events have been considered in the cumulative affects analysis. The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past actions may have affected general wetland ecosystem health. General wetland ecosystem health is generally static with current cattle grazing. In the action alternatives cattle grazing would occur over the next ten years. There would be some variation in the improvement of general wetland ecosystem health due to timing of the cattle grazing season related to wildlife grazing, recreation use, and climatic conditions. Improvements to the general wetland ecosystem health would also vary because the effects may overlap in the wetland ecosystems.

Past Actions. The past actions related to general wetland ecosystem health include previous livestock and wildlife grazing, farming, and recreation.

Livestock grazing. Past livestock grazing began in the 1870's, peaked in 1891, and has declined since this time (Range Specialist Report, PRD # 65). Utilization levels have declined over time

as well. General wetland ecosystem health has followed this livestock use pattern with trends that have improved as livestock numbers have been matched with carrying capacity.

Wildlife grazing. Past wildlife grazing specifically elk increased from the 1950's to peak numbers in the mid 1980's and have generally declined since the mid 1980's. Elk utilization levels have followed their population numbers. General wetland ecosystem health has followed this elk use pattern with trends that have improved as elk numbers have decreased.

Farming. In the late 1800's and early 1900's settlers farmed and cut hay on the deepest soils, which included many of these wetland areas. Farming declined after the establishment of the Coconino National Forest in 1908. General wetland ecosystem health declined as native vegetation was disturbed and/or removed.

Recreation. Dispersed camping, hunting, boating and fishing were the main types of recreation. Many new roads were a result of these recreation activities. General wetland ecosystem health was reduced as a result of this increase in recreational activities, especially in and around wetlands. These effects were somewhat offset by motorized use restrictions around some wetlands (List of Projects, PRD # 68, and Map PRD #68), and implementation of state rules regarding no camping within ¼ of a mile from open water. Developed campgrounds were constructed some of the larger lakes with some of these excluded from cattle grazing.

Present Actions. The present actions include livestock, and wildlife grazing, and recreation.

Livestock grazing. Wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. Spike rush and annual riparian species exist on many of the wetlands in this area. This wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. Cattle do not graze within water, so cattle do not generally affect emergent vegetation. As the water recedes, cattle graze the vegetation at the edge of the pool. Current livestock grazing occurs within the 35% to 50% utilization levels on adjacent allotments. General wetland ecosystem health is generally static with livestock numbers that are matched with carrying capacity on these allotments.

Wildlife grazing. Current elk grazing utilization levels are set within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. General wetland ecosystem health is generally static with elk numbers that are matched with carrying capacity.

Recreation. Dispersed camping, hunting, boating and fishing are the main types of recreation. General wetland ecosystem health may be reduced as recreational use pressures increase on wetlands and in wetland areas. The Arizona Trail, a National Forest System Trail, passes by a few wetlands in the area.

Reasonably Foreseeable Actions. The reasonably foreseeable actions include livestock and wildlife grazing, recreation and fencing projects.

Livestock grazing. Future livestock grazing will most likely occur within the 35% to 50% utilization levels on adjacent allotments. General wetland ecosystem health will be generally static with livestock numbers that are matched with carrying capacity.

Wildlife grazing. Future wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. General wetland ecosystem health is generally static with elk numbers that are matched with carrying capacity.

Recreation. Dispersed camping, hunting, boating and fishing are the main types of recreation. Recreation use continues to increase over time. General wetland ecosystem health will likely be reduced with increased recreation in and around wetlands and wetland areas. Some road and recreation management may offset these effects at high use sites.

Fencing. Portions of Fisher and Fry Lake, Prime Lake and Deep lake will be fenced to exclude cattle grazing in these areas. Fisher and Fry and Prime Lakes are on the Walnut Canyon Allotment. Deep Lake is on the Deep Lake Allotment.

Cinnamon Teal

In order to discuss the issue of wetlands further, the effects to the Management Indicator Species, Cinnamon Teal are described here.

Affected Environment

As described above, the productivity, distribution and size of wetlands are profoundly affected by the amount and timing of precipitation, influencing whether the basins have water or not; how long they hold water within and between years; and consequently the type of vegetation and wildlife species that can be supported and when. All wetland types have some value to wildlife although this may differ depending on individual needs of the species. In general, those basins that are larger, hold water longer, and have a combination of vegetation types will retain wildlife values longer.

From a water bird standpoint, and by definition, semi-permanent and seasonal wetlands have higher values, followed by ephemeral, temporary and stock tank wetlands. Cinnamon teal nest in the seasonal and semi-permanent wetlands. They may use the other wetland types for resting and feeding when there is water. Closed basins function similarly to uplands in dry years, and have some wetland values in wet years, though for a short period of time.

Environmental Consequences – Direct and Indirect Effects

By removing cattle in Alternative B there will be no direct and indirect effects on teal habitat from cattle grazing in wetlands, closed basins, reservoirs and springs. However, conditions may not improve due to elk use and the natural water regime.

There are effects to teal habitat in Alternatives A, C and D based on direct, indirect and cumulative impacts to wetlands but it is emphasized that wetland use is driven by precipitation. The majority of wetlands lie within Ashurst, Breezy, Boot and Ducknest Pastures. The value of wetlands to wetland wildlife species varies by species and wetland type. Semi-permanent and seasonal wetlands have higher values for teal due to habitat interspersed within the wetland, extended flooding regimes and higher species diversity within and adjacent to the basin.

The cinnamon teal nesting season occurs from May 1 to July 15. Waterfowl disturbance and reduction in vegetation height can occur when cattle graze during this time period. All action alternatives allow cattle to graze in Ashurst, Breezy, Boot and Ducknest pastures during this time period. Pasture graze periods between alternatives do not vary greatly in these pastures during this time (see Table 3). There are year-to-year variations between alternatives, but overall they are similar.

Table 3 Summary of Days Used by Cattle During the Waterfowl Nesting Season from May 1 to July 15 by Alternative and Year in Key Pastures. Key pastures are Ashurst, Ducknest, Breezy and Boot because they contain the majority of wetlands.

ALTERNATIVE	Days Used by Cattle During the Waterfowl Nesting Season, May 1 to July 15			
	YEAR A	YEAR B	YEAR C	YEAR D
Alternative A Two Herds	32 days in Ashurst	20 days in Boot and Breezy	31 days in Ashurst	No cattle grazing during this time
Alternative A One Herd	24 days in Ashurst	15 days in Boot and 1 day in Breezy	24 days in Ashurst	10 days in Ducknest
Alternative B	None	None	None	None
Alternative C	28 days in Ashurst	24 days in Boot and 15 days in Breezy	39 days in Ashurst	No cattle grazing during this time
Alt D Two Herds	Same as Alt A, two herds	Same as Alt A, two herds	Same as Alt A, two herds	Same as Alt A, two herds
Alt D One Herd	Same as Alt A, one herd	Same as Alt A, one herd	Same as Alt A, one herd	Same as Alt A, one herd

Alternatives A and D:

The following effects are anticipated for cinnamon teal throughout the year with the implementation of Alternatives A and D:

- Ashurst, Breezy, Boot and Ducknest Pastures are rested every fourth year, benefiting the wetlands and uplands in these pastures.
- Cattle use during the waterfowl-nesting season is limited. Cattle graze in Ashurst Pasture every other year for 32 days. Cattle graze in Boot and Breezy pastures every four years for 20 days. In the one-herd rotation systems cattle graze Ashurst every other year for 24 days, Boot Pasture every four years for 15 days and Ducknest Pasture every fourth year for 10 days. Cattle grazing during this time period could cause waterfowl disturbance and reduce vegetation height.
- Cattle use during the fall migration season during the last two weeks of September is limited. Cattle graze Boot pasture two years in four for one week. Cattle graze Ashurst pasture every four years for one and a half weeks. Cattle graze Ducknest Pasture every fourth year for one week. In the one-herd rotation systems there is no cattle use during

this time period. Cattle grazing during this time period could cause waterfowl disturbance and reduce vegetation height.

- The hardstem bulrush community at Post Lake is fenced in both alternatives, which benefits habitat for cinnamon teal.
- The fence work in Elliot Driveway will prevent cattle from using Boot Spring and Billy Back Spring which are springs that could be stop over sites for water birds during flight, including cinnamon teal.
- Cattle use in uplands is more in Alternative A then Alternatives C or D. Alternative D has less use in uplands than Alternative C.
- The 35% use level in Alternative A and 20% in Alternative D are adequate to maintain habitat in uplands because there should be adequate residual regrowth, structure, diversity and seedhead production.
- Cattle graze periods are shorter in Alternatives A and D than in Alternative C. Shorter graze periods gives each pasture more rest before cattle graze them the following year.

In addition, Boot Pasture will be rested for three years, which began in 2002. Ducknest Pasture will be deferred between August 16 and June 14 for 3 years, which began in 2002. As a result, Boot Lake, Replacement Tank, East Tank, McDermott Tank and East McDermott Lake will be rested from cattle grazing for three years; starting in 2002 and cattle will be deferred from Ducknest Lake, Indian Tank, Perry Lake and Coconino Dam Reservoir between August 16 and June 14. Monitoring will indicate whether or not the lack of cattle in the rested pastures or cattle grazing under the deferred schedule improves these areas and to what degree. This information can be used to make future decisions on improving wetlands and closed basins.

Alternative B (No Grazing)

No livestock grazing or other actions are proposed in the analysis area, so no direct, indirect, or cumulative effects from cattle grazing would occur. Wildlife would continue to graze wetlands, which will have effects on cinnamon teal, and could include disturbing the birds, stepping on nests, and reducing vegetation height.

Cattle utilization, condition and trend, and general plant health monitoring would not occur under Alternative B.

Alternative C (Current Management)

The following effects are anticipated for cinnamon teal with the implementation of Alternative C:

- Ashurst, Breezy, Boot and Ducknest Pastures are rested every fourth year, benefiting the wetlands and uplands in these pastures.
- Cattle use during the waterfowl-nesting season is limited. Cattle graze in Ashurst Pasture every other year from 28 to 39 days. Cattle graze in Boot Pasture for 24 days and Breezy Pasture for 15 days every four years. Cattle grazing during this time period could cause waterfowl disturbance and reduce vegetation height.

- Livestock use occurs after spring migration for water birds. As a result, vegetation production during migration is primarily influenced by climate, recreation or wildlife factors.
- Cattle use during the fall migration season in last two weeks of September is limited. Cattle graze Breezy pasture two years in four for two weeks. Cattle graze Ashurst pasture every four years for two weeks. Cattle graze Ducknest Pasture every four years for two weeks. Cattle grazing during this time period could cause waterfowl disturbance and reduce vegetation height.
- The hardstem bulrush community at Post Lake is not fenced in this alternative and will be grazed by cattle, which may affect habitat for cinnamon teal.
- Cattle will graze Boot Spring and Billy Back Spring. This grazing may have an affect on these stop over sites for water birds during flight, including cinnamon teal.
- Cattle use in uplands for this alternative is less than Alternative A and more than Alternative D.
- The 35% use level in Alternative C is adequate to maintain habitat in uplands because there should be adequate residual regrowth, structure, diversity and seedhead production.
- Cattle graze periods are longer in these alternatives than in Alternatives A and D. Longer graze periods gives each pasture less rest before they are grazed by cattle in the following year.

Cumulative Effects

The area used to describe commulative effects is Anderson Mesa, which is generally described as the area on top of the Mesa that lies south of Walnut Canyon, east of Lake Mary Road, north of Highway 87 and west of Anderson Mesa Rim (near the Coconino National Forest boundary).

Projects mentioned below such as wildlife grazing on adjacent allotments, activities on private and State lands, prescribed fires and vegetation treatments on adjacent allotments and associated with the Arizona Game and Fish Pronghorn Plan, are described in more detail in PRD#68 in the project file. Recreation activities on Anderson Mesa are generally low to moderate levels of dispersed use with higher use at developed sites (Ashurst Lake, Kinninick Lake, Marshall Lake). There are only a few developed sites and improved roads, with most roads suitable for high clearance vehicles. The Arizona trail is located on a portion of the Mesa. Other uses include hunting, horse riding, mountain biking, dispersed camping, hunting and driving.

The effects to vegetation in the vicinity of wetlands are additive to use by elk. Cattle and elk use occurs in wetland areas at similar times of the year as antelope. In addition, recreation activities also occur in wetland areas in the summer months. The effects of grazing in these alternatives are additive to livestock and wildlife grazing in the wetlands on adjacent allotments. This is because wetland productivity as it relates to cinnamon teal habitat is strongly influenced by precipitation. High waterbird numbers have been observed on the Mesa historically, concurrent with wildlife and cattle grazing (District records). Over the years, a variety of closures on the Forest have been implemented that improve habitat conditions for species like this one, including motorized vehicle closures at Pine Hill on Anderson Mesa and seasonal recreation restrictions

such as at nearby Hay Lake (USDA Forest Service 2002c). Habitat quality for wetland dependent species Forest wide has improved over time at some sites through improvements (such as fencing) and restriction of grazing (e.g. Marshall Lake, Ashurst Spring, Vail Lake and Horse Lake) and recreation use over time.

Populations of avian predators will remain high, and this may continue to offset reproductive success.

Described below are several activities and natural events within the vicinity of the project area that already have or will likely occur in on near the project area. These activities may produce environmental effects on issues or resources relevant to the action alternatives. Therefore, these activities and events have been considered in the cumulative affects analysis. The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past actions may have affected cinnamon teal. Cinnamon teal habitat is generally static with current cattle grazing. In the action alternatives cattle grazing would occur over the next ten years. There would be some variation in cinnamon teal habitat due to timing of the cattle grazing season related to wildlife grazing, recreation use, and climatic conditions. Effects to cinnamon teal habitat would vary because the effects may overlap for habitat in the wetland ecosystems.

The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past Actions. The past actions include previous livestock and wildlife grazing, farming, and recreation.

Livestock grazing. Past livestock grazing began in the 1870's, peaked in 1891, and has declined since this time (Range Specialist Report, PRD # 65). Utilization levels have declined over time as well. Cinnamon teal nesting habitat has followed this livestock use pattern with trends that have improved as livestock numbers have been matched with carrying capacity.

Wildlife grazing. Past wildlife grazing specifically elk increased from the 1950's to peak numbers in the mid 1980's and have generally declined since the mid 1980's. Elk utilization levels have followed their population numbers. Cinnamon teal nesting habitat has followed this elk use pattern with trends that have improved as elk numbers have decreased.

Farming. In the late 1800's and early 1900's settlers farmed and cut hay on the deepest soils. Farming declined after the establishment of the Coconino National Forest in 1908. Cinnamon teal nesting habitat declined as native vegetation was disturbed and/or removed.

Recreation. Dispersed camping, hunting, boating and fishing were the main types of recreation. Many new roads were a result of these recreation activities. Cinnamon teal nesting habitat was reduced as a result of this increase in recreational activities, especially in and around wetlands when these activities overlapped with the next season. These effects were somewhat offset by motorized use restrictions around some wetlands (List of Projects, PRD # 68, and Map PRD

#68), and implementation of state rules regarding no camping within ¼ of a mile from open water. Developed campgrounds were constructed near some of the larger.

Present Actions. The present actions include livestock and wildlife grazing, and recreation.

Livestock grazing. Wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. Spike rush and annual riparian species exist on many of the wetlands in this area. This wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. As the water recedes, cattle graze the vegetation at the edge of the pool. Current livestock grazing occurs within the 35% to 50% utilization levels on adjacent allotments. Cinnamon teal habitat is generally static with livestock numbers that are matched with carrying capacity on these allotments.

Wildlife grazing. Current wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. Cinnamon teal nesting habitat is generally static with elk numbers that are matched with carrying capacity.

Recreation. Dispersed camping, hunting, boating and fishing are the main types of recreation. Cinnamon teal nesting habitat may be reduced as recreational use pressures increase on wetlands and in wetland areas. The Arizona Trail, a National Forest System Trail, passes by a few wetlands in the area.

Reasonably Foreseeable Actions. The reasonably foreseeable actions include livestock and wildlife grazing, recreation and fencing.

Livestock grazing. Future livestock grazing will most likely occur within the 35% to 50% utilization levels on adjacent allotments. Cinnamon teal nesting habitat will be generally static with livestock numbers that are matched with carrying capacity.

Wildlife grazing. Future wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. Cinnamon teal nesting habitat are generally static with elk numbers that are matched with carrying capacity.

Recreation. Dispersed camping, hunting, boating and fishing are the main types of recreation. Cinnamon teal nesting habitat will likely be reduced with increased recreation in and around wetlands and wetland areas. Some road and recreation management may offset these effects at high use sites.

Fencing. Portions of Fisher and Fry Lake, Prime Lake and Deep lake will be fenced to exclude cattle grazing in these areas. Fisher and Fry and Prime Lakes are on the Walnut Canyon Allotment. Deep Lake is on the Deep Lake Allotment. The exclusion of cattle from these wetlands may increase the nesting habitat for Cinnamon teal in the nearby wetlands.

Issue #2 Utilization

The utilization level of 35% as proposed, may inhibit grass plants' growth, reduce vertical height and remove too many seed heads. The 35% utilization level may also lessen the plant's ability to grow to maturity and build necessary root mass. This use level may lessen the plant's ability to propagate and move into new areas.

This issue will be discussed in terms of general plant health.

Affected Environment

Condition and trend are long-term measures of the health of vegetation. The estimates in this paragraph give an overview of conditions and trends for large areas and do not necessarily uniformly apply to all areas. Range conditions and trends vary widely from area to area. Ponderosa pine area trends are generally static to upward. Pinyon and juniper grassland areas above the rim are generally static. Lake and deep soils sites above the rim vary greatly from site to site. Pinyon and juniper grassland areas below the rim are generally static to downward. Cattle are contributing to downward trends in a few locations. The increasing density of trees is the primary reason for areas of static or downward trends (Range Specialist Report PRD#65).

The range condition trends, exist under the current cattle grazing system and elk use. The current grazing system has included a 35% utilization level. Other than last year (2002), this utilization level has been achieved, and cattle have been able to use the area for the length of the grazing season. Cattle must be moved earlier if the utilization level is reached prior to cattle rotations, or cattle may not enter a pasture if elk already meet the utilization level. Early moves or skipping pastures has not been routinely needed under the current grazing system, and has only occurred on occasion.

Livestock grazing has the potential to modify understory plant height, to select some species over others, reduce seedhead growth and encourage regrowth in good years. The main forage ground cover species are blue grama, squirreltail, western wheatgrass, blue grass, three-awn, sand dropseed and needle-and-thread. Plant height and cover varies with seasonal moisture and temperatures.

The Vegetation, Soil and Water Report in the project file (PRD#66) describes how District personnel conducted a review and evaluation of understory vegetation conditions on these two allotments. The Range Specialist Report (PRD#65) also describes the grazing history of these allotments.

The Pickett Lake and Padre Canyon allotments combined consist of 55,807 acres. Of these, full capacity rating for livestock is given to approximately 44,426 acres⁴. Potential capacity classification areas are scattered throughout the allotment (approximately 5,181 acres). No capacity classification is give to approximately 6,200 acres where slopes are over 40% and/or where forage production is less than 100 pounds per acres.

⁴ Capacity determination is explained in detail in the Range Specialist Report.

Elk use falls within this carrying capacity estimate. Elk use on browse is a problem on the allotments, while cattle use on browse is low because cattle are primarily grazers. Elk use on small areas can cause impacts, but overall fall with the carrying capacity of the area. (Range Specialist Report PRD#65).

Rangeland management status is considered to be in satisfactory condition when the existing vegetation community is similar to the desired condition or short-term objectives are being achieved to move the rangeland toward the desired condition. Rangeland management status is a comparison of existing vegetation and soil conditions to either potential natural community or desired plant community. Approximately 40,687 acres have satisfactory rangeland management status and mid to high similarity to the desired natural community. Approximately 15,120 acres have unsatisfactory rangeland management status and low similarity to the desired natural community.

Cattle are contributing to unsatisfactory conditions on 2,410 of these acres. Unsatisfactory areas include:

UNSATISFACTORY AREAS	RELATIONSHIP TO CATTLE GRAZING
Steep Slopes with a grade over 40%	Cattle do not graze.
Dense Pinyon and Juniper stands	Cattle do not usually graze these areas.
Wetlands, Closed Basins, Swales, valley plains, elevated plains	Cattle may be contributing to these conditions, along with other factors.
1977 Yellow jacket Fire	Cattle graze here, transition will occur over time regardless of cattle use.

Environmental Consequences – Direct and Indirect Effects

The unsatisfactory conditions on the 2,410 acres of swales, elevated plains, and wetlands and closed basins are not expected to change under all alternative.

Alternative B:

By removing cattle in Alternative B there will be no direct and indirect effects from cattle grazing on plant health. However, conditions may not improve due to elk use and the natural water regime in wetlands and swales.

Cattle utilization, condition and trend, and general plant health monitoring would not occur under Alternative B.

Alternatives A and C:

In Alternatives A and C there are direct effects to understory plants. Condition and trend would indicate if proper utilization standards are being applied to the vegetation, and if this utilization is negatively affecting general plant health.

A utilization of standard thirty five percent is set for cattle and/or elk. This is an appropriate utilization level, by these grazing ungulates, for forage because it allows the residual 65 % of the plant to be available to reproduce, grow to maturity, build necessary root mass, produce seed heads, produce litter important for nutrient recycling, propagate and move into new areas, and provide for the needs of other wildlife species. When pasture use approaches 35% by cattle and/or elk, cattle will move to the next pasture in the rotation. If elk use exceeds 35% before cattle enter a pasture, cattle will skip the pasture and move to the next pasture in the rotation.

Under all action alternatives, trends will be static to upward except where trees limit improvement potential (treating these areas is outside the scope of this analysis).

Cattle can improve or decrease plant species composition depending on the timing of grazing. Grazing use is rotated so forage is grazed and rested at a different time each year. For instance, spring and early summer grazing occurs mainly on cool season species. After the monsoon season, grazing occurs mainly on warm season species. As the weather cools down in the fall, use changes back to cool season species. The vegetation that is green when cattle are grazing a pasture will determine which vegetation is grazed and what is left for hiding cover or ground cover.

The number of days cattle graze a pasture in Alternative A is shorter than current management so the vegetation has longer to recover. For example, when Ashurst pasture is grazed in June, cool season species are mainly grazed and the warm season species may never be grazed that year. Typically, in the fall, these cool season species will then fully regrow from this early season cattle use.

The effect of cattle grazing in wetland areas and highly productive forage areas will be lower plant heights and sometimes cover. This effect should be less under alternative A than the current grazing system. If no cattle grazed these areas, plant height and cover would be unaffected by cattle. Plant height and cover varies with seasonal moisture and temperatures. How much plant height and cover is affected by cattle depends on the palatability of the grass species as well. It is difficult to estimate the plant height and cover difference between alternatives. Monitoring of rested pastures within productive grasslands described for the current situation and common to all alternatives will add to our knowledge of cattle effects to plant height and cover.

Alternative D

Alternative D applies a 20% utilization guideline. This alternative allows more of the residual plant, 80 % compared to 65 % in Alternatives A and C, to be available to reproduce, grow to maturity, build necessary root mass, produce seed heads, produce litter important for nutrient

recycling, propagate and move into new areas, and provide for the needs of other wildlife species.

Alternative D also has reduced graze periods, increased rest periods in each pasture and improved cattle and wildlife distribution just like Alternative A. In addition, there is a decrease in the number of cattle to 15%, in Alternative D from that in Alternative A. The effects of Alternative D are similar to those of Alternative A.

Cumulative Effects

The area considered for cumulative effects for utilization, condition and trend and general plant health includes Anderson Mesa, adjacent allotments, and adjacent state and private land under ownership of the Hopi Three Canyon Ranches, Flying M Ranch, Bar T Bar Ranch and the Raymond Ranch. The adjacent Forest Service allotments along with utilization limits as described in their Annual Operating Instructions include: Deep Lake-35%, Anderson Springs-50%, Bar T Bar-40%, Walnut Canyon-35%, Apache Maid-50%. Utilization levels on state and private land typically follow the levels set for Forest Allotments. Condition and trend along with general plant health is similar on adjacent allotments, state and private land.

The direct effects to plants from cattle use are additive to elk grazing and other herbivory. The combined use by elk and cattle has been occurring at levels describe in Alternative C for many years. The resulting allotment condition is a stable situation with patches of unsatisfactory conditions. The combined cattle and elk will not cause significant environmental affects under any Alternative.

Trends are expected to be static to upward under all alternatives. The trends on adjacent allotments are also static to upward resulting in a combined static to upward trend situation for the region. Upward trends that result from improved cattle management in these and surrounding allotments, are offset somewhat by dense pinyon and juniper conditions in other portions of the allotments.

The unsatisfactory conditions on the 2,410 acres of swales, elevated plains, and wetlands and closed basins are not expected to change under any alternative. These areas of unsatisfactory conditions may be a result of one or more of the following: historic and current use by cattle and elk, transition between high and low water levels, human disturbance from growing crops, cutting hay, driving and other various recreational uses. Adjacent allotments most likely have similar areas on the landscape. However, like the Pickett and Padre Canyon allotments, the overall percentage of these areas is low when compared with the surrounding landscape. Therefore there is not a significant cumulative effect from the combined cattle grazing situation on the landscape overall. A more detailed discussion of cumulative effects to the wetlands and closed basins is described for Issue#1.

Overall ground cover on the allotment is adequate for watershed health and does not change under any alternative. Plant canopy cover is adequate overall for watershed health and does not

change under any alternative. Therefore, there are no cumulative effects for overall watershed conditions. (Vegetation, Soil and Water Report, PRD#66).

Described below are several activities and natural events within the vicinity of the project area that already have or will likely occur in or near the project area. These activities may produce environmental effects on issues or resources relevant to the action alternatives. Therefore, these activities and events have been considered in the cumulative effects analysis. The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past actions may have affected general plant health. General plant health is generally static with current cattle grazing. In the action alternatives cattle grazing would occur over the next ten years. There would be some variation in general plant health due to timing of the cattle grazing season related to farming wildlife grazing, vegetative treatments, fire suppression, fire, recreation use, and climatic conditions. General plant health would also vary because the effects are not all site specific but may overlap in some areas on the allotments.

The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past Actions. The past actions are previous livestock and wildlife grazing, farming, vegetative treatments, fire suppression and recreation.

Livestock grazing. Past livestock grazing began in the 1870's, peaked in 1891, and has declined since this time (Range Specialist Report, PRD # 65). Utilization levels have declined over time as well. General plant health has followed this livestock use pattern with trends that have improved as livestock numbers have been matched with carrying capacity.

Wildlife grazing. Past wildlife grazing specifically elk increased from the 1950's to peak numbers in the mid 1980's and have generally declined since the mid 1980's. Elk utilization levels have followed their population numbers. General plant health has followed this elk use pattern with trends that have improved as elk numbers have decreased.

Farming. In the late 1800's and early 1900's settlers farmed and cut hay on the deepest soils. Farming declined after the establishment of the Coconino National Forest in 1908. General plant health declined as native vegetation was disturbed and/or removed.

Vegetative treatments. During the 1950's and 1960's pinyon and juniper trees were pushed to increase forage production. General plant health improved in areas that had these vegetative treatments. PRD # 68 lists recently completed vegetative treatments.

Fire suppression. Since the early 1900's wildfires were suppressed which increased the encroachment of trees into the grasslands. In the mid 1980's the Forest Service allowed fires in the pinyon juniper to burn under certain conditions. General plant health has been reduced with fire suppression.

Recreation. Dispersed camping, hunting and fishing were the main types of recreation. Many new roads were a result of these recreation activities. General plant health was reduced as a result of this increase in recreational activities. These effects were somewhat offset by motorized use restrictions (List of Projects, PRD # 68, and Map PRD #68). Developed campgrounds were constructed some of the larger lakes with some of these excluded from cattle grazing.

Present Actions. The present actions include livestock and wildlife grazing, vegetative treatments, fire and recreation.

Livestock grazing. Current livestock grazing occurs within the 35% to 50% utilization levels on adjacent allotments. General plant health is generally static with livestock numbers that are matched with carrying capacity on these allotments.

Wildlife grazing. Current wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. General plant health is generally static with elk numbers that are matched with carrying capacity.

Vegetative treatments. Pinyon and juniper trees are being removed through mechanical and hand thinning methods to open corridors for pronghorn antelope and to increase forage production as part of the 2002 Arizona Game and Fish Pronghorn Plan for Anderson Mesa. General plant health is improving in vegetative treatment areas.

Fire. The Forest Service is allowing fires in the pinyon juniper to burn under certain conditions. The Mormon fire burned 2,719 acres of the Padre Canyon Allotment, and the Lizard fire burned 5,127 acres of the Angell Allotment just adjacent to the Padre Canyon Allotment to the north. General Plant health may improve in these areas.

Recreation. Dispersed camping, hunting and fishing are the main types of recreation. New roads are a result of these recreation activities. General plant health may be reduced with recreation. The Arizona Trail, a National Forest System Trail, passes by a few wetlands in the area.

Reasonably Foreseeable Actions. The reasonably foreseeable actions include livestock and wildlife grazing, vegetative treatments, fire.

Livestock grazing. Future livestock grazing will most likely occur within the 35% to 50% utilization levels on adjacent allotments. General plant health will be generally static with livestock numbers that are matched with carrying capacity.

Wildlife grazing. Future wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. General plant health is generally static with elk numbers that are matched with carrying capacity.

Vegetative treatments. Pinyon and juniper trees will continue to be removed through mechanical and hand thinning methods to open corridors for pronghorn antelope and to increase forage production, as part of the 2002 Arizona Game and Fish Pronghorn Plan for Anderson Mesa.

General plant health will improve within these new vegetative treatment areas. Grassland restoration and maintenance in Ponderosa Pine and PJ Woodland on the Anderson Springs and Bar T Bar Allotments will affect overall vegetation conditions (List of Projects, PRD # 68).

Fire. The Forest Service allows fires in the pinyon juniper to burn under certain conditions. General plant health will be improved with most fires, following the 2002 Arizona Game and Fish Pronghorn Plan for Anderson Mesa. General plant health may improve in these areas (List of Projects, PRD# 68).

Recreation. Dispersed camping, hunting and fishing are the main types of recreation. New roads are a result of these recreation activities. Recreation use continues to increase over time. General plant health will likely be reduced with increased recreation. Some road and recreation management may offset these effects at high use sites.

Analysis of Pronghorn

The 2002 Arizona Game and Fish Department Pronghorn Plan for Anderson Mesa was developed by the Arizona Game and Fish Department with participation from many interested agencies and groups, states the following needs: 1) Support managing livestock with the intent of avoiding major negative impacts on pronghorn forage or fawning cover in the frequent years of below normal precipitation. 2) Advocate managing livestock at the level where in the judgment of biologists, range specialists, and ranchers working directly with this pronghorn herd, livestock impacts on pronghorn forage or fawning cover are not major through the fawning period.

Specifically, fawning habitat occurs in Boot, Breezy and Ducknest pastures on the Pickett Lake Allotment. Boot pasture will be rested from cattle grazing for years 2002, 2003 and 2004 under the current Annual Operating Instructions. Ducknest pasture is deferred from cattle grazing August 15 to June 15 for years 2002, 2003, and 2004 under the current Annual Operating Instructions. Breezy pasture will be grazed as scheduled for the next three years. There is a need to continue this management scheme and monitor the effects to fawning habitat, as outlined in the Arizona Game and Fish Pronghorn Plan, to learn about fawning habitat needs and the potential for future adjustments.

Because cattle and elk affect plant height, where it is important to allow plants to reach their maximum plant height potential, such as in antelope fawning areas, a change in cattle distribution could be considered. This would increase plant height somewhat, but elk use would continue to effect plant height.

All the action Alternatives are tied to the 2002 Arizona Game and Fish Department Pronghorn Plan for Anderson Mesa. Management from this plan was started in 2002 through the Annual Operating Instructions, along with Forest Service monitoring and improvements for the two allotment areas. This work will continue with any alternative selected.

The effects of Alternatives A, C and D, are similar for pronghorn. Alternatives A and D have less effects than C because the duration of graze periods is less and rest periods are greater. The

fencing at Post Lake under Alternatives A and D should improve the hardstem bulrush community. The one-herd scenarios in Alternatives A and D provide a lower duration of graze periods in key pastures than the two herd scenarios. The new water source in Alternatives A and D will provide additional water for pronghorn. All action alternatives are expected to impact plant structure and height around waters that will vary by grazing schedule and precipitation. The 20% use proposed in Alternative D should provide for less use in the uplands which would benefit pronghorn.

Antelope Habitat

Affected Environment

Game Management Units 5B and 5A consist of Forest Service, state and private ownership. Many pronghorn seasonally migrate between the spring, summer and fall range on top of Anderson Mesa, which includes part of the project area, and the winter range below the Anderson Mesa rim on state and private lands. Another herd resides year round below the rim on state and private land. There is an additional small herd associated with the Pinegrove Quiet area and Upper Lake Mary in GMU 6A. The Arizona Game and Fish Pronghorn Plan also shows the wide historical variability of the herds in GMU 5A and 5B.

Fawn recruitment is a concern in the project area. As mentioned in the Arizona Game and Fish Pronghorn Plan, coyote control is underway until a larger integrated management approach can take effect. Ongoing nutrition and disease research may also shed some light on condition and productivity of pronghorn within the project area (AGFD, 2002).

Water:

Water on the project area consists of stock tanks; and a variety of wetlands and closed basins, most of which contain stock tanks (PRD#66 –stock tank review at end of Vegetation, Soil and Water Report). Water is well distributed on the Pickett Lake Allotment and there is a lower density of waters on the Padre Canyon Allotment. Water is not dependable in portions of the analysis area because it is dependent on precipitation, flooding regimes and size of the basin.

Recreation use:

Recreation use within the analysis is generally low with areas of moderate to high use. Recreational use around some lakes may reduce use of the lakes by pronghorn. There is a campground and boat launch at Ashurst Lake. Nearby Coconino Reservoir also receives moderate use. The Arizona Trail is located in the Railroad Pasture and accesses some pronghorn habitat. Antler gatherers use antelope habitat during the spring and hunters during the fall and winter with other recreational users during the summer. Fuelwood gathering, both for personal and commercial use, occurs in this area from mid-April through mid-December, as is year-round off-road vehicle use, except in few areas where motorized traffic is restricted. A nearly 20,000-acre fawning season motorized vehicle closure in the project area has been in place since 1989. The nearly 12,000-acre Pinegrove closure limits motorized traffic during the fall. Most roads are in poor condition that restricts traffic to high clearance vehicles.

Fragmentation:

Much of the habitat has small trees on the edge of openings or has regrowth of trees following treatment in the past. Growth of pine and pinyon-juniper trees threatens the future use of isolated forest openings, grassland and travel corridors. Lack of fires to maintain grasslands and forest openings is evident in the area. Livestock and wildlife grazing, historic and current, can affect shrub and tree encroachment by removing fine fuels that might otherwise carry fire that would kill woody growth. Climate also influences the establishment of trees in existing openings.

Antelope diet and understory vegetation height:

Understory species composition and residual height of vegetation is influenced by climate and grazing. This in turn influences forage, nutritional status, as well as fawn hiding cover. Vegetation height can be reduced when grazing occurs on certain plants. The ability of the area to recover from grazing is influenced by climate and rest. Amount, distribution and quality of fawn hiding cover varies spatially and temporarily on these allotments and is influenced by amount and timing of precipitation, timing and intensity of grazing by ungulates and the area's overall productivity. Cover heights can be low at fawning time compared to other areas in the state and the west for these reasons.

Areas surrounding waters receive heavier grazing use by livestock and wildlife in general. Unless there is a grazing deferral or rest from grazing, the height, diversity and abundance of vegetation close to lake basins or waters can be below potential. The timing and intensity of livestock use varies between years with some waters and lake basins receiving deferred use, or total rest for one or more years or use during the grazing season.

Range conditions:

The Range Specialist Report (PRD#65) broadly documents range conditions in grasslands above and below the rim, in wetlands and closed basins, and deep soils, all of which are used by pronghorn. Above the rim, vegetation trends are generally static with some spots of both upward and downward trends. The points of downward trend are generally associated with higher densities of trees and are areas where plant cover is lower than potential for the site and bare soil is increasing. In pinyon and juniper grasslands below the rim, range conditions have generally remained static to downward responding to an increase in pinyon and juniper trees since the early 1960's, often in areas with old vegetation treatments. There are some areas with high plant cover and others with low. Likewise, there are some areas with litter and bare soil ranging from high to low.

Overall forage production is low on slopes greater than 40% and where there is a relatively closed canopy of pinyon and juniper. Forage production in formerly cleared pinyon and juniper areas is lower than potential. Generally speaking, monitoring in wetlands and closed basins along with deep soils showed most areas had high plant cover, or plant cover near potential; litter ranging from low to near potential and high to low bare soil.

Fence:

Barbed wire fence is generally considered wildlife friendly with bottom and top wire heights that allow for easier animal passage below or above the fence. For new or reconstructed fence, the

Coconino National Forest Land Management Plan (1996) specifies an 18” smooth bottom wire height, which exceeds the bottom wire height in the Pronghorn Management Guides (Lee et al 1998) and a 42” top wire height, which is intended to accommodate animals that jump over fences.

On the Pickett Lake and Padre Canyon Allotments there are approximately 96 miles of fence. During 2001 and 2002, beginning with the best pronghorn habitat, approximately 68 miles of fence were inventoried to determine the status of these fences. At the same time this inventory was completed, goat bars were installed at least every mile. Goat bars are pieces of PVC pipe installed on a raised bottom wire that make it easier for pronghorn to crawl underneath.

As of May 2003, approximately 40 miles of fence have been modified to the 18” smooth bottom wire height as part of Arizona Game and Fish Pronghorn Plan. Of these 40 miles, 10 miles were improved in 2002 on these two allotments. Twenty-eight miles of fence that currently have goat bars need additional improvements such as raising the bottom wire to 18” or smooth bottom wire installation. In 2003, funding will be utilized to continue work on improving these fences.

Tree Encroachment:

Tree encroachment is a concern within the project area because it reduces the amount and quality of pronghorn habitat. Pinyon-juniper woodland and young ponderosa pine have established in areas that were historically grassland, or savannah-like grasslands interspersed with trees, and in areas where antelope were historically more common. Many areas have been treated to remove or limit this encroachment and to increase grass and forb production. Regrowth of shrub and tree species since the treatments were done has reduced the quality of habitat for antelope in these areas. As tree density and canopy cover increases, predator hiding cover may increase; herbaceous understory can decline in vigor, abundance and diversity, and erosion may increase.

Environmental Consequences – Direct and Indirect Effects

Over time, livestock grazing can alter plant composition, species diversity, vegetative ground cover, plant community structure, and plant vigor over large areas. These changes are largely dependent on the grazing intensity, the number of livestock grazed, the season of use, climatic conditions, and the amount of rest an area receives. Competition for forage between cattle and antelope is usually minimal, but competition for early spring forage occurs at times (Lee et al. 1998). Loeser et al compared the effects of four grazing regimes on plant communities in semi-arid grassland for three years. Their preliminary results suggested that inter-annual variability is high and that different grazing strategies did not have a dramatic short term effect on the plant community in regards to native and exotic species’ richness and ground cover of grasses and forbs (Loeser et al. 2001).

Livestock grazing does not occur throughout all fawning habitat during fawning season every year because different pastures are used at different times between years. Grazing effects on hiding cover is dependent on the amount of re-growth that occurs between cattle removal in the fall and fawn use the following spring; the density and height of the residual vegetation following cattle grazing; the amount and timing of wildlife grazing and how these variables

interact with snow pack (which flattens vegetation), precipitation and temperature. A photographic assessment of vegetation cover for pronghorn fawns was conducted in 2001. This assessment compared cover in four-year-old exclosures and adjacent grazed areas managed with high cattle stocking densities for short duration rotations. These comparisons did not show any differences in percent hiding cover (Mezulis et al. 2001). This study is expected to continue to gain a better understanding of long term grazing effects on cover.

The following table compares rest, late use and grazing in key pastures by alternative (one and two herd). Rest years are those in which competition between pronghorn and cattle is reduced and the pastures recover. Late use is a factor to consider because the later in the season grazing occurs, the less time there is for regrowth to occur prior to pronghorn establishing fawning territories in the spring. Residual cover, from the previous year, can be an important feature in providing fawning cover from predators. This can vary year-to-year depending on the timing of moisture, temperature, and duration and timing of the snowpack (which can flatten vegetation).

Grazing in key pastures during the fawning season is another key factor because grazers reduce vegetation height, which can facilitate predation. Grazers also concentrate around waters that are key foraging areas for pronghorn does during late pregnancy and lactation.

Table 4. Summary of Late Use in Key Pastures, Impacts to Uplands, and Grazing in Key Pastures During April 15-June 15 Pronghorn Fawning Season.

ALT	LATE USE IN KEY PASTURES	IMPACTS TO UPLANDS	GRAZING IN KEY PASTURES DURING APRIL 15-JUNE 15 PRONGHORN FAWNING SEASON
Alt A Two Herds	Mid to late September in one pasture per year (Boot, Ashurst or Ducknest Pasture).	More upland grazing than Alternative C and D. Shorter graze periods and longer rest periods than C.	June 15 th in Ashurst Pasture every other year. Boot Pasture eight days every fourth year. No use in these pastures every fourth year during this time.
Alt A One Herd	Mid September every fourth year in Ashurst Pasture.	Similar as Alternative A two herds.	June 14-15 th in Ashurst Pasture every other year. No use in these pastures every other year during this time.
Alt B	None	None	None
Alt C	Mid September to mid October in one to two of these pastures.	Less upland use than C and more than D. Longer graze periods and shorter rest periods than A.	Eight days in Boot or Ashurst Pasture two out of four years. No use in these pastures two out of four years during this time.
Alt D Two Herds	Same as Alternative A, two herds.	Less upland use than A or C. Same graze and rest periods as A.	Same as Alternative A, two herds.
Alt D One Herd	Same as Alternative A, one herd.	Similar to Alternative D, two herds.	Same as Alternative A, one herd.

Alternative A and D:

The following effects are anticipated for pronghorn with the implementation of Alternatives A and D:

- Ashurst, Breezy, Boot and Ducknest Pastures are rested every fourth year, benefiting the uplands and wetlands in these pastures.
- The fencing at Post Lake should improve habitat conditions in the wetland for pronghorn and decrease diet competition with cattle. The fence at Post Lake may be a barrier to pronghorn; however, it will meet Forest Plan standards for wildlife passage.
- The pipeline and drinkers will be accessible to pronghorn and assist with water reliability and distribution in the area.
- Late use in key pastures is confined to a maximum of one pasture per year. Late use comes in mid to late September in one pasture per year in either Boot, Ashurst or Ducknest Pastures. For the one-herd grazing systems, late use in key pastures is mid September every fourth year in Ashurst Pasture. This use would keep all the unused late pastures available for the next fawning season, as long as the snow-pack did not flatten the hiding cover.
- Upland use varies by Alternative. In Alternative A, there is more impact to uplands than Alternative C and D. Shorter graze periods and longer rest periods reduce this affect to uplands habitat. In Alternative D, there is less affect on the uplands than Alternative A and C with less cattle numbers and lower utilization with the same grazing system as Alternative A. Less upland use would potentially provide greater hiding cover for pronghorn fawns.
- Grazing in key pastures during the fawning season is minimal. One day of use in the Ashurst Pasture every other year, eight days in Boot Pasture every fourth year, and no use every fourth year. For the one-herd grazing system, there are only two days of cattle grazing in the Ashurst pasture every other year and there is no cattle grazing in these pastures every other year. The remainder of the unused pastures would be undisturbed during this time period.
- These alternatives are expected to impact structure height around waters and this will vary by grazing schedule and precipitation.
- The current and future three-year deferral in Ducknest Pasture and rest in Boot Pasture (Annual Operating Instructions) may be beneficial, and the monitoring associated with this will be instrumental in understanding the impacts of varying grazing schedules on vegetation height and other key habitat factors.

Alternative C, Current Management:

The following effects are anticipated for pronghorn with the implementation of Alternative C:

- Ashurst, Breezy, Boot and Ducknest Pastures are rested every fourth year, benefiting the uplands and wetlands in these pastures.
- No fencing will occur at Post Lake to exclude the hardstem bulrush community. Pronghorn would benefit by not having a fence as a barrier, but cattle would graze the wetland. Cattle would limit the potential of this hardstem bulrush plant community.

- No pipeline and drinkers would be installed on the allotments. This would eliminate a reliable water source below the Anderson Mesa Rim for pronghorn.
- Late use in key pastures is confined one to two pastures per year. Late use comes in mid September to early October in Breezy Pasture and in October in Boot Pasture two out of four years. Ashurst Pasture is used thru September to mid October every fourth year. Ducknest Pasture is used thru September to mid October every fourth. Two to three pastures per year would be unused late season pastures available for the next fawning season, as long as the snow-pack did not flatten the hiding cover.
- Upland use is less than Alternative C and more than Alternative D. Less upland use would potentially provide greater hiding cover for pronghorn fawns. However, this grazing system has longer graze periods and shorter rest periods than Alternatives A and D, which reduces the benefit of less upland use.
- Grazing in key pastures during the fawning season is minimal. Only eight days are grazed during this time period in Boot and Ashurst Pastures every fourth year. Two years in four, no cattle are grazed in these pastures during this time period. The remainder of the unused pastures would be undisturbed during this time period.
- This alternative is expected to impact structure height around waters and this will vary by grazing schedule and precipitation.
- The current and future three-year deferral in Ducknest Pasture and rest in Boot Pasture (Annual Operating Instructions) may be beneficial, and the monitoring associated with this will be instrumental in understanding the impacts of varying grazing schedules on vegetation height and other key habitat factors.

Early season grazing by livestock or wildlife reduces fawn hiding cover, provided by new growth or residual growth from the prior year, facilitating predation. The magnitude and effect of this varies by the number of animals, and timing and duration of graze periods during the fawning season.

Alternative B No Grazing:

Implementation of Alternative B is not expected to have direct, indirect or cumulative impacts from livestock grazing. Forage competition, dietary overlap and reduction of cover in fawning habitat would not occur. Antelope rely on well-distributed available water, especially during fawning. The majority of water sources in the analysis area are stock tanks, which need regular maintenance. The Arizona Game and Fish Department and Forest Service personnel would determine what maintenance would be done on existing water developments. Monitoring would compare allotments ungrazed by cattle to the surrounding allotments grazed by cattle.

Cumulative Effects

The effects to vegetation in the vicinity of wetlands are additive to use by elk. Cattle and elk use occurs in wetland areas at similar times of the year as antelope. In addition, recreation activities also occur in wetland areas in the summer months. All uses, including use by antelope, are influenced by the presence of water as a result of precipitation. See the wetlands cumulative effects section of this EA.

The effects to fawning areas are additive to use by elk. Elk may graze in the pastures identified as fawning habitat, during the fawning season of April 15-June 15 when cattle are not present.

Dispersed recreation can also occur during fawning season and includes driving on and off roads, camping, antler gathering, hunting and firewood gathering. Current levels of dispersed recreation in these areas of the Pickett Lake and Padre Canyon allotments are low to moderate. Similar combined effects occur in wetland areas and fawning habitat on the remainder of Anderson Mesa. Effects have been offset over the years by a variety of vehicle restrictions including: the Pine Grove Quiet Area south of Lake Mary; the vehicle closure at Pine Hill on Anderson Mesa; and seasonal recreation restrictions at Hay Lake (PRD#68 map of vehicle restrictions). There are no cumulative effects in areas fenced and excluded from cattle including Ashurst, Vail Lake, and Horse Lake. Recreation uses may be unduly influenced at critical time periods like fawning or breeding when human uses increase above a certain level. This could result in increased stress to animals, fawn drop spread over a long time period or less time spent with young. Human use in this area is expected to increase over the life of the permit. Trash or gut piles and other human related food sources could provide a nutritional boost to predators resulting in higher reproductive output and better condition. Cattle grazing does not effect how people recreate on these allotments.

Overall cattle, combined with other wildlife, can possibly affect vegetative health of grasses, forbs and shrubs on Anderson Mesa. These effects also combine with the dense forest overstory found on large parts of Anderson Mesa. Encroachment of conifer trees into grasslands has diminished antelope habitat over time. Tree cutting and prescribed fire projects are underway to reverse this deleterious trend and details of these projects are listed in PRD#68). In addition recent wildfires removed some conifer vegetation.

The fences erected along the railroad and Interstate 40 are considered a negative effect because the combination of traffic and fence barriers has been shown to be barriers to pronghorn movements. Old fences within the project area are in the process of being upgraded to include a smooth bottom wire 18 inches above the ground to help facilitate pronghorn movement. In addition goat bars have been installed in some locations.

Pronghorn numbers have varied considerably on the Mesa historically, concurrent with wildlife and cattle grazing (District records). The cumulative effects of cattle and wildlife grazing, and recreation use can fall within a range of effect that pronghorn successfully live with under good conditions or may stress adults or young if predators, forage, nutrition, climate or other factors have an undue influence on populations or habitat.

The implementation of the Arizona Game and Fish Pronghorn Plan is an anticipated positive and integrated approach, with a number of collaborating groups, to improvement of habitat for pronghorn in this area.

Described below are several activities and natural events within the vicinity of the project area that already have or will likely occur in on near the project area. These activities may produce environmental effects on issues or resources relevant to the action alternatives. Therefore, these

activities and events have been considered in the cumulative effects analysis. The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past actions may have affected pronghorn. Vegetation is generally static with current cattle grazing. In the action alternatives cattle grazing would occur over the next ten years. There would be some variation in pronghorn habitat due to timing of the cattle grazing season related to wildlife grazing, recreation use, and climatic conditions. Effects to pronghorn habitat would vary because the effects may overlap for habitat in the wetland ecosystems.

The cumulative effects of the action alternatives consider past, present and reasonable foreseeable actions.

Past Actions. The past actions include previous livestock and wildlife grazing, farming, highway and railroad construction, fence construction, and recreation.

Livestock grazing. Past livestock grazing began in the 1870's, peaked in 1891, and has declined since this time (Range Specialist Report, PRD # 65). Utilization levels have declined over time as well. Pronghorn habitat has followed this livestock use pattern with trends that have improved as livestock numbers have been matched with carrying capacity.

Wildlife grazing. Past wildlife grazing specifically elk increased from the 1950's to peak numbers in the mid 1980's and have generally declined since the mid 1980's. Elk utilization levels have followed their population numbers. Pronghorn habitat has followed this elk use pattern with trends that have improved as elk numbers have decreased.

Farming. In the late 1800's and early 1900's settlers farmed and cut hay on the deepest soils. Farming declined after the establishment of the Coconino National Forest in 1908. Pronghorn habitat may have declined as native vegetation was disturbed and/or removed.

Recreation. Dispersed camping, hunting, boating and fishing were the main types of recreation. Many new roads were a result of these recreation activities. Pronghorn habitat was reduced as a result of this increase in recreational activities, especially in and around wetlands when these activities overlapped with the next season. These effects were somewhat offset by motorized use restrictions around some wetlands (List of Projects, PRD # 68, and Map PRD #68), and implementation of state rules regarding no camping within ¼ of a mile from open water. Developed campgrounds were constructed at some of the larger lakes with some of these excluded from cattle grazing.

Highway and Railroad construction The construction of Interstate 40 in the late 1950's/early 1960's created a barrier to antelope affecting their migration patterns. The amount of traffic has increased over time.

Fence construction Old fences of various types were constructed for management of livestock and to delineate boundaries between property owners on the Pickett Lake and Padre /Canyon Allotments as well as surrounding allotments and properties on Anderson Mesa. These fences, if not built to a particular standard, can be barriers to pronghorn movements. The fences erected

along the railroad and Interstate 40 also affect the antelope because the combination of traffic and fence barriers has been shown to be barriers to pronghorn movements.

Present Actions. The present actions include livestock and wildlife grazing, highways and railroads, fence construction and recreation.

Livestock grazing. Wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. Spike rush and annual riparian species exist on many of the wetlands in this area. This wetland vegetation is dependent on water being present in the basin long enough to allow hydric soils to form. As the water recedes, cattle graze the vegetation at the edge of the pool. Current livestock grazing occurs within the 35% to 50% utilization levels on adjacent allotments. Vegetation is generally static with livestock numbers that are matched with carrying capacity on these allotments.

Wildlife grazing. Current wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. Pronghorn habitat is generally static with elk numbers that are matched with carrying capacity.

Highways and Railroads Highways are a barrier to antelope as they attempt to migrate between their summer and winter ranges. Interstate 40 and the Burlington Northern Santa Fe Railroad, in particular are a barrier to antelope affecting their migration patterns. The high and steady amount of traffic and trains poses a barrier to animals trying to cross the highway.

Fence construction Fences of various types for livestock management and delineation of boundaries between property owners on the Pickett Lake and Padre /Canyon Allotments as well as surrounding allotments and properties on Anderson Mesa. These fences, if not built to a particular standard, can be barriers to pronghorn movements. Fences within the project area are in the process of being upgraded to include a smooth bottom wire 18 inches above the ground to help facilitate pronghorn movement. In addition goat bars have been installed in some locations.

Recreation. Dispersed camping, hunting, boating and fishing are the main types of recreation. Pronghorn habitat may be reduced as recreational use pressures increase on wetlands and in wetland areas. The Arizona Trail, a National Forest System Trail, passes by a few wetlands in the area.

Reasonably Foreseeable Actions. The reasonably foreseeable actions include livestock and wildlife grazing, highways and railroads, fences and recreation.

Livestock grazing. Future livestock grazing will most likely occur within the 35% to 50% utilization levels on adjacent allotments. Pronghorn habitat will be generally static with livestock numbers that are matched with carrying capacity.

Wildlife grazing. Future wildlife grazing utilization falls within the utilization levels set for cattle. Elk utilization levels continue to follow their population numbers. Pronghorn habitat is generally static with elk numbers that are matched with carrying capacity.

Highways and Railroads Highways will continue to pose a barrier to antelope as they attempt to migrate between their summer and winter ranges. Interstate 40 and the Burlington Northern Santa Fe Railroad, in particular are a barrier to antelope affecting their migration patterns. Traffic and trains will increase and will continue to pose as barriers to animals trying to cross the highway.

Fence construction Fences of various types for livestock management and delineation of boundaries between property owners on the Pickett Lake and Padre /Canyon Allotments as well as surrounding allotments and properties on Anderson Mesa. These fences, if not built to a particular standard, can be barriers to pronghorn movements. Fences within the project area will continue to be upgraded to include a smooth bottom wire 18 inches above the ground to help facilitate pronghorn movement. In addition goat bars have been installed in some locations. Portions of Fisher and Fry Lake, Prime Lake and Deep Lake will be fenced to exclude cattle grazing in these areas. Fisher and Fry and Prime Lakes are on the Walnut Canyon Allotment. Deep Lake is on the Deep Lake Allotment.

Recreation. Dispersed camping, hunting, boating and fishing are the main types of recreation. Pronghorn habitat will likely be reduced with increased recreation in and around wetlands and wetland areas. Some road and recreation management may offset these effects at high use sites.

Analysis of Other Features of the Environment

Soils, Water Quality and Watershed

Affected Environment

Generally the Forest Service lands on the Pickett Lake and Padre Canyon Allotments are in satisfactory watershed condition (Vegetation, Soil and Water Report PRD#66). Unsatisfactory soils where cattle are contributing factors are listed above in the utilization section. The Vegetation Soil and Water Report (PRD#66) contains detailed information about the Terrestrial Ecosystem Survey Soil Unit characteristics. The 2,410 acres of unsatisfactory soil conditions within valley plains, elevated plains, swales and basins (TES units 41, 50, 53, 55 and 515) are dispersed across the landscape in small patches.

Due to elevation and soil texture, no cryptogammic soils are found within the Pickett Lake and Padre Canyon Allotments.

The nearest perennial waters to these allotments are Mormon Lake and Lake Mary. Lake Mary is located approximately ¼ mile from the Railroad pasture of the Pickett Lake Allotment. Mormon Lake is located approximately one mile south of this same pasture. The next closest perennial water is located roughly 20 miles downstream from these allotments. Current cattle grazing does not have a direct or indirect effect on these waters (Vegetation, Soil and Water Report, PRD#66).

Current watershed conditions occur under the current cattle grazing system that incorporates Best Management Practices and Guidance Practices per the Non-point Source Intergovernmental Agreement signed by the Forest Service (Region 3) and the Arizona Department of Environmental Quality.

Environmental Consequences

The water quality of perennial water is not affected under any alternative.

Watershed condition is overall stable in terms of the factors, which affect hydrologic function and soil productivity. The impaired and unsatisfactory soil conditions described in the vegetation section above, will continue to function below potential. There is no difference between alternatives for the 2,410 acres of unsatisfactory soil areas where cattle are contributing to unsatisfactory conditions. Treating the factors contributing to unsatisfactory soil conditions in the remainder of the allotments, such as reducing tree density, is outside the scope of this analysis and decision.

Because there is little direct or indirect effect to overall soil and water quality, there is no cumulative effect.

Threatened and Endangered Species

This section shows how the project complies with section 7 of the threatened and endangered species act. Prior consultation with USFWS on the effects of ongoing grazing on the Padre Canyon Allotment was conducted in 1998. There was a no effect determination for bald eagles, Mexican spotted owls, and black-footed ferret. A biological assessment and evaluation will be prepared and consultation will occur for both allotments prior to a decision for this analysis. The determination of effects for threatened species is based on the Guidance Criteria for Determining Effects of On-going Grazing and Issuing Term Grazing Permits on Selected Threatened and Endangered Species, and Species Proposed for Listing and Proposed and Designated Critical Habitat (USDA, 2002). Mitigation measures for bald eagle and Mexican spotted owl are listed in the Items Common to Alternatives section of Chapter 2.

The Pickett Lake and Padre Canyon Grazing Allotments contain potential or occupied habitat for threatened and Forest Service sensitive species. The Threatened, Endangered and Sensitive Species (TES) List for the Mormon Lake and Peaks Ranger District was reviewed and a TES list for this project was created in November 2000 (USDA Forest Service, 2000a). The following is a description of the species and their habitat, and an analysis of the effects of implementation of each alternative on each species that occurs within or adjacent to the analysis area.

Additional information that supports the conclusions described here is located in the Wildlife Specialist's Report for Threatened, Endangered and Sensitive Species, Existing Condition and Environmental Consequences, Pickett Lake and Padre Canyon Allotment Management Plan Environmental Assessment, March 31, 2003

Affected Environment

The Threatened, Endangered and Sensitive Species List for the Mormon Lake and Peaks Ranger District was reviewed and a list was created for this project (PRD#7). More information on the affected environment, and the monitoring completed to determine affected environment for these species is located in the Wildlife Specialist's Report for Threatened, Endangered and Sensitive Species (PRD#67).

These allotment areas provide habitat for two threatened species, the Mexican spotted owl and the bald eagle, and habitat for Gunnison's prairie dogs, food for the endangered but locally extirpated black-footed ferret.

Bald Eagle: Bald eagles are primarily winter visitors, occupying all habitat types and elevations. Livestock use does not overlap with the primary use period of wintering bald eagles. They usually arrive in late October or early November and leave in early to mid-April. They feed on fish, waterfowl, terrestrial vertebrates, and carrion. There are no known nests on these allotments. There are three known roosts in the area. Carrion is the primary food source for eagles on the Padre Canyon Allotment and cattle grazing does not affect the availability of carrion. Fish are most likely to persist only in perennial reservoirs (Ashurst Lake and Coconino Dam) which have been stocked with trout. Cattle grazing does not generally affect fish populations. Eagles are expected to use any open water that would support waterfowl because waterfowl can make up a portion of their diet if available.

Mexican spotted owl (MSO): Habitat consists of a portion (7 acres) of a Protected Activity Center (PAC) and approximately 1,026 acres of restricted habitat on the Pickett Lake Allotment. Of the restricted habitat, there is no known target threshold habitat⁵. There is no known habitat on the Padre Canyon Allotment. The majority of said MSO habitat has an overstory canopy cover of over 40%, limiting understory plant growth and is therefore not readily used by cattle. Currently, the 4-inch stubble height criteria described for MSO habitat is being maintained.

Black Footed Ferret: No records of black-footed ferret exist for the analysis area. There are two known colonies of prairie dogs, one in the Ducknest pasture and one in the Breezy Lake pasture. Currently, cattle grazing and other herbivory are not affecting prairie dogs.

Environmental Consequences:

Bald Eagle: For Alternatives A, C and D there are no effects to bald eagles or their habitat under any alternative because grazing occurs outside the primary use period of wintering bald eagles; because there is no nesting or nesting habitat; because grazing does not reduce roost trees or roost tree regeneration; because there is no disturbance to known roosts, and because installation of drinkers and fence will not disturb eagles or modify roosts. There are no direct or indirect effects that would add to other project effects, and therefore no cumulative effect. The affects to waterfowl habitat are described in more detail in the MIS section. There are no effects under Alternative B.

⁵ The characteristics of restricted and target threshold habitat are described in the Wildlife specialist report (PRD#67) and in the Coconino Forest Plan.

Mexican spotted owl: For Alternatives A, C and D, there is a determination of “may affect, not likely to adversely affect.” This is appropriate because there is no disturbance or construction activity within PACs during the breeding season. Riparian regeneration is not affected because there are no riparian trees in this MSO habitat. Species composition, residual biomass and seedhead production will be sufficient to support MSO prey and to carry fire in occupied habitat and most of the restricted habitat. Mountain meadows are lacking within MSO habitat that would be considered foraging areas for MSO e.g. meadows of a size to be identifiable with TES units or stand exam.

Range data shows static to upward trend and satisfactory rangeland conditions in the pine type (Range Specialist report, PRD#65). Protected and most restricted habitat maintains the 4-inch stubble height minimum⁶. Because there are little direct or indirect effects to MSO habitat, there is only a very slight cumulative effect when added to the effects of other projects. Projects reviewed for cumulative effects on MSO habitat included the Ashurst and Pickett Agra axe projects, the Mud Tinny Grazing Allotment, and the Arizona Trail, the Pinegrove Campground to Railroad Springs. Details about these projects are located PRD#20 and PRD#68. There are no effects from cattle grazing, direct, indirect or cumulative in Alternative B.

Black-footed ferret: For all alternatives there is a determination of “no effect” to black-footed ferret. This is because prairie dogs are a primary food source for ferrets, and prairie dog control is not part of the livestock management program. There are no significant cumulative effects to prairie dog habitat and therefore there are no cumulative effects to black-footed ferret.

Region Three Forest Service Sensitive Species

Forest Service policy requires the consideration of Region 3 Forest Service Sensitive Species (referred to hereafter as sensitive species) in project analyses. A biological evaluation will be prepared prior to a decision for this analysis. Fourteen sensitive species are present or have potential habitat within the analysis area and have been evaluated.

The following sensitive species were considered for this project, but were withdrawn from detailed analysis because there is no suitable or potential habitat for these species within the analysis area: Wupatki Arizona pocket mouse, Narrow-headed gartersnake, Arizona bugbane, Bearded gentian, Crenulate moonwort, San Francisco Peaks groundsel, Sunset Crater beardtongue, and disturbed rabbitbrush.

Tables describes the findings for these species. Additional information that supports the conclusions described here is located in the *Wildlife Specialist’s Report for Threatened, Endangered and Sensitive Species, Existing Condition and Environmental Consequences, Pickett Lake and Padre Canyon Allotment Management Plan, Environmental Assessment, March 31, 2003, PRD#67.*

⁶ Small portions of restricted habitat near roads and waters are not expected to maintain the 4-inch stubble height.

Table 5 List of Sensitive species on the Pickett Lake and Padre Canyon Grazing Allotments

SPECIES NAME	SCIENTIFIC NAME	DETERMINATION
American Peregrine Falcon	Falco peregrinus anatum	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability”. There are no impacts to eyries or no disturbance to peregrine reproduction under any alternative.
Northern Goshawk	Accipiter gentilis	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability”. No actions modify late seral ponderosa pine. Livestock grazing is expected to occur at levels that maintain prey species habitat.
Northern Leopard Frog	Rana pipiens	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability” due to improvement of potential habitat at Boot and Billy Back Spring
Mountain Silverspot Butterfly	Speyeria nokomis nitocris	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability”. This is the effect for Alternative C. Alternatives A, B and D reduce the effect because of exclusion of Billy Back and Boot Springs.
Blue-black Silverspot Butterfly	Speyeria nokomis nokomis	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability” This is the effect for Alternative C. Alternatives A, B and D reduce the effect because Billy Back and Boot Springs are excluded from cattle grazing.
Spotted Skipperling	Piruna polingii	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability” This is the effect for Alternative C. Alternatives A, B and D reduce the effect because Billy Back and Boot Springs are excluded from cattle grazing.
Freeman’s Agave Borer	Agathymus baueri freemani	There would be no direct, indirect or cumulative effects for this species due to the minimal amount of habitat present.
Aryxna Giant Skipper	Agathymus aryxna	There would be no direct, indirect or cumulative effects for this species due to the minimal amount of habitat present.

SPECIES NAME	SCIENTIFIC NAME	DETERMINATION
Early Elfin	Incisalia fotis	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability” because livestock grazing will occur within potential habitat and livestock may browse cliffrose.
Cliff Fleabane	Erigeron saxatilis	“no impact”. Potential habitat for this species, but is inaccessible to livestock.
Ruby’s Milkvetch	Astragalus rubyi	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability” due to grazing by cattle and wildlife, including small mammals and seed predators.
Arizona Sneezeweed	Helenium arizonicum	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability”. Cattle avoid grazing the plant but may trample it walking to and from water.
Flagstaff Beardtongue	Penstemon nudiflorus	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability.” There is potential habitat and there could be some possible effects to reproduction if plants are present.
Navajo Mountain Mexican Vole	Microtus mexicanus navaho	“May impact individuals, but not likely to result in trend toward federal listing or loss of viability”. Grazing by both livestock and wildlife would directly result in loss of cover and some food for voles and make them more susceptible to predation. The duration and subsequent impacts on voles will vary depending on vole distribution and timing relative to their reproductive cycle.

Management Indicator Species

The Antelope and Cinnamon Teal habitat discussion earlier in the document contains further information related to these species, respectively.

A working draft forest-wide assessment entitled "*Management Indicator Species Status Report for the Coconino National Forest*" dated 7/1/02 summarizes current knowledge of population and habitat trends for species identified as management indicator species (MIS) for the Coconino National Forest (USDA Forest Service, 2002a). Population trends need to be monitored as the Forest Plan is implemented, and relationships to habitat changes over time determined (36 CFR 219.19). Table 6 displays management indicator species by management area and Table 7 displays the habitat feature the management indicator species represent.

All of the conclusions described for MIS are located in the Project Record Document titled Wildlife Specialist’s Report: Management Indicator Species, Migratory Birds, Game and Non-game wildlife, Pickett Lake and Padre Canyon Allotment Management Plan, Environmental Assessment, April 9, 2003 (PRD#67).

Table 6 Management Indicator Species by Management Area

MANAGEMENT AREA (MA)	MANAGEMENT INDICATOR SPECIES
MA 3 (Ponderosa Pine and Mixed Conifer with <40% Slopes)	Abert squirrel, red squirrel, Mexican spotted owl, elk, northern goshawk, pygmy nuthatch, turkey, and hairy woodpecker
MA 4 (Ponderosa Pine and Mixed Conifer with >40% Slopes)	Abert squirrel, red squirrel, Mexican spotted owl, elk, northern goshawk, pygmy nuthatch, turkey, and hairy woodpecker
MA 6 (Unsuitable Timber Land in Ponderosa Pine)	Elk, Mule Deer, Abert squirrel, and hairy woodpecker
MA 7 (Pinyon-juniper Woodland with <40% Slopes)	Plain (juniper) titmouse, Mule deer, and elk
MA 8 (Pinyon-juniper Woodland with >40% Slopes)	Plain (juniper) titmouse, mule deer, and elk
MA 10 (Grassland and Sparse Pinyon-juniper)	Pronghorn Antelope
MA 12 (Riparian and Open Water)	Cinnamon Teal, Lincoln's sparrow, yellow-breasted chat, Lucy's warbler, and macro invertebrates

Table 7. Coconino National Forest Management Indicator Species, the habitat they represent, and findings

SPECIES	HABITAT	FINDINGS
Abert Squirrel	Early seral ponderosa pine	All alternative result in no anticipated changes to population trend or trend of habitat Forest-wide. No actions modify the overstory.

SPECIES	HABITAT	FINDINGS
Northern Goshawk	Late seral ponderosa pine	None of the alternatives are expected to impact habitat or Forest-wide population trends during the Forest Plan period. No actions modify late seral ponderosa pine.
Pygmy Nuthatch	Late seral ponderosa pine	All alternatives would result in no change in habitat capability. No actions modify late seral ponderosa pine.
Turkey	Late seral ponderosa pine	The implementation of any alternative will not result in effects that change the population trend on the forest or seral stage that turkeys were chosen to represent. ⁷ No actions modify late seral ponderosa pine.
Elk	Early seral ponderosa pine, mixed conifer, and spruce-fir	None of the alternatives are expected to impact habitat or population trends during the Forest Plan period. ⁸ No actions modify ponderosa pine, mixed conifer or spruce-fir.
Hairy Woodpecker	Snag component of ponderosa pine, mixed conifer, and spruce-fir	None of the alternatives change population or habitat trend for this species due to lack of impact to snags.
Mexican Spotted Owl	Late seral mixed conifer and spruce-fir	The implementation of any alternative will not result in effects that change the population trend on the forest or seral stage that owls represent ⁹ .
Red Squirrel	Late seral mixed conifer and spruce-fir	Late seral mixed conifer and spruce fir does not occur on allotment.
Red-naped (Yellow-bellied) Sapsucker	Late seral and snag component of aspen	Aspen does not occur on allotment.
Mule Deer	Early seral aspen and pinyon-juniper	The implementation of any alternative will not result in effects that change the population trend on the forest or seral stage that mule deer represent. ¹⁰
Juniper (Plain)	Late seral and snag component of pinyon-	None of the alternatives are expected to impact forest-wide trends or trends for habitat. No actions modify

⁷ Alternative B has no effect. Of the action alternatives, Alternative A has the least effect followed by D and then C.

⁸ Alternative B has no effects. Of the action alternatives, Alternative D provides the least effects and most benefits, followed by A and then C.

⁹ See the threatened species findings above.

¹⁰ Alternative B has no effect. Of the action alternatives, Alternative D has the least effect, followed by A then C.

SPECIES	HABITAT	FINDINGS
Titmouse	juniper	late seral and snag components of pinyon-juniper.
Pronghorn Antelope	Early and late seral grasslands	The implementation of any alternative will not result in effects that change the Forest-wide trend for pronghorn. Forest-wide population trend is declining, and habitat trend is stable to declining. ¹¹
Lincoln's Sparrow	Late seral, high elevation riparian ($\geq 7000'$)	The implementation of any alternative will not result in effects that change the population or habitat trends on the forest. ¹²
Lucy's Warbler	Late seral, low elevation riparian ($< 7000'$)	No habitat is found on these allotments.
Yellow-breasted Chat	Late seral, low elevation riparian ($< 7000'$)	No habitat is found on these allotments
Macro invertebrates	Late seral, high and low elevation riparian	No habitat is found on these allotments ¹³
Cinnamon Teal	Wetlands/aquatic	The implementation of any alternative will not result in effects that change the population or habitat trends on the forest. ¹⁴

Migratory Bird Species

President Clinton signed Executive Order 13186 on January 10, 2001, placing emphasis on conservation of migratory birds. This order requires that an analysis be made on the effects of Forest Service actions on Species of Concern listed by Partners in Flight, the effects on Important Bird Areas (IBA's) identified by Partners in Flight (Latta, et al., 1999), and the effects to important over-wintering areas. There are no IBA's within the analysis area.

¹¹ See analysis of Pronghorn section earlier in this chapter.

¹² The trend for Lincoln's sparrow on the Forest is inconclusive. Currently, Lincoln's sparrows are only known to nest on the Coconino National Forest in the inner-basin on the San Francisco Peaks. Otherwise, nesting information is lacking, and population trend is unknown. Overall, data from the Coconino National Forest indicate stable to increasing wintering populations.

¹³ The riparian area targeted are perennial streams and there are no perennial streams within or adjacent to the analysis area.

¹⁴ See analysis of significant issues section for more detail.

The following is a description of the species’ status within the analysis area and an analysis of effects for each alternative. Tables 8,9,10, and 11 summarize each migratory bird species of concern by habitat.

All of the conclusions described for MIS are located in the Project Record Document titled Wildlife Specialist’s Report: Management Indicator Species, Migratory Birds, Game and Non-game wildlife, Pickett Lake and Padre Canyon Allotment Management Plan, Environmental Assessment, April 9, 2003 (PRD#67).

Table 8 Pine habitat priority species

PRIORITY SPECIES	STATUS IN THE PROJECT AREA	FINDINGS
Olive-sided Flycatcher	BBS data indicates that this species exists in low numbers, but is stable to slightly increasing within the analysis area.	No impact on habitat is expected
Cordilleran Flycatcher	It is expected that this species is static to increasing within the analysis area.	No impact on habitat is expected
Purple Martin	BBS data indicates that this species is static to slightly declining in the analysis area.	No impact on habitat is expected

Table 9 Pinyon-juniper habitat priority species

PRIORITY SPECIES	STATUS IN THE PROJECT AREA	FINDINGS
Gray Flycatcher	Status of gray flycatchers is expected to be static to increasing. Expected to be common in analysis area. Large-scale chaining and juniper pushes were done in much of the pinyon-juniper vegetation types on Anderson Mesa. Large acreages affected with few trees being left regardless of size, age, or value from a wildlife perspective. These early treatments greatly reduced the availability of mature stands of pinyon and juniper trees tied mainly to rocky, inaccessible sites.	Some impact to habitat. Some potential to get parasitized on years when grazing occurs in nesting habitat during nesting season.
Pinyon Jay	Mixed stands of pinyon-juniper occur over large areas and pinyon heavily impacted by drought and beetle kill. In general, trees greater than 75 years old are preferred in large numbers. Pinyon jays were common on the area prior to beetle kill. Their presence and breeding behavior is dependent upon availability of pine seed crops.	No impact

Gray Vireo	Gray vireos generally occur at naturally low population densities. Within the analysis area, rare open stands of mature pinyon-juniper are interspersed with areas of young trees. In general, mature stands of pinyon-juniper within the analysis area have much higher tree densities than the preferred 280 trees per hectare, thus limiting the availability of habitat for this species. Common in the analysis area. Considered to be stable within the project area.	Some impacts from cattle grazing in riparian vegetation when riparian vegetation is present in wetlands and closed basins. Of the action alternatives Alternative A and D have the least effects followed by C. Potential for cowbird parasitism exists under all action alternatives.
Black-throated Gray Warbler	They are common within the analysis area and are considered to be stable to increasing.	Same as Gray Vireo

Table 10 High elevation grassland habitat priority species

PRIORITY SPECIES	STATUS IN THE PROJECT AREA	FINDINGS
Ferruginous Hawk	No known nesting. Fall migratory use in grasslands on the Pickett Lake Allotment. This species is expected to be static within the analysis area.	Any alternative is not expected to impact this species to any great degree.
Swainson's Hawk	Swainson's hawks occupy grassland habitats within the analysis area, although habitat is limited to short grass prairie habitats. Woodland encroachment into these grasslands and global decreases in this species numbers are expected to be resulting in static to decreasing numbers of Swainson's hawks within the analysis area.	None of the alternative are expected to impact this species to any great degree.
Burrowing Owl	Habitat is limited to grasslands on the Pickett Lake Allotment. Documented in area. Considered to be declining throughout the majority of their range. Population numbers vary with burrow availability. Within the analysis area, they are expected to be stable to slightly declining.	None of the alternatives are expected to impact this species to any great degree.

Table 11 high elevation riparian habitat species

PRIORITY SPECIES	STATUS IN THE PROJECT AREA	FINDINGS
MacGillivray’s Warbler	Potential habitat in springs.	Any alternative should not alter habitat. Of the action alternatives A and D have least impact due to fencing springs, followed by C.
Red-faced Warbler	Potential habitat in springs.	Same as MacGillivray’s Warbler

Game and Non-Game Wildlife

Several game and non-game species occur within the analysis area. Game species include Rocky Mountain elk, mule deer, turkey, pronghorn antelope, Coue's white-tailed deer, black bear, mountain lion, rabbits and furbearers. Non-game species include many ground, tree, and cavity nesting birds; and small mammals such as wood rats, mice, and other rodents. Over 130 species of birds are found in the area, including many Neotropical migrants and migratory water birds. There are also a variety of reptiles and amphibians occupying the analysis area. These in turn supply food for raptors and carnivores such as fox, coyotes, bobcat, mountain lion, and black bear.

Alternatives A, C and D:

Proposed fencing in Alternatives A and D would create a partial barrier to some wildlife yet result in improved wetland conditions at Post Lake, benefiting water birds. Proposed water developments in Alternatives A and D would be beneficial to many other animals. Fencing modifications in Alternatives A and D should also restrict cattle access to Boot and Billy Back Springs, and browse areas below the rim, benefiting both riparian dependent.

Species that benefit from a more open understory, as well as ground feeders that forage on bare ground or in short grass can be positively affected by livestock grazing.

Impacts to ground or shrub nesting birds during the breeding season include trampling of nests, and alteration of structural support and cover. Species that prefer dense vegetation or that depend on particular plants that are preferred by livestock are particularly affected. Livestock may also impact: foliage gleaners (species that prefer open canopies in forests); species that nest or forage near water; and species affected by cowbird parasitism.

Below the rim: Grazing in the browse component and in the openings (which are small and scattered) occurs either early or late in the season and varies by year and duration depending on the year and one or two herd scenarios. The early season graze can occur during fawning season for wildlife and has the same effect as described in the pronghorn section. The late season graze also varies and has potential impacts to browse that wildlife rely on in the winter and may allow

limited time for regrowth for structure height that some animals might need for fawning or nesting early in the next spring.

As described above, areas around water in all action alternatives receive heavier use by cattle and wildlife. Upland use is higher with Alternative C and A due to a higher utilization level than Alternative D. Because of the high canopy cover in portions of the Padre Canyon Allotment, use in the open and semi-open areas is expected to be higher due to the reduced forage in these dense woodland. This may impact seedhead production and vegetation height until cattle move on and regrowth occurs.

Alternative B - (No Grazing)

Competition for forage between wildlife and livestock would not occur in this alternative. Impacts on vegetation structure would only occur as a result of wild ungulate grazing. Overall, implementation of this alternative would be beneficial to wildlife however there are no direct, indirect or cumulative impacts due to lack of grazing. Plant productivity and plant species composition would potentially increase, although wildlife grazing would continue to impact vegetation. No other actions are proposed that would impact wildlife.

Economics

Affected Environment

Income associated with cattle grazing represents a small percentage of the Flagstaff area economies. The nearest community to the allotments is Mormon Lake which is primarily supported by recreation and summer homes. The Flagstaff economy is large and fairly diverse. Grazing and associated revenues make up a very small portion of that economy. Permittees contribute a small percentage to the overall County tax revenues. Cattle grazing permit revenues is a small percentage, but an important contributor, to the funds Coconino County receives from National Forest grazing fees.

Cattle grazing operations make a larger contribution to the economy of rural landowners in the area. There are 1,100 acres of private land on the allotments, a portion of which is owned and operated by the permittee. Outside of the Pickett Lake and Padre Canyon allotments, some of the private land on Anderson Mesa is owned and operated as a ranch by different permittees.

Although it recognized that the contributions of grazing to local economies and county government is small in relation to other businesses and funding sources, this section will display the differences between the alternatives for jobs, National Forest fees, and other revenues.

Domestic cattle grazing contributes 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 Pickett Lake and Padre Canyon Allotments are in Coconino County. These allotments are currently permitted for 845 head of livestock, so the economic affect is moderate.

The economy of Coconino County gains 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, recreational uses and cattle grazing uses, are an important part of county revenues but provide only a fraction of available funds. 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 Pickett Lake and Padre Canyon permittees 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.

Environmental Consequences

Estimates of direct and indirect jobs and payments to Coconino County from federal receipts provide a relative comparison of economic effects that could occur due to changes in cattle grazing. Table 6 estimates effects expected on these indicators in Coconino County from implementing Alternatives A through D on the Pickett Lake and Padre Canyon Allotments.

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 Pickett Lake and Padre Canyon Allotments. 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 is difficult, if 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 calculations, although these figures may vary: 90 percent cow to calf ratio, 500 pounds per calf at \$0.80 per pound. The estimated gross revenue for Alternatives C is \$292,000 per year. Alternative A estimated gross revenue is \$336,800. Alternative B's estimated gross revenue is \$0. The estimated gross revenue for Alternatives D is \$286,000. This is somewhat misleading because these cows do not graze on the Coconino National Forest yearlong. The cattle graze on the Forest five months in Alternative C and four months in Alternatives A and D.

Under Alternative B, the permit for grazing livestock on these allotments would be cancelled. The permittee would lose future revenue derived from the sale of livestock that would have been produced on these allotments. Private land owned by the permittee could also be affected.

When the public land permit associated with the ranch operation is lost, the permittee’s economic ability to maintain a ranching operation may be greatly diminished or eliminated. Without the public land permit, the base property controlled by the permittees would be greatly affected. No projections are made for the permittee’s 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 Pickett Lake and Padre Canyon Allotment permits will eliminate \$2,005.93, at the 2002 fee rate of \$1.43/AUM 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 permittee’s use of federal lands.

The loss of jobs shown for Alternative B is shown in Table 12. Not all jobs associated with the permit will be eliminated if no grazing is allowed on these allotments. However, all jobs directly associated with and some jobs indirectly associated with the permit will be eliminated. 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 Pickett Lake and Padre Canyon Allotments support these businesses.

Table 12 Economic Effects Coconino County Alternative.

ECONOMIC EFFECTS	ALT A	ALT B	ALT C	ALT D
Direct and Indirect Jobs (#) About 1.14 jobs per 100 cattle	11.1	0	9.6	9.4
Federal Payments to Counties	\$1,727.08	0	\$2,005.93	\$1,467.18

*The amount shown under the alternatives is a projection of 25% of all grazing fees to Coconino County at the 2002 grazing fee rate of \$1.43. 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 Pickett Lake and Padre Canyon Allotments may help maintain current jobs within communities around these allotments and revenues for Coconino County and the State. If changes are made in the use of the Pickett Lake and Padre Canyon Allotments in the future, contributions to State, county and local economies from fees, taxes and jobs associated with cattle grazing on these allotments will change accordingly.

Under Alternatives A and D, jobs and revenues will be reduced, theoretically, with a 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 Pickett Lake and Padre Canyon Allotments. 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 Pickett Lake and Padre Canyon Allotments over the next 10 years by the permittee, along with the present value of the grazing fees over the next 10 years by the 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 13 displays the results of an investment analysis, by alternative, for the Pickett Lake and Padre Canyon Allotments (Quicksilver model PRD#59). These figures have been rounded to the nearest dollar.

Table 13 Investment Analysis by Alternative.

FOREST SERVICE	ALT A	ALT B	ALT C	ALT D
Present Value of Benefit	\$4,927.50	\$0	\$5,703.75	\$4,471.20
Present Value of Cost	\$-37,319	\$-3,374	\$-23,619	\$-37,319
Present Net Value	\$-32,391	\$-3,374	\$-17,915	\$-32,848
Benefit/Cost Ratio	0.13	0	0.24	0.12
Permittee				
Present Value of Benefits	\$27,339	\$0	\$31,645	\$24,807
Present Value of Costs	\$-158,907	\$0	\$-153,555	\$-155,058
Present Net Value	\$-131,568	\$0	\$-121,909	\$-130,251
Benefit/Cost Ratio	0.17	0	0.21	0.16
All Partners				
Present Value of Benefits	\$32,266	\$0	\$37,349	\$29,278
Present Value of Costs	\$-678,036	\$-3,374	\$-177,173	\$-674,187
Present Net Value	\$-645,770	\$-3,374	\$-139,824	\$-644,909
Benefit/Cost Ratio	0.05	0	0.21	0.04

The investment analysis displays that for every dollar the Forest Service spends on the Pickett Lake and Padre Canyon Allotments; there would be a return of \$0.13 for Alternative A, \$0.24 for Alternative C, and \$ 0.12 for Alternative D. Conversely, for every dollar the permittee spends on management of the Pickett Lake and Padre Canyon Allotments, there would be a return of \$ 0.17 for Alternative A, \$0.21 for Alternative C and \$0.16 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 \$0.05 for Alternative A, \$0.21 for Alternative C and \$ 0.04 for Alternative D.

Environmental Justice

The Team 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. Eliminating the livestock grazing would have an impact to the current permittees, who are minorities, by not allowing their cattle to run on these allotments. However, this action would not have a disproportionate impact to their entire livestock grazing operation. In addition, there are no impacts to Americans with disabilities from implementation of the livestock grazing alternatives or from removing livestock grazing from the area for 10 years.

Heritage Resources/Traditional Cultural Properties

This section shows how the project complies with the National Historic Preservation Act, American Indian Religious Freedom Act and Native American Graves Protection and Repatriation Act.

The archaeological clearance for the project documents the archaeological inventory, results of consultations with the Tribes, and the determination of no adverse effect in compliance with the National Historic Preservation Act of 1966, as amended. This report contains site-specific protection measures for implementation, and monitoring requirements.

Consultations with tribes resulted in no specific concerns about the effect of the proposed Action (Alternative A). Tribal access will not be affected by the proposed project.

Since there is not an adverse effect to cultural resources as a result of the project activities, there is no added effect or cumulative effects as a result of this project.

Air Quality

Pickett Lake and Padre Canyon Allotments 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 deterioration to visibility is from smoke and dust.

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 on the Pickett Lake and Padre Canyon Allotments may occur from dust when cattle are herded and transported or from odor in the immediate vicinity of the animals. Alternative B will not affect air quality on these allotments on Forest Service lands. There are no cumulative effects.

Public Safety

There is little human interaction between cattle and people on the Pickett Lake and Padre Canyon Allotments. Fences are interspersed across the landscape and do not currently pose a public safety risk.

There are no direct, indirect or cumulative effects to public safety from this project.

Other NEPA Requirements

Implementation of any action alternative would cause some adverse environmental effects that cannot be effectively mitigated or avoided. In this analysis, none of these effects are described in this chapter as significant¹⁵. The interdisciplinary procedure used to identify specific practices was designed to eliminate or lessen adverse consequences. The application of Forest Plan standards and guidelines, Best Management Practices, project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. The range resource, a renewable resource is managed in such a way that it is available for future generations. There are no irreversible¹⁶ or irretrievable¹⁷ commitments associated with this project.

There is less than complete knowledge about many of the relationships and conditions of wildlife, fish, forests, jobs, and communities. The ecology, inventory, and management of a large forest area combined, are a complex and developing science. The biology of wildlife species prompts questions about population dynamics and habitat relationships. The interaction of resource supply, the economy, and communities is the subject matter of an inexact science. However, the basic data and central relationships are sufficiently well established in the respective sciences for the deciding official to make a reasoned choice between the alternatives and to adequately assess and disclose the possible adverse environmental consequences. New or updated information would be very unlikely to reverse or nullify these understood relationships.

None of the effects described in this chapter are uncertain, unique or unknown. The Forest Service has had ample experience implementing similar types of projects. Monitoring described for this project will add to our knowledge of possible effects and the level of these effects. In addition, management of the Pickett Lake and Padre Canyon Allotments under any alternative does not set a precedent for adjacent allotments.

¹⁵ Significance is determined using the 10 points of significance in 40CFR1500.

¹⁶ Irreversible commitments are decisions affecting non-renewable resources such as soils, wetlands, roadless areas, and cultural resources. Such commitments are considered irreversible because the resource has deteriorated to the point that renewal can occur only over a long period of time or at a great expense, or because the resource has been destroyed or removed.

¹⁷ Irretrievable commitments represent opportunities foregone for the period during which resource use or projection cannot be realized. Such decisions are reversible, but the projection opportunities foregone are irretrievable. As an example, deferring timber harvest at this time in certain areas due to resource concerns or economic would be an irretrievable commitment of timber volume otherwise obtainable. The commitment is irretrievable rather than irreversible, because future entries could harvest those areas if they are still part of the suitable timber base.

The Forest Planning Regulations require that certain species, whose population changes are believed to indicate the effects of management activities, be selected and evaluated in forest planning alternatives (CFR 219.19). Effects to habitat components for Management Indicator Species relevant to the Pickett Lake and Padre Canyon areas are described in this chapter.

The human environment is defined in CFR40 1508.14. Chapter three contains information about economics, and the project record has information on social values including recreation opportunities, aesthetics, and perceptions (PRD#72). The natural environment is discussed in this EA including the discussion of significant issues, air quality, soil and water quality, threatened species, Forest Service sensitive species, management indicator species, migratory birds, and other game and non-game wildlife.

Shown below is a list of federal laws and executive orders pertaining to the Pickett Lake and Padre Canyon Allotments.

- Multiple-Use Sustained-Yield Act of 1960 – This law is followed by this project because it is consistent with the Forest Plan.
- National Historic Preservation Act of 1966 (as amended) – This law is followed by this project and the appropriate documentation is located in the project file (Cultural Resources Report, PRD#41).
- National Environmental Policy Act (NEPA) of 1969 (as amended) – The effects of the project have been analyzed and are disclosed in this Environmental Assessment.
- Endangered Species Act (ESA) of 1973 (as amended) – Analysis and disclosure of effects is complete, documentation meets standards of this law and consultation with US Fish and Wildlife Service is underway and will be completed prior to a decision.
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended) – This law is met because this project is consistent with the Forest Plan.
- National Forest Management Act (NFMA) of 1976 (as amended) – See the Forest Plan Direction and Consistency section above. This project meets the intent of this law by consistency with the Forest Plan.
- Clean Water Act of 1977 (as amended)
- Archeological Resource Protection Act of 1980 – The effects on archaeological sites are analyzed and disclosed in the Cultural Resources report (PRD#41), there are no significant effects so this law is met.
- Executive Order 11593 (cultural resources) – See NHPA above.
- Executive Order 11990 (wetlands) – There is no construction within wetlands or disposition of wetlands to other ownership, nor easement through wetlands. Chapter 3 has a detailed analysis of effects from cattle grazing on wetland areas.
- Executive Order 12898 (environmental justice) – See the Environmental Justice section of this chapter.
- Executive Order 13186 (migratory birds) - There are no Important Bird Areas (IBA's) within the analysis area. Chapter 3 contains a description of the species' status within the analysis area and an analysis of effects for each alternative.

CHAPTER 4 – MONITORING

Monitoring on these allotments for all action alternatives for a permit period of 10 years will include: permit 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 will monitor to determine accomplishments of terms and conditions of this permit, the Allotment Management Plan, and the Annual Operating Instructions.

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 a monitoring summary.

Range Readiness: Each spring, Forest Service personnel will assess range readiness prior to livestock coming on the allotment to determine if vegetative conditions are ready for livestock grazing. 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 these allotments will be done every nine to thirteen years. Methods used for these surveys will be done by the best available methods at that time. These values will be used as tools to manage this allotment, but will not be the sole measure to set carry capacity.

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 these allotments include blue grama, squirreltail and western wheatgrass. Utilization monitoring will be conducted by the permittee and 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%+).

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. (Coconino National Forest Plan 1987, as amended).

Condition and Trend: Watershed and vegetative condition and trend monitoring will help determine the effectiveness of the Allotment Management Plan and long-term range and watershed trend.

Parker 3-step and paced transect monitoring points were established throughout this allotment in the 1950-60's. These transects are one of best historic records of range condition and trend. The photo points and vegetative ground cover data show how the site has changed over time. The new plots will be placed with the Parker 3-step transects in most locations to add to this historic data. The original photo points will be retaken.

Ocular plant canopy cover 0.10 acre plots will be used to compare existing conditions with potential and desired vegetative community conditions. Over time, these plots will show how canopy cover changes. Canopy cover will provide an indication of how plants are growing, assuming that if they are getting bigger and occupying more space, then they are doing well and that can be a relative gauge of vigor.

Frequency and ground cover data will be collected using the widely accepted plant frequency method (University of Arizona, Extension Report 9043, 1997). These plots will monitor trends in plant species abundance, plant species distribution and ground cover. All this information will be statistically valid. This will provide information on plant composition and additional information on regeneration.

These transects will be read at least every 10 years by Forest Service personnel. These plots will be used to help determine the effectiveness of the current management.

Precipitation: Precipitation is currently recorded within or near this allotment at Flagstaff National Weather Service Office at Bellemont, Flagstaff Airport, Sedona Airport and all the active fire lookout towers on the Forest. Precipitation data may be recorded throughout the year and summarized in the annual inspection.

Soil and Riparian 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.

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.

Improving trends for riparian vegetation and stream channel conditions (if applicable on this allotment) should indicate that management practices are effectively benefiting water quality. Conversely, decreases in riparian vegetation or channel condition indicate that management practices are not effective and need to be changed. Environmental factors, especially flooding, will be considered when interpreting monitoring results. Several Fixed Station, Biocriteria Program, and other water quality monitoring sites maybe located within or near the allotment. These sites 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.

Individuals and Agencies Consulted

Rocky Mountain Research Station,
USFS
City of Flagstaff City Council
President, Plateau Group Sierra Club
President, AZ Wildlife Federation
Friends of Walnut Canyon
Coconino County Board of Supervisors
President, AZ Chapter, Wildlife Society
Vickie Amabisca, Coconino County
Public Works
Eathan Aumack, Grand Canyon Trust
Jeff Burgess
Dick Cameron, Forest Guardians
Steve Canning
Carig Dible
Sandra Eastlake, AZ Cattlemen’s Assoc.
Rick Erman
Mark Fitch, ADEQ
Joh Geddie
Leslie Glustrom
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Kelly Janecek, Grand Canyon Trust
Renz Jennings
Colin Kaltenbach, U of A College of Ag
Jaince Kerata
William Kruse
Richard Miller, AZ Game and Fish Dept
Elaine Moffitt, Congressman JD
Hayworth
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Brother’s Ranch
Glen Morrison, Windmill Ranch
Garry Parrot, NRCS
Pete Rael
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Kim Graber, National Wildlife
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Kirsten Stade, Forest Guardians
Martin Taylor, Center for Biological
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Shaula Hedwell, US Fish and Wildlife
Service
Malcolm Bowekaty, Governor, The
Pueblo of Zuni
Raymond Stanley, Chairman, San Carlos
Apache Tribe
Dallas Massey, Sr., Chairman, White
Mountain Apache Tribe
Kelsey Begay, President, The Navajo
Nation
Sammie Slivers, President, Dine’
Medicine Man’s Association
Vivian Burdett, Chairwo man, Tonto
Apache Tribe
Wayne Taylor Jr., Chairman, The Hopi
Tribe
Johnny Murphy Lehi, Sr., President, San
Juan Southern Paiute Council
Vincent Randall, Chairman, The
Yavapai-Apache Nation
Clinton Pattea, President, Fort
McDowell Yavapai Nation
Augustine Hanna, Chairman, The
Havasupi Tribe
Louise Benson, Chairwoman, The
Hualapai Tribe
Loyd D. Tortalita, Governor, The Pueblo
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Stan Rice Jr., President, Yavapai-
Prescott Indian Tribe
Bob Arambula, Cocopai RC&D
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Mary Babbitt, CO Bar Livestock LTD
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Bill and Dollie Beaver
Robert Best
Bob Blanks
Bet Blay, Horse Trails Coalition
Don & Erma Brackin
Frank Brandt, N AZ Audubon Society
Brian Nowicki Southwest Forest
Alliance
Gail & George Busha
Mr. Button, Rocky Mt Elk Foundation
Dan Dagget
John Davison
Ruth Drye
Steve Fairaizl, Anima l& Plant Health
Inspector
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Mae Franklin
Michael George
Michael Golightly, AZ Game and Fish
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Sam Henderson, NPS Flagstaff Area
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Ursual Montano, City of Flagstaff
Tom & Stephanie Moody
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