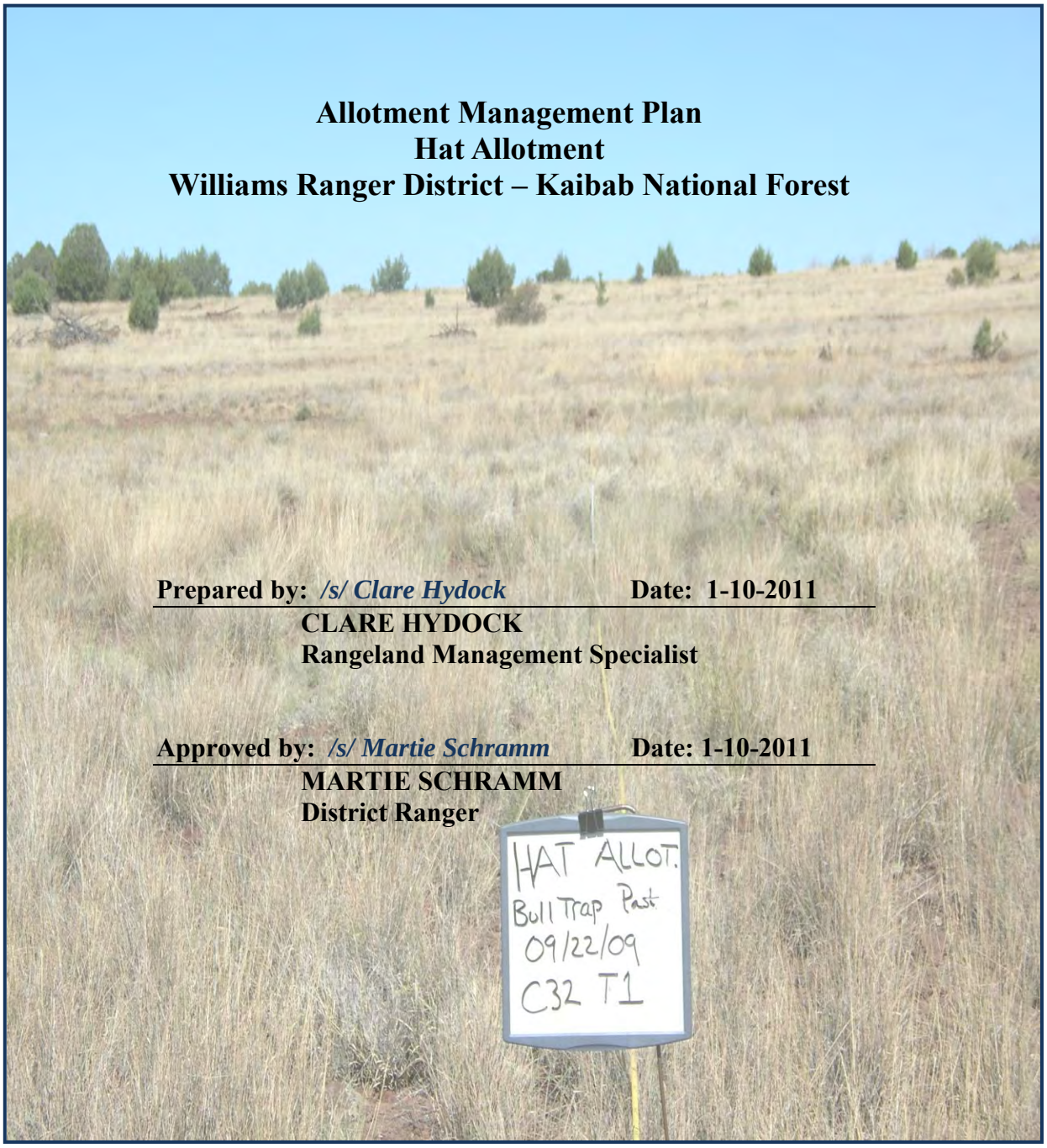
Allotment Management Plan
Hat Allotment
Williams Ranger District – Kaibab National Forest



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Introduction

This Allotment Management Plan (AMP) was developed following a Decision Memo for the Hat Allotment signed by Martie Schramm, Williams District Ranger, in September 2010.

The Hat Allotment is located south of Williams, Arizona, primarily south of Interstate 40 (Figure 1, page 22). It runs from the Welch Interchange of I-40 on the west side to County Road 73 on the east side, and then south to the Forest boundary. There are two pastures north of I-40; one at the Welch Interchange and the other at the Devil Dog Interchange. The allotment contains approximately 103,256 Forest Service acres. Grasslands, pinyon/juniper and ponderosa pine dominate the vegetation on the allotment at elevations ranging from 5,000 to 9,256 feet.

Background

The Hat Allotment was formally created in 1979 by combining three allotments (Devil Dog Summer, Devil Dog Winter, and West Bear) which had been operated together since 1962. The current permittee has held the permit on the Hat Allotment since 2006.

Devil Dog Summer and Winter Allotments

Historical grazing records for the Devil Dog Allotments are vague but what is known is that fencing was non-existent into the 1930's. Livestock that grazed around Hearst Mountain in the summer were placed on Devil Dog Winter. Mr. Clyde Polson wintered livestock in the same area during the early 1900's. Sheep are known to have grazed the western slope of Bill Williams Mountain some summers in the early 1900's.

The record shows that throughout the history of the Devil Dog Allotments, repeated adjustments have been made in an effort to bring the permitted numbers in line with carrying capacity.

West Bear Allotment

This allotment used to include lands on the Prescott and Kaibab Forests; from Drake northward through Williams and on past the Forest in the 1930's. Entry dates for both the permit and actual use records were not shown and are not available. In 1938, the grazing permit first showed the period of time that livestock would be on the Kaibab.

Sheep were trailed across the allotment during the early 1900's and followed the general vicinity of the Perkinsville Road (County Road 73). Sheep numbers were estimated between 50,000 and 100,000 head.

Quarter Circle Double X Ranch, Inc. was issued a permit in 1962 for 1,000 CYL (cattle yearlong), this included use on the Devil Dog Allotments. Beginning in 1971, the permittee took a number of years of partial non-use for range protection.

Following a five year production-utilization study it was concluded that the allotment was in declining condition and that both a significant livestock reduction and changes in management were necessary. The result was a 75% reduction in term permitted numbers or approximately 9,000 AUM's.

Hat Allotment

The Quarter Circle Double X Ranch, Inc. permit was waived in the fall of 1977 and issued to Mrs. Ruth Tankersley for 330 cattle from June 1 to November 31, and 210 cattle from December 1 to May 31 (total of 3,240 AUM's).

In 1978, an aggressive plan for structural and non-structural range improvements began. Projects included construction of: 14 earthen tanks, 2 trick tanks with 7 miles of pipeline, 96 miles of new fence, 11,367 acres of pinyon/juniper pushing and seeding, 300 acres of meadow seeding, 3,120 acres of fuelwood harvest, and 1,750 acres of prescribed burning.

In 1983 approximately 6,415 acres were converted into a Savory Grazing System authorizing 100 CYL (Decision Notice May 12, 1983, Leonard Lindquist). Sixteen paddocks (pastures) were planned using the Perrin North, Perrin East, and Perrin South pastures. Thirteen different segments of electric fencing were used to divide up the paddocks. In 1986 a new permit was issued for 4,350 AUM's (330 head summer use and 300 winter use) in addition to variable numbers and seasons of use in the Savory Cells. In effect, 430 head during the summer (June 1 to October 31) and 400 head in the winter (November 1 to May 31). Permitted numbers remained the same through 1991 although temporary increases were granted from 1986-1991; total non-use was taken in 1992.

Mrs. Tankersley waived the permit to William J. and Betty Lo Wells in late 1992. The Savory Grazing System was abandoned in 1993 following this transfer, and all electric fencing and other improvements from the former SGM units were to be removed (1993 AMP, page 7). The Wells' permit was issued for 430 CYL (5,174 AUM's). The permit changed hands in December of 2001 and was issued to Matt Bates & Rebecca Bates for the same numbers yearlong. They kept the permit through 2005.

In May of 2006 the permit was waived to Joseph and Tammy Auza who requested a conversion to sheep. The Forest Service approved their request and the permit was issued for 4,160 sheep from May 1 to October 31, and 140 rams from June 1 to July 15 (5,074 AUM's).

Actual use records indicate that from 1938 through 2005 there have been a number of years that some level of non-use occurred (Figure 2 and Table 1, page 4).

Figure 2. Hat Allotment Actual versus Permitted Use (in AUM's) from 1938 through 2009.

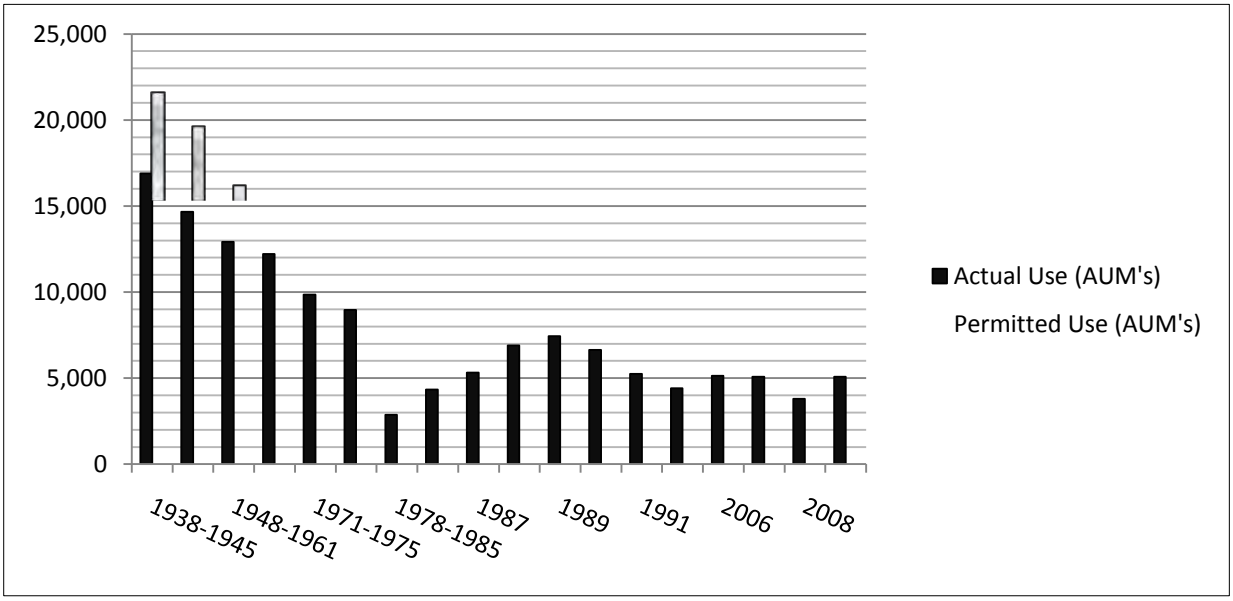

Table 1. Hat Allotment History of Use from 1938-2009.

Year(s)	Permitted Use Number and AUM's on Hat Allotment	Actual Use Number and AUM's	Comments
1938-1945	1,799 CYL (Cattle Yearlong); 21,588 AUM's	1,784-2,431 head; 10,568-21,109 AUM's	Permitted and Actual numbers and AUMs from 1938-1945 are my best estimates since records are scarce. Average use = 16,892 AUM's
1946 & 1947	1,635 CYL; 19,620 AUM's	1,425-1,564 head; 14,643 -14,695 AUM's	
1948-1961	1,350 CYL; 16,200 AUM's	837-3,146 head; 8,541 -21,858 AUM's	Average use = 12,921 AUM's
1962-1970	1,000 CYL; 12,000 AUM's	±400-1,071 head; 11,274-14,639 AUM's	Quarter Circle Double X Ranch using all 3 allotments as one operation. Average use = 12,210 AUM's.
1971-1975	1,050 CYL; 12,600 AUM's	±600-1,000 head; 6,898-12,120 AUM's	Average use = 9,849 AUM's.
1976 & 1977	1,000 CYL; 12,000 AUM's	±600-1,000 head; 8,112-9,816 AUM's	Average use = 8,964 AUM's.
1978-1985	330 head summer, 210 head winter; 3,240 AUM's	200-350 head; 1,561-3,743 AUM's	Average use = 2,861 AUM's.
1986-1988	330 head summer, 300 head winter, 50-265 head in Savory cell; 4,350-6,930 AUM's	±300-500 head; 4,338-6,908 AUM's	1986 first year using Savory Grazing Cells. Average use = 5,524 AUM's.
1989-1992	330 summer, 600 winter, 215-310 Savory cell; 4,050-7,770 AUM's	0-400 head; 0-7,443 AUM's	**Total non-use in 1992.** Average use = 4,829 AUM's.
1993-2005	430 CYL; 5,174 AUM's	300-430 head; 2,726-5,160 AUM's	Average use = 4,411 AUM's.
2006-2009 **Sheep**	4,160 ewes; 140 rams; 5,074 AUM's	3,225-4,306 sheep; 3,806-5,135 AUM's	Converted to sheep in 2006. 1 year 25% suspension in 2008. Average use = 4,772 AUM's.

Desired Conditions (Goals and Objectives)

The overall desired condition is maintenance of sustainable ecosystems within and surrounding the Hat Allotment, in which livestock grazing does not impair important ecosystem functions, such as maintaining soil stability and productivity, and maintaining vegetation diversity and productivity.

Specific desired conditions that apply to the allotment include the following:

Vegetation

- Total herbaceous plant cover trends mirrors or improves upon trends in livestock excluded areas.
- Provide for a diversity of cool and warm season plants. Cool season plants trends mirrors or improves upon trends in livestock excluded areas.
- Protect Threatened, Endangered, and Sensitive plant species from adverse effects caused by livestock grazing and grazing management activities.
- Eradicate or control as many existing populations of noxious weeds as possible and prevent new introductions of noxious weeds caused by livestock management activities.
- Protect aspen regeneration and riparian vegetation at springs.

Soils

- Minimize erosion caused by livestock grazing and grazing management activities by maintaining a stable to upward trend in soil condition and maintaining or increasing vegetative cover across the allotment.
- Protect watershed resources such as ephemeral lakes, ephemeral stream channels and downstream water bodies from adverse effects caused by livestock grazing and grazing management activities.

Management Strategy

Livestock grazing on the Hat Allotment is authorized through a term grazing permit allowing up to 4,160 head of sheep from May 1 to October 31 (184 days) and 140 head of rams from June 1 to July 15 (45 days), which are 5,074 Animal Unit Months (AUM's). Allotment management follows a deferred rotation grazing system, which is managed by herders running a minimum of two bands of sheep (Table 7, page 21).

This grazing management system incorporates seasonal deferment, with an emphasis on spring deferment. Spring deferment, from May 1 to June 15, includes minimizing the number of areas used during this time period, and not using the same areas again the following spring.

Sheep are not allowed to bed in the same area for more than 3 days in a row.

Permitted use is based on professional opinion, condition and trend studies completed in 2009, actual use data for the allotment for the past 20 years, and the effects of this use on resource conditions. It also reflects the estimated annual forage production available for livestock on the allotment considering climate, grazing period, grazing occurrence, timing, frequency, and intensity of grazing, as well as proper livestock management.

The sheep will be herded to avoid use on riparian vegetation at springs and aspen regeneration. The riparian vegetation at Coleman Lake, MC Draw, Twin Springs West and Mud Springs will continue to be excluded from sheep grazing by existing exclosure fences. Two additional 0.5 acre exclosures will be built at both Twin Springs West and Mud Springs to exclude sheep from riparian vegetation (Figures 3 and 4, pages 23-24).

Range managers will adjust the timing, duration, and frequency of livestock grazing in areas with declining conditions via the Annual Operating Instructions.

Forage utilization in aspen and riparian areas is limited to light use (0-10%).

Approximately four miles of fence will be removed from the allotment to improve the movement of pronghorn from their winter to summer range (Figure 5, page 25). PVC pipe will be placed on the bottom wire on fences within this migration corridor. Any remaining electric fencing in the Savory Cells will be removed. The Forest Service is responsible for these projects.

The southwest portion of the Perrin South Pasture west of Highway 89 (approximately 590 acres) has been reassigned to the Irishman Dam Allotment (Figure 6, page 26).

Slopes over 40% around Bill Williams Mountain have been removed from the Hat Allotment boundary (approximately 2,500 acres). Livestock do not use these steep slopes and there is very little forage produced here (Figure 7, page 27).

Forage utilization[1] will allow up to 40 percent use by sheep and/or wildlife at the end of the grazing season. This includes "conservative" grazing intensity which is measured before the end of the growing season and is used in determining when sheep need to move to the next pasture, in consideration of other factors such as weather patterns, likelihood of plant regrowth, and previous years' utilization levels. Sheep will move to the next grazing area when grazing intensity approaches a conservative level (40%) before August 30. This area would not be grazed again during the grazing season.

Adaptive Management

The AMP includes the continued use of adaptive management, which provides more flexibility for managing sheep. Adaptive management allows the Forest Service to adjust the timing, period and occurrence of sheep grazing, movement of sheep within the allotment, and sheep numbers. If adjustments are needed, they are implemented through the Annual Operating Instructions, which would adjust numbers so use is consistent with current productivity. This allows plant, soil, and watershed conditions to be maintained or improved while range improvements are implemented over time. An example of a situation that could call for adaptive management adjustments is drought.

[1] Utilization is the proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects). It is a comparison of the amount of herbage left compared with the amount of herbage produced during the year. Utilization is measured at the end of the growing season when the total annual production can be accounted for, and the effects of grazing in the whole management unit can be assessed. Utilization guidelines are intended to indicate a level of use or desired stocking rate to be achieved over a period of years.

Adaptive management is designed to provide sufficient flexibility to adapt management to changing circumstances. If monitoring indicates that desired conditions are not being achieved, management will be modified in cooperation with the permittee. Changes may include administrative decisions such as the specific number of livestock authorized annually, specific dates of grazing, or modifications in grazing rotations, but such change will not exceed the limits for timing, intensity, period, number, occurrence and frequency of sheep grazing defined in this AMP.

Range Improvements

Existing Structures: Range improvements (fencing, waters, handling facilities, etc.) are critical components of any grazing management plan. Range improvements assigned to the permittee (Table 6, pages 17-20) need to be maintained in order to facilitate proper management of the allotment.

Permittees are required to follow the District's Heavy Equipment Policy prior to beginning any ground disturbing activities which may require an archaeological survey and/or wildlife clearances.

New Construction: Two additional 0.5 acre exclosures will be built by the Forest Service at both Twin Springs West and Mud Springs to exclude sheep from riparian vegetation (Figures 3 and 4, pages 23-24).

Monitoring

Monitoring will occur during the permit term and can include one or more of the following activities: permit compliance, allotment inspections, range readiness, forage production, rangeland utilization, condition and trend, soil condition, and noxious weeds. Monitoring frequency varies by each activity and funding, and may be accomplished by either the permittee and/or Forest Service personnel. Monitoring is adaptive, and as improved methods are developed these new methods would be considered.

Permit Compliance: Throughout each grazing season Forest Service personnel would monitor to determine accomplishments of the permit terms and conditions, the AMP, and the AOI.

Allotment Inspections: Allotment inspections are a written summary documenting compliance monitoring 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: Forest Service personnel and/or the grazing permittee will assess range readiness prior to sheep coming onto spring pastures to determine if vegetative conditions are ready for 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 would not seriously impact these forage plants.

Rangeland Utilization: Long-term condition and trend monitoring is the primary standard for monitoring of this grazing management system. Utilization is used as a tool to understand and achieve the goals of long-term management. Utilization guidelines are intended to indicate a level of use or desired stocking rates to be achieved over a period of years (page 6).

Utilization measurements (ocular and/or actual measure) would be taken in key areas which would reflect grazing effects within the allotment. Utilization guidelines are not intended as inflexible limits. Utilization measurements can indicate the need for management changes prior to this need being identified through long term monitoring. Utilization data would not be used alone, but would be used along with climate and condition/trend data, to set stocking levels and pasture rotations for future years.

Sheep are to be moved when seasonal utilization in a pasture approaches a conservative level (40%); in aspen and riparian areas a light seasonal utilization guideline of 10% applies. These are approximate values because they take into account any additional growth which might occur later that year and considers season of use, wildlife use, weather conditions, availability of forage, and water in pastures. These utilization levels leaves residual cover for wildlife and soils and provides for long term health of the grazed plants.

If monitoring shows utilization rates exceed the utilization guidelines in a given year, the grazing schedule and/or permitted numbers would be adjusted the following year so utilization guidelines are not exceeded again. If utilization is exceeded after these adjustments are made, then the grazing management system would be changed to ensure this does not happen in the future.

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 trends.

Parker Three-Step and paced transect monitoring points were established throughout this allotment in the 1950-1960s. These transects are one of the best historic records of range condition and trend. The photo points and vegetative ground cover data show how the site has changed over time. Canopy cover and frequency plots were placed with the Parker Three-Step transects in 2009 to add to this historic data. Transects would be read at least every 10 years by Forest Service personnel. These plots would help determine the effectiveness of current management.

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

Frequency and ground cover data were collected using the widely accepted plant frequency method (Ruyle 1997). These plots would monitor trends in plant species abundance, plant species distribution, and ground cover. This would provide information on plant composition and additional information on regeneration.

Precipitation: Precipitation is currently recorded at the Flagstaff National Weather Service Office at Bellemont. Precipitation data may be recorded within or near the allotments for more localized information. Precipitation data may be recorded throughout the year and summarized in the annual inspection. This data assists managers with forage utilization and production data collection.

Noxious Weeds: Noxious weeds located in these allotments would be treated as necessary. The permittee and Forest Service would coordinate the weed inventory and treatment. Noxious weed monitoring is carried out at the same time allotment inspections are conducted. As noxious weed populations are found they are mapped, monitored, and treated. Treatment methods would follow guidelines established in the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds" (2005).

Soil and Watershed Condition: The current sheep grazing system incorporates best management practices (BMP) and grazing practices and constitutes compliance with Arizona State and Federal Water Quality Standards. Arizona Department of Water Quality (ADEQ) would continue to monitor water quality in the area. Watershed condition can be assessed using information from the monitoring schemes above.

Grazing Capability and Grazing Capacity

An analysis of grazing capability and grazing capacity was conducted on the Hat Allotment in 2010 (Table 2, page 10). Grazing capability of a land area is dependent upon the interrelationship of the soils, topography, plants and animals. Grazing capability is expressed as one of three capacity classes: full, potential, and no capacity.

Carrying capacity was based on actual use data, livestock and wildlife use patterns, livestock health and condition, condition and trend determinations, TES soil survey, forage production measurements and estimates, and professional opinion. Forage production measurements and estimates are used to determine allotment management practices. Annual Operating Instructions (AOI) would adjust livestock numbers and/or the length of the grazing season to match forage production in a given year with the grazing system to meet the goals of maintaining or improving conditions.

Forest Service personnel observe how current livestock management is affecting the allotment and determine if this use will sustain a static or upward trend. Long-term monitoring data points located throughout the allotment were used for this analysis. Sheep health is also used to gauge capacity. If the sheep are in good condition and show good weight gains through the years, this is a positive indicator that numbers are in line with the allotment's vegetative health.

Grazing capacity is a function of grazing capability, forage production, proper use by livestock, and the level of management that may be applied. This analysis used forage production and grazing capability to estimate grazing capacity. Forage production measurements were collected on the Hat Allotment. Production data from other allotments and the Terrestrial Ecosystem Survey (TES) were used for any data gaps. An allowable use standard of 40% was applied to Full Capacity acres (0-30% slope), 20% for Potential Capacity acres (31-40% slope), and zero for No Capacity acres (slopes over 40%).

Table 2. Grazing Capability and Grazing Capacity on the Hat Allotment.

Slope Class, %	Acres*	Estimated Forage Production, Pounds	Livestock Utilization Allowed, %	Est. Forage Available to Livestock, Pounds	Est. AUM's** Available to Livestock	Permitted AUM's
0-10	54,672	19,054,627	40	7,621,851	9,648	
11-30	35,404	9,872,523	40	3,949,009	4,999	
31-40	4,351	1,019,993	20	203,999	258	
40+	2,731	618,814	0	0	0	
Total	97,158	30,565,957		11,774,859	**14,905**	**5,074**

***The acreage figures reflect the removal of the pasture west of Highway 89 and around Bill Williams Mountain.*
****An AUM (Animal Unit Month) is amount of forage required by an animal unit for one month; approximately 790 pounds/AUM. In this case 5 sheep = 1 animal unit.*

This analysis shows that under current management, permitted livestock are utilizing 34% of the estimated AUM's available to livestock on the Hat Allotment. This analysis also shows that current livestock numbers are within the estimated carrying capacity of the Hat Allotment. The remaining capacity should support wildlife populations within the allotment and provide for watershed health.

Range Condition and Trend

One method used to determine range condition and trend over time is the Parker Three-Step Cluster method (Table 3, page 11). The Forest Service has been using the Parker Three-Step method to evaluate condition and trend of rangelands since 1954. This method represents one of the longest records of apparent vegetation changes on national forests.

Another method commonly used is Paced Frequency Transects. Paced Frequency Transects are used to supplement information on range condition and trend, delineate vegetation condition classes and provide additional data on composition, vigor, cover, and soil conditions over a broader area.

Range condition is a subjective expression (very poor, poor, fair, good, and excellent) and is evaluated relative to a standard that encompasses the composition, density, and vigor of the vegetation and the physical characteristics of the soil. Range trend expresses the direction of change in range condition over time in response to livestock management and other environmental factors.

It is important to note that the methods used to evaluate range condition and trend are generally considered a process for determining range condition and trend relative to the lands ability, or value for grazing livestock and do not provide information of ecological status (USDA Rangeland Analysis and Management Training Guide 1997). As such, there is not a strong correlation between range condition class and ecological condition; an area could be in a poor or fair condition simply because the area has a low value for livestock grazing.

Monitoring data were evaluated by a Kaibab National Forest interdisciplinary team to assess changes in range conditions on the Hat Allotment. Data were available from fourteen Parker Three-Step method transects (Parker transect hereafter), two grazing exclosures, and the Terrestrial Ecosystem Survey. Parker transect long-term monitoring data were collected in 1956, 1963, 1975, 1983, 1984, 1985, 1987, 1988, 1989, 1990, 2001, 2003, and 2007 on the Allotments. Paced transect data were collected in 2009 to supplement the Parker transect data.

Table 3. Range Condition Scores from Parker 3-Step Transects.

Cluster	1956	1960	'62	'63	'65	'74	'75	'76	'79	'87	'89	'90	'01
C1		27*				27		28		38			
C2	20		27			29				54			49
C6			44			41				51			
C8			7			5				13			
C12	24		16			17				31			61
C14	29		42			6				20			
C16	17				33	23		16		41			70
C17	20			25			20			36			
C18						10				35			11
C32	29				31		33					33	37
C34	22		26				24			35			36
C35								17	17	49	50		53
Savory Sites	**1956**	**1963**	**'75**	**'83**	**'84**	**'85**	**'87**	**'88**	**'89**	**'90**	**'01**	**'03**	**'07**
C11			22	32	33	37	37	36	38	34			
C19				18	25	35	39	38	39	38			
C20				35	34	25	46	56	51	40			
C21				13	12	10	7	16	1	-			
C22				15	19	38	49	49	55	46			
C28				28	27	32	36	39	40	33			
C29				39	45	42	58	42	43				
C30, Relict			62	58	48	55	56	56	66	50	78	41	53
C33	29	31		27	26	23	33	29	31	29	28		

Range Condition Score: 0-20 Very Poor, 21-40 Poor, 41-60 Good, 81-100 Excellent

The health of vegetation on the Hat Allotment is measured through range condition and trend, and is called range management status. Range condition and trend are a subjective expression of the status or health of the vegetation relative to their combined potential to produce a sound and stable floral community. Soundness and stability are evaluated relative to a standard that encompasses the composition, density, and vigor of the vegetation.

Fourteen sites on the allotment were monitored at historic Parker three step sites in 2009 (Table 4, pages 14-15). Data collected at these sites include frequency, canopy cover, dry weight rank, comparative yield, photos, and ground cover readings to estimate trend. In addition, seven canopy cover and photos plots were also read at historic sites.

The 2009 data was collected in August through October. Spring moisture conditions were good for cool season species production. However, the summer moisture was below average resulting in lower production of warm season species. In 1987, spring and summer moisture was near average. Since 1987, precipitation has been up and down; the area was very wet in 1992-1993 and very dry 2001-2002. Since 1987, the general trend for ecological conditions on the Hat Allotment is upward or static.

Two sites (C32 & C33) show a downward trend; C32 declined because drought conditions in 2001-2002 reduced blue grama within a tobosa grass community. Site C33 declined because an increase in juniper has negatively affected the understory. Both sites have more forbs (4% and 25 % respectively) than potential indicates (1% and 1.2 % respectively). **Livestock use in these areas (Meath and Bull Trap Pastures) will be restricted by both days of use and season of use until monitoring indicates otherwise.**

Plant communities on the allotment have changed since the early 1980's. Juniper has invaded or increased on many grassland and savannah soils. Cool season grass species have declined in some areas and have been replaced by the warm season grass blue grama. A reduction in cool season grass species is following a trend found throughout the Forest in grazed and ungrazed areas. The cool season grass reduction is most likely caused by a decrease in winter/spring moisture, an increase in average temperature, and/or an increase in warm season grasses.

Litter cover has increased on many transects since 1987, leading to a decline in exposed ground. Both increased ground cover and organic matter improve soil condition; therefore we expect that soil conditions have improved in most areas of the allotments. Most key areas appear to have stable soils, without rills or gullies.

Changes in the density and diversity of cool-season perennial grasses are important factors in evaluating range condition and trend. On the allotment, impacts from drought periods occurring after 1985 and changing precipitation patterns (drier winters and springs, late monsoons) are believed to be a significant factor in the loss of cool season grasses. This is supported by Parker Three-Step Cluster data from the relict mesa on the Hat Allotment that has never been exposed to livestock grazing (C30), and from the exclosure on the allotment and on the Pine Creek Allotment. Data collected from both sites shows similar declines in cool-season grasses.

The results of the 2009 monitoring indicate an overall static to slightly upward trend in range condition as supported by exclosure data. The exclosures mentioned above do not show a difference inside and outside the exclosures. From 1996 to 2007, during a drought period, cool season grasses have declined while warm season grasses and ground cover have increased.

These trends exist under the current sheep grazing system and within the current utilization guideline for sheep and wildlife. Grazing by livestock has remained within this utilization guideline. This guideline requires that sheep be moved early if the grazing intensity level is reached prior to planned rotations, or that sheep not enter an area if grazing intensity from wildlife already meets the grazing intensity guideline.

Stocking rate will be adjusted for range conditions as discussed previously.

Rangeland management status is also a comparison of existing vegetation and soil conditions to either the potential natural plant community or desired plant community and vegetation trend. Rangeland management status is considered to be in satisfactory condition when the existing vegetation community is similar to the desired condition, maintaining or improving vegetation trend, and/or short-term objectives are being achieved to move the rangeland toward the desired condition. Similarity is a comparison of existing vegetation and soil conditions to either potential natural community or desired plant community.

The assessment of current conditions and trends in this analysis provides an overview for large areas and does not necessarily uniformly apply to all areas on the Hat Allotment. Range management status is satisfactory throughout the allotments. Unsatisfactory conditions occur in portions of the grasslands and within dense pinyon-juniper communities where trees are encroaching on the understory grasses.

Plant community similarity is analyzed when determining plant community conditions. Similarity is the comparison of existing vegetation and soil conditions to either the potential natural community or the desired plant community (Table 5, page 16).

Table 4. Hat Allotment Transect Trend Results.

Cluster	Years Read & Trend	2009 Trend and Comments
1	1960-1974 ↓, plant decline 1974-1987 → 1987-2009 ↑, increase in ground cover	↑ Increase in Bogr since 1987
2	1962-1974 ↓, decrease in all vegetation 1974-1987 ↑, increase in cool season species 1987-2009 ↑, increase in PJ and Pipo but also in grass	↑ Increase in grasses but with the increase in PJ and Pipo the grass & forb production will decrease over time
6	1962-1974 ↘, due to increase in PJ 1974-1987 →, but increased hits on plants 1987-2009 →, but increases in PJ	→ Little change over the history of the plot
8	1962-1974 ↑, in grass cover 1974-1987 →, shift from warm to cool season species 1987-2009 ↑, increase in cool season species	↑ Due to cool season species increasing
11	1975-1990 ↑, increase in grasses due to 1980 PJ push 1990-2009 ↑, increase in grasses but PJ also increasing	↑ PJ increasing significantly
12	1962-1974 → 1974-1987 ↗, PJ was pushed sometime in this period 1987-2009 →	→ Seeing a decrease in cool season species and increase in warm seasons
14	1962-1974 ↓, decrease in Bogr and heavily grazed 1974-1987 ↑, increase in grasses 1987-2009 ↗, slight decrease in bare soil, increase in PJ	↗Surrounding area had a prescribed burn in Sept 2009, just before transect reading
16	1965-1974 ↘ 1974-1987 ↑, upward trend on cool season grass species 1987-2009 →, some shift from cool to warm season species	→ PJ increasing and moving into grassland
17	1975-2009 →, increase in PJ, little change in Bogr and low warm season production in 2009 due to lack of rain	→PJ chipped under power line in 2008 and needs to be reduced on the rest of the site
18	1974-1987 ↑, increase in grass cover 1987-2009 ↗, increase in Muwr, static out of drainage	↗ Upward trend due to increase in Muwr
19	1983-1985 ↑, increase in grasses; pushed & seeded ’83 1985-1990 ↑, increase in grasses 1990-2009→	→Static

Table 4, continued. Hat Allotment Transect Trend Results

Cluster	Years Read & Trend	2009 Trend and Comments
20	1983-2009→, pushed & seeded in 1983	→Reduce sheep use in 2010-2011
21	1983-2009→, untreated PJ site installed to compare against C20	→Little change since plot was established in 1983
22	1983-2009↑, pushed 1981 & seeded 1982. Increase in grass cover	↑Trees starting to reestablish and need to be reclipped
28	1983-1990↑, big increase in grasses following push 1990-2009→, similar grass composition	→PJ clipping would keep trends static
29	1983-2009→, increase in PJ, decrease in grass and shrubs are static	→Little overall change in ground cover but PJ is increasing so should be reduced to increase grasses & shrubs
30 Relict	1975-1983 ↓, decrease in all grass species 1983-2001 →, shifting from cool to warm season species 2001-2003 →, shift from cool to warm continuing 2003-2007 → 2007-2009 →, increase in beargrass (Nomi)	→ Juniper is increasing on mesa
32	1965-1975 ↓, decrease in grass cover 1975-1991 →, juniper pushed in 1980's, back to '65 level 1991-2009 ↘, decrease in Bogr but Plmu static	↓ Due to loss of Bogr from summer drought conditions in 2002, etc
33	1963-1975 ↓, decrease in Bogr 1975-1989 ↑, increase in cool season species 1989-2009 ↓, PJ increasing and Bogr decreasing	↓ Due to loss of Bogr and Elel and increasing Juniper. Should treat Juni to maintain grasses & forbs
34	1962-1975 →, but increasing PJ 1975-1988 ↑, increase in grasses; pushed in 1982 1988-2009 ↑, increase in grasses and PJ	→, however the juniper is coming back
35	1989-2009→, slight increase in PJ, similar grass cover	→PJ clipping may be needed to maintain grass cover
Exclosure	1940-1953 to 2009,↑ juniper and litter, ↓shrubs and junegrass and squirreltail.	↓ Due to reduction in shrubs and two grass species.
Legend	↑ Upward	→ Stable
↘ Stable to slightly downward	↓ Downward	↗ Stable to slightly upward

Table 5. Plant Community Similarity

Plant Community	High	Mid/High	Mid	Low	Unable to Determine
Pinyon/Juniper	2		9	1	1
Grassland	2	1	4		
Meadow			1		

Of the 90,076 full capacity acres, approximately 77,465 acres (86%) have satisfactory rangeland management status and a mid to high-similarity to the desired natural community with a static trend. Sheep currently graze a large portion of these satisfactory acres. Approximately 12,611 acres have unsatisfactory rangeland management status and a mid-similarity to the desired natural community with primarily static but some downward trends. Unsatisfactory rangeland management status acres include unsatisfactory and impaired soils in dense juniper stands.

Climate conditions are one of the major contributing factors, if not the primary factor, affecting range condition and trend. Generally, drought conditions occurred in the 1950s and early 2000s. Wet conditions occurred in the 1970s through the 1990s and in 2005. Plant species change with these dry and wet periods (SRM 2006).

Ponderosa pine and grasslands is the dominant cover on the eastern half of the allotment. As the elevation drops, primarily to the west and south, vegetation transitions to juniper grasslands. Blue grama and bottlebrush squirreltail are the primary grassland species on the allotments. Aspen stands occur on 134 acres at 31 locations throughout the upper portions of the allotment.

The topography varies from flat to steep. Several mountains, mesas, and knolls exist including: Bill Williams Mountain, Bixler Mountain, Flat Mesa, Wild Steer Mesa, Deadman Knoll and Dutch Kid Knoll. Five sandstone quarries exist in the southern most portion of the allotment. Ephemeral drainages including Hell Canyon, Devil Dog, MC Canyon, and Meath Wash occur throughout. These drainages run during snow melt and heavy monsoon storms and do not contain riparian vegetation types.

Coleman Lake is the only wetland within the allotment and is surrounded by a livestock exclosure fence. Seven springs are located within the allotment. The springs contain riparian vegetation that vary with the flow of the springs. Three of these are fenced to exclude livestock grazing: MC Draw, Twin Spring West and Mud Springs; four are not: Jackass Spring, Section 21 Spring, Stewart Spring and Campbell Springs.

Table 6. Hat Allotment Improvements & Permittee Maintenance Responsibility

Improvement Number	Improvement Name	Improvement Type	Units or Miles
2085A	HAT-BIG SPRING FENCE	FENCE, ALLOTMENT BOUNDARY	2
2085B	HAT-CHALENDER FENCE	FENCE, ALLOTMENT BOUNDARY	1
2088	DOGTOWN FENCE	FENCE, ALLOTMENT BOUNDARY	1
7603	HAT-TULE	FENCE, ALLOTMENT BOUNDARY	2
7605	FOREST BOUNDARY TRICK TANK	APRON	1
7605A	FOREST BOUNDARY TRICK TANK	STORAGE TANK	1
7605B	FOREST BOUNDARY PIPELINE	DISTRIBUTION PIPELINE	0.5
7605C	FOREST BOUNDARY TROUGH	TROUGH	1
7606	COLEMAN-SNYDER FENCE	FENCE, ALLOTMENT INTERIOR	7
7607	HAT SUMMER-WINTER	FENCE, ALLOTMENT INTERIOR	10
7608	WASHOUT WATERLOT	FENCE, WATER SOURCE	1
7609	IRISHMAN DAM/HAT	FENCE, ALLOTMENT BOUNDARY	4
7611B	HAT-CORVA	FENCE, ALLOTMENT BOUNDARY	3
7625	MAYES TANK WATERLOT	FENCE, WATER SOURCE	1
7654	QUARRY TANK WATERLOT	FENCE, WATER SOURCE	1
7682	RAIN TO SAWTOOTH	FENCE, ALLOTMENT INTERIOR	5
7683	MEATH TRAPS	FENCE, ALLOTMENT INTERIOR	3
7684	WINTER CAMP TRAP	FENCE, ALLOTMENT INTERIOR	3
7685	MCCAULEY PASTURE	FENCE, ALLOTMENT INTERIOR	1
7686	KESSLER TRAP	FENCE, ALLOTMENT INTERIOR	3
7688	TAGGING PASTURE	FENCE, ALLOTMENT INTERIOR	1
7689	JJ TANK	EARTHEN TANK	1
7690	JESUS TRAP	FENCE, ALLOTMENT INTERIOR	1
7691	REVEG TANK	EARTHEN TANK	1
7692	CAMPBELL SPRINGS	SPRING	1
7693	SUMMER HQS TRAPS	FENCE, ALLOTMENT INTERIOR	1
7694	SNYDER-DUTCH KID DIVISION	FENCE, ALLOTMENT INTERIOR	1
7694B	SNYDER-DUTCH KID FENCE	FENCE, ALLOTMENT INTERIOR	1
7695	COW TANK TRAP	FENCE, ALLOTMENT INTERIOR	3
7696	COLEMAN DT FENCE	FENCE, ALLOTMENT INTERIOR	1
7697	36 TANK TRAP	FENCE, ALLOTMENT INTERIOR	3
7698	TRAP-TRAP	FENCE, ALLOTMENT INTERIOR	1
7699	BARNEY TRAP	FENCE, ALLOTMENT INTERIOR	2
7700A	COLEMAN-SEVIER FENCE	FENCE, ALLOTMENT INTERIOR	1
7700B	COLEMAN-SEVIER FENCE	FENCE, ALLOTMENT INTERIOR	1
7700C	COLEMAN-SEVIER FENCE	FENCE, ALLOTMENT INTERIOR	1
7737	THIRTEEN MILE TANK	EARTHEN TANK	1
7739	PRAIRIE TANK	EARTHEN TANK	1
7740	PRAIRIE WATER LOT	FENCE, WATER SOURCE	1
7741	WASHOUT TANK	EARTHEN TANK	1
7742	BOTTOM TANK	EARTHEN TANK	1

Table 6, continued

Improvement Number	Improvement Name	Improvement Type	Units or Miles
7743	PIPELINE TANK	EARTHEN TANK	1
7744	HELLS CANYON TANK	EARTHEN TANK	1
7745	WOOD CAMP TK	EARTHEN TANK	1
7746	QUARRY TANK	EARTHEN TANK	1
7747	FLOE TANK	EARTHEN TANK	1
7748	MAYES TANK	EARTHEN TANK	1
7749	RATTLESNAKE TANK	EARTHEN TANK	1
7750	TULE TANK	EARTHEN TANK	1
7751	LAWLESS TANK	EARTHEN TANK	1
7753	KEESLER TANK	EARTHEN TANK	1
7754	NAGILLER TANK	EARTHEN TANK	1
7755	WASH TUB TANK	EARTHEN TANK	1
7757	MEATH TANK	EARTHEN TANK	1
7758	LITTLE RAIN TANK	EARTHEN TANK	1
7759	MERCHANT TANK	EARTHEN TANK	1
7760	SECTION-22 TANK	EARTHEN TANK	1
7763	UPPER MCCAULEY	EARTHEN TANK	1
7764	LOWER MCCAULEY	EARTHEN TANK	1
7765	BUCK TANK	EARTHEN TANK	1
7766	LOST TANK	EARTHEN TANK	1
7768	DEPRESSION TANK	EARTHEN TANK	1
7770	ROCK TANK	EARTHEN TANK	1
7773	JC TANK	EARTHEN TANK	1
7774	ARKANSAS TANK	EARTHEN TANK	1
7777	SEVIER TANK #2	EARTHEN TANK	1
7779	COW TANK TRAP	FENCE, ALLOTMENT INTERIOR	7
7780	MESCAL TANK	EARTHEN TANK	1
7783	COW TANKS	EARTHEN TANK	1
7784	STAGE TANK	EARTHEN TANK	1
7785	36 TANK	EARTHEN TANK	1
7786	SHEEP TANK	EARTHEN TANK	1
7787	DT TANK	EARTHEN TANK	1
7788	JACKASS TANK	EARTHEN TANK	1
7789	DAVENPORT TANK	EARTHEN TANK	1
7791	BARNEY TANK	EARTHEN TANK	1
7792	MESA TANK	EARTHEN TANK	1
7793	STATION TANK	EARTHEN TANK	1
7794	SEVIER TANK #1	EARTHEN TANK	1
7795	HIDDEN TANK	EARTHEN TANK	1
7796	BLACK MESA TANK	EARTHEN TANK	1
7797	TRAP TANK	EARTHEN TANK	1
7798	METATE TANK	EARTHEN TANK	1

Table 6, continued

Improvement Number	Improvement Name	Improvement Type	Units or Miles
7799	MC TANK	EARTHEN TANK	1
7800	WOUNDED RANGER TANK	EARTHEN TANK	1
7801	JESUS TANK	EARTHEN TANK	1
7804	ELK TANK	EARTHEN TANK	1
7810	SGM CENTER	MULTIPLE PENS	1
7811	WEST IKE TANK	EARTHEN TANK	1
7812	DUTCH KID TANK	EARTHEN TANK	1
7813	ICE POND TANK NAT	EARTHEN TANK	1
7816	PERRIN EAST/WEST FENCE	FENCE, WATER SOURCE	1
7864	DELTA TANK	EARTHEN TANK	1
7925	STUMP TANK	EARTHEN TANK	1
7935A	KAIBAB-PRES BDRY	FENCE, ALLOTMENT BOUNDARY	3
7962	HELLS TANK	EARTHEN TANK	1
7963	SUMMIT TANK	EARTHEN TANK	1
7964	POWER TANK	EARTHEN TANK	1
7973	BORROW TANK	EARTHEN TANK	1
8004	FOREST BDY FENCE	FENCE, ALLOTMENT BOUNDARY	2
8013	MEATH TRAP SOUTH FENCE	FENCE, ALLOTMENT INTERIOR	2
8018	STEWART SPRINGS	SPRING	1
8019	MUD SPRING	SPRING	1
8019A	MUD SPRING PIPELINE	DISTRIBUTION PIPELINE	0.25
8019B	MUD SPRING TROUGH	TROUGH	1
8020	TWIN SPRING NO 1	SPRING	1
8020A	TWIN SPRING NO. 1 TROUGH	TROUGH	1
8020B	TWIN SPRING 1 PIPELINE	DISTRIBUTION PIPELINE	0.25
8022	RACETRACK TANK	EARTHEN TANK	1
8023	MAHALA TANK	EARTHEN TANK	1
8024	CRAMER TANK	EARTHEN TANK	1
8025	TWIN SPRING NO 2	SPRING	1
8031	WINTER HQS BARN	BARN	1
8032	WINTER HQS CORRAL	MULTIPLE PENS	1
8033	HEADQUARTERS TANK	STORAGE TANK	1
8034	WINTER HQS BLDG	ALL OTHER	1
8037	FIRST TANK	EARTHEN TANK	1
8039	BEAR TANK #2	EARTHEN TANK	1
8042	BURRO TANK	EARTHEN TANK	1
8046	SPLIT TANK	EARTHEN TANK	1
8074	BIG T TANK	EARTHEN TANK	1
8077	SNYDER DIV FENCE	FENCE, ALLOTMENT INTERIOR	3
8078	PERRIN DIV FENCE	FENCE, ALLOTMENT INTERIOR	2
8079	COLEMAN DIV FENCE	FENCE, ALLOTMENT INTERIOR	5
8098	DT-36-COLEMAN	FENCE, ALLOTMENT INTERIOR	4

Table 6, continued

Improvement Number	Improvement Name	Improvement Type	Units or Miles
8118	LOCKETT TRAP	FENCE, ALLOTMENT INTERIOR	2
8119	HAM TANK	EARTHEN TANK	1
8120	KUNDE TANK	EARTHEN TANK	1
8121	MCCRACKEN TANK	EARTHEN TANK	1
8129A	WINTER TRICK TANK	APRON	1
8129B	WINTER TT STORAGE	STORAGE TANK	1
8129C	WINTER TROUGH 1	TROUGH	1
8129D	WINTER TROUGH 2	TROUGH	1
8129E	WINTER TROUGH 3	TROUGH	1
8129SOUTH	WINTER PIPELINE SOUTH	DISTRIBUTION PIPELINE	0.75
8129F	WINTER TT TROUGH 4	TROUGH	1
8129G	WINTER TROUGH 5	TROUGH	1
8129WEST	WINTER PIPELINE WEST	DISTRIBUTION PIPELINE	2
8131	JCT TANK	EARTHEN TANK	1
8132	HILL TANK	EARTHEN TANK	1
8133	MUDD TANK	POND	1
8134	COYOTE TANK	EARTHEN TANK	1
8135	BUZZARD TANK	EARTHEN TANK	1
8136	NEW SNYDER TANK	EARTHEN TANK	1
8137	NORTH IKE TANK	EARTHEN TANK	1
8138	RABBIT BILL TANK	EARTHEN TANK	1
8139	REED TANK	EARTHEN TANK	1
8130	SOUTH TRICK TANK	APRON	1
8141	SOUTH STORAGE	STORAGE TANK	1
8145	SOUTH PIPELINE	DISTRIBUTION PIPELINE	2
8145A	SOUTH TT TROUGH 1	TROUGH	1
8145B	SOUTH TT TROUGH 2	TROUGH	1
8145C	SOUTH TT TROUGH 3	TROUGH	1
8148	BOWDON TANK	EARTHEN TANK	1
8385	S. PASTURE DIV. FENCE	FENCE, ALLOTMENT INTERIOR	7
8402	WILLIAMS TANK	EARTHEN TANK	1
8406	SEVIER BDRY FENCE	FENCE, ALLOTMENT BOUNDARY	2

Travel Management

The Kaibab National Forest has actively pursued a road closure program for the last several years. Additionally, the Williams Ranger District is currently planning the implementation of the Travel Management Rule, as directed by the Washington and Regional Offices of the Forest Service. These programs are aimed at reducing non-essential roads for watershed and resource protection. These closures must also be honored by the Permittees.

If you need to enter a motor vehicle restricted area, you must have special authorization in the form of an Off-Road Vehicle Permit or specific authorization through your Annual Operating Instructions. Entering a restricted area without authorization is a violation of 36 CFR 261.

Table 7. Example Grazing Schedules

Year 1			
Band #1, approximately 2,000 sheep		**Band #2, approximately 2,000 sheep**	
Grazing Location	**Graze Dates**	**Grazing Location**	**Graze Dates**
South	5/1-6/15	Sevier	5/1-6/15
T-Y	6/16-6/25	Bear Tank	6/16-6/25
South Snyder	6/26-7/10	North Coleman	6/26-7/20
North Snyder	7/11-7/26	Dutch Kid	7/21-8/14
McCauley	7/27-8/15	Cow Tank	8/15-8/24
Perrin	8/16-9/15	DT 36	8/25-9/15
Meath/Bull Trap	9/16-9/30	South Coleman	9/16-10/20
North Winter	10/1-10/31	Barney Flat	10/21-10/31
Year 2			
13 Mile	5/1-5/15	DT 36	5/1-6/30
McCauley	5/16-6/10	South Coleman	7/1-7/21
North Snyder	6/11-7/10	North Coleman	7/22-7/31
South Snyder	7/11-8/5	Sevier	8/1-8/21
T-Y	8/6-8/15	Bear Tank	8/22-9/12
South	8/16-9/15	Dutch Kid	9/13-10/7
North Winter	9/16-9/30	Cow Tank	10/8-10/31
Meath/Bull Trap	10/1-10/15		
Perrin	10/16-10/31		
Year 3			
North Winter	5/1-5/31	Bear Tank	5/1-6/15
Meath/Bull Trap	6/1-6/15	North Coleman	6/16-6/25
Perrin	6/16-7/15	Dutch Kid	6/26-7/20
McCauley	7/16-7/31	Cow Tank	7/21-8/14
North Snyder	8/1-8/21	DT 36	8/15-8/24
South Snyder	8/22-9/15	South Coleman	8/25-9/15
T-Y	9/16-9/30	Barney Flat	9/16-10/20
South	10/1-10/31	Sevier	10/21-10/31

Figure 1. Hat Allotment Boundary

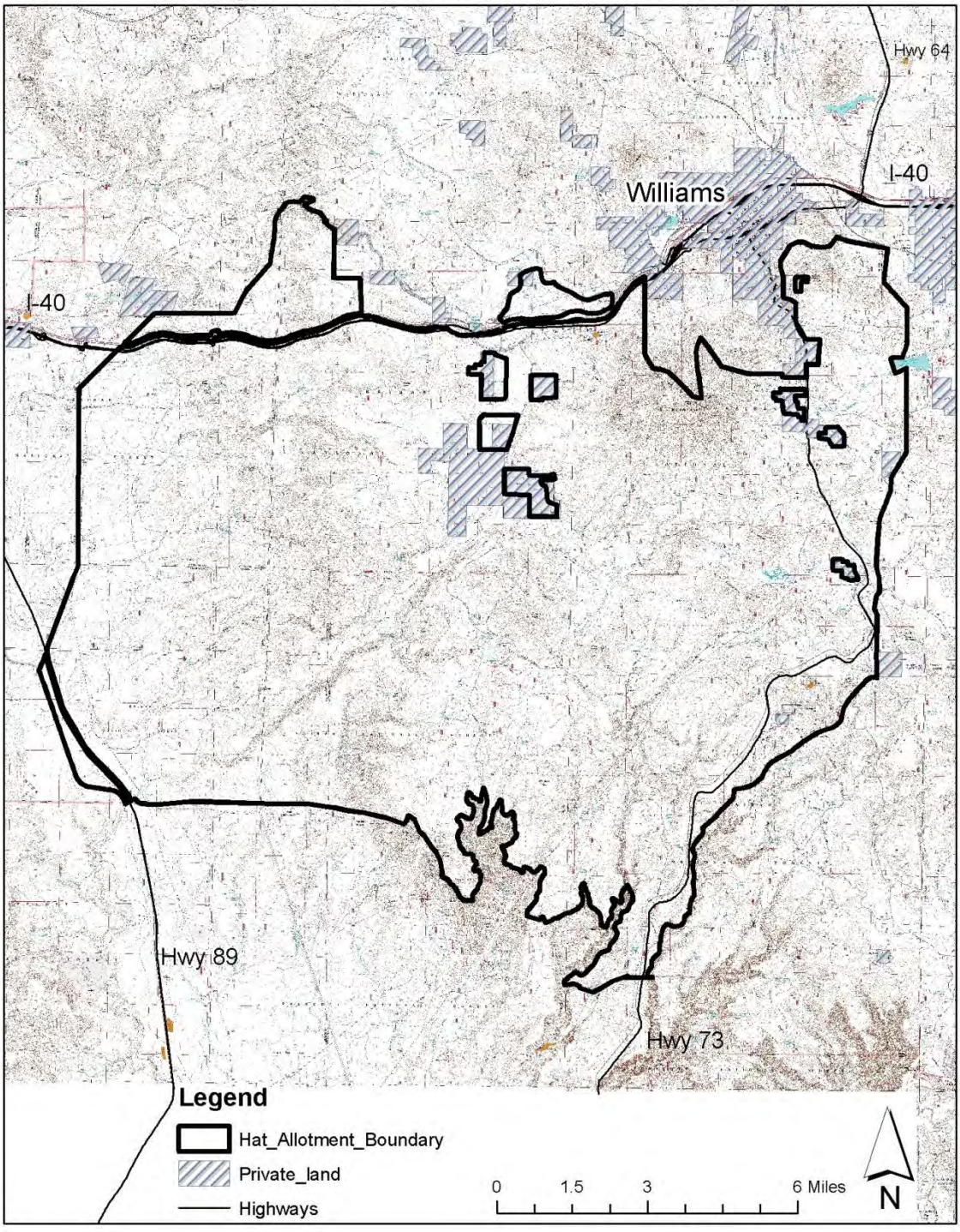

Figure 3. Twin Springs West Exclosure

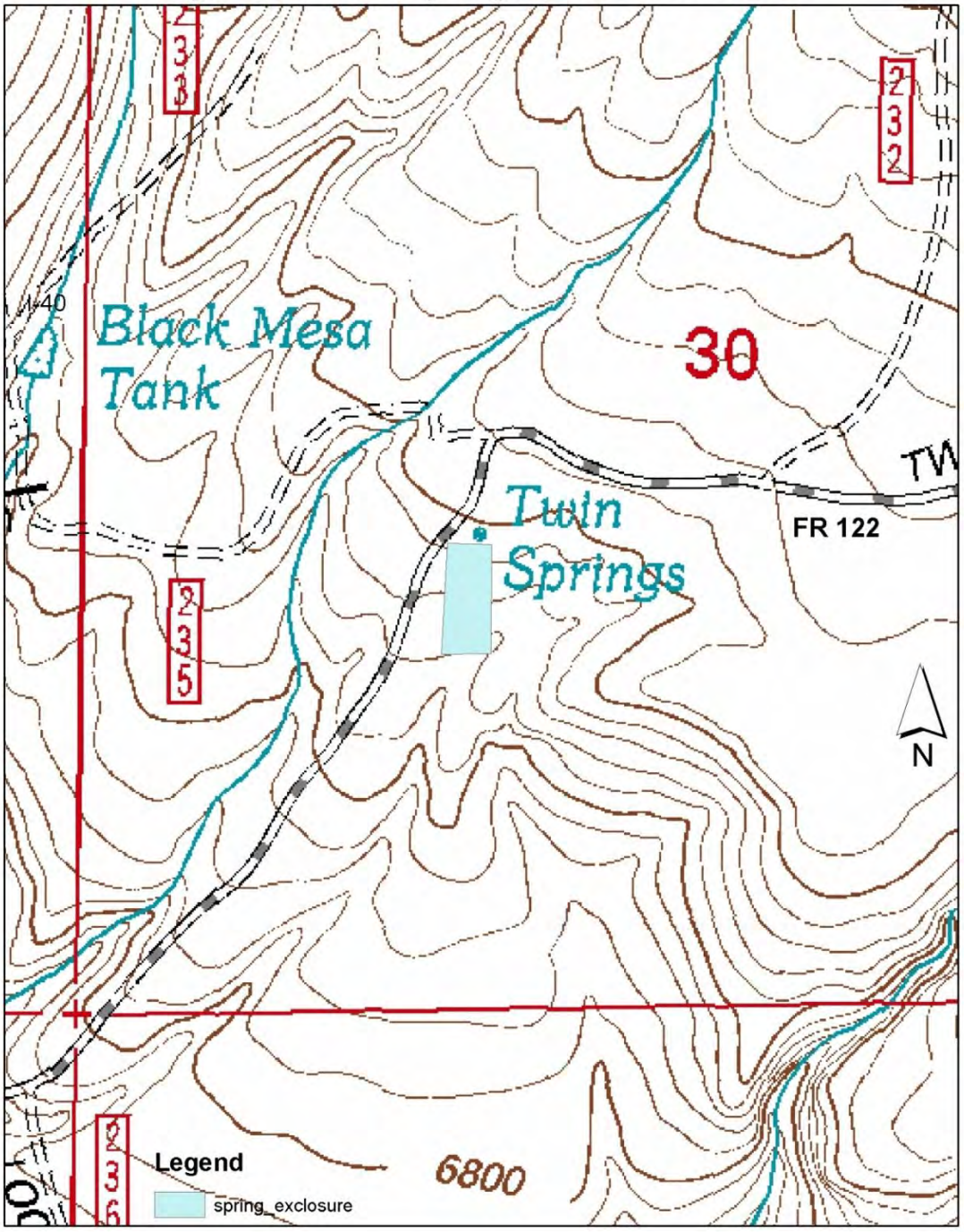

Figure 4. Mud Springs Exclosure

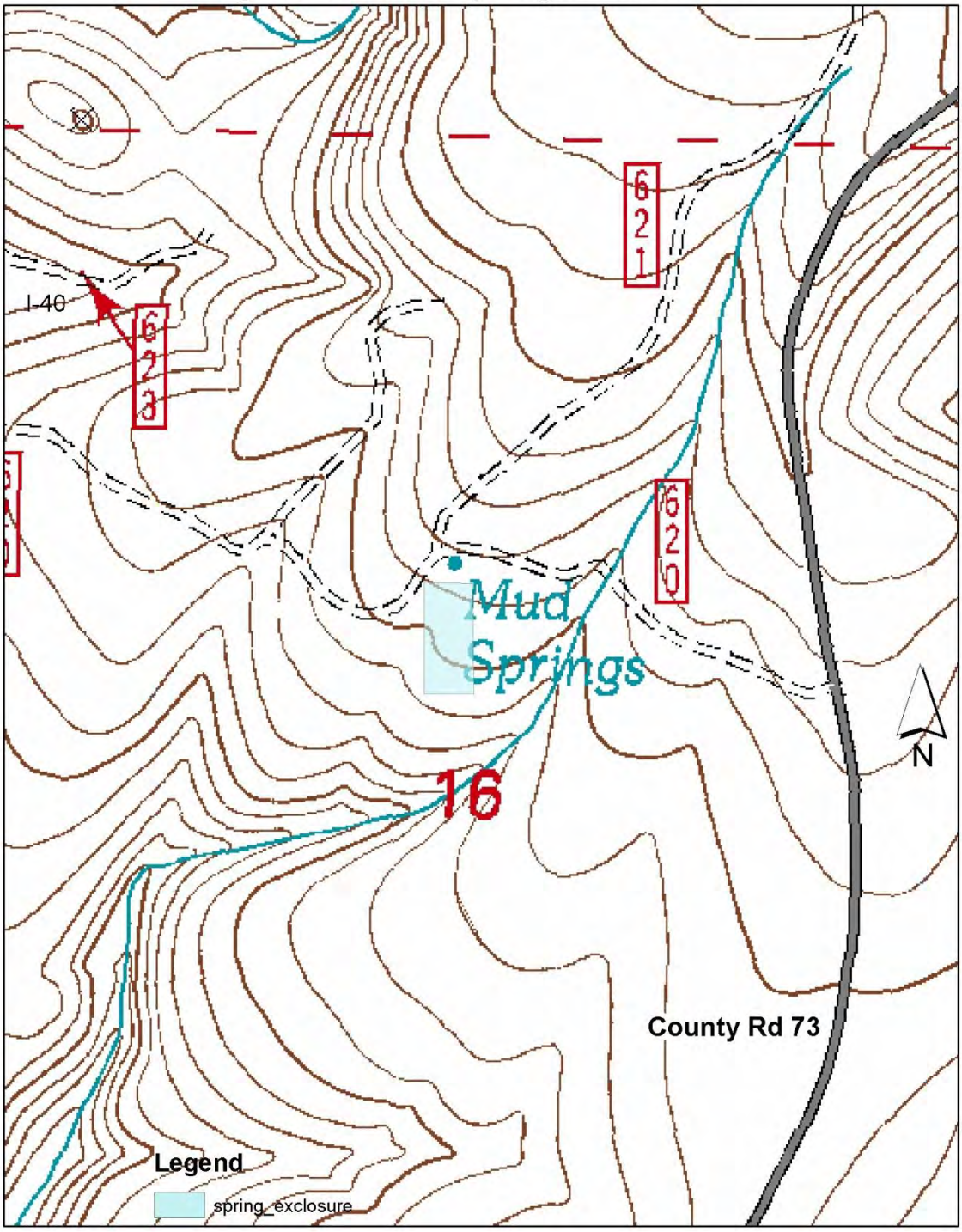

Figure 5. Fence Removal

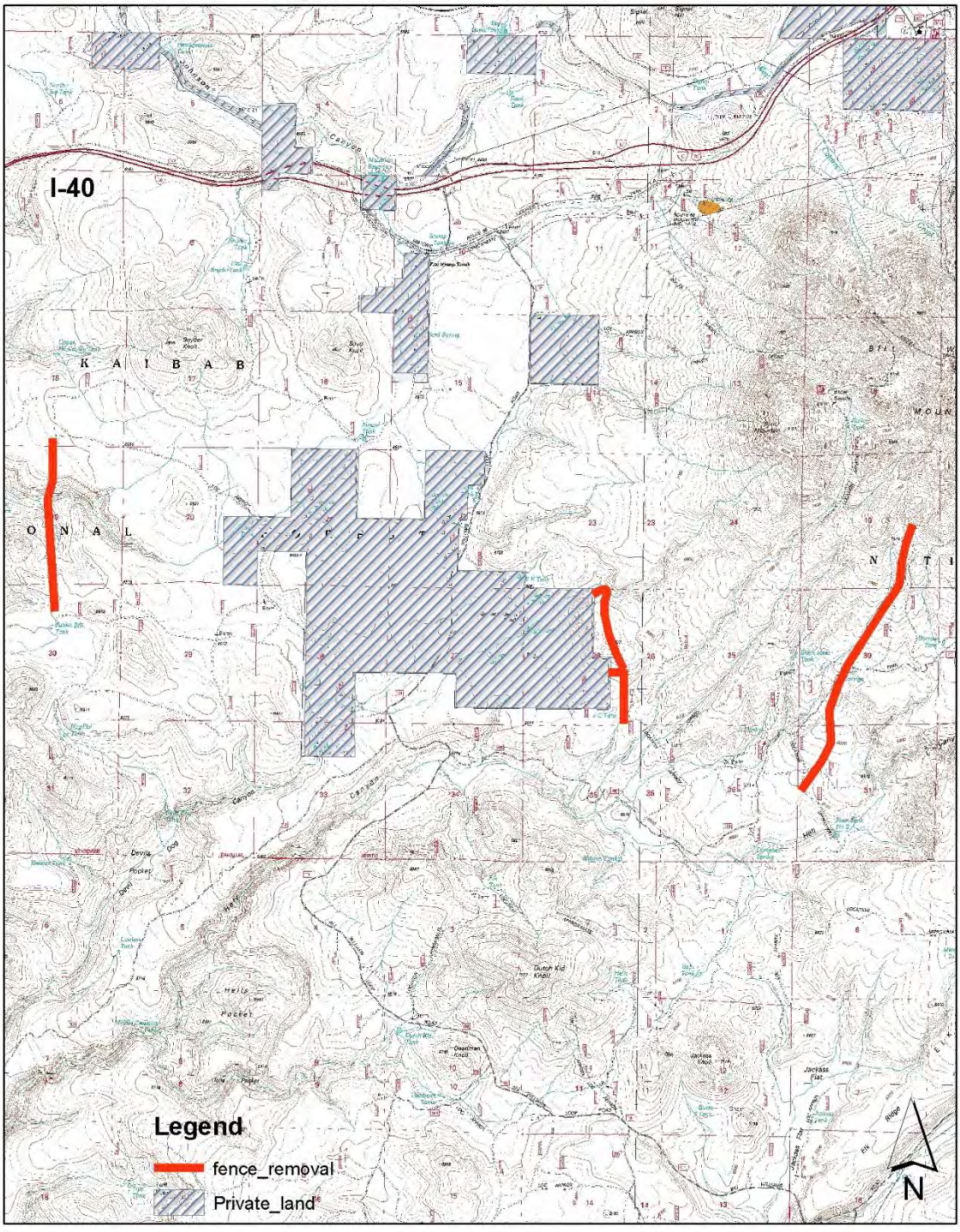

Figure 6. Southwest Portion of Perrin South Pasture.

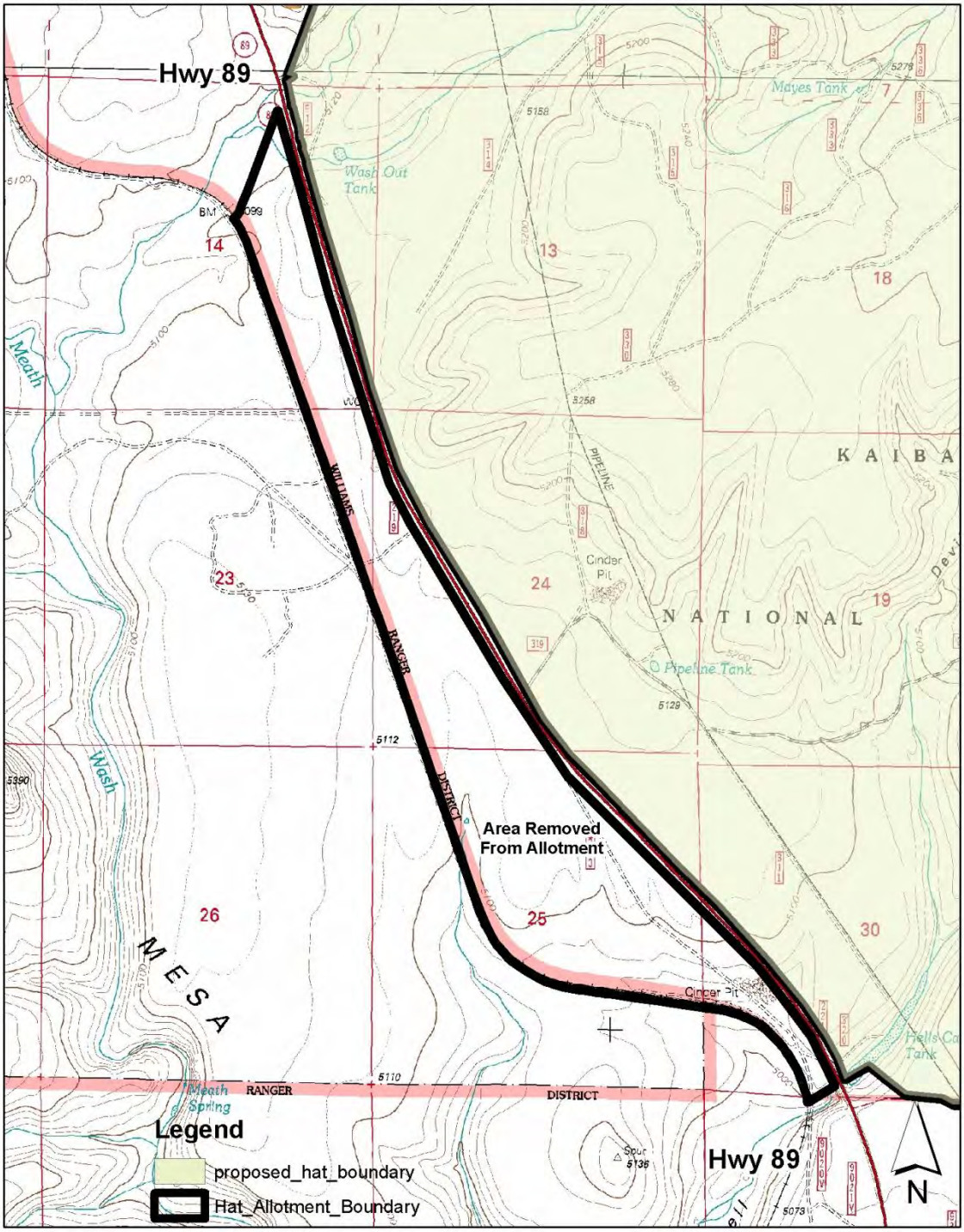

Figure 7. Steep Portion of Hat on Bill Williams Mountain