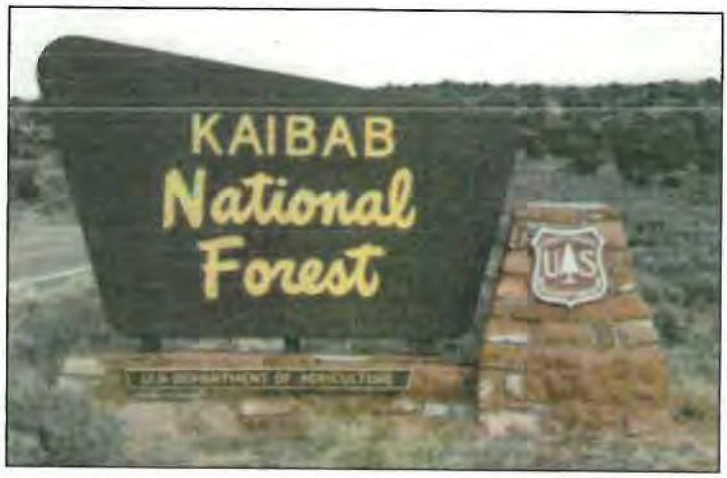
Kane Ranch Allotments
Allotment Management Plan (AMP)



North Kaibab Ranger District
Kaibab National Forest
Coconino County - Arizona

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I. Decision Summary

The Final Decision Notice (DN) and Finding of No Significant Impact (FONSI) for the Kane Ranch Allotment Management Plan Environmental Assessment (EA) was signed/approved by the U.S. Forest Service - North Kaibab Ranger District (NKRD), on November, 19, 2013. This Allotment Management Plan (AMP) for Kane Ranch Allotments [i.e., the Central Summer, Kane, Central Winter and Kanab Creek cattle and horse (C&H) allotments] reflects the desired management of these allotments as described in the selected alternative of the DN-FONSI (2013). A complete listing of the selected alternative and its actions or activities is listed in pages 12-21 of the Final EA, as referenced in the DN-FONSI. Copies of the Final EA and the DN-FONSI can be viewed at the following U.S. Forest Service world-wide-web link: http://www.fs.usda.gov/project/?project=37319.

II. Allotment Management Plan Goals and Objectives

Management of the Central Summer, Kane, and Central Winter C&H allotments will be conducted to achieve the following objectives as presented in the Kane Ranch AMP Final EA and DN-FONSI:

- Re-authorize cattle grazing in a manner that is consistent with the goals, objectives, standards and guidelines of the *1988 Forest Land Management Plan/Forest Plan*,[1] as amended.
- Provide logical, flexible, and adaptive grazing rotations, by ensuring that the maintenance and/or improvement of vegetation and soil conditions provide for ecosystem stability while allowing livestock grazing to occur on the allotments.
- Meet the goals and objectives as expressed in the Kane and Two Mile Research and Stewardship Partnership, as follows (see slide 13 of 22 in power-point link[2]):
    a. Establish public-private partnership to share resources
    b. Bring additional science capacity to land and wildlife management agencies
    c. Enable effective, efficient, collaborative, and science-based adaptive management
    d. Develop tools for anticipating and managing for rapid environmental change (including climate change, as applicable)
    e. Develop educational and experiential opportunities to foster stewardship
- Manage the Central Summer and Kane allotments for multiple-use objectives including livestock grazing.
- Authorize a new grazing strategy and research program on the Central Winter Allotment: The Central Winter Allotment Management will be managed independently from the Central Summer and Kane Allotments. The allotment would be managed in a way that balances livestock grazing with a series of well-defined research projects focused on the best grazing strategy for a variety of natural resource objectives.[3]
- Follow and implement applicable Design Features, Mitigation Measures, Monitoring, and/or Adaptive Management Strategies as outlined in this AMP, the AOI and Grazing Permit. **(See Appendices "B" through "D").**
- The Kanab Creek allotment will continue to be closed to grazing as specified in the 2001 NEPA decision for that area.

[1] [Note: at the time of the signing of the Decision Notice in 2013, the new Forest Plan (dated February 2014) had not been approved, therefore this AMP will follow the 1988 Forest Plan until the next AMP NEPA review.]

[2] http://azrangelands.org/presentations/Winter%202013/Williamson_AZSRM_K2MJan2013.pdf

[3] [Note: each research project proposal must define its resource objective(s) and be submitted to the Forest Service, prior to field implementation].

III. Allotments & Configurations

The "Kane Ranch" allotments currently consist of cattle grazing on three allotments the Central Summer, Kane, and Central Winter allotments. A fourth allotment called the Kanab Creek allotment will remain closed (in accordance with the 2001 NEPA decision) to livestock grazing at this time and no permit will be issued for this area. The Kane Ranch allotments cover approximately 435,000 Forest Service acres. A more detailed breakout of each operational allotment is presented below:

Central Summer Allotment (~ 281,000 acres):

The **Central Summer allotment** is currently divided into **two pastures (Central Summer North** and **Central Summer South)**. To increase management opportunities and provide additional grazing rotations, the Central Summer North Pasture may be divided (east/west) into two pastures. This could be accomplished by constructing a fence along the west side of State highway 67 (see Figure 1). This fence would create the Central Summer Northwest and Central Summer Northeast pastures. This fence construction would be dependent upon monitoring and adaptive management (based on need and public safety), and would be constructed only as funding and labor became available. Before the construction of the fence is pursued, the Forest Service will test the effectiveness of large flashing signs warning the public of the livestock hazard. If collisions do not decrease from their current rate, then the fence(s) would be built as soon as funding is granted.

The Central Summer South pasture will be divided to create a new pasture (Burnt Corral) in the northwest portion of the pasture (Figure 1). Also, if herding efforts are unable to adequately manage livestock grazing in the meadows on the east side of State highway 67, an additional fence may be constructed along the west side of highway 67 (dependent upon public safety needs) from Pleasant Valley to the north boundary of Grand Canyon National Park. This fence would bisect the Central Summer South Pasture and create two new pastures (Central Summer Southwest and Central Summer Southeast pastures). This fence will not be planned for immediate construction, but would be considered as a potential future action associated with the adaptive management concept.

Two new fences may be constructed on the National Forest/National Park boundary to prevent livestock from entering the National Park (Figure 1). These fences would be less than one mile long and would extend from the existing boundary fence to natural topographic barriers.

Three holding pastures (**Murray**, **Lookout Canyon** and **Pleasant Valley**) may be constructed on the allotment (see Figure 1), as needed, to facilitate livestock gathering and allow timely removal of livestock from the allotment as specified in the Annual Operating Instructions.

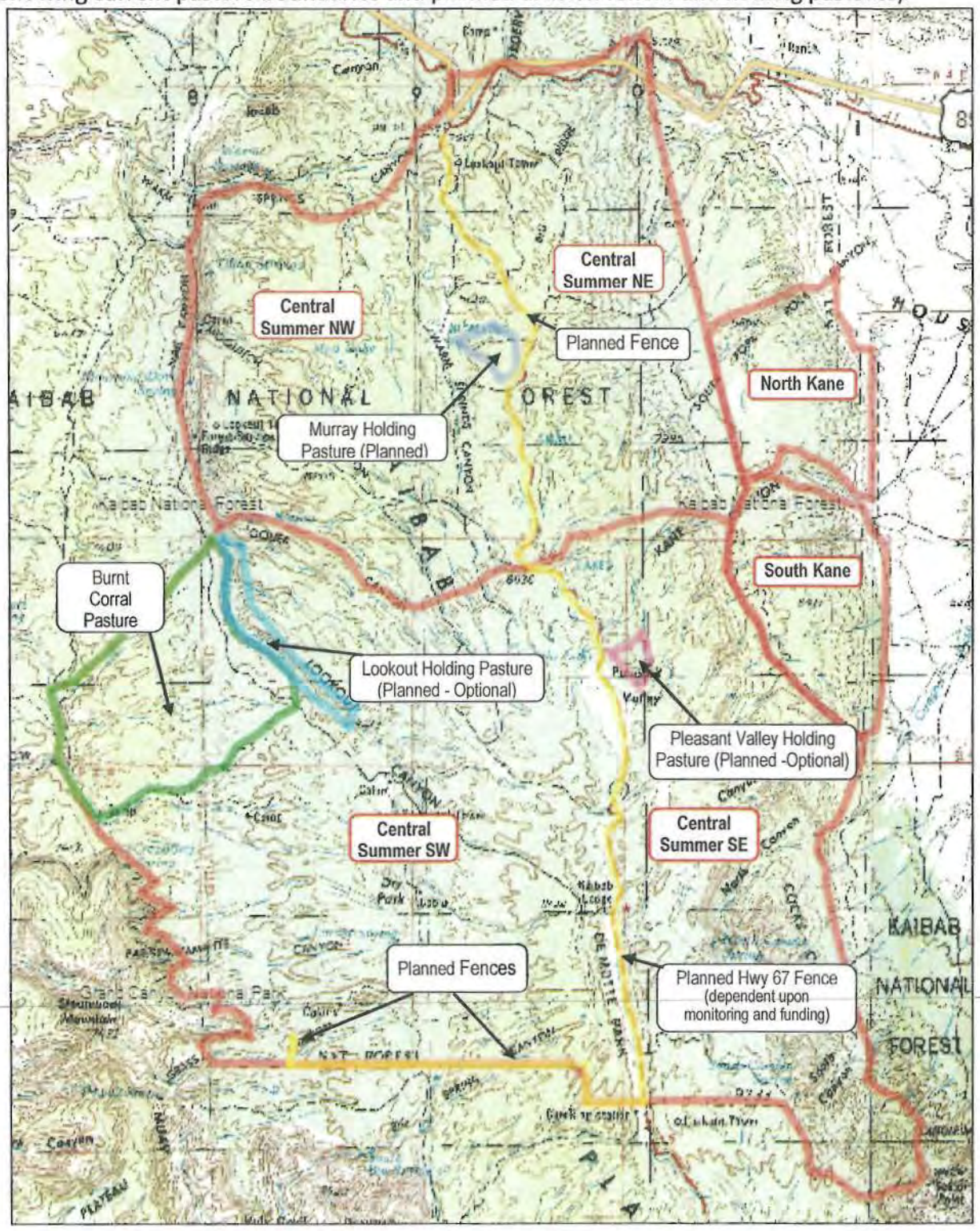
Several exclosures and/or enclosures may be constructed on the allotment to facilitate long-term monitoring and vegetation research projects. The area within these research areas will be removed from the normal grazing rotation for the life of the exclosures and/or enclosures.

All new fences discussed in this AMP will be constructed according to the wildlife friendly design criteria specified in Chapter 2, page 13 of the "*Kane Ranch Allotment Management Plan – Final Environmental Assessment*," and page 7 of the associated Decision Notice and FONSI.

Kane Allotment (~ 25,000 acres):

The Kane allotment (Figure 1) includes 25,000 acres (+/-) and is divided into two pastures (North Kane and South Kane). No pasture changes are anticipated for this allotment.

FIGURE 1. - Central Summer and Kane Allotments
(Showing current pasture boundaries and planned division fences and holding pastures).

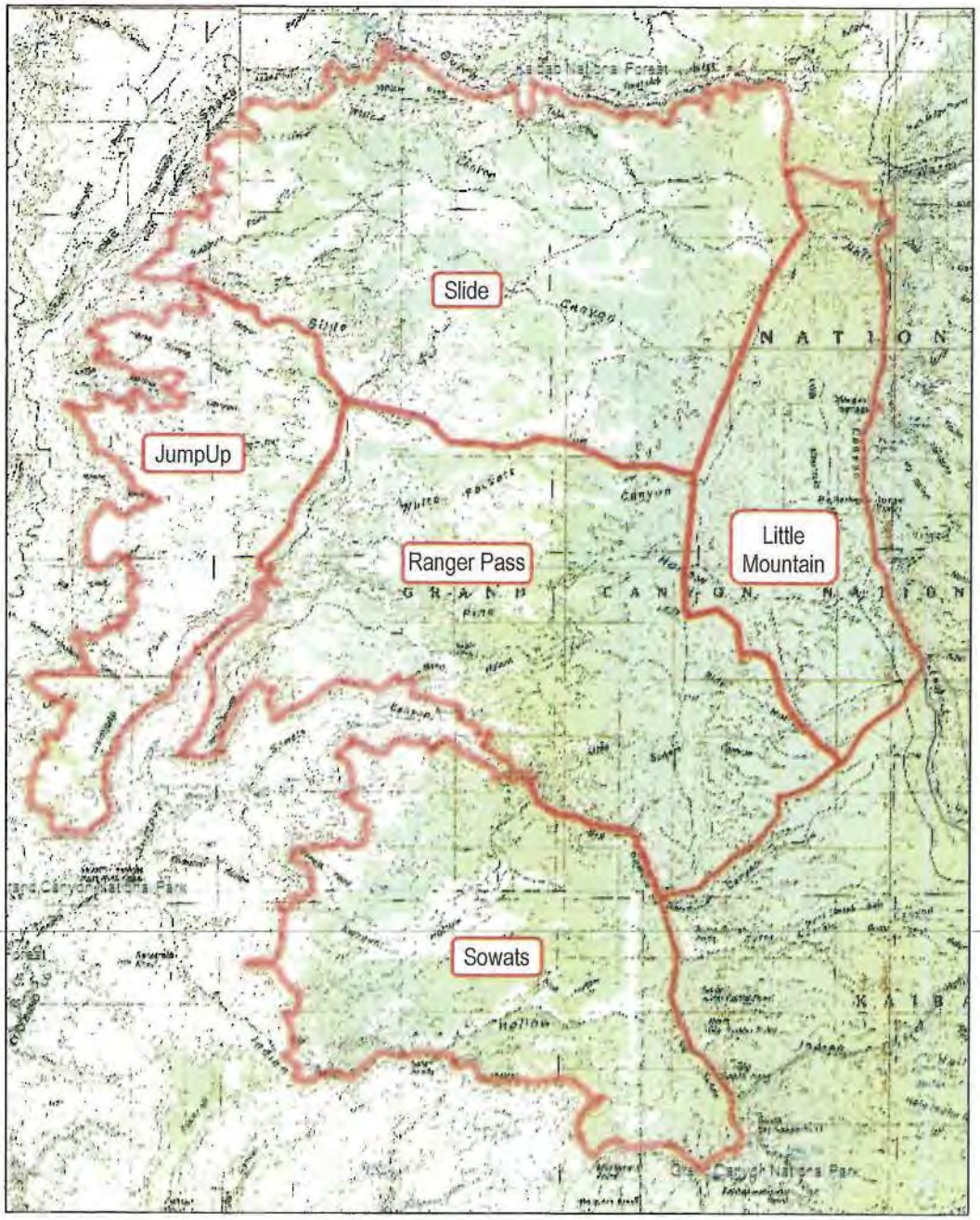


Central Winter Allotment (~ 129,000 acres):

The Central Winter allotment (Figure 2) includes 129,000 acres and is currently divided into five pastures. Four of these pastures (Little Mountain, Ranger Pass, Slide and Sowats) are open for livestock grazing. The fifth pasture (JumpUp) is being managed to promote wildlife habitat and is currently closed to livestock grazing.

Several exclosures and enclosures are being constructed on the Central Winter Allotment to facilitate long-term monitoring and vegetation research projects. The area within these research areas will be removed from the normal grazing rotation for the life of the exclosures. No other changes in allotment or pasture configuration are planned at this time.

FIGURE 2. - Central Winter Allotment (Showing current pasture boundaries).



Kanab Creek Allotment (~ 39,000 acres):

The Kanab Creek allotment has been associated with the Kane Ranch for several decades. However, a 2001 NEPA decision determined that livestock grazing would no longer be permitted on this allotment. The recent (2013) Environmental Assessment and Decision Notice continued this decision and the allotment will remain closed to livestock grazing. The continued closure of this allotment to livestock grazing is primary due to poor rangeland conditions and archeological site protection. Other reasons for continued closure include: riparian resource protection, remote wilderness values, lack of functioning range improvements needed for proper livestock management, noxious weed expansion, and difficultly of managing livestock in this rough remote desert area.

IV. Allotment Management and Grazing System (Pastures & Use)

Grazing/livestock management on the Central Summer, Central Winter and Kane allotments is based on adaptive management practices i.e., an authorized number of livestock, length and timing of grazing season, and grazing rotation that is changed as needed to respond to changes in resource conditions such as available water, drought, wildfire or declining/improving vegetative conditions. Table 1 below represents a summary of the allotment management and grazing system for the Central Summer, Kane and Central Winter allotments.

Table 1. Planned Allotment Use.

Allotment	Pasture	Primary Use	Time & Frequency of Use
Central Summer	Northwest	Primary Grazing Area	NW & NE grazed together every other year
	Northeast		
	Southwest		Grazed every other year
	Southeast	Trailing & Gathering	Used each year if cattle are trailed to the Forest and every other year if cattle are trailed off the Forest from the Southwest pasture.
Kane	North Kane	Trailing & Gathering	Used every other year if cattle are trailed off the Forest from the Northeast & Northwest pastures
	South Kane	Trailing & Gathering	Used each year if cattle are trailed onto the Forest and every other year if cattle are trailed off the Forest from the Southwest pasture.
Central Winter	Burnt Corral	Potential Grazing	These pastures may be grazed every other year to respond to drought, fire or other needs and opportunities.
	Little Mountain		
	Slide		
	Ranger Pass		
	Sowats	Research & Forage Reserve	Variable if grazed
	Jump up	Wildlife Habitat	No livestock grazing

Central Summer and Kane Allotments

The Central Summer allotment will be managed for commercial livestock grazing using a rest rotation system and each pasture will be rested every other year. The Central Summer allotment will provide the primary grazing areas while the Kane allotment may be used for gathering and trailing livestock to and from the Central Summer allotment. Grazing on these allotments is intended to be managed independently from grazing that occurs on the Central Winter allotment. However, the Little Mountain and Burnt Corral (planned) pastures within the Central Winter allotment may be used for added management flexibility for the cattle that are grazed on the Central Summer allotment. The planned use of pastures in each allotment is shown in Table 1, under Central Summer and Kane Allotments.

Specific components of the grazing management on the Central Summer and Kane allotments are as follows:

- The primary grazing areas will be the Central Summer - Northwest, Northeast and Southwest pastures. These pastures will be grazed in a two-year rest-rotation pattern with the Northeast and Northwest pastures being grazed one year and the Southwest pasture being grazed the following year.
- The Central Summer Southeast pasture and both Kane allotment pastures will be used as gathering and trailing pastures between summer and winter ranges.
- Livestock may be trailed onto the Central Summer pastures via the Kane Trail (that passes through the South Kane and Central Summer Southeast pastures). Cattle may also be trucked directly to the Northwest, Northeast or Southwest pastures.
- The North Kane pasture may be used every other year when cattle are trailed off the Northeast and Northwest pastures to winter on the BLM allotment in House Rock Valley.
- Central Summer Southeast and South Kane pastures may be used each year if cattle are trailed to the Central Summer Allotment. These pastures will also be used in the fall if cattle are trailed from the Southwest pasture to the winter BLM allotment in House Rock Valley.
- The Central Summer Southeast and Kane allotment pastures will not be used on those occasions when cattle are trucked to or from the Central Summer Allotment.

Forage utilization on all pastures (except for research areas) should range between 30 percent to 40 percent (maximum)[4]. Utilization is measured before the end of the growing season and is used to determine when livestock shall move (on applicable pastures) to the next pasture in the rotation. In applicable cases, livestock would move to the next pasture when grazing intensity approaches a conservative level (30-40% utilization); total use at the end of the growing season should generally be within these conservative use levels to maintain or improve rangeland vegetation (Holechek, J.L., H. Gomez, M. Francisco, and D. Galt. 1999 *Grazing studies: What We've learned.* Rangeland 21(2)).

[4] [**Note:** > or = to 40% represents moderate grazing; research has shown that in dry years, forage production is 24% higher under light (< 32%) rather than moderate grazing (Holechek et al. 1999). Forage utilization should be monitored to ensure the "conservative" grazing intensity is not exceeded. Other factors that aid in rotation decisions include weather patterns, the likelihood of plant regrowth, and previous years' utilization levels. Monitoring (see section VII and appendix D) and Adaptive Management will be used to make adjustments as needed. Specifics regarding required monitoring and adjustments made, or to be made, based on Adaptive Management should be detailed or listed within Annual Operation Instructions (AOIs).]

Central Winter Allotment

The Central Winter Allotment will be managed to combine commercial livestock grazing with long-term experimental research and monitoring activities. Livestock grazing on this allotment is intended to be managed independently from grazing that occurs on the Central Summer allotment. However, the Little Mountain and Burnt Corral (planned) pastures within the Central Winter allotment may be used if needed for added management flexibility for the cattle that are grazed on the Central Summer allotment in response to events such as wildfire or drought.

Upon implementation of this AMP, the Central Winter Allotment, with the exception of fenced experimental exclosures/ enclosures, will not be grazed until:

a) The West Side stock water system is repaired and operational.
b) The existing allotment and pasture fences are maintained and repaired to functional condition.
c) Monitoring data and research results verify that conditions on the ground are improving and that resource impairment is unlikely [i.e., a reduction in cheatgrass (*Bromus tectorum*) to occur when grazing is resumed.

When grazing is resumed on the Central Winter Allotment, the initial stocking rate will be no more than 200 head of cattle. If implementation monitoring and/or associated research results indicate an increase in vegetative conditions, the authorized number of livestock may be increased up to a maximum of 400 of cattle. The planned use of pastures in the Central Winter allotment is shown in Table 1.

Specific components of the grazing management on the Central Winter allotment are as follows:

- The Burnt Corral, Little Mountain, Ranger Pass and Slide pastures may be grazed no more than four months per pasture.
- One pasture can be utilized two consecutive years if the second year of grazing occurs outside of the growing season.
- Forage utilization on all the pastures (research areas excepted) should be from 30 to a maximum of 40 percent.
- The grazing season for the Burnt Corral, Little Mountain, Slide and Ranger Pass pastures may be modified to meet the needs of grazing research projects.
- The Sowats pasture will not be used as part of a regular grazing rotation. It will be used for research needs and as a forage reserve if needed.
- The JumpUp pasture will remain closed to regular and research grazing as per the 2001 Kane Ranch EA Decision Notice.

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V. Livestock Numbers, Season of Use and Adaptive Management

Central Summer and Kane Allotments

The number of livestock permitted on the Central Summer and Kane allotments is 600 to 1,000 head of adult cattle with a permitted grazing season of May 15th through either November 1st or November 30th (see Table 2 below).

Upon implementation of this AMP, the initial stocking will be 600 head of cattle. Once post-implementation monitoring has occurred (i.e., over a 2 to 5 year period) and indicates static or increasing vegetative conditions, the permittee may request an increase in the number of permitted livestock up to the maximum upper limit of 1,000 head. The permitted number of cattle (600 to 1,000 head) will range from 3,900 to 6,500 Animal Unit Months (AUMs) of livestock grazing.

While the range of 600 to 1,000 head of cattle represents the lower and upper limits of permitted livestock, the authorized number of livestock can be reduced to as low as zero and/or the authorized season of use may be reduced if conditions (available water, drought, wildfire or declining vegetative conditions) require that such changes be made. Adjustments to the annual authorized livestock numbers (increase or decrease) may occur during the grazing season based on conditions and/or range inspections. The length of each authorized grazing season will also be limited to a maximum forage utilization rate of 40% (see note above, page 6). This utilization rate reflects the proportion of current year's herbaceous vegetation that is consumed or destroyed by all animals (including wildlife and insects) compared to the amount produced each year.

Table 2. Permitted Livestock Numbers and Grazing Seasons (for the Central Summer and Kane Allotments and the Burnt Corral and Little Mountain pastures of the Central Winter Allotment).

Allotment	Pasture	Permitted Number[1]	Permitted Season[2]	Initial Maximum AUMs[3]	Potential Maximum AUMs[4]
Central Summer	C. Summer N.W.	600 – 1,000	5/15 – 11/1	2,400	4,000
	C. Summer N.E.	600 – 1,000	5/15 – 11/1	200 – 600[3]	2,000
	C. Summer S.W.	600 – 1,000	5/15 – 11/1	2,700	5,000
	C. Summer S.E.	600 – 1,000	5/15 – 6/1 10/1 – 11/1	150	1,000
Kane	North Kane	300 – 500	10/15 – 11/30	300	500
	South Kane	300 – 500	5/15 – 6/1 10/15 – 11/30	300	500
Central Winter	Little Mountain[5]	600 – 1,000	5/15 – 11/1	1,200	1,200
	Burnt Corral[5]	600 – 1,000	5/15 – 11/1	1,200	1,200
	Murray	600 – 1,000	9/1 – 11/1	200	500
	Lookout Canyon	600 – 1,000	9/1 – 11/1	200	500
	Pleasant Valley	600 – 1,000	9/1 – 11/1	200	400

[1] The permitted number of livestock is shown here for reference. The actual number of cattle authorized to graze in any given season will vary from zero up to the Potential Maximum AUM's for each pasture shown in the above table.

[2] The actual length of each grazing season will depend upon environmental conditions and will be adjusted throughout the grazing season to achieve a maximum average utilization rate of 40%.

[3] Authorized AUM's under initial stocking rate and standard rest rotations.

[4]Maximum authorized AUM's following completion of planned fence construction and monitoring studies that show static or improving vegetative conditions.

[5]The permitted number and season of use shown here will be applied when these pastures are used in rotation with other pastures in the Central Summer allotment. The maximum annual grazing authorization for these pastures is 1,200 AUM's.

In the event that one or more of the Central Summer allotment pastures need to be rested for multiple years or to modify the standard grazing rotations to improve vegetative conditions, the sequence of grazing the remaining pastures may be modified and may involve grazing the pastures in a deferment system. The Southwest, Northwest and Northeast pastures could be utilized up to their AUM limits for a season of use from May 15 to November 1 as needed on a temporary basis. The Little Mountain and Burnt Corral pastures may be used to add additional flexibility to the grazing management system. However, adaptive grazing rotations will not apply to the Central Summer Southeast pasture, the Murray, Lookout Canyon or Pleasant Valley holding pastures, or the Kane allotment pastures. These pastures are for transitional use and trailing only during the times specified in Table 2.

Central Winter Allotment

The Central Winter Allotment, with the exception of the Little Mountain and Burnt Corral pastures, and any fenced experimental exclosures, will not be grazed until the West-Side stock water system is repaired and operational, the existing allotment and pasture fences are maintained and repaired to functional condition and monitoring data and research results verify that conditions on the ground are improving and that resource impairment is unlikely to occur when grazing is resumed. Once these conditions are met, the initial stocking will be up to 200 head, or 600 AUM's of cattle grazing. Once post-implementation monitoring and/or associated research activities have occurred and indicate satisfactory vegetative conditions, the permittee will have the option to increase livestock numbers to the upper limit of 400 head, or 1,200 AUM's of cattle grazing as shown in Table 3.

Table 3. Permitted Livestock Number and Grazing Season for the Central Winter Allotment.

Pasture	Permitted Number[1]	Permitted Season[2]	Initial Maximum AUM's[3]	Potential Maximum AUM's[4]
Little Mountain[5]	200 - 400	5/15 – 11/1	600	1,200
Slide	200 - 400	8/1 – 11/1	600	1,200
Ranger Pass	200 - 400	8/1 – 11/1	600	1,200
Sowats[6]	0 - 400	Variable	n/a	1,200
JumpUp	0	none	n/a	n/a

[1]The permitted number of livestock is shown here for reference. The actual number of cattle authorized to graze in any given season will vary from zero to a maximum of 1,200 AUM's.

[2]The actual length of each grazing season will depend upon environmental conditions and will be adjusted throughout the grazing season to achieve a maximum average utilization rate of 40%.

[3]Authorized AUM's under initial stocking rate and standard rest rotations.

[4]Maximum authorized AUM's following installation of structural improvements and completion of monitoring studies that show that vegetative conditions are improving.

[5]The authorized number and season of use shown here will be applied when the Little Mountain pasture is used in rotation with other pastures in the Central Winter allotment.

[6]The Sowats pasture is not included in the regular grazing rotation and will be used for monitoring, research and as a forage reserve.

While the range of 200 to 400 head of cattle represents the lower and upper limits of permitted livestock, the number of livestock authorized to graze in any given season can range from zero to 1,200 AUM's per pasture depending upon available forge and water or for drought, wildfire,

declining vegetative conditions, or a specific research project. Adjustments to the authorized livestock numbers (increase or decrease) may occur during the grazing season based on conditions and/or range inspections. The length of each authorized grazing season will also be limited to a maximum forage utilization rate of 40%. This utilization rate reflects the proportion of current year's herbaceous vegetation that is consumed or destroyed by all animals (including wildlife and insects) compared to the amount produced each year.

Adaptive Management Strategy

Adaptive management is a formal, systematic, and rigorous approach to learning from the outcomes of management actions, accommodating change and improving management. It involves synthesizing existing knowledge, exploring alternative actions and making explicit forecasts about their outcomes. Management actions and monitoring programs are carefully designed to generate reliable feedback and clarify the reasons underlying outcomes. Actions and objectives are then adjusted based on this feedback and improved understanding. In addition, decisions, actions and outcomes are carefully documented and communicated to others.

The key to development of adaptive management actions is to focus on factors that are essential to ensure management objectives are met. Adaptive management utilizes the interdisciplinary planning and implementation process that provides:

- Identification of site-specific desired conditions and design criteria as outlined in this AMP [5]
- Identification of pre-determined optional courses of action, as part of a proposed action to be used to make adjustments in management over time, and
- Establishment of carefully focused project monitoring to be used to make adjustments in management over time.

Management activities should strive to promote ecosystem resilience and resistance to impacts of climate change. Management activities should focus on maintenance and restoration of native ecosystems, thereby reducing the vulnerability of these ecosystems to variations in climate patterns. Regardless of the causes of climate change, our responsibility is to determine effective ways to respond to changes and manage the land effectively. One of our identified goals is maintaining and improving watershed health. Healthy, resilient watersheds are more likely to support desired ecological services in the face of climate change (Furniss 2010). Ecological diversity remains an integral component in native ecosystems. Projects should promote connected landscapes and endeavor to restore significantly altered biological communities, thus restoring their resilience to changes in climate.

Planning for adaptive management should be performed every year when the AOI is being developed or reviewed for changes for the next consecutive year of use for all allotment operations under a grazing permit. AOIs should identify future management options that may be needed to accelerate or adjust management decisions to meet desired conditions and/or project standards and objectives, as the need is determined through monitoring. (See next section – Management Requirements and section VII – Monitoring within this AMP).

[5] See sections I through IV of this AMP for reference to desired conditions, management plan goals and objectives, as well as tables 1 through 3, and Section VI – Management Requirements)

VI. Management Requirements

Annual Operating Instructions

Annual operating instructions (AOI)[6] will be issued to the permittee prior to the start of each grazing season. These "Instructions" [as indicated in Part 2, Section 8, paragraph (a) of the term grazing permit] are part of the Special Terms and Conditions associated with this grazing permit and any future grazing permits issued for the Central Summer, Central Winter and Kane allotments. **See tables 1 through 3 above for annual livestock numbers.**

AOIs make adjustments to livestock numbers and time and duration of pasture use based on current and anticipated range conditions. AOIs are developed cooperatively with the permittee and will include instructions and/or information related to the following: authorized livestock numbers; period of use; pasture grazing schedule; grazing strategy; utilization standards; seasonal utilization standards; monitoring; mitigation measures; range improvements; salting & mineral practices; and fire protection. The AOIs may be changed to reflect new information based on applicable studies and/or field observations.

Adaptive management will be the tool by which livestock numbers can be adjusted (upwards or downwards) based on future allotment conditions if it appears that areas are experiencing a downward trend or upward trend due to range conditions. As needed and/or based on adaptive management strategies or actions, other instructions may be included in the AOI. AOIs may be adjusted throughout the grazing season as conditions change (AOIs may be amended during the grazing season due to under/over seasonal utilization, climatic changes, and other unexpected changes affecting management of the allotment.) Given projections for climate change in the region, drought and climate impacts are a particular concern over the course of implementation of this AMP. Completing AOIs for each permit each year and adjusting throughout the season as conditions change, provides the needed flexibility for livestock operations. Livestock numbers may vary annually, but would not exceed the maximum number set in the Final EA and DN-FONSI (See Tables 1 through 3 above).

If changes are suggested that fall outside the parameters of the DN-FONSI, they would be subject to additional NEPA analysis and possibly a decision by the responsible official. The Forest Service would make the determination whether or not to undertake a new NEPA analysis at the time the recommendation is brought forward. In most cases, the only situations that would require an updated NEPA analysis would be where unforeseen changed conditions have occurred that require management actions that have not been considered, and which may produce effects outside the scope of those predicted within the original NEPA analysis document. In circumstances where changes in conditions warrant implementation of a management option that has not been provided for in the NEPA analysis, or when the predicted effects of implementation are determined to be greater than the effects originally predicted, a supplemental or new NEPA analysis and NEPA-based decision is needed.

[6] Annual Operating Instructions (AOI): A set of instructions cooperatively developed by the Forest Service and range permittee on an annual basis that explains the specific pastures to be used and adjustments to the allotment management plan for the current year.

Standard Pasture Rotations (Including Kane Trailing)

Utilizing adaptive management to alter the grazing rotations would not apply to Summer Southeast, North or South Kane and the three holding pastures. These pastures are for transitional use for spring trailing and/or fall transition. Their season of use, duration, and intensity would not change with the potential exception being multiple years of rest in which trucking livestock and/or not utilizing the pasture is the change in management.

Table 2 (above) list the permitted livestock numbers and grazing seasons for North and South Kane pastures. The Northeast and Southeast pastures would only be built after signs and/or herding does not work. Use of the Northeast pasture would depend on water availability and there are no current plans to add additional water sources. Standard pasture rotations to be implemented includes a typical two-year rest rotation system including overlap in pasture timing to account for pasture moves, as follows:

Year 1: (May 15 to May 31) - Livestock may be herded up the Kane Trail that crosses through the South Kane and Summer Southeast Pastures to the Summer Northwest Pasture. Livestock may also be transported by semi-truck during this timeframe instead of utilizing the trail.

(May 15 to October 15) - Livestock may graze the Summer Northwest Pasture, with the livestock numbers scaling down in mid-September as the pasture move begins. The Murray holding pasture would be utilized to facilitate the pasture move.

(October 15 to November 30) - Livestock would transition through the North Kane pasture to winter range. Exact timing of transition would be dependent on fall snow storms.

Year 2: (May 15 to May 31) - Livestock may be herded up the Kane Trail that crosses through the South Kane and Summer Southeast Pastures to the Summer Southwest Pasture. Livestock may also be transported by semi-truck during this timeframe instead of utilizing the trail.

(May 15 to November 1) - Livestock would graze the Summer Southwest Pasture, with the livestock numbers scaling down as the pasture move begins.

(October 1 to November 30) - Livestock would transition through the Summer Southeast and South Kane pastures to winter range. The Little Pleasant Valley and Lookout Canyon holding pastures would be utilized to facilitate the pasture moves.

Trailing - North Kane Stock Trail ("Seasonal" Fall movement only – Optional)

Due to the significant amounts of *Pediocactus paradinei* that occur within the area of the North Kane Stock Trail, spring trailing of cattle from the House Rock Valley to the summer Forest pastures along the North Kane Stock Trail will not be authorized. However, fall (October 15 – November 30) movement of cattle from the Central Summer Northwest and Northeast pastures to the House Rock Valley BLM allotment through the North Kane Pasture is authorized.

Trailing - South Kane Stock Trail ("Seasonal" Spring movement only – Optional)

Livestock will be allowed to trail from the House Rock Valley BLM allotment to the summer Forest allotments using the South Kane Stock Trail. Spring trailing through the Pediocactus Paradinei Conservation Area is an optional way to move or transport livestock. Use of this trail can be discontinued at any time. Because this trail passes through a *Pediocactus paradinei* Conservation Area, livestock grazing and trailing through the area must follow the management and mitigation measures that are specified in the *Pediocactus paradinei* Conservation Agreement (September 2015). Those measures include the following:

- Use of this trail is considered optional. The permittee may continue truck livestock to the Central Summer allotment.
- The four mile portion of the South Kane Trail that crosses the conservation area must be surveyed annually to find additional cacti that may occur along the trail. This Survey must be conducted with Forest Service employees trained to identify the species during the April 15 to May 31 survey window. If the survey does not occur, the trail would not be authorized for use.
- Any cacti found on or near the trail would be avoided by either posting a ranch employee at that location to prevent livestock entry or by installing temporary fencing.
- The two locations along the trail containing "suitable habitat" would be flagged by the Forest Service. The permittee would be responsible for keeping the livestock directly on the trail and not allowing them to venture off.
- Use of this trail would be authorized for up to three days a year with the goal of moving livestock through and out of the conservation area on the first day.
- Effectiveness monitoring performed by Forest Service personnel or other qualified/trained persons, would be part of the annual survey. If the monitoring determines that the above mitigation measures have not been successful, use of the trail would be discontinued until a new mitigation measure is devised.
- If new information becomes available that determines a decline in the species and use of the trail by livestock is a direct, indirect, or cumulative effect; the use of the trail would be discontinued.

Also see Appendix "C" – *Mitigation Measures* for additional conservation measures.

Feed Supplements

Salt and protein feed supplements can be valuable tools to help distribute livestock if placed in proper locations at the proper time. Any supplements will be placed in locations away from water features, meadows, and sensitive soils, so as not to encourage livestock to concentrate in one location. (Also refer to appendix "C" Mitigation Requirements).

Maintenance of Structural Range Improvements

Structural range improvements are to be maintained annually and are to be kept in fully functional condition. Currently, several of the structural improvements in each allotment are in poor or non-functional condition. These improvements are to be replaced as funding and labor are available. However, the amount and timing of authorized livestock grazing may be reduced if the condition of the improvements impairs the ability of the permittee to manage their

livestock according to provisions of this Allotment Management Plan or Annual Operating Plans.

Maintenance responsibility for these improvements varies but, in general, maintenance responsibilities are the responsibility of the grazing permittee. The maintenance responsibilities for each improvement are shown in Appendix A – *"Structural Range Improvements for the Central Summer, Central Winter and Kane Allotments."* Additionally, a corresponding assignment of permittee maintenance responsibility will be included in Part 2 of the grazing permit associated with the Central Summer, Central Winter and Kane allotments. Unless noted otherwise, the permittee is responsible for all maintenance materials, supplies, equipment and labor necessary to properly maintain all range structural improvements. The Forest Service will provide materials and/or supplies for the replacement of structural range improvements (subject to funding availability) at the end of the improvement's life, as necessary (i.e., when the continued use is needed or when maintenance and repair is no longer feasible to keep the improvement functioning properly).

(Note: see Appendix A for Structural Range Improvements Table for the Central Summer, Central Winter and Kane Allotments.)

Reconstruction of Structural Range Improvements

As detailed in Appendix "A" - *"Structural Range Improvements Table for the Central Summer, Central Winter and Kane Allotments,"* structural range improvements will be completed as time, materials, and annual budgets, and allow. The Forest Service and the grazing permittee have an understanding and operate on a cooperative basis (i.e., a 50% / 50% partnership). However, when the Forest Service has funding available for improvements, the FS will aid in replacement of structural range improvement materials and/or supplies at the end of the improvement's life, as necessary (i.e., when the continued use is needed or when maintenance and repair is no longer feasible to keep the improvement functioning properly). The supply of FS procured materials may be offset by the grazing permittee by them supplying labor (voluntary personnel or hired staff) for installation of structural range improvements, as needed.

In addition to the above assignments for maintenance of structural improvements the following improvements need to be reconstructed on the Central Winter Allotment:

- Up to 10 existing earthen ponds would be modified to improve the water holding capability for livestock and wildlife at their existing location(s). [Note: earthen ponds that need to be modified or improved will be listed and prioritized within the AOIs]
- Approximately thirty miles of the existing Little Mountain pipeline system would be repaired or replaced, as funding, materials and labor becomes available. The Little Mountain storage tank that is part of the system may also need to be replaced. (Note: this work may be driven by monitoring of conditions on the ground and research results from cheat grass studies on the west side).
- Approximately three miles of allotment boundary fence (burnt in the 1996 Bridger Knoll fire) between the Central Summer South Pasture and the Ranger Pass pastures will need to be replaced.

VII. Monitoring

Appropriate monitoring will be performed to determine if management objectives are being met or if adaptive management changes are needed. Management objectives are listed in section II of this AMP above; the AOI will list adaptive management actions. Monitoring requirements will be included in each year's AOI to identify those activities for which monitoring is needed. All monitoring will be documented in a written report or e-mail as needed. Monitoring results and other data used to make determinations or make decisions regarding adaptive management strategies will be exchanged between Forest Service and the permittee or (associated Kane Ranch research personnel) in a timely manner after acquiring and/or proofing of data (data quality verification). Monitoring will occur, but the frequency varies by each activity and funding, and may be accomplished by the range permittee, Forest Service personnel, and/or third-party involvement in accordance with monitoring standards and protocols. Monitoring is adaptive, and as improved methods are developed these new methods would be considered. Standard monitoring requirements as detailed in the decision document (i.e., the DN-FONSI & Final EA), as well as terms and definitions associated with monitoring, are listed in **Appendix "D"- *Monitoring*.**

Permittee Monitoring:

To ensure that livestock grazing activities are maintaining forest resources in a desired condition (or moving towards them) the grazing permittee is responsible for the following monitoring and management activities:

When Cattle are grazed in the Central Summer Southwest pasture:

- Livestock permittee is required to monitor the meadows and area of the Southeast Summer Pasture periodically throughout the grazing season. Any livestock found during the June 1 to October 15 timeframe would be returned to the Southwest Summer Pasture. Random small bunches of less than 20 head that are found and removed a few times (i.e., 2 or less) a season would be acceptable.
- If large groups of livestock in excess of 20 head continue to return after a several removals (i.e., more than two, but not many more), the permittee would post a rider to inspect for and remove livestock on a weekly basis. This action would primarily be based on livestock impacts to meadow and riparian areas, greater than 10% use or damage to resource values.
- If livestock can regularly be found in the Southeast Summer pasture in spite of the efforts above, a fence would be constructed parallel to highway 67 (see page 13 of the Kane Ranch Final EA) with joint investment by the Forest Service and Permittee. This action would primarily be based on livestock impacts to meadow and riparian areas, greater than 20% use and/or evidence of trailing.

Forest Service Monitoring:

The following items will be monitored in accordance with livestock grazing on the Central Summer, Central Winter and Kane allotments as often as needed to assure compliance with the provisions specified in this AMP (this includes AOIs and the Terms and Conditions of the associated grazing permit): Permit and Permittee compliance, range readiness, forage production, forage utilization, condition and trend, precipitation, noxious weeds, threatened and endangered and sensitive species and soil condition. Long term condition and trend monitoring will be the standard for monitoring the effects of livestock use.

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, class of animal or modifications in grazing area rotations. Recommended changes would not exceed the limits for grazing intensity, livestock numbers, or the occurrence and frequency of livestock grazing defined in tables 1 through 3 above.

Rangeland conditions would be monitored to assess plant population stability and soil stability. Managers would adjust timing, duration, and frequency of livestock grazing in areas with declining conditions via the AOIs. Visual observations (documented in writing) would be conducted annually to assess permit compliance, range readiness, and forage production.

Forage utilization would be monitored to ensure that "conservative" grazing intensity is not exceeded.

Utilization is measured before the end of the growing season and is used to determine when livestock shall move (on applicable pastures) to the next pasture in the rotation. Other factors that aid in rotation decisions include weather patterns, the likelihood of plant regrowth, and previous years' utilization levels. Livestock would move to the next pasture when grazing intensity approaches a conservative level (30-40% utilization).

Long-term trend monitoring would be conducted at the historic Parker Three-Step plot locations on the allotment every 5 to 10 years, or as funding becomes available. Monitoring data at the Parker Three-Step plots currently includes frequency, canopy cover, dry-weight rank, comparative yield, repeat photography, and ground cover to estimate trend. Plant frequency, ground cover, canopy cover, and repeat photography is used to assess rangeland trend; dry-weight rank is used to estimate relative species composition by weight; and comparative yield is used to estimate forage production.

IX. Additional Items - Natural Lakes, Earthen Ponds & Springs

Natural Lake Fencing

Partial to full livestock access may resume at Dry Park, West, Murray and Snipe Lakes and fully excluding four new natural lakes. The lakes that would be resuming some level of livestock access have been modified by equipment and contain limited to no riparian vegetation.

- Dry Park Lakes - Does not contain wetland habitat or riparian vegetation; livestock access may resume on one of the two lakes. The second lake would continue to be excluded from livestock by an existing fence line that divides the two lakes.
- Murray Lakes - Consists of two lakes that are currently divided by a fence. The lake that contains riparian vegetation would continue to be excluded to livestock. The other lake may be used by livestock during the period that the Murray holding pasture is utilized.
- West Lakes - Contains three lakes. The two lakes that contain riparian vegetation would be separated from the third lake by constructing 400 feet of wildlife accessible fence. The third lake would resume limited livestock access. An exclosure will be built with a livestock lane to a stock tank(s) in a design to protect riparian and heritage resources while providing livestock water.
- Snipe Lake – Has limited riparian vegetation. A fence will be constructed to allow livestock access to approximately a third of the lake. Livestock access to the Lake would only be authorized for limited windows to facilitate rounding up livestock.
- Bear, Cougar, Indian, and Wall Lakes – [Note: Bear, Indian and Wall Lakes will not be excluded until completion of the Grand Canyon National Park Bison EA.] Fences will be constructed to fully exclude livestock from these lakes. Cougar Lake has a fence that would be converted to an exclusion fence. Indian Lake could be excluded by the construction of the Highway 67 right-of-way fence and plans to exclude the area from livestock. If the Southern section of the highway right-of-way is not constructed, an exclusion fence would be constructed around the lake and adjoining riparian area. Bear and Wall Lakes would be excluded by a potential combination of terrain, tree felling, and small fence segments that would encompass the riparian area.
- Fourteen lakes that were in the 2001 EA would continue to be partially or fully excluded from livestock use. [Note: page 91 of the 2013 Kane Ranch AMP EA listed the following lakes: Corral, Crane, Deer, Dog, East, Fracas, Franks, Indian, Glen, Lookout, Mile and a Half, Oquer, Three and VT. Notations made within Appendix A; some of these lakes are listed in the bullets preceding this one - above].

Earthen Ponds

Up to ten (10) earthen ponds or wildlife guzzlers may be modified across the Central Summer Allotment for the purposes of increasing water availability in drier years. Earthen ponds that currently do not hold water due to erosion or sedimentation, may be repaired and potentially lined. Wildlife specific (livestock excluded) ponds that are currently not functioning would be repaired or replaced on the same location. The ponds proposed for modification, including their priority, will be included or listed within the AOIs.

Spring Restoration

Up to 20 spring-improvement projects would be completed within the project area to restore full or partial natural flow and riparian vegetation. Existing spring improvements would be removed where human and livestock improvements are no longer necessary. Fences would be built, removed, or modified to best protect the spring while still providing water to livestock and wildlife where necessary. The following are specific spring restoration and improvements:[7]

- Acer Unnamed Spring – (Kanab Creek Wilderness). Remove old spring box to restore more natural spring flow and to enhance riparian vegetation.
- Big Spring – (Forest Service Big Springs Administrative Site). Construct a small stepping stone trail to the spring source area to reduce erosion. Increase the area of riparian habitat at the base of the slope by increasing channel width and sinuosity. (partially completed in 2014)
- Castle Spring – (one mile south of Big Spring in cattle exclosure area). Adjust and remove current fencing to better protect site. Alter or remove existing pipeline system to allow more natural spring flow and to enhance riparian vegetation. (Completed in 2014)
- Locust Spring – (South Summer Pasture). If possible, alter or remove existing pipeline system to allow more natural spring flow and to enhance riparian vegetation.
- Mangum Spring – (North Summer Pasture). If possible, alter or remove existing pipeline system to allow more natural spring flow and to enhance riparian vegetation.
- Mangum Springs 1 – (North Summer Pasture). If possible, alter or remove existing pipeline system to allow for more natural spring flow and to enhance riparian vegetation. Construct a trail of stepping-stones to the source to reduce site erosion.
- Mangum Springs 7 – (North Summer Pasture). If possible, alter or remove existing pipeline system to allow more natural spring flow and to enhance riparian vegetation.
- Oquer Spring – (South Summer Pasture). Remove spring box and old fencing to restore the site to a wet meadow. Add fencing around spring source if needed.
- Pasture Spring – (Southwest Summer Pasture). If possible, alter or remove, pipe and drinker system or to maximize riparian vegetation while maintaining drinker water. Fence the spring source to enhance riparian vegetation.
- Pigeon Spring – (Snake Gulch, Kanab Creek Wilderness) Remove all piping, troughs, and fencing to improve open water riparian habitat.
- Table Rock Spring – (Snake Gulch, Kanab Creek Wilderness). No changes would be done to current management because it would take a massive effort to undo a higher impacted historic livestock/human use water source. It also makes sense to leave this watering site for packhorses and human consumption in this dry gulch.
- Watts Spring – (South Summer Pasture). Fence the hill slope spring source to enhance the native riparian vegetation.

Spring restoration work would be largely completed with grant funding and volunteer labor with oversight by the Forest Service. Great care shall be taken to protect archeological resources and maintain the integrity of the spring source and existing riparian vegetation.

[7] (listing per "Soils, Watershed, and Air Quality Specialist's Report for Kane Ranch Allotments Management Environmental Assessment," MacDonald - January 2013)

IX. Travel Management Guidelines / Restrictions

The range permittee or any contractor performing work on behalf of the permittee, are required to follow or utilize the public transportation system as designated by the NKRD Motor Vehicle Use Map (MVUM), dated August 15, 2014, as annually updated thereafter. The only exception to this rule is for those fence line roads and other allotment or pasture roads that necessary to manage, administer, repair, maintain, or construct features as outlined in the AOI or grazing permit, and for loading and unloading stock. AOIs and/or the grazing permits must include specific information pertaining to road numbers or locations (i.e., fence line, water-line and cow tank locations) so that appropriate road use by the permittee can be determined. The permittee will be held responsible and accountable for any resource damages caused by other off-road travel or use of roads during periods of wet weather, which is not specified or detailed in the AOI or grazing permit. The AOI and/or grazing permit should clearly indicate that utilization of any road is not authorized during periods of wet weather; seasonal weather conditions and natural events may render designated roads or trails impassible for extended periods.

References:

- USDA Forest Service, *Final Decision Notice and Finding of No Significant Impact for the Kane Ranch Allotment Management Plan EA*, North Kaibab Ranger District - Kaibab National Forest, Coconino and Mojave Counties, Arizona, November 2013.
- USDA Forest Service, Southwestern Region, *Kane Ranch Allotment Management Plan, Final Environmental Assessment*, September 2013.
- USDA Forest Service, *Motor Vehicle Use Map for North Kaibab Ranger District, Kaibab National Forest, Arizona* (September 2015, as updated annually).
- USDA Forest Service, Forest Service Handbook, Southwest Region (Region 3), Albuquerque, NM, FSH 2209.13 – Grazing Permit Administration Handbook; Chapter 90 – Rangeland Management Decisionmaking. Supplement No.: R3-2209.13-207-1, Effective Date: September 8, 2007.
- USDA Forest Service, WO Amendment 2209.13-2005-10, FSH 2209.13 – Grazing Permit Administration Handbook. Chapter 90 – Rangeland Management Decisionmaking. (Effective Date: 09/09/2005. Duration: This amendment is effective until superseded or removed.) 16 pages.
- USDA Forest Service. 2005. *Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds: Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mojave, and Yavapai Counties, Arizona*; MB-R3-16-1; January.
- Appendix B of the Three Forest Integrated Treatment of Noxious or Invasive Weeds Environmental Impact Statement would be implemented (USDA 2005).
- USDA Forest Service. 2003. *First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities Among New Mexico Historic Preservation Officer, and Arizona State Historic Preservation Officer and Texas State Historic Preservation Officer, and Oklahoma State Historic Preservation Officer, and the Advisory Council on Historic Preservation, and United States Department of Agriculture Forest Service Region 3.*
- USDA Forest Service. 2007. Appendix H, *Standard Consultation Protocol Rangeland Management*, pp. 61-67. In, First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities Among New Mexico Historic Preservation Officer, and Arizona State Historic Preservation Officer and Texas State Historic Preservation Officer, and Oklahoma State Historic Preservation Officer, and the Advisory Council on Historic Preservation, and United States Department of Agriculture Forest Service Region 3.
- Additional Heritage references available at North Kaibab Ranger District (NKRD) Headquarters in Fredonia, Arizona:
  - 2013 "Kane Ranch Allotment Management Plan, Coconino County, Arizona; Project No(s). 2012-07-19 and 2013-07-30 Memo" (File code 2360 dated June 24, 2013) in the implementation file.
  - 2013 Addendum to the Kane Allotment Management Plan Revision: H.R. Assessment. North Kaibab Ranger District, Kaibab National Forest. Report #2013-07-030 on file at the NKRD. (Connie Reid, Britt Betenson, and Tanner Whetstone)
  - 2012 Kane Ranch Allotment Management Plan 2013. North Kaibab Ranger District, Kaibab National Forest. Report #2012-07-019 on file at the NKRD. (Connie Reid and John Hanson)
  - 2006 A Proposed Survey Strategy for the North Kaibab Ranger District. North Kaibab Ranger District, Kaibab National Forest. On file at the NKRD.
  - 2000 Kane Ranch Allotment Management Plan. North Kaibab Ranger District, Kaibab National Forest. Report #1999-07-04 on file at the NKRD.
- 2015 (Sept.) Candidate Conservation Agreement – Paradine (Kaibab) Plains Cactus (*Pediocactus paradinei*) among US Fish & Wildlife Service, US Forest Service, Kabab National Forest, Bureau of Land management, Arizona Strip District, Amended and Revised September 2015.

Appendix A

Structural Range Improvements Table for the Central Summer, Central Winter and Kane Allotments

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Summer	Tilton Spring	2	1	Permittee
	Road 224G Pond	6	1	
	Dugway Pond	7	1	
	Bear Spring Pond (ke fencing)	8	1	
	Big Saddle Pond	10	1	
	Big Saddle Corral	10a	1	
	Oak Pond #1	11	1	
	Sowats/Central Summer Fence	13	5 mi	
	Oak Pond #2	16	1	
	Oak Pond #3	17	1	
	Oak Pond #4	18	1	
	Oak Pond #5	19	1	
	Snipe Pond (2001 DN-FONSI)	23	1	
	Top Grouse Pond #1	24	1	
	Glen Lake Pond (2001 DN-FONSI)	25	1	
	Indian Hollow Pond (fencing?)	26	1	
	Indian Hollow Corral	26a	1	
	Top Grouse Pond #2	27	1	
	Bee Spring	28	1	
	Parrisisawampitts Spring	29	1	
	Parrisisawampitts Corral	29a	1	
	Road 274a Pond	30	1	
	Grassy Pond	31	1	
	Locust Spring	32	1	
	Timp Spring	33	1	
	Quaking Aspen Spring	34	1	
	Quaking Aspen Corral	34a	1	
	Oquer Lake Fence (2001 DN-FONSI)	35	1	Forest Service
	Upper Two Springs	36	1	Permittee
	Oquer Spring	37	1	
	4188 Pond	38	1	
	East Lake Pond (2001 DN-FONSI)	39	1	
	Lookout Canyon Pond	40	1	
	Lookout Canyon Corral	40a	1	
	Snipe Lake Pond (2001 DN-FONSI)	41	1	
	Snipe Lake Corral	41a	1	
	Big Saddle Point Pond	42	1	
	Joes Mudhole Pond	43	1	
	Joes Mudhole Corral	43a	1	

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Summer	Central Summer/Winter Fence	45	15 mi	Permittee
	Dry Parks Lakes (2001 DN-FONSI)	47	2	
	Dry Park Lakes Corral	47a	1	
	Castle Canyon Spring	49	1	
	Castle Canyon Corral	49a	1	
	Castle Canyon Fence	51	1	
	Riggs Spring	52	1	
	Riggs Corral	52a	1	
	Riggs Water Trough	52b	1	
	Riggs Pasture Fence	54	1	
	South Big Springs Pond	55	1	
	Timp Pond	57	1	
	Francis Lakes Pond	58	1	
	Francis Lakes Corral	58a	1	
	Lookout Pond #2	59	1	
	Lookout Pond #2 Fence (2001 DN-FONSI)	59a	1	
	Corral Lake Pond	60	1	
	Corral Lake Fence (2001 DN-FONSI)	60a	1	
	Lookout Pond #3	61	1	
	Lookout Pond #3 Fence (2001 DN-FONSI)	61a	1	
	Moquitch Pond	62	1	
	Moquitch Corral	62a	1	
	Lookout Pond #4	63	1	
	Lookout Pond #4 Fence	63a	1	
	Mile and a Half Pond (2001 DN-FONSI)	64	1	
	Mile and a Half Pond Corral	64a	1	
	Lookout Pond #5	65	1	
	Lookout Pond #5 fence	65a	1	
	Jackson Pond	66	1	
	Jackson Pond Corral	66a	1	
	Lookout Pond #6	67	1	
	Lookout Pond #6 Fence	67a	1	
	Fracas Canyon Pond (2001 DN-FONSI)	68	1	
	Mud Lake Pond	69	1	
	Mud Lake Pond Fence	96a	1	
	Road 633 Dead End Pond	70	1	
	Murray Ponds	71	2	
	Murray Pond Corral	71a	1	
	Road 633 Pond #1	72	1	
	Road 633 Pond #2	74	1	
	Road 633d Pond	85	1	
	Road 758/762 Pond	87	1	
	Road 757/757D Pond	90	1	

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Summer	Road 268/268b Pond	96	1	Permittee
	Road 268a Pond #1	98	1	
	Lower Moquitch Pond	102	1	
	Warm Springs Pond	103	1	
	Blowdown Pond	106	1	
	Upper Moquitch Pond	107	1	
	Road 769 Pond	108	1	
	Road 769 Pond Fence	108a	1	
	Road 769x Pond	109	1	
	Road Hollow Pond	111	1	
	Road Hollow Corral	111a	1	
	Burnt Corral Pond	112	1	
	Burnt Corral Pond Fence	112a	1	
	Road 759 Pond #1	114	1	
	Road 759 Pond #2	115	1	
	Road 760 Pond #1	116	1	
	North Blowdown Pond	117	1	
	Aspen Pond	118	1	
	VT Ridge Pond #1 (2001 DN-FONSI)	119	1	
	VT Ridge Pond #2 (2001 DN-FONSI)	120	1	
	Road 760 Pond #2	122	1	
	Road 760 Pond #2 Fence	122a	1	
	Road 274a 1.2 Mile Pond	123	1	
	Road 274 2.6 Mile Pond	125	1	
	Road 274 3.6 Mile Pond	126	1	
	Road 416 3.3 Mile Pond	128	1	
	Road 268a Pond #2	129	1	
	Stina Pond	131	1	
	Road 633d 2.7 Mile Pond	132	1	
	Mid Burnt Corral Pond	133	1	
	Locust point Pond	135	1	
	Mid Oak Canyon Pond	138	1	
	Mid Moquitch Pond	139	1	
	Round Valley Pond	141	1	
	Fence Ridge Pond #3	142	1	
	Jackson Pond #2	144	1	
	Road 759 Pond #3	145	1	
	Road 759 Pond #4	147	1	
	Road 759b Pond #1	148	1	
	Three Lakes Pond (2001 DN-FONSI)	153	1	
	Three Lakes Fence (2001 DN-FONSI)	153a	1	
	Jack Pond	163	1	
	Mangum Spring (Camp only)	167	1	

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Summer	South Blowdown Pond	180	1	Permittee
	Squaw Spring	185	1	Permittee
	Big Saddle Line Cabin	205	1	Permittee*
	Moquitch Spring & Trough	207	1	Permittee
	Road 430a Pond	221	1	
	Brown Canyon Pond	224	1	
	Road 640 Pond #1	228	1	
	Oak Pond #6	229	1	
	Road 430 Pond	230	1	
	Fripe Pond	265	1	
	Ryan/Central Summer Fence	3839	12	
	Central Summer/Buffalo Fence	3879	5	ADG&F
	Spare Pond	3880	1	Permittee
	Burn Pond	3881	1	
	Saddle Fire Fence	3882	2	
	Vaughn Pond	3883	1	
	Sour Dough Pond	3887	1	
	Airport Corral	3888	1	
	Crystal Springs	3889	1	
	Crystal Springs Fence	3889a	1	
	Crystal Springs Pond	3890	1	
	Dog Lake (Fence? 2001 DN-FONSI)	3892	1	
	Dog Canyon Pond	3893	1	
	Tater Canyon Spring	3894	1	
	Tater Canyon Pipeline #1	3894a	1	
	Tater Canyon Trough #1	3894a	1	
	Tater Canyon Pipeline #2	3894b	1	
	Tater Canyon Trough #2	3894b	1	
	Tater Canyon Pipeline	3894c	7 miles	Permittee/ Mackelprang
	Little Pleasant Valley Pond	3896	1	Permittee
	Little Pleasant Valley Corral	3896a	1	Permittee
	Crane Lake Fence (2001 DN-FONSI)	3897	1	Forest Service
	Telephone Hill Pond	3898	1	Permittee
	Sink Hole Pond	3899	1	
	Three Lakes East Corral	3900	1	
	Jolly Sink Road Pond	3901	1	
	Ridge Pond	3902	1	
	Buffalo Hill Pond	3904	1	
	Buffalo Hill Pond Fence	3904a	1	
	Big Ridge Pond	3905	1	
	Big Ridge Corral	3905a	1	
	Makelprang Pond	3907	1	

Appendix A (continued)

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Summer	Three Lakes East Pond	3908	1	Permittee
	Three Lakes East Fence	3908a	1	
	Jolly Sink Pond	3909	1	
	Jolly Sink Corral	3909a	1	
	Sorenson Pond	3915	1	
	Water Tank Road #628	3919	1	
	Jacks Pond #2	3921	1	
	S. Three Lakes Pond Road 282	3921	1	
	Road 241/633 Pond	3923	1	
	Red Point Pond #2	3951	1	
	Road 262 Pond #1	3954	1	
	Road 262 Pond #2	3965	1	
	Allen Tank West 282	3967	1	
	Pleasant Valley Cabin	3968	1	FS / Permittee*
	Pleasant Valley Corral	3968a	1	Permittee
	Rolly's Pond Road 282	3971	1	
	East Branch Pond South	3983	1	
	Fence Ridge Pond #1	3984	1	
	Fence Ridge Pond #2	3985	1	
	Tater Canyon Pond	3986	1	
	Tater Point Pond #1	3987	1	
	John's Pond	3989	1	
	Tater Point Pond #2	3998	1	
	Blowdown Pond	3999	1	
	Question Pond	4000	1	
	Marble View Sink Pond	4001	1	
	Central Summer Division Fence	4015	14 mi	
	Nail Pond Road 454	4019	1	
	Upper Pond Erosion Control	4020	1	
	Willie Air Patch pond	4021	1	
	Hole in the Rock Pond	4022	1	
	VT Sink Hole #1	4024	1	
	VT Sink Hole #2	4025	1	
	Pit Pond Road 206	4026	2	
	Steep Pond	4032	1	
	North Oak Pond	4033	1	
	South Oak Pond	4034	1	
	Red Point Pond	4035	1	
	Clear Cut Pond	4036	1	
	Francas Canyon North Pond	4038	1	
	Moquitch Pont Pond	4039	1	
	Oquer Pond (2001 DN-FONSI)	4040	1	
	Pond 416/422	4041	1	

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Summer	Pond Road 416	4042	1	Permittee
	South Fracas Canyon Pond	4043	1	
	Cross Over Pond	4044	1	
	Buffalo Trick Tank Apron	4045	1	
	Buffalo TT Storage Tank	4045a	1	
	Buffalo TT Trough #1	4045b	1	
	Buffalo TT Trough #2	4045c	1	
	Buffalo TT Pipelines	4045d	2	
	Buffalo TT Fence	4045e	1	
	Buffalo TT Overflow Pond	4045f	1	
	East Branch Pond North	4091	1	
	South Big Saddle Point Pond	4092	1	
	Upper Sowats Pond	4093	1	
	Bee Spring Point Pond	4094	1	
	Harold's Pond	4095	1	
	Road 272a Pond	4097	1	
	Junction 218/425 Pond	5009	1	
	Big Saddle Trough	5011	1	
	South Dog Canyon Pond	5020	1	
	Road 610E Pond	5021	1	
	Upper Tater Canyon Pond	5022	1	
	Dog Point Pond	5023	1	
	Road 610k Pond	5024	1	
	Road 2569 Pond	5025	1	
	Junction Pond	5031	1	
	Dave's (Sleepy) Pond	5034	1	
	Kay's Pond	5035	1	
	Sniper Pond	5036	1	
	Frank's Lake Fence (2001 DN-FONSI)	5041	2	
	North Canyon Upper Drift Fence	(2001 DN-FONSI)	1	
	North Canyon Lower Drift Fence	(2001 DN-FONSI)	1	

Appendix A (continued)

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Winter	Oak Corral Trough	3a	1	Permittee
	Oak Corral	3c	1	
	Faver Pond	4	1	
	Slide Pond	5	1	
	Slide Corral	5a	1	
	Big Saddle pond	10	1	
	Big Saddle Corral	10a	1	
	Sowats/Central Summer Fence	13	4 mi	
	Sowats/Central Winter Fence	14	3 mi	
	Sowats Pond	15	1	
	Sowats Corral	15a	1	
	Sowats Spring	21	1	
	Indian Hollow Pond (fencing?)	26	1	
	Indian Hollow Corral	26A	1	
	Central Summer/Winter Fence	45	14 mi	
	Lookout Pond #1	50	1	
	Lookout Pond #1 Fence	50a	1	
	Castle Canyon Fence	51	1	
	West Lake Pond (2001 DN-FONSI)	56	1	
	West Lake Corral	56a	1	
	Pine Flat Pond	73	1	
	Pine Flat Corral	73a	1	
	Jumpup Pond	77	1	
	Big Cove Pond	76	1	
	Jumpup Spring	77	1	
	East Side Pond	80	1	
	East Side Corral	80a	1	
	South Slide Pond	81	1	
	South Slide Corral	81a	1	
	Jumpup Cabin Corral	82	1	
	Jumpup Cabin	83	1	Forest Service
	Tablerock Pond	84	1	Permittee
	Tablerock Corral	84a	1	
	Bone Hollow Pond	86	1	
	Bone Hollow Corral	86a	1	
	Little Sowats Spring	88	1	
	White Spring	89	1	
	Buck Horn Pond	91	1	
	White Pockets Corral	92	1	
	Oak Drift Fence	93	1	
	Pine Hollow Pond	100	1	
	White Pockets Pond	101	1	
	Slide Elbow Pond	104	1	
	Divide Pond	105	1	

Appendix A (continued)

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Winter	Mather's Pond	110	1	Arizona Game & Fish Department And Forest Service
	Dinner Pockets Trick Tank Apron	113	1	
	Dinner Pockets Storage Tank	113a	1	
	Dinner Pockets Trough	113b	1	
	Dinner Pockets Fence	113c	1	
	Little Spring Trick Tank Apron	121	1	
	Little Springs Storage Tank	121a	1	
	Little Springs Trough	121b	1	
	Little Springs Fence	121c	1	
	Horse Springs Trick Tank Apron	124	1	
	Horse Springs Storage Tank	124a	1	
	Horse Springs Trough	124b	1	
	Horse Springs Fence	124c	1	
	Jensen Trick Tank Apron	127	1	
	Jensen Storage Tank	127b	1	
	Jensen Trough	127c	1	
	Jumpup Trick Tank Apron	130	1	
	Jumpup Storage Tank	130a	1	
	Jumpup Trough	130b	1	
	Jumpup Fence	130c	1	
	Rice Hollow Trick Tank Apron	134	1	Permittee
	Rice Hollow Storage Tank	134a	1	
	Rice Hollow Trough	134b	1	
	Rice Hollow Fence	134c	1	
	Kwagunt Trick Tank Apron	137	1	
	Kwagunt Storage Tank	137a	1	
	Kwagunt Trough	137b	1	
	Kwagunt Fence	137c	1	
	Gooseneck Trick Tank Apron	140	1	
	Gooseneck Storage Tank	140a	1	
	Gooseneck Trough	140b	1	
	Gooseneck Fence	140c	1	
	Pine Hollow Trick Tank Apron	143	1	
	Pine Hollow Storage Tank	143a	1	
	Pine Hollow Trough	143b	1	
	Pine Hollow Fence	143c	1	
	Ranger Pass Trick Tank Apron	146	1	
	Ranger Pass Storage Tank	146a	1	
	Ranger Pass Trough	146b	1	
	Ranger Pass Fence	146c	1	
	Slide Pasture Fence	150	13 mi	
	Jumpup Pasture Fence	151	4 mi	Forest Service

Appendix A (continued)

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Central Winter	Oak Pasture Fence	152	.5 mi	Permittee
	Ryan/C. Winter Fence	155	.5 mi	
	Slide Spring	165		
	Sowats Trick Tank Apron	176	1	
	Sowats Storage Tank	176a	1	
	Sowats Trough	176b	1	
	Sowats Fence	176c	1	
	Little Mountain Pipeline	194	2 mi	
	Little Mountain Pump	194a	1	
	Little Mountain Storage Tank	194b	1	
	Slide Pipeline System	196	23 mi	
	Slide Pipeline Addition	196b	2 mi	
	Slide Pipeline Addition	196c	2 mi	
	Table Rock Trough	196d	1	
	Willow Canyon Trough	196e	1	
	White Pockets Trough	196f	1	
	Buckhorn Pond Trough	196g	1	
	Lower White Pockets Trough	196h	1	
	Board Corral Trough	196i	1	
	South Slide Trough	196j	1	
	Slide Trough #1	196l	1	
	Slide Trough #2	196m	1	
	Upper Ranger Trough	196n	1	
	Little Mountain Trough	196p	1	
	West Fall Pasture Fence	198	15 mi	
	Board Corral Pond	201	1	
	Board Corral Fence	201a	1	
	Big Saddle Cabin	205	1	Permittee*
	Sawmill Pond	220	1	Permittee
	Sawmill Pond Fence	220a	1	
	White Pockets Exclosure	243	1	Forest Service
	Road 218a Pond	5005	1	Permittee
	Lower Sawmill Pond	5006	1	
	Road 255 Pond	5007	1	
	Road 255a Pond	5008	1	
	Ranger-Slide Holding Pasture		1	

Structural Range Improvements Table (Central Summer, Central Winter and Kane Allotments)

Allotment	Improvement Name	Improvement Number	Number of units	Maintenance Responsibility
Kane	Seegmiller Trick Tank Apron	3803	1	Permittee
	Seegmiller Storage Tank	3803a	1	
	Seegmiller Trough	3803b	1	
	Seegmiller Fence	3803c	1	
	N. Kane/C. Summer Fence	9877	9 mi	
	S. Kane/C. Summer Fence	3878	4 mi	
	Kane Division Fence	3916	3 mi	
	Kane Springs	3917	4	
	Kane Pipeline	3917a	2 mi	
	Kane Forest Boundary Fence	3925	7 mi	
	Kane/Buffalo Fence	3927	1 mi	
	South Houserock Storage Tank	3934	1	
	South Houserock Trough	3934a	1	
	South Houserock Fence	3934b	1	
	Kane Pond	3934c	1	
	Kane Trick Tank Apron	3970	1	
	Kane TT Trough #1	4056	1	
	Kane TT Fence	4056a&b	1	
	Kane TT Pipeline	4056c	2 mi	
	Kane TT Trough #2	4056d	1	Permittee
	South Rock Pond	4057	1	Permittee
	Kane Corral		1	

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Appendix B

DESIGN FEATURES

Refer to Appendix "C" – *Mitigation* and Appendix "D" – *Monitoring* concerning Heritage, Wildlife, and sensitive or endangered species protocols to be followed.

The following design features apply to the management of any allotment or pasture area associated with the Kane Ranch Allotment Management Plan, unless otherwise stated or varied by scientific research areas such as test plots or other controlled areas. These design features were listed in the NEPA documentation (including resource specialists reports) and included or referenced within the DN-FONSI and Final Environmental Assessment (EA). The design features purpose is to minimize and reduce potential impacts from associated management activities.

Allotment Management Plan (AMP):

A plan cooperatively developed by the range permittee and Forest Service that lists management practices, cattle numbers, improvement needs, salting practices, and administrative policies. Each AMP shall become a part of Part 3 of the grazing permit with a letter to the permittee(s) notifying them of this modification.

Annual Operating Instructions (AOI):

A set of instructions cooperatively developed by the Forest Service and range permittee on an annual basis that explains the specific pastures to be used and adjustments to the allotment management plan for the current year. Actions in the AOIs must be within the scope of the project-level decision (i.e., the Final EA and DN-FONSI), and as such are not required to undergo any additional site-specific environmental analysis.

Annual operating instructions (AOI) document adjustments to livestock numbers and time and duration of pasture use based on current and anticipated range conditions. Annual operating instructions may be adjusted throughout the grazing season as conditions change. Livestock numbers may vary annually, but would not exceed the maximum number set in this decision. The annual minimum livestock number is zero.

The AOIs may be changed to reflect new information based on applicable studies and/or field observations. If changes are suggested that fall outside the parameters of the decision resulting from this EA, they would be subject to NEPA analysis and a decision by the responsible official. The Forest Service would make the determination whether or not to undertake a new NEPA analysis at the time the recommendation is brought forward.

To the extent feasible, the AOI should be developed with the permittee. The AOIs shall clearly and concisely identify the obligations of the permittee and the Forest Service, and clearly articulate annual grazing management requirements, standards, and monitoring necessary to document compliance.

The AOI should set forth:

1. The maximum grazing use authorized on the allotment for the current grazing season and should specify numbers, class, type of livestock, and timing and duration of use.
2. The planned sequence of grazing on the allotment, or the management prescriptions and monitoring that will be used to make changes.
3. Structural and non-structural improvements to be constructed, reconstructed, or maintained and who is responsible for these activities.
4. Allowable use or other standards to be applied and followed by the permittee to properly manage livestock.
5. Monitoring for the current season that may include, among other things, documentation demonstrating compliance with the terms and conditions in the grazing permit, AMP and AOI. In addition, the permittee may be asked to provide information regarding livestock distribution or the condition of improvements. Where adaptive management prescriptions are being followed, this section of the AOI must provide details about those monitoring items and decision points needed to determine when a change is necessary and to guide the direction that those changes take.

Utilization:

The definitions of utilization and seasonal utilization are adopted from protocols developed by the Society of Range Management and the Region 3 Regional Forester (Smith et al. 2005). If monitoring shows maximum utilization rates are exceeded the grazing schedule and/or permitted numbers would be adjusted the following year to better match forage conditions. If utilization rates continue to exceed the established guideline the grazing management system would be altered to ensure that utilization is within the desired limit.

Best Management Practices for Livestock Grazing:

The following grazing practices were selected for the Allotments through the integrated resource management process and would also apply:

- *Pastures are alternately rested and grazed in a planned sequence*. Livestock rotate in a planned grazing system that alternates rest and grazed periods throughout a given year and from year to year. A deferred rest rotation grazing system meets this practice.
- *Grazing at a level that would maintain enough cover to protect soils and maintain or improve the quantity and quality of desired vegetation*. This practice would be applied through the utilization guidelines for all action alternatives.

Monitoring: (See Appendix "D" – *Monitoring*.)

Permittee and permit compliance; allotment inspections; range readiness; forage production; rangeland utilization; condition and trend; precipitation; noxious weeds; threatened and endangered species; and soil condition should be monitored. Long-term condition and trend monitoring will be the standard for monitoring the effects of livestock use.

Fencing:

Newly constructed and reconstructed fencing would have a smooth bottom wire 18-inches above the soil surface and a top wire no higher than 42-inches to facilitate wildlife passage. Elk jumps and goat bars (PVC pipes placed on the bottom two strands of fence wire and on the top strand at a crossing point) would be installed along new fences or along existing fences on game trails and known migration corridors as volunteers and funding are available. As fence inventories are completed, those fences that are complete barriers to wildlife would be modified. Fences deemed unnecessary by both the grazing permittee and the Forest Service would be removed as opportunities (e.g., funding) become available. Fencing guidelines from both the Arizona Game and Fish Department, and Arizona Department of Transportation will be reviewed and evaluated for wildlife friendly fencing design standards, which may be applicable.

Heritage/Cultural Resources:

The Kane allotments cover an estimated 475,100 acres. In addition to modifications in cattle numbers and rotation seasons, the Kane AMP includes various infrastructure changes. These developments, or subprojects, lie in varying terrain and vegetation, spread widely over the NKRD. All improvements that will result in ground disturbance were assessed to determine the adequacy of existing heritage/cultural resource inventories. Any locations lacking adequate survey were intensively inventoried. Approximately 761 acres were newly surveyed during the 2012 assessment phase and a clearance report was submitted to the Arizona State Historic Preservation Office (AZSHPO) on January 24, 2013. The AZSHPO concurred with the findings in the report on February 28, 2013 pending clarification of a few questions regarding the use of the historic cattle drive. Several modifications were made to the proposed action; therefore an addendum report was submitted to the AZSHPO on May 13, 2013. This report addressed the proposal modifications as well as included clarifications to the AZSHPO questions on the first report. The AZSHPO concurred with addendum on June 6, 2013.

The following are a list of general management recommendations and mitigation measures for specific activities, locations or sites. These measures are designed to ensure that there will be no adverse effects to cultural resources under the Kane Ranch AMP guidelines. Project administrators must consult and coordinate with the NKRD staff archaeologist prior to project implementation to ensure that these protection measures are followed.

- Archaeologists will work with KNF range staff to ensure the ranch managers are aware of the location of eligible or unevaluated sites located along the Kane trail/road. Wranglers will be required to take special care in these locations to confine cattle movement to the trail/road. Archaeologists will conduct post monitoring of the route following initial use. If impacts are observed, mitigation measures such as fencing the sites or discontinuing use of the route as a cattle driveway will be implemented. The KNF will share the results of monitoring with the AZSHPO and consult on appropriate mitigation measures as needed, prior to implementation.
- Future construction, maintenance or replacement projects associated with existing dirt tanks and guzzlers, natural springs restoration, Little Mountain pipeline restoration and research enclosure/exclosure fencing structures will be addressed in future clearance

reports as the decision to implement these projects is made. Completion of all Section 106 requirements, including inventory and establishment of any necessary site avoidance or mitigation measures will be required prior to implementation of any of these projects as per Appendix H of the Region 3 First Amended Programmatic Agreement (2007) which permits phased survey and consultation for these improvements.

- Should any previously unidentified cultural materials be discovered during project implementation, work must cease immediately and the NKRD Archaeologist must be contacted to initiate the consultation process as outlined in the Advisory Council on Historic Preservation Regulations (36 CFR Part 800.13.(b)(3)). In the event that there are activities proposed that are not covered in this report, additional review by the Forest Archaeologist will be needed.

Please keep a copy of the June 24, 2013 "*Kane Ranch Allotment Management Plan, Coconino County, Arizona; Project No(s). 2012-07-19 and 2013-07-30 Memo*" (File code 2360) in the project planning and implementation files. Please contact Connie Reid (928) 643-8165 regarding any questions or coordination effort related to heritage and/or cultural surveys.

Wildlife (including threatened, endangered, and sensitive species):

Threatened and endangered species are those listed under the Endangered Species Act of 1973. On the Kaibab NF, these species include the California condor, Mexican spotted owl, Apache trout (*Oncorhynchus apache*), and Fickeisen Plains cactus (*Pediocactus peeblesianus var. fickeiseniae*) at the time of this AMPs implementation. Region 3 Sensitive Species are those plants and animals identified by the Regional Forester for which population viability is a concern. The primary needs for threatened, endangered, and sensitive species (TES) are addressed through law, regulation, and policy (e.g., recovery plans and conservation agreements).

Wildlife mitigation measures and BMPs are prescribed to either reduce or remove direct impact to certain species from grazing related activities, such as new construction. Appendix "C" – *Mitigation Measures* lists general mitigation measures and best management practices (BMPs) related to northern goshawk, raptors, California condor, and Pediocactus.

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Appendix C

MITIGATION MEASURES

(Also refer to Appendix "A"- *Design Features* and Appendix "D"- *Monitoring*, as applicable.)

The following mitigation measures apply to the management of any allotment or pasture area associated with the Kane Ranch Allotment Management Plan, unless otherwise stated or varied by scientific research areas such as test plots or other controlled areas. These mitigation measures were developed during the NEPA process and were included within the DN-FONSI as referenced in the Final Environmental Assessment (EA), and their purpose is to minimize and reduce potential impacts from associated management activities. The following mitigation measures would apply to any range related field activity in order to help minimize and reduce potential impacts.

Noxious and Invasive Exotic Weeds

- A noxious and invasive weed assessment/inventory was completed as part of the Final EA. Noxious and invasive weeds located within the allotment would be treated as necessary. The grazing permittee and Forest Service would coordinate weed inventory and treatment activities with responsibilities identified through the AOI. The design features, best management practices, and mitigation measures in ***Appendix B of the Three Forest Integrated Treatment of Noxious or Invasive Weeds Environmental Impact Statement*** (USDA 2005) would be implemented.
- Minimize soil disturbance to the extent practical.
- Utilize best management practices (BMPs) by removing mud, dirt, and plant parts from equipment before moving it into the area. This practice does not apply to vehicles traveling frequently in and out of the project area that would remain on a clean roadway.
- Prohibit or avoid work in areas that have large infestations of weeds until the weeds are controlled. "Controlling the weeds" means to at least removing all above ground plant parts and seeds that could be spread by project activities. Clean all equipment before leaving the infested project site. Seeds and plant parts need to be collected when practical and incinerated (or bagged and solarized before sending to a landfill).
- Including weed prevention practices in the allotment management plan and the annual operating instructions.

Soils and Microphytic Soil Crusts

- Work on all projects (stock tanks, pipelines, trick tanks, fences, power line, roads, etc. may only be conducted when soils are dry enough to support heavy equipment without creating compaction, ruts, or erosion.
- Microphytic (cryptogamic) soil crusts may exist on the Kane Ranch Allotments primarily on soils that contain a high proportion of sand. Livestock can trample microphytic crusts when they trail through the area. To mitigate the potential negative affect to microphytic soils from livestock, salting would not be allowed on soil types within Terrestrial Ecosystem Units that contain a high proportion of sand and are readily accessible to livestock grazing.

Recreation and Scenery Resources

- Newly constructed features would be designed to meet the scenic integrity level requirements. Materials, colors, and textures would be selected so that the structure is not evident to the casual observer (i.e., materials for corrals and trick tanks would be matte finish and blend with the vegetation, if possible made of wood or other natural material; the design of roadside tanks would implement a low-profile design).
- Water developments will be avoided in the foreground (0 - 1,320' from the highway shoulder) of the Highway 89 corridor and will be designed to blend into natural contours or landforms wherever possible and will utilize the low-profile design. Scenery and Recreation Mangers will be consulted for the placement and design of the roadside earthen tanks.
- Access clearing along fence lines will not exceed 15 feet and is restricted primarily to one side of the fence line
- When performing maintenance on existing range and wildlife improvements, take measures to reduce or minimize negative or unnatural appearing features whenever possible. The permittee should consult with Scenery and Recreation Managers prior to maintenance which involves the installation of new materials.

Sensitive Plant Species

Sensitive plant surveys are to be completed in suitable habitat before constructing of new range improvements. Surveys would not be necessary if the construction would occur in an area that is already disturbed, such as existing roads and ditches or existing earthen tanks. If sensitive plant species are located, coordination with a wildlife biologist or botanist would occur to mitigate impacts as needed (i.e. flagging specific plants and/or adjusting the location of the improvement).

Wildlife (including threatened, endangered, and sensitive species):

Threatened and endangered species are those listed under the Endangered Species Act of 1973. On the Kaibab NF, these species include the California condor, Mexican spotted owl, Apache trout (*Oncorhynchus apache*), and Fickeisen Plains cactus (*Pediocactus peeblesianus var. fickeiseniae*) at the time of this AMPs implementation. Region 3 Sensitive Species are those plants and animals identified by the Regional Forester for which population viability is a concern. The primary needs for threatened, endangered, and sensitive species (TES) are addressed through law, regulation, and policy (e.g., recovery plans and conservation agreements). This AMP provides a basic framework for implementing the recommendations from these higher-level laws, regulations, policies, plans, and agreements for TES, with limited needed additional (below) direction.

The following mandatory design features, mitigation measures and BMPs are prescribed to either reduce or remove direct impact to the following species from grazing / range related activities:

1) Northern Goshawk & Raptor BMPs
2) California Condors Conservation Measures
3) Pediocactus

1) Northern Goshawk & Raptor BMPs

- Project activities and special uses should be designed and implemented to maintain refugia and critical life cycle needs of wildlife, particularly for raptors.
- The northern goshawk (*Accipiter gentilis*) is a sensitive species on the North Kaibab Ranger District; during northern goshawk breeding season (March 1st through September 30th) ground disturbing activities (such as trenching or water tank construction) should be coordinated with NKRD Wildlife Biologist prior to start of any field activities, so as to limit disruptions near nest sites.
- Per the Forest Plan, potentially disturbing project-related activities (such as construction) should be restricted within 300 yards of active raptor nest sites between April 1 to Aug. 15.

2) California Condor Conservation Measures

- As needed, NKRD will contact personnel monitoring California condor locations and movement on the district to determine the locations and status of condors prior to allotment and/or pasture use - rotation.
- Any presence of condors in a pasture or allotment area should be recorded and reported to the district range or wildlife specialist.
- If condor nesting activity is known within one mile of the permitted activity area, then loud activities (such as construction) will be restricted during the active nesting season. The active nesting season is February 1- September 30. These dates may be modified based on the most current information regarding condor nesting and consultation with the district biologist and the Fish and Wildlife Service.
- If condor nesting activity is known within 0.5 mile of a range related construction improvement activity, then noise producing activities near the nest site will be restricted during the active nesting season.
- If a condor visit occurs at a range related construction site, activities will cease in the immediate area until the condor leaves on its own or until techniques are employed by permitted personnel which results in the individual condor leaving the area (e.g. hazing).
- The range permit holder and its contractors/sub-contractors will be instructed to avoid interaction with condors and to immediately contact the appropriate district biologist or Peregrine Fund personnel if and when condor(s) occur at any construction related site.
- The permit holder and its contractors/sub-contractors will clean up construction areas at the end of each day when construction activities are conducted (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site. District staff may complete a site visit to the area to ensure adequate clean-up measures are taken.
- To prevent water contamination and potential poisoning of condors, any vehicle fluid-leakage and or spill of a hazardous substance (such as anti-freeze) must be contained and cleaned up when utilizing vehicles larger than pickup trucks and water tenders (i.e. 18-wheelers). Any spill that occurs will be brought to the attention of NKRD staff to ensure that proper clean-up occurs.
- Guests or personnel accompanying the grazing permit holder will not haze (i.e., bother, annoy or harass) condors.

3) Paradine (Kaibab) Plains Cactus (Pediocactus paradinei)

Permitted Livestock Grazing and Pedicatus paradinei Conservation Area:

There are two allotments that overlap with the *Pediocactus paradinei* conservation area. For any grazing or trailing activity east of Highway 67 towards House Rock valley within Central Summer or Kane Allotments, the grazing permittee is required to follow certain conservation activities relating to livestock management as discussed below. These items included:

- Manage ungulate grazing and browsing within the habitat so that no long-term detriment to the species occurs. Defer livestock grazing until at least July 15 in any pasture where concentrated livestock use would impact *P. paradinei* during its spring emergence and reproductive cycle.
- Confine future water developments on the Central Summer and Kane Allotments to areas beyond 0.5 miles of known populations.
- Do not place mineral supplements within 0.5 miles of known populations.
- Develop allotment management plans for the Central Summer and Kane Allotments that implement utilization standards and other appropriate measures to ensure allotments do not degrade vegetation conditions.
- Thresholds of acceptable impacts to watersheds are to be developed where ungulate management is concerned because of the potential impact to *P. paradinei* from direct, indirect, and cumulative effects.

General rangeland monitoring and adaptive management process for the Kaibab National Forest. As of November 2015, Long-term monitoring of plots has not indicated trampling or grazing by cattle. Any trailing of livestock through the conservation area will need to follow the North Kaibab Ranger District *Pediocactus paradinei* survey & cattle trailing criteria, as detailed below:

A. Identification of Proposed Route

- Livestock Permittee will identify which route(s) would be identified for livestock movements within the habitat area.
- Permittee should meet with NKRD personnel to review a map depicting the proposed route(s).
- The proposed route will be overlaid on a map showing the *P. paradinei* conservation area, conservation units, and subunits. The route may go through a conservation unit, but not a subunit.

B. *P. paradinei* Survey Requirements

- Before conducting surveys, surveyors must go a *P. paradinei* survey training given by a KNF, US F&W, or a resource specialist with specific *P. paradinei* survey experience.
- Training will include plant identification, survey methods, and visiting known *P. paradinei* habitat.
- A *P. paradinei* trained KNF resource specialist must be part of any documented survey.

C. *P. paradinei* Survey Protocol

- Surveys must be conducted between April 1 and May 15, after the flower buds are visible and plants have become visible above the soil surface.
- The entire proposed trailing route within the conservation area will be surveyed.

- Within the potential trailing route, look for potential habitat in the field. Potential habitat for the species within the potential trailing route will define the boundaries of "Search areas" needing more in depth survey. Searching for suitable habitat may be completed outside of the April 1 to May 15 survey-window if needed.
- "Search areas" in potential habitat should be a sufficient distance apart so that they don't overlap, but close enough to accomplish an understanding of the presence and density of the species in the project area.
- When potential habitat is located, timed random walks are done in a searching manner throughout the "search area" for a standard number of minutes (usually 10-15 minutes). If no plants turn up during that time, then the surveyors proceed to the next "search area".
- If plants are found at a "search area" within 10-15 minutes, more time is spent in an intensive fanning out from the known site until the fringe of suitable habitat is reached or the edge of the potential trailing route, whichever comes first.
- Walking arbitrary straight-line transects is not desirable when surveying for such habitat-specific species since time would be wasted on unsuitable habitat. However, all potential habitat within the corridor should be addressed under the survey method, unless finding colonies precludes the use of the route entirely.
- Found *P. paradinei* locations are marked on topographic map sheets and the location recorded on GPS units. GPS files are to be provided to the KNF to update *P. paradinei* population GIS layers.
- Information is recorded on data sheets (species, estimated size of population, recorder, and date).
- Suitable but unoccupied habitat should also be noted on maps and data sheets for future survey.

D. Implementation Results

- If both mapping of the proposed route and the conducted surveys find no suitable habitat and no cacti, the trail can be utilized and no additional *P. paradinei* surveys will be necessary.
- If the mapping of the proposed route and the surveys find suitable habitat and/or limited numbers of cacti, the following steps can be initiated to approve the use of the route:
  - All cacti found will be avoided by either posting a rider at the site, temporary fencing, or rerouting the trail.
  - Measures will be taken to reduce livestock impacts to suitable habitat including those mentioned above.
  - Increases and decreases in cacti populations along the route will be documented for effectiveness.
  - The route will be surveyed annually prior to livestock use. If the survey does not occur, the trail will not be utilized that year.
  - At any point, if survey data determines that mitigation measures have not succeeded in preserving individual cacti or habitat, the use of the trail will be discontinued.
- If the proposed route consists primarily of suitable habitat and surveys indicate notable concentrations of cacti, the route will not be authorized for livestock use.

Heritage Resources (*see Heritage Site Specific Mitigation Measures Table on page 42*)

Heritage Resources – Grazing Allotments

During the 2012 field season, North Kaibab archaeologists surveyed a total of 761 acres for the newly proposed Kane Ranch improvement projects. The results of that inventory and site specific information can be found in section 106 clearance report prepared for this project (Reid et. al. 2013). Exceptions to this are future maintenance, monitoring, or restoration projects including repair and maintenance of dirt tanks and guzzlers, installation of research monitoring plots, possible restoration of the non-functioning Little Mountain pipeline, and restoration of natural springs. All of these projects will be addressed on a case by case basis prior to implementation. Appendix H of the Region 3 First Amended Programmatic Agreement (2007) permits phased survey and consultation for these improvements. Proposed activities associated with allotment improvements would be evaluated and managed to avoid adversely effecting cultural resources in accordance to *Appendix H Standard Consultation Protocol for Range Land Management, of the Region 3 First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities among New Mexico, Arizona, Texas, Oklahoma and the Advisory Council on Historic Preservation*. Prior to the implementation of structural improvements (including new fence line) project managers must contact the North Kaibab archaeologist. The North Kaibab archaeologists would evaluate the improvements and develop appropriate protective measures pursuant Appendix H of the Region 3, First Amended Programmatic Agreement (USDA 2007). The Kaibab would also continue to consultation with the AZSHPO and appropriate tribes to ensure that the activities would have a minimal effect on heritage resources.

Heritage Resources - Establishing Holding Pastures

Archaeologists will work with range conservationists to identify any potential disturbances that might occur following implementation. An adaptive management approach will be used. If impacts to cultural resource sites are identified, protection measures such as fencing or other suitable measures will be implemented.

Heritage Resources - Dirt tank, water guzzler, and Little Mountain pipeline maintenance and reconstruction

Completion of all Section 106 requirements, including inventory and establishment of any necessary site avoidance or mitigation measures will be required prior to implementation of any of these projects.

Heritage Resources - Spring Restoration

Spring restoration activities will be phased in as funding and resources are available. Each project will be assessed on an individual basis. If any eligible prehistoric or historic sites are found, the sites will be completely documented and project activities will be designed to avoid adverse effects to the properties. The NKRD will consult with the Arizona SHPO regarding site eligibility and the suitability of proposed mitigation measures. Completion of all Section 106 requirements, including inventory and establishment of any necessary site avoidance or mitigation measures will be required prior to implementation of any of these projects (USDA Forest Service 2007).

Heritage Resources - Fence Construction

Given the absence of unevaluated or eligible cultural resource properties associated with new fencing for Lookout Canyon, Murray's Lake, Little Pleasant Valley, and Burnt Corral Pastures; Indian, Wall, Bear, and Cougar Lakes; KNF/GCNP Boundary Fence; Sowats Fence, no mitigation measures are required for these improvements.

However, sites at West Lake and along the highway 67 fenceline will require special mitigation measures to ensure that there are no adverse effects to these sites from fence construction. The fence associated with West Lake will be designed to protect the site. However, construction will be monitored by an archaeologist. The highway 67 project will be designed to mitigate potential adverse effects to sites in several ways. Where the fence crosses a prehistoric site, the distance between the fence posts will be maximized to reduce ground disturbance or where visually suitable, the fence will be situated to avoid the site. All work will be done by hand. Dirt retrieved from the post holes within any site boundaries will be screened, artifacts collected and curated and results documented. An archaeologist will be present on site during fence installation to screen back fill and monitor fence construction. A report containing the results of this effort will be prepared and submitted to the Arizona SHPO upon completion of fence installation. This procedure was used during implementation of the Kane Ranch 2001 AMP, natural lakes fencing projects where cultural sites were present. The approach worked very well. Only a small amount of ground was excavated for the fence posts and none of the projects yielded any cultural material in the screen.

Heritage Resources - Cattle Trailing along Kane Trail

Kane Ranch wranglers will be required to keep cattle on the existing two-track road when herding through the portions of the Kane trail that contain cultural sites. This will confine trampling to the existing two-track, which was used historically for many decades. The trail also runs through pediocactus habitat, so, attention will be given to keeping the cows on the existing trail to protect both cultural sites and vegetation. Sites located within canyons flanking the Kane Trail will be monitored for possible impacts from errant cattle. The cattle drive will occur in May. Forest Service archaeologists and range staff will work with wranglers to effectively protect these sites prior to the drive. Archaeologists will initially monitor the route, after the drive, to see if there are noticeable impacts outside the trail/road prism. If impacts are found, the district will consider fencing or other suitable mitigation options to ensure that cattle stay on the trail, or use of the trail for cattle drives may be eliminated. The forest will share the results of its monitoring efforts with the Arizona SHPO and consult on suitable mitigation measures that might be needed. Adherence to these requirements should minimize the potential for adverse effects to archaeological sites crossed by the existing road.

Heritage Resources - Research Plot enclosure/exclosures

No mitigation measures are necessary. However, Completion of all Section 106 (clearance) requirements will be required prior to installation.

Heritage Site Specific Mitigation Measures Table

Location or Activity Name	Type of Activity	Site Protection Measures or Require Action
Kane Trail	Cattle Drive once a year	Cattle will be confined to trail/driveway where prehistoric sites are present (see above two pages for further discussion)
Lookout Canyon Holding Pasture	Construction of new fenceline	N/A
Murray's Lake Holding Pasture		No ground disturbance within heritage/arc site boundaries
Little Pleasant Valley Holding Pasture		
Burnt Corral Pasture	Construction of new fenceline Install new cattle guards	No ground disturbance within heritage/arc site boundaries
Highway 67 Fenceline Project	Construction of new fenceline (if warranted and only after agreed to – last resort for public safety) Installation of new cattle guards	1) Where sites are present, they will be avoided or the distance between fence posts will be maximized 2) All work will be completed by hand 3) Dirt from post holes will be screened 4) Excavated artifacts will be documented and curated. 5) Heritage/arc sites will be monitored periodically
Park Boundary Fenceline Project	Repair fenceline	N/A
West Lake Fencing	Repair and extend fenceline	1) All work will be completed by hand 2) Dirt from post holes will be screened 3) Excavated artifacts will be documented and curated. 4) Heritage/arc sites will be monitored periodically (see above for further discussion)
Natural Lakes Fencing Project (Dry Park Lake Cattle Access)	None	N/A
Sowat's Fenceline Repair	Repair fenceline	No ground disturbance within heritage/arc site boundaries *Heritage Clearance completed for original Kane AMP in 2000
Monitoring Plots	Construction of new enclosures	Future Consultation (Contact NKRD Archeologist)
Dirt Tank and Guzzler Modification	Repair of up to 10 existing waters	Future Consultation (Contact NKRD Archeologist)
Little Mountain Pipeline Replacement	Repair /Replacement of existing pipeline	Future Consultation (Contact NKRD Archeologist)

Appendix D
MONITORING

Monitoring will occur, but the frequency varies by each activity and funding, and may be accomplished by the permittee, Forest Service personnel, and/or third-party involvement in accordance with monitoring standards and protocols. Monitoring is adaptive, and as improved methods are developed these new methods would be considered. See pages 14 and 15 for requirements of Permittee and Forest Service Monitoring; details of monitoring to be carried out should be included in the Annual Operating Instructions (AOIs).

Implementation Monitoring: Within key areas of these allotments, annual monitoring would be conducted, which may include, but is not limited to evaluating grazing intensity during the season, and utilization at the end of the growing season in order to practice adaptive management and make necessary management changes needed for plant development and plant recovery from the grazing event. Managing for plant development and recovery would provide for increased ground cover and potential changes in species composition. Example methods for implementation monitoring may include, but is not limited to, permit compliance, allotment inspections, range readiness, forage production, rangeland utilization, comparative yield, grazed plant count, paired plot clipping and weighing.

Effectiveness Monitoring: Long term condition and trend monitoring would be used to assess the effectiveness of management in achieving desired objectives. This monitoring may include, but is not limited to measurements to track upland vegetative conditions and soil condition towards achievement of the objectives. Example methods for effectiveness monitoring may include, but are not limited to, condition and trend, invasive species, soil and watershed conditions, dry weight rank, pace transects, pace quadrat frequency, ground cover, sensitive plant species, and repeat photography. Monitoring would occur on historic benchmarks, which correspond with key areas. Depending upon the method selected monitoring should occur at an interval of at least every 5-10 years in key areas.

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 would assess range readiness prior to cattle coming onto spring pastures to determine if vegetative conditions are ready for cattle grazing. The range is generally ready for grazing when cool season grasses and shrubs are leafed out and forbs are in bloom. 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.

The definition of utilization and seasonal utilization is adapted from standard protocols established by the Society of Rangeland Management and the new guidelines established by Region 3 Regional Forester (Smith et al. 2005). The following definitions and procedures for utilization were taken and adapted to fit this project.

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.

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.

Cattle would move when seasonal utilization in a pasture approaches a conservative level, with a conservative seasonal utilization of approximately 30-40 percent (see note, page 6). This is an approximate value because it takes 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. This utilization level 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 guideline 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 would 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 the allotment in 1953. Transect data from these monitoring points is the best historic records of range condition and trend available. The photo points and vegetative ground cover data show how the site has changed over time. One-tenth acre canopy cover plots and pace-frequency transects were established on top of the Parker Three-Step transects in 2010 to

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

Precipitation: Precipitation is currently recorded at Fredonia and Jacob Lake. Precipitation data may be recorded within or near the allotment 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 and invasive weeds located within the allotment would be treated as necessary. The grazing permittee and Forest Service would coordinate weed inventory and treatment activities with responsibilities identified through the AOI. The design features, best management practices, and mitigation measures in Appendix B of the Three Forest Integrated Treatment of Noxious or Invasive Weeds Environmental Impact Statement will be implemented (USDA Forest Service 2005).

Soil and Watershed Condition: The current and proposed cattle 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. Monitoring of plant abundance, ground cover, species diversity, and estimates of overall soil condition (using the methods described throughout this monitoring section) would 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, would be considered when evaluating monitoring results. If plant cover, litter cover, and/or soil condition decline, changes would be made to the livestock numbers, grazing period, grazing time, or pasture rotation.

Monitoring would be conducted during and after any pipeline replacement or construction to insure little erosion and water channeling. If erosion or water channeling is discovered, more effective erosion and drainage control/diversion structures must be installed.

Heritage:

The NKRD archaeologists will work with range conservationists to identify any potential disturbances that might occur following implementation. An adaptive management approach will be used. If impacts to cultural resource sites are identified, protection measures such as fencing or other suitable measures will be implemented.