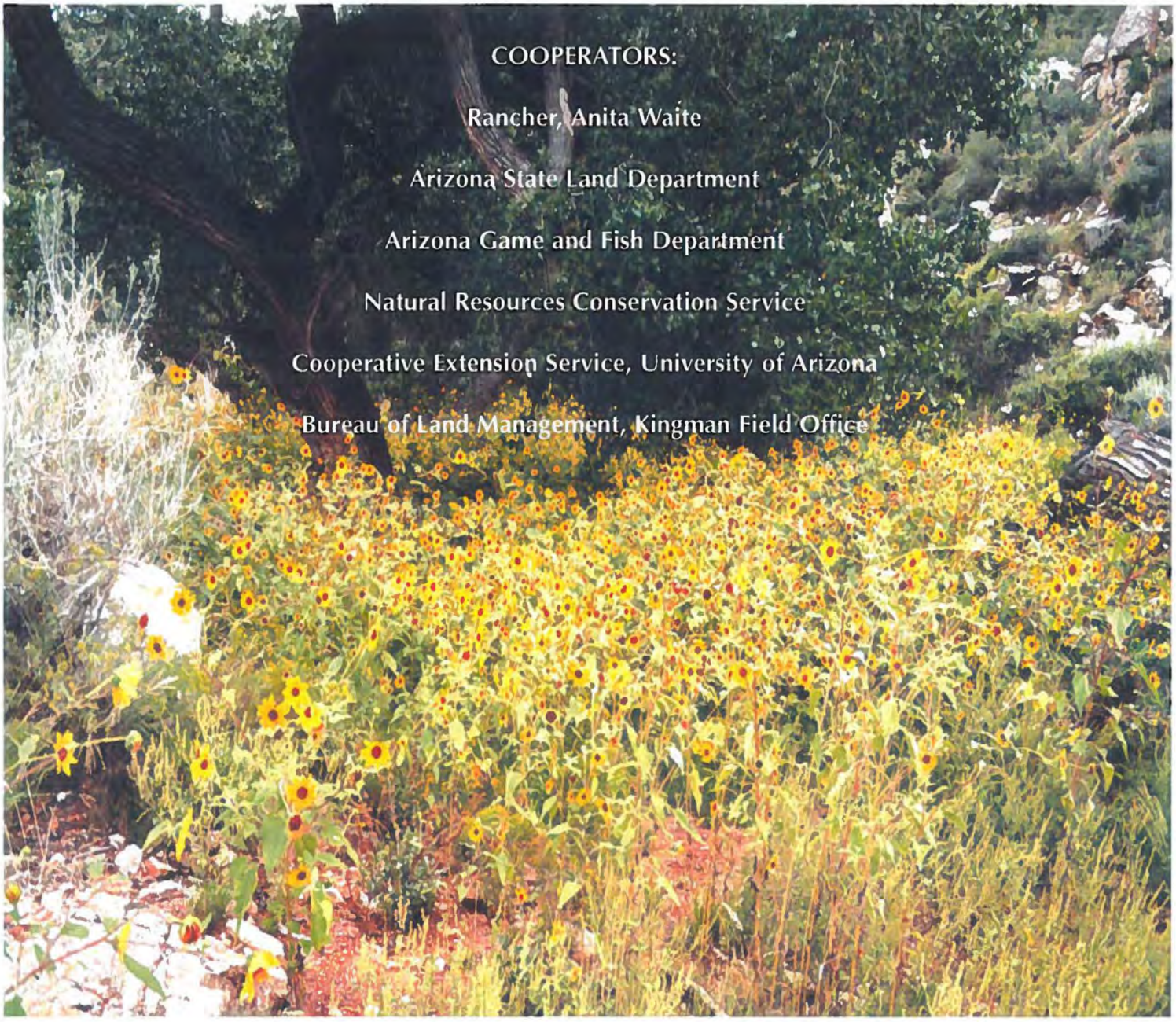
CANE SPRINGS RANCH

COOPERATIVE MANAGEMENT PLAN



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INTRODUCTION

This interagency and interdisciplinary plan is intended to be dynamic and adaptable. Natural forces, agency emphasis and political situations are not static, so it is assumed that situations and conditions in and about the Hualapai Mountains will change from those existing when this plan was developed. In addition, management may wish to implement some identified actions before final plan approval. To accommodate this and maintain viability of this plan, an Adaptive Management strategy is being included. Continuing the Interdisciplinary Team approach, actions that are previously unidentified, or proposed plan changes will be presented to the team. The team will determine if the proposal is in conformance with the vision and objectives stated in the plan. During implementation, some actions prescribed in this plan may cease to be feasible or desirable as new information or conditions ensue. The team may change any part of or the entire plan, may be refined or re-written to adapt to changing conditions. Controlled experimentation with new management techniques is encouraged and these techniques may be applied to broader areas as the team dictates.

I. PURPOSE

A. To define management objectives for the ranch

B. To define management actions to meet the management objectives.

C. Use monitoring studies to determine if the management actions are achieving the management objectives.

II. RANCH RESOURCES

A. Location

The Cane Springs Ranch is located 35 miles southeast of Kingman, Arizona, and 15 miles north northwest of Wikieup on Highway 93, on the eastern slopes of the Hualapai Mountains. Elevation on this allotment ranges from 2,680 to 6,922 feet.

The ranch is presently managed as two units; the A Unit consists mainly of steep, mountainous country predominantly covered with dense

chaparral. This unit falls into the 12 - 20 inch precipitation zone. The B Unit is desert shrub/grassland covered hills. It is in the 10 - 12 inch precipitation zone.

B. Land Status

Unit A (administered by the Bureau of Land Management)

Status		Acres
Public		14,604
State Leased		1,226
Private Leased		13,252
Private Not Leased		100
	Total	29,182

Unit B (administered by the Arizona State Land Dept.)

Status		Acres
Public		1,045
State Leased		18,772
Private Leased		20,530
Private Not Leased		340
	Total	40,687

Due to the topographical and vegetation differences between these two units, they have been run separately in the past.

Unit A: Is one large pasture containing mostly public and private land. Referred to as Mountain pasture.

Unit B: Is sectioned off into four pasture containing mostly state and private land. There are three main pastures referred to as North, Middle and South. The fourth is small and used as a temporary holding pasture.

C. Environment

1. Climate

Average annual precipitation on this ranch may vary from 10 inches in the lower foothills to 20 inches in the mountains. Distribution of precipitation throughout the year averages approximately 60 percent in the winter and 40 percent in the summer, however this can vary greatly from year to year.

Average high temperature for the months June-August is 85-90 degrees F. Average low temperature for the months December-February is 30-35 degrees F.

2. Soils/Vegetation

Unit A

* No production data has been collected in Unit A and therefore the current range condition is unknown.

All of the soils in Unit A of the Cane Springs Ranch are in the Granitic Hills Ecological Site,13-17" p.z. and Granitic Hills 17-20"p.z., except Tombstone-Caralampi-Eloma complex, which is in Limy Upland and Clay Loam Upland 13-17" p.z. The majority of the vegetative communities fall within the Major Land Resource Area (MLRA) Arizona Interior Chaparral (#38),

The following soils/ecological sites occur in Unit A:

1. 048-Lampshire-Rock Outcrop Complex

Ecological Site: Granitic Hills 13-17" p.z., MLRA 38-1 (Interior Chapparal)(Lampshire)

Acres: 14,599

Plant Community: Turbinella oak, manzanita, mountain mahogany, buckbrush, desert ceanothus, Wrights silktassel. On some northern exposed slopes pinyon pine also exists. A sparse understory of sideoats grama, black grama, desert needlegrass, and threeawn occurs on some sites where the soil is too rocky to support dense stands of chaparral.

2. 180A-Romero-Chiricahua-Rock Outcrop Complex

Ecological Site: Granitic Hills 13-17" p.z., MLRA 38-1 (Interior Chapparal)(Romero, Chiracahua)

Acres: 5,810

Present Plant Community: Turbinella oak, rayless goldenhead, birchleaf mountain mahogany, desert ceanothus, shrubby buckwheat, buckbrush. Sideoats grama, Desert needle grass occurs in significant quantities on southern exposures.

3. 175A-Romero-Lampshire-Rock Outcrop Complex

Ecological Site: Granitic Hills 13-17" p.z., MLRA 38-1 (Interior Chapparal), (Romero, Lampshire)

Acres: 5,248

Present Plant Community: Broom snakeweed, sideoats grama, threeawn, false mesquite, catclaw, cane beardgrass, shrubby buckwheat, prickly pear, rayless goldenhead. Dense chaparral consisting of Turbinella oak, desert ceanothus, birchleaf mountain mahogany, rayless goldenhead, catclaw, and on some sites manzanita and pinyon pine, are the predominant species on northern exposures.

4. 046-Hassel family-Lampshire-Rock Outcrop Complex

Ecological Site: Granitic Hills 13-17" p.z., MLRA 38-1 (Interior Chapparal), (Hassel family, Lampshire)

Acres: 1,588

Present Plant Community: Turbinella oak, manzanita, birchleaf mountain mahogany, buckbrush, black grama, sideoats grama.

5. 047-Docdee-Rock Outcrop Complex

Ecological Site: Granitic Hills 17-20" p.z., MLRA 38-1 (Interior Chapparal),(Docdee)

Acres: 1,107

Present Plant Community: Ponderosa pine, turbinella oak, Gambel oak, shrubby buckwheat,muttongrass, Arizona fescue.

6. 220C-Tombstone-Caralampi-Eloma Complex

Ecological Site: Limy Upland 13-17"p.z.,MLRA 38-1 (Interior Chapparal),(Tombstone, Caralampi)or Clay Loam Upland 13-17" p.z., MLRA 38-1 (Interior Chapparal),(Eloma)

Acres: 401

Present Plant Community: (Tombstone and Caralampi) turbinella oak, desert ceanothus, sideoats grama, range ratany.(Eloma) turbinella oak, desert ceanothus, falsemesquite, sideoats grama, and range ratany.

Unit B

1. Romero-Lampshire-Rock Outcrop (175A)

Ecological Site: Granitic Hills, 13-17 inch p.z., MLRA 38-1 (Interior Chaparral),(Romero, Lampshire)

Present Range Condition Class: Fair

Acres: 2040

Present Plant Community: Turbinella oak, flattop buckwheat, globemallow, desert trumpet, calliandra, indian wheat, euphorbias, englemann pricklypear, broom snakeweed, catclaw, hedgehog, and baccharis spp. Grassland species are sideoats grama, desert needlegrass, sideoats, black grama and threeawn.

2. Nickel-Topawa family-Eba family complex (220A)

Ecological Site: Clay Loam Upland, 9-12" p.z., MLRA 30-2 (Grand Canyon Desert Scrub), (Eba family), Limy Slopes, 9-12" p.z., MLRA 30-2 (Grand Canyon Desert Shrub) (Nickel,Topawa family)

Present Range Condition Class: Fair

Acres: 21,415

Present plant community: (Nickel, Topawa) Big galleta, poverty threeawn, fluffgrass, sand dropseed, bush muhly, desert trumpet, twinberry, plains blackfoot, wire lettuce, rockpea, paperflower, range ratany, mexican bladdersage, broom snakeweed, calliandra, catclaw acacia, running pricklypear, turpentine bush, canotia, flattop buckwheat, beavertail pricklypear, brittlebush, graythorn, broom snakeweed rayless goldenhead hedgehog.(Eba family)broom snakeweed, big galleta, canotia, flattop buckwheat.

3. Stagecoach-Topawa-Eba complex, dry,(220)

Ecological Site: Limy Slopes, 7-10" p.z., MLRA 40-3 (Sonoran-Mohave Desert Shrub Mix)(Stagecoach,Topawa), Clay Loam Upland, 7-10" p.z., MLRA 40-3 (Sonoran-Mohave Desert Shrub Mix)(Eba)

Present Range Condition Class: Fair (both key areas)

Acres: 8,915

Present plant community: big galleta, fluffgrass, sideoats grama, poverty threeawn, bush muhly, desert needlegrass, paperflower, blackfoot daisy, euphorbia, Mexican bladdersage, range ratany, rayless goldenweed, banana yucca, canotia, catclaw acacia, broom snakeweed, graythorn.

D. Sensitive Resources

1. Riparian Areas

Definition:

A riparian area or zone is an area of land directly influenced by permanent water either on the surface or as free subsurface water within the rooting zone of dependent vegetation. A riparian area has visible present or potential vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the present or potential vegetation dependent upon free water in the soil. Although ephemeral washes do not generally support obligate riparian vegetation, it is acknowledged that these

ribbons in the desert are more productive and are desirable by livestock, wildlife, recreationists and others, and should be treated with care.

Ephemeral streams have surface water present for short periods following runoff events. The vegetation along these dry streams or washes has been called various names by researchers. Johnson and Haight (1985) and Warren and Anderson (1985) used the term, "xeroriparian". Lowe (1985) suggests "desert riparian".

Although they are usually dry, these ephemeral streams receive available water in the form of runoff from adjacent slopes which allows plant species to become established that are not found on the uplands (Lowe, 1964). These plant species in turn support wildlife species that are absent from or rare to the dry uplands (Lowe, 1964). Shreve (1951) points out that xeroriparian habitats contribute to the biodiversity of a desert area that is far in excess of the percentage of land they cover. Research has shown that these xeroriparian areas support a substantially larger diversity of bird species than adjacent upland areas in desert ecosystems (Johnson and Haight, 1985). They felt this trend held true throughout both the Sonoran and Mohave deserts. Krausman et al. (1985) showed that the xeroriparian drainages were important components of desert mule deer habitat. In studies in Arizona, Krausman et al. (1985) found that "the plant species composition of washes was more diverse than that of the surrounding vegetation and provided a higher density of forage and cover than adjacent areas." They also found that the most preferred forage species for desert mule deer were found along washes, as well as a higher percentage of shaded bedding sites.

Plant species typically found in xeroriparian zones include deergrass, California brickellbush, squaw waterweed, netleaf and desert hackberries, mesquite, paloverde, burrobrush, seep willow, canyon ragweed, desert willow and hollyleaf buckbrush.

Unit A (Riparian/Xeroriparian)

There are three major drainages in Unit A of the ranch Bull Canyon, Hibernia Canyon and Pilgrim Wash. These streams are intermittent, however along the course of them are numerous perennial springs and seeps. In many areas the water table is shallow enough to influence the vegetation, this includes seep willow, velvet ash, red willow, coyote willow, Goodings willow, Fremont cottonwood, Arizona black walnut, deer muhly, and Arizona grape.

Land status of major drainages in Cane Springs Ranch Unit A (in miles):

	Private	Public
Bull Canyon	3.5	5.1
Hibernia Canyon	4.3	4.0
Pilgrim Wash	2.1	0.6

Unit B (Xeroriparian)

There are three major drainages in Unit B of the ranch lower portions of Bull Canyon, Blue Tanks Wash and Cane Springs Wash. These drainages are ephemeral and dry for most of the year. Generally the water table in these lower drainages are too deep to support large areas of riparian vegetation. Despite this, these ephemeral drainages support a great diversity of plants and animals and are distinctly different from the adjacent upland areas.

2. Species of Special Concern

a. Hualapai Mexican Vole

The Hualapai Mexican Vole (Microtus mexicanus hualpaiensis), a federally listed endangered species, is known to occur in the extreme Northwestern portions of the ranch in Unit A . Recently occupied habitat (within the last 10 years) is known from Pine Flat above the headwaters of upper Bull Canyon. This habitat area has been fenced to exclude livestock grazing. The headwaters of upper Bull Canyon (3/4 mile below Pine Flat) contains potential vole habitat. There are no known records of voles from the headwaters habitat area. A trapping effort by the Arizona Game and Fish Department, in 1995 resulted in no capture of voles. No vole sign were detected during this survey effort.

b. Sonoran Desert Tortoise

Portions of this ranch both Units A and B are classified as Category III Tortoise Habitat. Criteria for the placement of an area into this category are: 1) it is not essential to maintaining a viable desert tortoise population, 2) most management conflicts are not resolvable, 3) there is a low to medium density of desert tortoises in the area and it is not contiguous with areas of medium or high

density tortoise populations, and 4) tortoise populations are stable or decreasing.

Very little tortoise habitat occurs on the public lands on this grazing allotment. Most of the Category III desert tortoise habitat occurs on non-federal range where BLM lacks management jurisdiction. The public lands on this allotment generally occur at the higher elevations where tortoises do not occur. Because of the lack of federal jurisdiction on the tortoise habitat on this allotment, but recognizing that they do occur there, the area was classified as Category III tortoise habitat.

c. Southwestern Willow Flycatcher

Inventories for this species have not been conducted on the ranch. Although the native broadleaf dominated (mixed cottonwood/ willow/tamarisk) communities that occur within Unit A have been classified as riparian habitat, none have been identified as suitable for this species. This species is not known to occupy riparian habitats that are narrow and linear and less than 10 m wide which typifies the riparian habitat on this allotment. Narrow canyons, such as those found within the Cane Springs Ranch, are subjected to frequent scouring from flood events and are likely incapable of producing or maintaining suitable habitat for Southwestern willow flycatchers as currently understood.

Southwestern willow flycatchers require dense stands or thickets of willows (or similar shrubby species such as seep willow, salt cedar, etc.) in wide bands for successful nesting habitat (Sogge, 1996). Within the "native broadleaf dominated" communities there is a distinct overstory of broaddleaf trees with subcanopy layers and a dense understory (Sogge, et.al 1997). Water or at least saturated soil needs to be present since they nest above or near water (Sogge, 1996). Habitat widths vary from as small as 0.8 ha to as large as several hundred hectares. Nesting success increases in wider bands of riparian vegetation since the impacts from cowbirds and livestock are more spread out (USFS, 1996).

d. Long-fin Dace

This species of fish was identified on the ranch in 1983. It appears that this fish move onto the ranch when flood conditions allow

them to move up-stream from the Big Sandy River into Hibernia and Bull canyons. When this movement onto the ranch occurs, it results in temporary occupation until surface water recedes. Long term habitat for this species is not expected to develop.

f. Plants

No plant species of special concern have been observed or recorded on this ranch.

3. Wilderness Area

Approximately 300 acres in the extreme Northwestern portion of this ranch unit A became part of the Wabayuma Peak Wilderness Area as a result of the Arizona Desert Wilderness Act of 1990.

III. GRAZING HISTORY

The first documentation of ownership is R.T. (Robert) Wilson in an application for a grazing permit dated April 24, 1936. Mr. Wilson applied to graze 1500 cattle and 30 horses on the Cane Springs Ranch. At that time Mr. Wilson claimed he had previously run 1500 head of cattle on the ranch and that his predecessors had used the ranch continuously over the past 20 years. Mr. Wilson ran a cow and calf operation.

This information sets a date of recorded use possibly as early as 1916. It also establishes a cow/calf operation with a total ranch herd size of 1500 cattle.

The ranch was sold to A.C. Dowdie, January 7, 1939. Mr. Dowdie sold the ranch November 23, 1942 to Lakin-Peter Cattle Company.

The George T. Peter estate, formerly the Lakin-Peter Cattle Company, was sold to J. M. Smith on October 9, 1946. J. M. Smith and son, Kent, managed the ranch as a partnership until July 1, 1955 when J. M. Smith assigned the ranch over to Kent Smith. Kent then sold the ranch to Billy J. Carson In June 1982.

William L. Nugent acquired the Ranch from Mr. Carson in April, 1989 and Anita M. Waite the current owner/lessee purchased the Ranch from Mr. Nugent in September, 1993.

Past licenses dating back to 1939 were reviewed to get an idea of preference history on both the A and B Units. These units were licensed as one until 1975. The yearly average of cattle year long (CYL) on both units for the 37 years between 1939 and 1975 was 538. The highest average was 1,254 CYLs in 1964 and the lowest was 0 CYLs in 1945 and 1946.

IV. ANALYSIS OF MONITORING DATA

Due to the fact that little or no monitoring data was collected on the Unit B portion of the ranch prior to this plan, this analysis is only covers the Unit A portion of this ranch in which monitoring data was collected.

A. Data shortfalls

* Ranch specific precipitation records for this area only go back to June of 1986.

* Actual grazing use has been submitted for the grazing seasons of 1983, 1985, 1990, 1991, 1993, 1994 and 1995. Licensed use has been used to reflect stocking rate for those years in which actual use was not submitted.

* Documentation of key forage utilization has been inconsistent.

- No production data has been collected in Unit A and therefore the current range condition is unknown.

B. Use On Unit A

Over the past 17 years separate bills have been issued to these units, the A unit has had an average of 143 CYLs. The highest for Unit A average was 230 CYLs in 1984 - 1988. Actual use on (Unit A) during the grazing seasons of 1983 and 1985 was 230 CYL's. During 1990 it was 0, and from October 1991 until March 1992 it was 100. November 1993 to November 1994 was 190. Use was 90 CYL Until January 15, 1995, 0 use until March of 1996, 300 through June, 1996.

This data only indicates the number of cattle that were licensed, no actual use information was recorded until 1983. Also, no records exist of

distribution in this portion of the ranch. It is apparent, however, that the preference has been significantly reduced in the past 25 years.

C. Trend

1. Plot #1

Frequency data on this plot was collected in 1986, 1987, 1988, 1989, and 1992. Data indicates that this plot is stable over a six year monitoring period with perennial grasses showing an upward trend, but very much responding to the variability of precipitation.

2. Plot #2

Frequency data for this plot was collected in 1987, 1988, 1989, and 1992. Data indicates that the plot is very stable over the five year evaluation period. Most perennial grasses show level status noting the significant change in black Grama between monitoring in 1989 to 1992 increasing from 25 to 33 percent. The cyclic nature of Sand dropseed is demonstrated by its range of 13, 8, 12, and 7 percent and probably reflects precipitation patterns and sampling error. It is not felt that these changes are due to livestock pressure.

3. Plot #3

Frequency data for this plot was collected in 1987, 1988, 1989, and 1992. The data suggests that the increases in perennial grass species maybe related to the decrease in grazing pressure. The five years of monitoring data indicates an upward trend for perennial grass species with Sand dropseed showing its cyclic nature as in Plot 2. Shrub species indicate stable growth.

D. Utilization

An average of the utilization levels of key forage species for the years 1986-91 was below allowable levels of 40 to 60 percent. Utilization data on the most utilized key species (Sideoats grama) averaged 39 percent at plot #1, 24 percent at plot #2, and 57 percent for plot #3.

E. Precipitation

Precipitation was the only weather factor used to determine weather conditions in the area. Precipitation is an important factor for plant condition and production during the growing seasons. The early growing season occurs from 3/01 to 6/30 and the late growing season from 7/01 to 10/31. Precipitation data, from Remote Area Weather Station (RAWS) in the northwest quarter of Section 17, and a BLM monitored rain gauge located in the northeast quarter of Section 24, Township 19 North, Range 15 West, G&SRM, was utilized to determine weather conditions in the area. The precipitation data was graphed and analyzed to determine if general weather patterns between the stations were similar. The data indicates, high and low precipitation occurred during the same months at both weather stations.

For purposes of this evaluation, precipitation data collected during a given year were totaled by growing season. The results of this evaluation are shown on (Table 1).

F. Conclusion

Utilization and trend data indicates all plots are showing an upward trend based on information collected on perennial grasses in Unit A. All plots are reflecting the variability of precipitation with 1988 and 1992 indicating good winter and spring moisture and 1986 and 1989 show good summer precipitation. Production data is not available to correlate condition classes for each plot. However, trend data indicates that all plots are in static to upward trend. It is important to point out that monitoring data is very limited for this allotment and therefore, it is very important to focus on setting good management objectives and collecting good monitoring data to adjust management actions in the future.

V. MANAGEMENT OBJECTIVES

A. Unit A (public and private land)

1. Upland Vegetation Objectives

a. Achieve a 50% average utilization level on key forage species and limit utilization of key forage species to 60% each year.

b. In plot #1 maintain or increase the frequency of the following key species over the next 10 years .

* Key species: Sideoats grama- presently @ 53%
Black grama- presently @ 6%

c. In plot #2 maintain or increase the frequency of the following key species over the next 10 years.

* Key species: Sideoats grama- presently @ 10%
Black grama- presently @ 26%
Cane beardgrass- presently @ 15%
Sand dropseed- presently @ 12%

d. In plot #3 maintain or increase the frequency of the following key species over the next 10 years.

* Key species: Sideoats grama- presently @ 59%
Black grama- presently @ 20%
Squirreltail- presently @ 10%
Sand dropseed- presently @ 4%

2. Riparian Vegetation Objectives

To determine present riparian conditions, utilization mapping and a Riparian Area Condition Evaluation (RACE) will be completed in Hibernia and Bull Canyons. Two study plots have been established in Hibernia Canyon and Two study plot in Bull Canyon. Baseline data will be gathered in all plots by October 1999. These studies will help direct management actions and to measure progress towards meeting the management objectives.

Observations taken of the riparian vegetative plants communities in Hibernia Canyon, Bull Canyon and Pilgrim Wash indicate good recruitment potential of woody plant species. The current age class distribution in Hibernia Canyon and Pilgrim Wash are old and young trees with the middle age class mostly absent. A good mix of different age classes exist in Bull Canyon.

The objectives to maintain properly functioning riparian areas are as follows:

a. Develop a diverse age class structure of key woody species (1-5% Old, 45-49% Mid, 45-49% young) at all study sites over the next 10 years.

   * Key species: Velvet Ash (Fraxinus velutina)
   Willow (Salix spp.)

b. By October 1999, baseline data will be collected at each study site, an objective for cover of herbaceous vegetation along the stream banks will be developed and agreed to by all team members.

c. Limit utilization of key woody and herbaceous vegetation to 50% of the current years growth at all study sites.

   * Key species: Velvet Ash (Fraxinus velutina)
   Willow (Salix spp.)
   Muhly (Muhlenbergia spp)

   Since utilization of riparian vegetation is not so much a function of stocking rates as much as it is of management of stock distribution, utilization data of key riparian forage species will not be used in stocking rate adjustments for this ranch. Upland utilization within the established study plots will be used to determine the stocking level. However, utilization data in the riparian areas will be used to adjust livestock management.

d. Increase the canopy cover of Velvet Ash at study site #1 in Bull Canyon from 12.8 percent to 20 percent over the next 10 years.

B. Unit B (state and private land)

1. Upland Vegetation

The objectives to maintain healthy range conditions on the uplands are as follows:

a. Achieve a 50% average utilization level on key forage species and limit utilization of key forage species to 60% each year.

b. In all plots maintain or increase the frequency and production of the key species.

VI. MANAGEMENT ACTIONS

The intent of this plan is to define the management actions that will move us toward meeting those objectives listed in the previous section. In order to meet the objectives the grazing schedule for the ranch focuses on allowing for rest during the growing season. Growing season in riparian plant communities is critical for tree regeneration and establishment. This schedule, however will allow the flexibility necessary to meet the management objectives.

A. Grazing Management

The current grazing system for Unit B is "Next-Best Pasture". Unit B has three pastures, and two are grazed each year, leaving one to rest. This system allows for rotating periods of rest in each pasture during the growing season.

Typically, Unit A receives late fall, winter, and early spring grazing. Cattle on Unit A are removed from May 1 to October 1 most years. The proposed grazing management for Unit A is focused on enhancing riparian habitat by resting the habitat during the growing seasons of spring and summer.

The total combined grazing capacity of the allotment is 640 cattle year long (CYL) figured by 230 animal units from Unit A and 410 animal units from Unit B.

1. Flexibility (For Drought and Economics)

For drought and economic purposes livestock grazing may occur during the growing season (May 1 to Oct. 15) in the Mountain pasture as long as all the management objectives are being met. In order to reduce the impacts of grazing pressure on the canyon bottoms during the growing season, herding would be utilized to push cattle out of the canyon bottoms.

Definitions:

Drought- When an area receive less than 75 percent of the average growing season precipitation.

Economics- When market condition are such that additional income or reduced expenses can be provided to the ranch through livestock management.

Grazing during the growing season in the Mountain pasture would be monitored and evaluated during the grazing periods to determine the effects of grazing on the riparian and upland habitat. If utilization levels exceeded 50 percent on riparian or upland habitat, this pasture would be rested from May 1 to October 15, for the next two years, despite drought or economic conditions. This two years of growing season rest should allow the riparian habitat to recover after grazing.

Utilization studies would be conducted during the time cattle are located in the Mountain pasture. If utilization levels reach 50 percent cattle would be removed from this pasture. When cattle are removed from Unit A they will then go to Unit B that has a preference of 410 animal unit year long. They will be rotated through the three large pastures in a next best pasture rotation.

In drought conditions cattle number may be reduced and redistributed throughout Unit A and Unit B. This will help to reduce the impacts of grazing to plant that are already stressed due to the drought.

2. Ranch Economics

In addition to improving and conserving the rangeland resources, the coordinated management plan seeks to assist the rancher in meeting their economic goals. The goals listed below focus on improving livestock performance:

*Improving the calf crop from 66% to 80% or higher, through the establishment of a defined breeding and calving season.

*Utilizing the BLM portion of the ranch (Mountain Pasture) during the fall/winter months and rotating to State portion of ranch (lower

pastures) in the spring/summer months should improve livestock performance.

*Utilize total permitted stocking rate on both Units A and B to maintain an economically viable ranch through cow numbers.

In addition to the implementation of rotation grazing, supplemental feeding and salting will be practiced as a livestock management tool for distribution and livestock health.

Federal grazing fees will be changed from advanced billing to actual use billing.

3. Range Improvements

Unit A

A. Livestock Trails

The permittee has identified the need to develop a network of livestock trails in the Unit A portion of the ranch. Due to the dense chaparral vegetation in the Mountain pasture the permittee has identified the need for these trails to move livestock. These trails will be cut by hand along existing game trails, jeep trails and drainages. These trails will not be put in potental Vole habitat in the headwaters of Bull Canyon.

B. Fire Management

Arizona Interior Chaperal is a fire adapted plant community that burns frequently. One of the most important tools for managing chaparral vegetation is fire. Fire allows both wildlife and livestock access to palatable browse regrowth and may helps improve watershed condition. The current shrubs condition is known as a closed canopy. This condition severely limits any large ungulates from utilizing large acres of vegetation. A closed shrub canopy can reduce stream flow by intercepting water before it reaches the stream channel. The use of fire in brushlands is highly complex because of variations among shrub density and type, burning techniques, and environments. It is recommended that a rotation involving burning, careful grazing management, and reburning as a means of reclaiming a more favorable brushland site should be implemented.

The BLM is currently working on a Fire Management Area Plan for the east side of the Hualapai Mountains and Unit A of the ranch falls within the planing area. This plan would allow natural fire starts, such as lightning strikes to burn as long as burning conditions are within allowable limits set forth in the fire plan. In addition to natural starts, the plan will define the parameters that will allow us to use prescribed fire to reduce fuel loading and the potential of large fires which are hard to manage or control. Depending on funding and when the fire plan is completed we would like to start using prescribed fire in 1998.

Unit B

A. Water Developments

The rancher, USDA-NRCS and the Arizona State Land Department has identified the need to covert 4 existing windmills to solar power. They have also identified the need to develop a spring to improve the water availability in this portion of the ranch. There is an existing conservation plan and long term agreement with the NRCS to complete the projects listed above.

B. Sensitive Wildlife Species Management

1. Hualapai Mexican Vole

The Pine Flats area, which contains Vole habitat has been eliminated from the ranch Unit A. To ensure that cattle do not drift into this area, approximately 1.75 miles of fence has been constructed.

Ungulate use on the remaining, unfenced riparian vegetation in the headwaters area of Bull Canyon, was documented in the summer of 1996. Utilization was approximately 5 percent. This use occurred during the growing season with a stocking rate in Unit A of approximately 380 animal units (for 6 months). Potentially this area could be stocked with up to 460 animal units (for up to 6 months).

2. Sonoran Desert Tortoise

All tortoise habitat on this allotment is categorized as Category III desert tortoise habitat. The goal for managing Category III desert tortoise habitats is to limit desert tortoise habitat and population declines to the extent possible by mitigating impacts.

3. Southwestern Willow Flycatcher

The main focus of this livestock management plan in Unit A is to enhance riparian condition within Hibernia Canyon, Bull Canyon and Pilgrim Wash in Unit A. Even with improved habitat condition it is doubted that suitable habitat can be developed in this portion of the ranch. Refer to the beginning of this plan, Section D, number 2, item c, for more data on why habitat is not considered suitable for the Southwestern willow flycatcher.

4. Long-fin Dace

Habitat for this species is only adequate on the ranch when rainfall and stream flows are in excess of normal averages. In wet years, this species may move into the ranch from the Big Sandy River. Long term or permanent habitat is not expected to develop.

C. Wilderness Management

The portion of this ranch which is in the Wabayuma Peak Wilderness Area will be eliminated due to the exclusion of the Pine Flats Area (see section IV, C, 1 of this document)

VII. MONITORING

Each of the stated vegetation management objectives recommended above will be monitored and evaluated to determine the progress of management actions toward meeting management objectives. All cooperators are invited and encouraged to help collect monitoring data in both Units A and B of the ranch.

An annual meeting will be held with all cooperating agencies to review monitoring data and progress towards meeting management objectives for the ranch. A copy of monitoring data will be provided to all cooperators.

For future analyses, frequency data on upland sites and canopy cover and age class structure data, on riparian vegetation will be collected. This data along

with utilization data on upland and riparian sites will be evaluated to guide management practices in meeting the resource objectives.

Additional monitoring sites may be identified upon agreement between all cooperators as this plan progresses.

(Unit A)

A. Upland Vegetation

1. Study Locations

Site locations are as follows:

a. Plot #1 Bull Canyon - T. 18 N., R. 15 W., Sec. 11 NENWSE

b. Plot #2 Midway - T. 18 N., R. 15 W., Sec. 18 SENWSW

c. Plot #3 Hair Clipper Wash - T. 18 N., R. 15 W., Sec. 29 NWSESE

2. Utilization

Utilization data will be collected on each pasture annually while livestock are in each pasture on all key forage species within the study plots listed above using the Grazed-Class photo guides (BLM Technical Reference 4400-3, pp. 23-6).

3. Trend

Frequency data will be collected every five years using the Pace Frequency method (BLM Technical Reference 4400-4, pp. 24-8).

4. Actual Use

The permittee will provide the BLM with an actual use report by March 15 of each year specifying numbers and dates of movement of livestock.

5. Weather

Weather data from the Remote Area Weather Station (RAWS) in the northwest quarter of Section 17, and a BLM monitored rain gauge

located in the northeast quarter of Section 24, Township 19 North, Range 15 West, G&SRM, will be used in the allotment analysis. These stations are four and three miles respectively north of the Cane Springs Ranch.

In addition to the stations listed above the rancher will collect rainfall data for each pasture during the year. This data will be used along with RAWS information to help direct management actions.

B. Riparian

1. Study Locations

* Study plot #1in the Bull Canyon (T.19N., R.15W., Sec 10 SESE).

* Study plot #2in the Bull Canyon (T.19N., R.15W., Sec 11 NWSE).

* Study plot #1in Hibernia Canyon (T.19N., R.15W., Sec 26 NWSW).

* Study plot #2in Hibernia Canyon (T.19N., R.15W., Sec 24 SWSW).

2. Utilization

Utilization data within riparian areas will be collected annually in each canyon while livestock are in each pasture using the Browse Utilization Classes in the Key Forage Plant Method (BLM TR 4400-3, pp. 11-13).

* Key species: Velvet Ash (Fraxinus velutina)
Willow (Salix spp.)

3. Age Class

Age class structure will be measured by walking through each riparian area and determining age class diversity. In addition a vegetation profile board will be used to document age class. Photos will be taken and used to get a general idea of the trend of age class diversity.

* Key species: Velvet Ash (Fraxinus velutina)
Willow (Salix spp.)

4. Cover

Vegetative cover will be measured using the Line Intercept Method (BLM TR 4400-3, pp. 42-45).

* Key species: Velvet Ash (Fraxinus velutina)
Willow (Salix spp.)

(Unit B)

A. Upland Vegetation

1. Study Locations

a. North Pasture: SEI/4 sec 33 TI9N RI4W; Limy slopes 30-2

b. Middle Pasture: SWI/4 sec 10 TI8N R14W;Limy slopes 30-2

c. South Pasture: NI/2 sec 33 TI8N RI4W; Granitic Hills 38
SEI/4 sec 26 TI8N RI4W; Limy slopes 30-2

d. Mtn Pasture: NE1/4 sec 31 T18N RI4W; Granitic Hills 38

2. Utilization

The Grazed-class photo guides or actual weight method will be used. Minimum sample size is 100 units. All species encountered will be recorded. This will be done annually following grazing.

3. Trend

Frequency data will be obtained at each study location using a 40 X 40cm plot frame with a minimum of 100 sampling units within the transect area. Grasses and forbs must be rooted in the plot frame to be counted shrubs and trees will be counted if their canopies extend over the frame. The AZ State Land Dept will also be collecting photo data to mark the visual change in plant communities over time. Photographs are taken at each key area. A photo is taken of a 3 X 3ft (1 square meter) plot and a second photo is taken of the general transect area. Photo plots will be permanently marked by steel rebar stakes. The photo will aid in the

interpretation of the trend data. These plots will be monitored annually in each of the key areas.

4. Actual Use

Rancher will provide livestock numbers to AZ State Land Dept.

5. Weather

In addition to the stations listed in Unit A, the rancher will collect rainfall data for each pasture in Unit B during the year. This data will be used along with rainfall information from Unit A and will help direct management actions.

6. Production and Composition

As needed, production and composition measurements will be taken in each key area. The three common methods for this include: double sampling; dry weight rank, and; comparative yield. This data will evaluate the rangeland condition class.

VIII. CONSULTATION AND COORDINATION

Anita Waite, Rancher

Rob Grumbles, Cooperative Extension Service, University of Arizona

Patrick H. Boles, Arizona State Land Department

U.S. Fish and Wildlife Service

Loretta J. Metz, Natural Resources Conservation Service

Bob Posey, Habitat Specialist, AZ Game and Fish Department

Mike Blanton, Range Staff, BLM-Kingman Field Office

Rebecca Peck, Wildlife Biologist, BLM-Kingman Field Office

Bruce Asbjorn, Recreation and Wilderness Specialist, BLM-Kingman Field Office

VIII. CONCURRENCE

Accepted By:

Anita M. Waite — Apr 29, 99
Permittee/Leasee Anita Waite — Date

Sherwood L. Koehn — 4-29-99
Permittee/ Leasee Sherwood L. Koehn — Date

John R. Christensen — 4-29-99
John Christensen, Field Office Manager, Bureau of Land Management — Date

Michael E Anable — 5/3/99
Mike Anable, State Land Commissioner, State Land Department — Date

Rod Lucas — 4/29/99
Rod Lucas, Regional Supervisor, AZ Game and Fish Dept. — Date

Tom Stahley — 4/29/99
Tom Stahley, Destrict Conservationist, Natural Resources Conservation Service — Date

Rob Grumbles — 4/29/99
Rob Grumbles, County Director, University of AZ Extension Mohave County — Date

Hubby Grounds — 7/12/99
Hubby Grounds, Chair Person, Big Sandy Natural Resource Conservation District — Date

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