

Sands Ranch Ranch Management Plan Sands Properties LLC

Introduction

The Sands Ranch is located in Cochise and Pima Counties, on the west side of the San Pedro River and about 5 miles north of Huachuca City. State Highway 90 divides the east pastures from the west pastures and the headquarters.

The entire ranch is in Major Land Resource Area (MLRA) 41, Southeastern Arizona Basin and Range. About one-half of the ranch is in Common Resource Area (CRA) 41-3, Semi-desert Grasslands, 12-16 inch precipitation zone; the other half is in CRA 41-1, Mexican Oak-Pine Forest and Oak Savannah, 16-20" precipitation zone. Elevations on the ranch range from a low of 3940 feet where the easternmost part slopes toward the San Pedro River, to a high of almost 8500 feet on the Mescal Allotment in the Whetstone Mountains.

The dominant ecological sites on the east side of the ranch are Limy Upland, Limy Fan, and Sandy Loam Upland. On the west side Loamy Upland, Limy Slopes, and various Hills sites predominate. However, there are several other important ecological sites on the ranch. See Ecological Site map for details.

This livestock operation is primarily a cow/calf operation with calves sold at weaning time and holding only replacement breeding stock. The grazing leases and land ownership are summarized in the table below:

| <u>Owner/Agency</u> | <u>Lease/Allotment Number</u> | <u>Lease/Allotment Name</u> | <u>Acres</u> |
|--------------------------------------|-------------------------------|----------------------------------|---------------|
| Forest Service | 00318 | Mescal Allotment | 17,572 |
| Bureau of Land Management (BLM) | 5277 | Sands Allotment | 1,080 |
| Arizona State Land Department (ASLD) | 05-1181 | | 28,536 |
| Pima County | 22-64-S-141624-1208 | Sands Ranch Management Agreement | 5,040 |
| Sands Ranch | N/A | N/A | 10,457 |
| TOTAL | | | 62,685 |

Sands Ranch has been operating since 1920 when Louis Sands traded part of the Mattie Canyon place to his friend William Banning Vail in exchange for Mescal Springs on the south slopes of the Whetstone Mountains. This water controlled grazing over quite an area. Subsequently, to round out and enlarge his holdings, Sands bought the adjacent Solano Ranch, the Watts Hammond Ranch and the WI brand. He also acquired the holdings of W. A. Neil at Elgin and his T Triangle Drag brand.

The ranch has been operated for the last several decades as a cow-calf operation. While the bulls are not out year long, the breeding season and therefore the calving season has gradually lengthened over time. The cows have been wintered on the Mescal Allotment between November 1 and April 30 and have summered on the adjacent State, County, BLM and Private lands from May 1 to the end of October. Calves have been weaned in the late fall or early winter and sold off the ranch.

In 2009, a portion of the ranch on the west slopes of the Whetstone Mountains in Pima County was sold to Pima County as part of the Sonoran Desert Conservation Plan (SDCP). Under a separate Ranch Management Agreement, Sands Ranch still utilizes the county lands as part of the overall ranch operation and maintenance of a working landscape.

In the fall of 2009 the ranch began a long term plan to deal with several problems that had been identified as impediments to profitability. From a range standpoint, the summer range on the ranch has been severely altered by the encroachment of woody species and a reduction in grass cover. This problem has been amplified by a

concurrent loss of water developments and infrastructure. In addition the cow herd has become less productive from both a genetic and a herd health standpoint. The decision was made to cut the herd significantly in order to begin to deal with the herd health issues as well as to provide a window of opportunity to address the brush encroachment and infrastructure issues.

Benchmark Condition and Resource Concerns

During the CRM planning process, several resource concerns were documented. A description of these concerns can be found in greater detail on the inventory sheets that describe current plant communities and rangeland health evaluations, and also in documents such as the Mescal Allotment Management Plan (AMP) and the Biological Reconnaissance of Sands Ranch prepared for the Arizona Land and Water Trust. Included here is a brief, general description of the resource concerns with the highest priority that will be addressed by this plan:

1. Biotic Integrity

- Woody species invasion. This is a concern on several of the ecological sites, including a majority of the areas mapped as Limy Upland 12-16", Sandy Loam Upland 12-16", and Loamy Upland 12-16".
- Other invasive species. Lehmann lovegrass and Boer lovegrass are present on most sites below 5,200 feet in elevation; Lehmann lovegrass is the dominant species present on much of the coarse-loamy soils associated with the Sandy Loam Upland and Loamy Upland ecological sites in both the 12-16" and 16-20" precipitation zones.
- A reduction in the native perennial grass component of the plant communities and in some cases a reduction in the native forbs as well. Several of the ecological sites, especially those mentioned above, do not have the species diversity of the historic native plant community (HNPC). Where woody species invasion has occurred the overall perennial grass component has also been reduced.

2. Soil/Site Stability

- Certain ecological sites have lost visible amounts of the upper soil horizon, and show continued signs of accelerated sheet and rill erosion. This concern is most noticeable on parts of the Clayey Upland 12-16", Limy Fan 12-16" and Limy Upland 12-16" sites, particularly in areas where the surface soil texture is loamy or fine-loamy with a low percentage of protective surface gravel and rocks.

3. Hydrologic Function

- The same areas mentioned above under Soil/Site Stability also typically exhibit impaired water run-off patterns and hydrologic function. Sites with significant woody species encroachment and the accompanying loss of herbaceous ground cover and spatial pattern also display some departure from the reference hydrologic function.
- Areas of gullies have been documented, some of them with unstable head cuts and side cuts. In many cases these gullies are associated with, and exacerbated by, access roads.

4. Access Roads

- In some place the ranch access roads divert and channel overland flow and disrupt the normal hydrology; in others, the roads themselves are eroding and contributing significantly to the sediment load.

5. Inadequate Stock Water

- Several existing wells and other water sources have been identified as no longer functioning adequately. There are other identified areas where a reliable water supply and more water locations will improve grazing distribution and the ability to maintain the grazing rotation as planned.

6. Wildlife Habitat

- Reliable year-round water sources and more locations will benefit some wildlife populations.
- Wildlife water availability and lack of escape ramps has been identified as a concern at some water points.

Goals

The over-arching goal of this CRM plan is to attain a healthy balance of livestock, plant communities, and wildlife on the land that allows each to thrive. More specifically, the goals are outlined below:

1. To maintain or improve the resource base and the diversity of the ranch. This includes the plant communities, biotic integrity, wildlife populations and habitat, watershed health and hydrologic function, and soil stability and integrity.
2. To the extent possible, restore rangeland to at least moderately high ecological condition, with stable soil and hydrologic conditions and a stable-to-upward biotic trend.
3. To provide adequate vegetative cover to maintain or improve watershed health, to reduce accelerated soil erosion, and to provide adequate cover for wildlife.
4. To conserve both the past and the present cultural heritage of the ranch, and the open spaces that it provides.
5. To improve the economic viability of the ranching operation.
6. To meet the unique needs and objectives of the individual landowners while maintaining the integrity of the ranching operation as a whole.

Objectives

For the purpose of this plan, an objective is a specific statement of measurable results to be achieved to meet a stated goal. There are two timeframes mentioned here; the first is the planned implementation period and the second is the anticipated timeframe to see measurable results. Specific objectives are outlined below:

1. Reduce the impact of woody species in areas where it has been identified as a resource concern. Give priority to the areas on the east side of the ranch. In treated areas, the targeted woody species will be reduced from their present levels of 70-90% of the plant community to less than 10%. Planned implementation period is 3-5 years. Early measurable results should be apparent in the same 3-5 year period; more-complete results will require one or more complete grazing rotation cycles.
2. Improve the calving percentage of the herd to 70-75%, and have replacement heifers calve at 2 years of age. Planned implementation period is 2-3 years.
3. Improve the quality, quantity, and diversity of the forage base to establish an upward trend, giving priority to the areas of woody species reduction as discussed in Objective 1. This will be measured using ground cover and frequency methods at key areas. Early measurable results should be apparent in the same 3-5 year period; more-complete vegetation changes will require one or more complete grazing rotation cycles before they can be measured.
4. Resolve the current herd health issues and implement a quality herd-health program. Planned implementation period is 2-3 years.
5. Continue to repair and improve the water distribution system according to the priorities and needs identified. Planned implementation period is 3-5 years. Results will be observed indirectly through the monitoring transects and other monitoring methods, and will require one or more complete grazing cycles.
6. Install durable and permanent wildlife escape ramps in all water troughs and open tanks to prevent wildlife drowning. Make water available to wildlife year-round when feasible. Planned implementation period is 1-2 years.
7. Create a plan for prescribed burning as an additional method of vegetation management. Timeframe to create a plan is 2-3 years; practice implementation will follow as burn conditions dictate. Early results can be measured within one year after a prescribed burn; complete results will require a longer period of time.
8. Identify areas of significant erosion, especially on roads and in other areas of heavy use. Identify the conservation practices necessary to address the problem, including a program of road maintenance for critical areas. Planned implementation period is 1-2 years. Early measurable results should be apparent in the same 1-2 year period; more-complete results will require a longer period of time.
9. Increase ground cover and litter, and stabilize soils, in areas of historic heavy livestock use. Monitor areas of particular concern through photo points or ground cover measurements. Planned implementation period is 3-5 years. Early measurable results should be apparent in the same 3-5 year period; more-complete results will require one or more complete grazing rotation cycles.
10. Continue to use the permanent monitoring transects to measure the changes in trend and vegetative

attributes. Establish other permanent transects and other types of monitoring methods as needed or desired. Planned implementation period for most new monitoring is 1-2 years. Monitoring is the primary method for plan evaluation; many trends will not be apparent for one or more complete grazing rotation cycles.

11. Identify the existing interior and boundary ranch fencing with the highest priorities to be replaced with fencing more compatible with wildlife movement and access, and implement a program for replacement. Planned implementation period is 3-5 years.
12. Document and quantify the current levels of access to the ranch by the general public and other user groups. Identify areas where public access can be enhanced or improved, and also where public access could be limited. Identify points where improvements such as cattle guards will help to address issues such as open gates. Document the impacts, both positive and negative, of public use on the ranch. Planned implementation period is 3-5 years.
13. Continue to explore possible sources of funding assistance for implementation of all other plan objectives. Possible sources include the Environmental Quality Incentives Program (EQIP) administered by the NRCS; the Habitat Partnership Committee (HPC) and other wildlife habitat programs administered by the Arizona Game and Fish Department (AGFD); wildlife conservation and sportsmen's groups; the Livestock and Crop Conservation Grant Program (LCCGP) administered by the Arizona Department of Agriculture; and the Arizona Water Protection Fund (AWPF) administered by the Arizona Department of Water Resources. Timeframe is 3-5 years.

Range Improvements and Other Specific Projects

Current Range Improvements

During the winter of 2010 the ranch completed the following improvements, with assistance from some of the agencies involved in this CRM plan:

- Replaced the pipeline to French Joe from Gravel Pit well and installed 10,000 gallons of storage.
- Extended the pipeline from French Joe to Dry Canyon and installed 5,000 gallons of storage.
- Extended the French Joe pipeline under Hwy 90 to Ramsey storage on N Flat in Pasture # 1a.
- Put a pump and 16,000 gallons of storage at the New Water well on N Flat in Pasture 1a.
- Obtained well video logs for Cottonwood, Copper Sands and N Flat wells.
- Purchased a new diesel generator unit for more reliable water pumping ability.
- Completed 400 acres of brush management in the Middle Pasture (Pasture # 4).
- Rebuilt existing division fences on the Flat east of Hwy 90, to separate Pastures 1a and 1b.

Proposed Range Improvements during the Next 3-5 Years

1. Complete 8,000-10,000 acres of brush management to address woody plant invasion. These acres have been generally identified and mapped out during the inventory process and are mainly on the east side of the ranch (see Conservation Plan Map in Appendix). Each year, as funding allows, 1,000-3,000 acres will be completed. Potential sources for financial assistance include EQIP, AGFD, and LCCGP.
2. Continue to repair and improve the water system according to the recently-completed ranch water inventory and priority list (see Appendix). Use solar power where feasible to improve reliability and reduce the amount of time needed to maintain the waters. Top priorities include the Cottonwood Well (well inspection and conversion to solar) and the Charlie Sands Well (conversion to solar). Potential sources for financial assistance include EQIP, LCCGP, and AWPF.

Forest Service Priority Improvements from the new Mescal AMP

1. Equip the Copper Sands Well with a submersible pump capable of lifting water 400 feet. Install 10,000 gallons of storage on the ridge between Bear and Simpson Spring. From there, approximately 2.5 miles of pipeline would be installed to 5 new troughs (storages on troughs optional) located to supplement Wild Cow, Death Trap, Simpson, and Bear Springs. The system would also service the neighboring Coal Mine Allotment to the west.
2. Fence Simpson Spring to exclude livestock from the riparian area.
3. Re-Construct the apron at the Mine Canyon Trick Tank.

4. Use water pumped from the Sands Ranch Cottonwood Well, after a new solar pump is installed, to supplement the existing Cottonwood trick tank and Christmas dirt tank.
5. Improve the Dry Canyon Well and pump water to Upper Dry Canyon trick tank.
6. Pump water from a mine in upper Mine Canyon to provide upland water to the ridges between Mine Canyon and Christmas Tank Canyon. (This is dependent on the ranch obtaining a water right on the mine.)

A potential funding source for these priorities is the Arizona Game and Fish Department's HPC and EQIP administered by the NRCS.

Pima County Property Projects

1. In selected key areas build small grazing exclosures near monitoring locations as an additional method of monitoring changes in trend.
2. Implement the following improvements to water sources:
 - a) Improve Goat Well and the water storage system and control valves, and the pipeline from Goat Well to Hub Storage.
 - b) Repair blown-out Victoria tank in the East Refrigerator pasture.
 - c) Rebuild and clean out Goat Tank and the sand trap.
 - d) Modify Ramsey Well to protect the aquifer, and install a solar pump system.
3. Fence improvements include:
 - a) Improve the existing fence from West Camp to Goat Well.
 - b) Improve all fences and gates.
 - c) Remove all non-functional electrical fencing and posts.
 - d) Convert existing fences to wildlife friendly fences.
4. Range improvements include:
 - a) Improve road conditions using methods recommended for erosion reduction.
 - b) Post signs designating routes to reduce public impacts on the resource.
 - c) Seek funds for road, gate, and cattle guard improvements where possible.
5. Clean up abandoned vehicles and areas of trash.

Possible funding sources include Pima County funds and Arizona Game and Fish Department's HPC.

Grazing and Herd Management

Numbers and Season of Use

The carrying capacity of the Sands Ranch is **955** animal units (AU's), or **11,454** animal unit months (AUM's). This is based upon the combined capacities of the land leased from the Forest Service, the ASLD, and the BLM; and on estimated figures for the county and private lands.

| | | | | |
|----------------|-------------|-------------|---------------|--------------|
| ASLD | 356 | AU's | 4274 | AUM's |
| BLM | 5 | AU's | 60 | AUM's |
| FOREST SERVICE | 800 (6 mo.) | AU's | 4,800 | AUM's |
| PIMA COUNTY | 83 | AU's | 992 | AUM's |
| PRIVATE | 111 | AU's | 1,328 | AUM's |
| TOTAL | 955 | AU's | 11,454 | AUM's |

A recent NRCS and CRM group inventory of the ranch on an ecological site basis is included in the Appendix (excluding the FS lands – the new Allotment Management Plan (AMP) is based on recent inventory and evaluation).

For both ranch management purposes and the purposes of this plan, the estimate of total cow/calf Animal Units will include all livestock of all ages on the ranch, adjusted for both age and type (horses, bulls, replacement

heifers, etc.). Actual use numbers reported as part of the lease agreements will follow the requirements of the respective agencies.

There are some other factors specific to this ranch that must be considered in the estimate of current carrying capacity, while this plan is implemented and the benefits of the priority improvements begin to take effect.

- Much of the ranch is watered by stock ponds. Although many of them are fairly reliable, and have been considered as such for water distribution factors, a lack of livestock water in certain pastures at critical times can significantly impact pasture use and management. This impact is magnified if livestock numbers are at or near their maximum.
- Currently, Forest Service use is limited to November 1 – April 30. This is one-half of the year, and close to one-half of the forage AUM's. However, this means that the remainder of the ranch must carry all of the livestock for the primary summer growing season every year. This suggests that more conservative numbers in the initial phases will help to achieve the goal of maintenance and improvement of the rangeland resources.
- One of the stated objectives of this plan is to address the concern of invading woody brush species, especially on the east side of the ranch. In the long-term addressing this problem will help to increase both the quantity and quality of the forage base; short-term, however, the need for grazing deferment in pasture with treated areas will also impact pasture use and livestock numbers.
- The planned deferred rotation grazing system needs to be in place through a complete cycle, to both allow for assessment and to begin to build a reserve of un-used forage for drought years and other adverse conditions.
- The management of lands owned by Pima County must be consistent with conservation goals of the Pima County Multi-species Conservation Plan and a potential Section 10 Permit administered by the U.S. Fish and Wildlife Service.

The cow herd currently consists of 525 cows and will be expanded to 600 head in the fall/winter of 2010-2011 either through additional purchases or by retaining heifers. It is anticipated that this stocking rate will be approximately maintained for the next 3-5 years, as the CRM plan is implemented.

Herd Management Plan

The ranch will address management issues that have been identified as impediments to profitability. The main issues are:

- Lack of genetic predictability from excessive crossbreeding
- Lack of uniformity in the calf crop
- Lack of well-developed herd immunity to common pathogens

Over the past couple of decades replacement females in this herd have generally been purchased from auctions in the area. While many of these were good quality commercial females, they came from many different genetic backgrounds. The result has been that the herd lacks the genetic uniformity necessary to be able to produce a consistent type and quality of calf. In order to increase the consistency of the calf crop and the genetic make-up of the cow herd, the ranch is culling the herd heavily and will either raise their own replacements or purchase genetically similar females through private treaty.

The current calf crop lacks both genetic and physical uniformity. In addition, the calf crop is spread out over a very long calving season which magnifies the size and quality differences. This makes them harder to market and less profitable. One focus will be to limit the calving season to around 90 days and moving it closer to the spring growing season. This will make the calf crop more uniform and will allow the cows to recover after calving more readily. An added benefit of this will be reduced carrying costs during the winter and early spring.

The lack of an annual vaccination program prior to the fall of 2009 has allowed the herd to be impacted by several common respiratory and reproductive diseases that have reduced annual production. The loss in production has come from cows either not getting bred or not carrying the pregnancy to term. Each fall the Sands Ranch will be pregnancy checking the herd and removing any open females as well as developing a herd vaccination program. In 2011 the ranch will be implementing a new vaccination protocol for the new calves, testing the bull herd for trichomoniasis and culling any bulls that test positive.

Grazing System

General

Apart from the Forest Service lands, the ranch is divided into several large pastures and a number of smaller pastures and traps. A best-pasture, deferred rotation grazing system will be used for the seven main pastures (identified on the Conservation Plan Map as 1a, 1b, 2, 4, 10, PC1, and PC2 – see Appendix). Decisions on move dates and pastures will be determined by the ranch manager with input from CRM team members representing the appropriate land management agencies. Climate, growing season rest, amount of annuals, availability of water, and plant recovery from previous or current grazing are all factors that will be considered when moving cattle. These factors will also be considered as they affect wildlife habitat quality; guidelines for specific species can be found in the Appendix.

Each pasture should receive sufficient growing season rest to allow plants to make seed two out of three years. Special emphasis should be given to the use of Lehmann lovegrass in certain pastures when it greens up in early spring, and then resting those pastures when the native grasses are growing.

Specifics

Since the grazing on the Mescal Allotment is governed by the AMP, and is specifically for the period between November 1 and April 30, the primary focus for the remainder of the ranch will be to provide adequate growing season rest for each pasture on a regular basis. The primary growing season is the summer period between July 1st and October 15th. Typically, 4-5 of the 8 large pastures will be grazed each year during this time, while the remaining pastures receive summer growing season rest.

With the movement of the herd both from and to the Mescal Allotment on the Forest Service, there will always be certain pastures that are primarily used either in May or October, as the herd is moved. These are often the times that the cow herd is tested and culling decisions are made, calves are branded and vaccinated, etc. For example Pasture 4, the long narrow pasture between the Forest and Hwy. 90, is well-suited for some grazing use each May because it is the natural place to gather the cattle while they are being moved from the Forest. However, there are several smaller pastures, including some of the traps, which in future years will be utilized more during the period when the herd is not on the Mescal Allotment. This will allow more rest to the larger pastures as mentioned above. These smaller pastures will be selected according to best-pasture deferred rotation principles, coupled with the need to have some un-grazed small pastures and traps each year for herd management.

When not with the cow herd, the bulls have historically been pastured in Pasture 9, the southern-most pasture on the east side of Hwy. 90. In subsequent years other small pastures will also be used by the bull herd. This will permit more balanced use of the total forage base, and will also allow Pasture 9 to receive growing-season rest in its turn. Pastures for the bulls will also be selected according to the same best-pasture principles and herd management requirements.

A priority objective is to apply brush management to 1,000-3,000 acres per year (depending on funding), and defer the treated areas for a two-year period during the summer growing season. This will dictate much of the grazing plan during the summer.

The herd will be moved off the Forest in the spring and will pass through the smaller pastures adjacent to the Forest prior to the growing season as they are branded. During the growing season they will be on the east side of Hwy. 90 and will rotate through those pastures based on the current year's growth and vigor. During the fall they will be gathered back to the headquarters, the calves will be weaned and the cow herd will be moved to the Mescal Allotment for the winter. This is similar to the past use of the ranch.

As the water reliability and distribution is improved the number of separate cattle groups will be reduced so that the majority of the cattle are kept together in one pasture. As the brush management is implemented and the forage base in the treated areas begins to increase, the herd numbers will be increased. However, these gains in capacity will be accompanied by improved pasture and rangeland management in order to be sustainable.

One part of the management change will be to wean the calves off the ranch and not on the rangeland; this will reduce the total AUM's and the impact of having multiple herds in multiple pastures during the fall of the year.

An important part of this overall strategy will be the possibility of extending the grazing season by 1-2 weeks at either end of the specified grazing period on the Mescal Allotment, with fewer animal units for a slightly longer period of time. This will help to provide rest at crucial times on the summer range while other objectives are implemented.

Salting / Supplemental Feeding

Supplemental protein will be provided to the cow herd during the spring of the year once they leave the forest in the form of range blocks primarily. Salt blocks and supplements are put ¼ mile from the waters, typically on the uplands and hills.

Management Strategy during extreme drought conditions and/or other exceptional circumstances

Perhaps the greatest annual variation in SE Arizona is the amount and effectiveness of precipitation received. Actual annual precipitation amounts are frequently 20% above or below the long-term annual average, and can vary by as much as 40% or more. The plant communities found here are well-adapted to this kind of variability and handle it well, as long as they are healthy and vigorous. As the best-pasture deferred-rotation system is implemented, one critical strategy will be to build up a reserve of forage in the rested pastures so that a single dry year, even one that is severely dry, will not require substantial reductions to the livestock numbers and consequently to the ranch economics.

All data will be analyzed each year in the fall for range condition and general trend, and decisions will be made based on this analysis. At this time, the effects of sustained drought conditions will be assessed and incorporated into the decision-making process. For more detail, see the section below on monitoring and trend assessment.

Other exceptional events, such as extensive wildfire and the possible short-term loss of a part of the forage base, will be addressed as they occur. Initial assessment of the impacts will be made by the Sands Ranch and the leasor, depending on land ownership. The CRM group will assist with near-term decision-making, if requested; otherwise, longer-term impacts will be assessed at the regular time of monitoring and data analysis.

Monitoring and Trend Assessment

In 2001, the Rangeland Technical Advisory Council prepared a report for Arizona's then-Governor Jane Hull (see Appendix for complete document). Taken directly from this report is the following:

"Properly assigned grazing capacities are critical from both ecological and economic perspectives. From the ecological perspective, they are critical for maintenance of productive ecosystems. From the economic perspective, they are often critical to the stability of rural economies and essential to individual ranch cash value. Grazing capacity for livestock (or proper stocking rate) is not an intrinsic biological characteristic of an ecosystem that can be directly determined. Grazing capacity is a function of the kind and amount of vegetation produced on the range, annual variability of this production, topographic characteristics of the landscape, availability of water sources, management goals and management intensity." The report goes on to discuss both the "forage inventory" approach and the "stock and monitor" approach to the issue of grazing capacity, and states that "stock and monitor" was generally recognized as the more objective of the two.

Following the guidelines of the NRCS National Range and Pasture Handbook, a recent forage and plant community inventory was completed for this CRM Plan, and a stocking rate was estimated from this inventory. This estimate will be used for comparison purposes only, and as a frame of reference. The "stock and monitor" approach will be used as the primary tool for both grazing management decisions and stocking rate decisions for the Sands Ranch CRM Plan.

On an annual basis, data from the established monitoring transects will be collected along with precipitation records and Actual Use reports. Other monitoring methods may be used as the CRM group determines the need; the techniques selected will be based on the need to collect data for specific vegetative attributes.

Key Areas

Currently, there are seven permanent pace-frequency monitoring transects on the ranch outside of the Forest Service Mescal Allotment; six were established on the main ranch in 1999 and a seventh was added in 2009 on the lands owned by Pima County. The six older transects are read every 2 years, with 3 being read each year in

alternate years. The newer transect, and any other permanent pace-frequency monitoring transects established, will be read each year for the first 3 years and then every other year.

With this pattern of monitoring established, there will be some monitoring transects read every year. The annual monitoring provides an excellent forum for the CRM group to assess and discuss plan implementation and trend.

There are also seven other permanent pace-frequency and Dry Weight Rank monitoring transects located on the Mescal Allotment portion of the ranch. The transects are read every 3-5 years and will also be used to assess ecological condition and trend.

During the inventory process it became apparent that there could be a benefit to adding 1-2 more permanent transects to represent other significant range sites, especially some of the Hills sites, on the north end of the Pima County property.

Methods and Responsibilities

1. Actual Use

The lessee will record actual use data throughout the year showing when, where, and how many livestock used the ranch during the grazing year.

2. Climate

Rainfall records will be provided by producer. There are rainfall gauges at each of the monitoring locations, plus the ranch headquarters. Records from both the current year and prior years will be used as factors to assess monitoring data and range trend.

3. Trend

Trend in rangeland condition will be measured using the Pace Frequency Method. Photographs will be taken at each trend location. General views of the site may serve as the appropriate photo recordation of trend. Trend data will be collected by NRCS, CES, FS, ASLD, BLM, AGFD, Pima County, and the Sands Ranch (Agency and County personnel will participate as available).

4. Timetable for Data Collection

Transects 1 through 6 are already established with three of them being read every year. Transect 7 is new and has been read once; a three-year baseline will be established and then it will be read every 2 years. Any new transect established will follow the same protocol. This CRM Plan strives to achieve a balance in the number of transects to be read each year. This pattern will allow annual monitoring but not of all transects.

5. Location of Key Areas

| <u>KA</u> | <u>Pasture # and Name</u> | <u>Ecological Site</u> | <u>Location (UTM coordinates, NAD-83)</u> |
|-----------|---------------------------|------------------------|---|
| #1 | #10 - Brush | Sandy Loam Upland 41-3 | 0558660 e 3509686 n |
| #2 | #2 - South Flat | Clayey Swale 41-3 | 0564040 e 3511053 n |
| #3 | #2 - South Flat | Limy Upland 41-3 | 0567481 e 3511569 n |
| #4 | FS1 - | Loamy Upland 41-1 | 0556044 e 3512267 n |
| #5 | #1a - | Limy Upland 41-3 | 0563081 e 3519894 n |
| #6 | PC3 - | Loamy Upland 41-1 | 0549664 e 3513130 n |
| #7 | PC1 - | Loamy Upland 41-1 | 0548994 e 3516256 n |
| #8 | TBD | TBD | TBD |
| #9 | TBD | TBD | TBD |

Evaluation and Revision

A review of the plan will be conducted each year in cooperation with the rancher, and with as many members of the CRM group as possible. This review will typically be at the time of the annual fall monitoring, and the records of actual use data and rainfall data will be updated. Data collected from the monitoring sites will be used to aid in management decisions. At this time, and at other times during the year if necessary, the CRMP group will discuss and evaluate progress on objectives, possible barriers to implementation, successes, potential partnership projects and other topics of interest.

Concurrence

Accepted by:

Marilyn W. Harris 10/14/10
Rancher - Sands Properties LLC Date

Thomas L. Loney 10/15/2010
for . Forest Service - Sierra Vista District Ranger Date

ASLD - Director, Natural Resources Division Date

BLM - Tucson Field Office Manager Date

Kenny Baldwin 10/14/10
Pima County Natural Resource Division Manager Date

[Signature] 14-Oct-2010
NRCS - Resource Conservationist Date

Kim McReynolds 10/14/10
U of A CES - Rangeland Management Specialist Date



AGFD - Wildlife Habitat Specialist Date

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| | |
|--|--|
| Rancher - Sands Properties LLC | Date |
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|  ASLD - Director, Natural Resources Division |  Date |
| BLM - Tucson Field Office Manager | Date |
| Pima County - Natural Resource Division Manager | Date |
| NRCS - Resource Conservationist | Date |
| U of A CES - Rangeland Management Specialist | Date |
| AGFD - Wildlife Habitat Specialist | Date |

Evaluation and Revision

A review of the plan will be conducted each year in cooperation with the rancher, and with as many members of the CRM group as possible. This review will typically be at the time of the annual fall monitoring, and the records of actual use data and rainfall data will be updated. Data collected from the monitoring sites will be used to aid in management decisions. At this time, and at other times during the year if necessary, the CRMP group will discuss and evaluate progress on objectives, possible barriers to implementation, successes, potential partnership projects and other topics of interest.

Concurrence

Accepted by:


| | |
|---|----------|
| Rancher - Sands Properties LLC | Date |
| Forest Service - Sierra Vista District Ranger | Date |
| ASLD - Director, Natural Resources Division | Date |
|  | 11/10/10 |
| BLM - Tucson Field Office Manager | Date |
| Pima County - Natural Resource Division Manager | Date |
| NRCS - Resource Conservationist | Date |
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|  AGFD - Wildlife Habitat Specialist | 10-25-10 Date |