

KS
BLACKBRUSH RELICT AREA
STUDIES

June, 1981



Manuscript prepared by:

U.S.D.A. Soil Conservation Service

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FOREWORD

This report was specifically prepared for an interstate correlation of blackbrush classification during the week of June 8, 1981. It presents proposed MLRA subresource area descriptions and range sites for Arizona. Also presented are data collected on relict areas.

The contents of this report have been jointly prepared by the Soil Conservation Service and the Bureau of Land Management. It does not constitute a complete analysis of the Blackbrush vegetation zone in Arizona. It does present data and information gathered intermittently over the last several years through studies conducted by SCS and BLM personnel.

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INTRODUCTION

Blackbrush (*Coleogyne ramosissima*) dominates the landscape over millions of acres in northern Arizona. Demand for basic resource data on these ranges has led the Soil Conservation Service and the Bureau of Land Management into a cooperative effort to develop range site data for the blackbrush formation.

Over the past few years, BLM and SCS personnel in Arizona have together been studying various blackbrush areas, including areas currently grazed, areas rested from livestock use, and relict areas which have never been grazed. The effects of disturbances such as drought and fire have also been studied.

The blackbrush formation complicates classification because of the variability of vegetation types it exhibits. The reason for this complexity is apparently due to a combination of highly variable environmental factors including geology and related soils, climate and topography.

In northern Arizona blackbrush is found along the Colorado River drainages from the northwest corner of the state to the northeast portion. Elevations range primarily from 3,000 to 5,800 feet.

Blackbrush is mostly found near large, warm canyons or valleys. This suggests they have some important climatic affect on blackbrush distribution. Perhaps thermal heating of local air basins is occurring in these areas.

Precipitation ranges from 6 to 12 inches with about 60 percent occurring in October thru April. Parent material includes basalt granite, schist, and a wide variety of limestones and sandstones. Soils are also highly variable and include very young soils (Orthents, Psamments) and very old soils (Paleargids, Paleorthids).

The plant seems to be most at home along the transition zone between the thermic and mesic temperature regimes. In the soil taxonomy the break between the mesic and thermic is a mean annual soil temperature of 15°C (59°F). These temperatures are measured at a 50cm depth or at the lithic contact. The most prolific stands of blackbrush studied occur on lithic soils in both the thermic and mesic designated temperature regimes. The studies conducted to date have not included the actual measurement of soil temperature. Actual measurement of soil temperature in the previously designated mesic zone may prove that the lithic soils have a mean annual temperature that meets the criteria for thermic soils. The shallow depth to parent material may cause an elevated mean annual temperature. The deep soils in the same area measured at 50cm may qualify as mesic.

Blackbrush exhibits a wide ecologic amplitude. In areas bordering the Mohave Desert, associated species represent the Mohave Desert flora. In areas bordering the Colorado Plateau Cold Desert, associated species represent a more mesic (vs. thermic) flora. This has led us to distinguish and propose two Subresource Areas in the blackbrush formation.

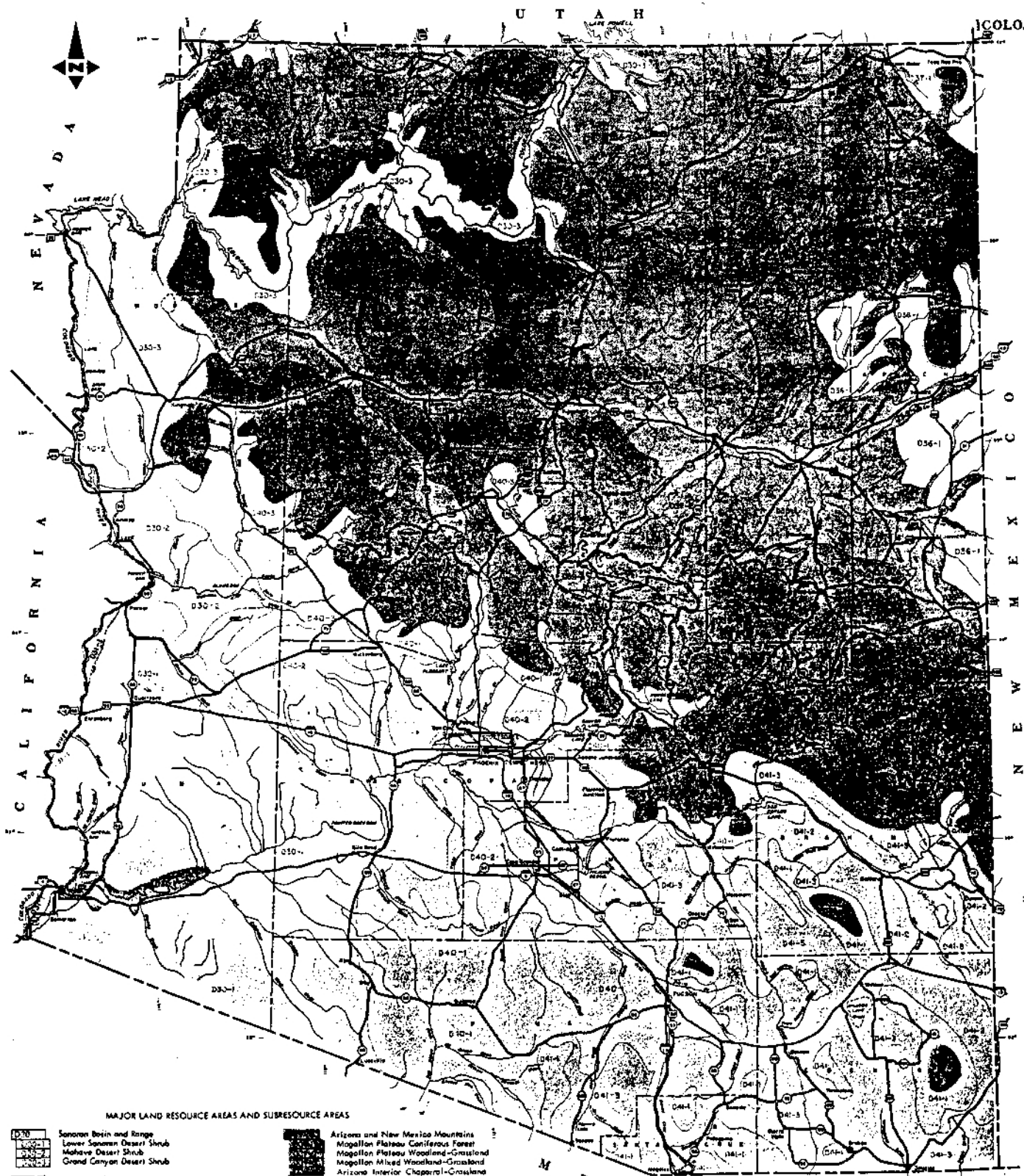
A Subresource Area D30-3 is proposed to include the blackbrush formation component closely allied to the Mohave Desert flora. Elevations range from 3,000 to 4,200 feet. Precipitation ranges from 8 to 12 inches.

Subresource Area D35-5 is proposed to include the blackbrush component more closely allied with the Colorado Plateau flora. Elevations range from 4,200 to 5,800 feet. Precipitation ranges from 6 to 12 inches.

Descriptions of these proposed Subresource Areas are included in this report. Also included are proposed range sites which represent the current status of our knowledge through considerable field studies over several years. Clipping data from several relict areas are also presented. We were able to find and access these relict areas with only limited helicopter time. As a result, range site descriptions are constructed around these data to include the variability we found and would expect to find on these and similar sites.



We expect to describe additional range sites as our cooperative BLM/SCS work continues. We also plan to formally publish our findings from the relict areas visited. They represent rare and important contributions to our knowledge of blackbrush ecology. Understanding the ecology of these areas is fundamental for the wise use and management of the resources within the blackbrush formation.



030 Sonoran Basin and Range
Lower Sonoran Desert Shrub
Mohave Desert Shrub
Grand Canyon Desert Shrub

031 Imperial Valley
Lower Colorado Shrub

032 Colorado and Green River Plateaus
Colorado Plateau Mixed Grass Prairie
Colorado Plateau Cold Desert Shrub
Colorado Plateau Sagebrush-Greaseland
Colorado Plateau Cold Desert Grassland

033 New Mexico and Arizona Plateaus and Mesa
New Mexico Woodland-Greaseland

034 San Juan River Valley Meas and Plateaus
Navajo Desert Shrub

035 Arizona and New Mexico Mountains
Mogollon Plateau Coniferous Forest
Mogollon Plateau Woodland-Greaseland
Mogollon Mixed Woodland-Greaseland
Arizona Interior Chaparral-Greaseland

036 Central Arizona Basin and Range
Upper Sonoran Desert Shrub
Phoenix Desert Shrub
Central Arizona Desert Grassland-Shrub

037 Southeastern Arizona Basin and Range
Mexican Oak-Pine Woodland and Oak Savannah
Chihuahuan Desert Shrub
Chihuahuan Semidesert Grassland

MAJOR LAND RESOURCE AREAS AND SUBRESOURCE AREAS

ARIZONA

JUNE 1978

10 0 10 20 30 40 MILES
SCALE 1:3,125,000

Source:
Base map prepared by SCS, WTSC Carto Unit from USGS 1:1,000,000 Nat. Atlas.
Thematic detail compiled by state staff.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE USDA-SCS/PLANS DIVISION

M7-PL-23930

DESCRIPTION

Subresource Area D30-3 - Grand Canyon Desert Shrub

Land Use

This area is used primarily as rangeland. Grazing operations with cow/calf and/or stockers dominate the livestock enterprises. Recreation is also a very important use in the area. Major recreation areas included at least partially in the area are Lake Mead National Recreation Area, Grand Canyon National Park, Marble Canyon National Monument and Glen Canyon National Recreation Area.

Cropland acreage is very minor, with approximately 2400 acres in the Virgin River Valley Area and 600 acres under irrigation in the Hualapai Valley. Other very small tracts of land are irrigated but make up a very small percentage of the area.

Traditional overuse of forage resources have resulted in both wind and water erosion in large valley areas. Other problems include inadequate livestock watering facilities and the increase of shrubby species on traditional grasslands. The complicated checkerboard land ownership pattern in the western portion of the area has caused management problems for federal and state land management agencies.

Elevation and Topography

Elevations are dominantly 1,500 to 4,500 feet. A few of the higher mountains reach an elevation of 5,500 feet. The area is primarily broad alluvial plains, terraces and fans interrupted by desert hills and mountains. The most prominent feature in the area is the Grand Canyon which dissects the area between Lake Mead and Lake Powell.

Climate

The climate is arid and warm. Annual precipitation ranges from about 8 inches to about 12 inches at the higher elevations. About 60 percent of the annual precipitation occurs during the October to May period as gentle rains with occasional snow. Snow normally remains on the ground a few hours after falling. The remaining precipitation occurs as summer thunderstorms during the June to September period. The average temperature ranges from 60° to 65° F. The average freeze-free period ranges from 200 to 230 days.

Water

The Colorado River is the only perennial stream in the area. Reservoirs along the Colorado River include Lake Powell and Lake Mead. These lakes are retained by Glen Canyon Dam and Hoover Dam respectively. These dams provide flood control,

recreation and hydroelectric power. Ground water is generally deep. Pumping of ground water for irrigation purposes is minimal but windmill driven shallow wells are relatively numerous. Many springs have been developed in mountainous areas for livestock water.

Soil

Typic Torrifluvents that are deep and range in texture from moderately coarse to fine make up a large part of the area (Anthony, Gila, Glendale, Vinton, Agua and Grabe series). Some of these Typic Torrifluvents occupy a large portion of valley areas in fan and terrace positions. Typic Haplargids are deep and range in texture from moderately coarse to fine (Continental, Eba, Mohave, Bitter Spring and Cornville series). Typic Calciorthids which are deep, high in lime and generally medium textured occur as rolling hills and plains dissected by numerous desert washes (Latene, Nickel and Whitlock series). Other soils very high in lime are very shallow and generally medium textured. These soils are Typic Paleorhithids (Tencee and Cave series). Lithic Torriorthents, ranging in depth from very shallow to shallow and in texture from coarse to medium, occur on low volcanic hills and mountains (House Mountain series). Other Lithic Torriorthents occur on granitic hills and mountains (Cellar series).

Potential Natural Vegetation

The soils in this area will support Mohave Desert Shrub and mixed grassland plant communities. Blackbush can dominate some upland soils in the northern portion of the area. Dominant shrubs on other upland soils include Joshua tree, creosotebush, ratany, yucca, white bursage, winterfat and various cactus species. Dominant midgrasses on upland soils include big galleta, bush muhly, black grama, indian ricegrass, desert needlegrass, dropseeds, and perennial threeawns. Bottomland soils are dominated by perennial midgrasses including big galleta, bush muhly, indian ricegrass, desert needlegrass, perennial threeawns and dropseeds. Fine textured bottomland soils are dominated by alkali sacaton, tobosa, vine-mesquite, fourwing saltbush and shadscale. Wet periods, particularly in the spring months, will produce large quantities of annual vegetation that are important to livestock operators. The plants are annual grasses and forbs and include lupine, desert indianwheat, primroses, sixweeks grama and sixweeks fescue.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

_____, Arizona Field Office

SHALLOW UPLAND, 8-12" p.z.
RANGE SITE DESCRIPTION
Major Land Resource Areas:
D30-3

Date: _____

Approved by: _____

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This site occurs in an upland position. It may benefit somewhat from run-in moisture due to steep rocky bluffs often associated with this site. It does not suffer from excessive run-off loss unless denuded of its vegetational cover. This site can occur on all exposures. Slopes are generally less than 50%. Elevation will range from 2,000-4,500 ft.

2. Soils

- a. The soils in this range site are very shallow and well drained and formed in calcareous gravelly valley fill. These soils have textures ranging from gravelly sandy loam to very gravelly loam. A petrocalcic horizon (caliche), limestone or soft limy material is at depths ranging from 4 to 20 inches. Cave soils have less than 35 percent coarse fragments and Tencee soils more than 35 percent. These soils are strongly calcareous throughout. Permeability and infiltration rates are moderate. Plant-soil moisture relationships are fair to poor. The hazards of erosion and soil blowing are slight to moderate. The pH ranges from 7.9 to 8.4 and the content of soluble salts is low.

b. Major soils associated with this site are:

Soil Taxonomic Unit

Loamy-skeletal, carbonatic, thermic, shallow Typic Paleorthids
Loamy, mixed, thermic, shallow Typic Paleorthids

Additional information may be found in Section II of the Field Office Technical Guide.

3. Climatic Features

- a. This area receives on the average 8 to 12 inches of precipitation annually. Generally 45% of this moisture comes from December to March. Snow from winter storms is not uncommon but only remains on the ground a day or two. Winter storms come from moist air bodies moving in off the coast of Southern California. Summer moisture generally comes from thunder storms originating in the Gulf of Mexico. Summer precipitation is light because this range site lies too far west to receive strong gulf flows.
- b. Mean temperatures for the hottest month (July) is 82° F. The coldest month is January when a mean temperature of 43° F. is experienced. Extreme temperatures of 111° F. for a low have been recorded in Kingman. Long periods, when little or no effective moisture is received, occur frequently. Frost free period ranges from 200 to 230 days.
- c. Cool season grasses generally green up between February and April and set seed by late spring to early summer depending on the year. Warm season grasses will come on in mid summer and remain green well into fall. This range site occurs in a transition zone between the mesic pine forests to the east and the xeric mojave desert to the west. This results in strong dry winds blowing a large part of the time desiccating both plants and soil. These winds are especially strong in the spring and fall.

4. Native (potential or climax) Vegetation

- a. This site has a potential to produce nearly pure stands of blackbrush, or blackbrush and joshua tree. In climax condition there are small percentages of cool season grasses and a moderate percent of warm season grasses. This site will always be dominated by blackbrush.
- b. The plant species most likely to increase on this site with continued disturbances are blackbrush, broom snakeweed, cacti and joshua tree. The species most likely to invade this site are burrobrush and cacti. Annual forbs also become more prevalent as the range deteriorates.
- c. The following is a list of plants that are found in the potential plant community. Range condition of areas within this site is determined by comparing the present plant community with that of this potential plant community. Count as potential no more than the maximum percent shown on the guide for any species. Four condition classes are used to express this degree of comparison of the present plant community to that of the potential:

Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Relative percentage of total plant community by weight:

<u>Grasses and Grasslike (20-30%)</u>	<u>Percent</u>
black grama (BOER4)	15-20
big galleta (HIRI)	5-10
desert needlegrass (STSP3)	5-10
indian ricegrass (ORHY)	5-10
bottlebrush squirreltail (SIHY)	5-10
parish threeawn (ARPA10)	0- 1
red brome (BRRU2)	0- 2

<u>Forbs (5-10%)</u>	<u>Percent</u>
peppergrass (LEPID)	5-10
globemallow (SPHAE)	5-10
annual forbs (AAFF)	5-10
perennial forbs (PPFF)	5-10

<u>Shrubs and Trees (60-70%)</u>	<u>Percent</u>
blackbrush (CORA)	40-60
joshuatree (YUBR)	0-20
cholla cactus (OPUNT)	5-20
yucca spp. (YUCCA)	0-15
mormontea (EPHED)	1-10
catclaw acacia (ACGR)	0- 5
desert almond (PRFA)	0- 2
wolfberry (LYPA)	1- 3
broom snakeweed (CUSA2)	1- 3

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

The potential (climax) plant community has been determined by study of range relict areas, or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures and historical accounts have also been used.

5. Total Annual Production

In excellent condition this site will produce approximately the following amounts of air dry herbage per acre in:

favorable year	<u>700</u>	lbs.
normal year	<u>500</u>	lbs.
unfavorable year	<u>250</u>	lbs.

B. MAJOR USES1. Livestocka. Site factors influencing management

This site will be best suited to stocker steers or bulls, as it tends to be quite rocky. Brush management should be approached very cautiously as it is quite difficult to replace blackbrush with anything but broom snakeweed or more blackbrush. Sheep and goats will better utilize blackbrush than cattle.

b. Guide to Initial Stocking Rate

The following stocking rates may be used as a guide to establish a safe starting stocking, but should be evaluated and livestock numbers adjusted based on actual use experience and climatic fluctuations.

<u>Condition</u> <u>Class</u>	<u>Percent</u> <u>Climax Vegetation</u>	<u>AC/AUM</u>	<u>AUM/AC</u>
Excellent	76-100	5-6	.17-.20
Good	51- 75	6-9	.11-.17
Fair	26- 50	9-20	.05-.11
Poor	0- 25	20-50	.02-.05

2. Wildlifea. Site factors influencing wildlife.

The most limiting factors for wildlife on this site is the lack of free water, and lack of diversity in the plant community. However, blackbrush is reported as fair forage for deer; and, possibly for other game animals.

b. Guide to site plant use by wildlife species.

Plant Species	Selected Wildlife Species				
	Mule Deer	Desert Cottontail	Cactus Mouse	Blacktail J-Rabbit	Rock Squirrel
blackbrush	F)foliage				
big galleta		C)foliage green	G)seeds when available	F)when green	
black grama	G)foliage	G)foliage	G)seed	C)foliage	G)fruit
yucca	G)flowers	G)tender leaves		G)tender leaves	G)fruit
joshua tree					G)fruit
mormontea	G)foliage				G)fruit
cholla					G)fruit
catclaw acacia	F)foliage		X)seeds	X)foliage	
G=Good	F=Fair	P=Poor	X=Used but degree of utilization not known		

3. Recreation and Natural Beauty

- a. Land form - This site is usually associated with broken land, often on the edge or bottom of limey cliffs.
- b. Landscape quality - General aspect of this site is blackbrush and associated sub dominants such as joshua tree. This vegetation, with the rough terrain and steep cliffs, make this a very high quality site.
- c. Climate - Summers are very hot and dry; however mild winters make the site attractive for winter recreational use.
- d. Activities - Horseback riding, hiking, rockhounding, wildlife observation and some limited hunting are the dominant recreational uses found on this site.

4. Other Uses - In limited areas hardrock mining for gold and silver.

C. THREATENED OR ENDANGERED PLANTS AND ANIMALS

1. Plants -
2. Animals -

D. LOCATION OF TYPICAL EXAMPLE OF THE SITE

1. State location - Sec14, T29N, R17W. Located south of Colorado River, Southeast of Meadview.
 - a.
 - b.

2. Field Office site location -

E. FIELD OFFICES

1. Kingman
2. Fredonia
3. Flagstaff

DESCRIPTION

Subresource Area D35-5 - Colorado Plateau Intermediate Mixed shrub-grassland

Land Use

This area is used primarily as rangeland. Grazing operations with cow/calf and/or stockers dominate the western and central part of the area. A mixture of cattle and sheep operations are used in the east on the Navajo Indian Reservation. Major recreation areas included at least partially in the area are Lake Mead National Recreation Area, Grand Canyon National Park, Marble Canyon National Monument and Glen Canyon National Recreation Area.

Cropland acreage is very minor. Some indian corn is dry farmed on the Navajo Indian Reservation.

The most serious problem confronting livestock operators is water developments. In Mohave and western Coconino Counties the ground water is very deep in the limestone formations. Earthen stock tanks are used very little because of the dominance of shallow soils. Cost effective water developments are difficult to justify because of the dominance of low forage production sites.

In eastern Coconino County wind erosion is a serious problem. The soils near Page are light textured formed from sandstone formations.

Elevation and Topography

Elevations range from 4,200 to about 5,800 feet. The subresource area is undulating to hilly plains frequently deeply incised by steep sided stream courses. Butts and mesas rise abruptly above the level of the plain in the area near Page.

The area roughly follows the course of the Colorado River from the mouth of Lake Mead easterly to the state line at Page and southerly to Kabito on the Navajo Indian Reservation.

Climate

Precipitation ranges from 6 to 12 inches annually. Fifty five to sixty five percent of the precipitation occurs in the cool season months, October through April. Warm season moisture, May through September, amounts to approximately 35 to 45 percent of the average annual precipitation. The mean annual temperature ranges from 52° to 57° F. The average frost free period ranges from 160 to 200 days.

Water

The Colorado River is the primary perennial stream in the area. The Little Colorado River also dissects the area in the southeastern portion. Lake Powell which is retained by Glen Canyon Dam is the only large reservoir in the area. It was constructed near Page to provide flood control, recreation and hydro-electric power. Ground water is generally deep. Pumping of ground water is done by windmill in areas where water is relatively shallow. Springs and seeps

Subresource Area D35-5 - Colorado Plateau Intermediate Mixed shrub-grassland

exist in the mountainous areas and along escarpments, but relatively few have been developed.

Soil

Lithic Ustic Torriorthents and Lithic Torriorthents range in texture from coarse to moderately coarse texture soils that occupy hillslopes and undulating plateaus. Typic Torriorthents are moderately deep to deep, moderately coarse textured soils on undulating plateaus. Typic Torripsamments are deep and on undulating plateaus. Ustollic Calciorthids are shallow to deep and range in texture from moderately coarse to moderately fine. These soils are on mesas, fan terraces and undulating plateaus. Ustollic Camborthids are deep and moderately deep and moderately textured soils on mesas and undulatory plateaus. Ustollic Paleorthids are shallow to moderately deep and range in texture from moderately coarse to moderately fine. These soils occupy old landscapes.

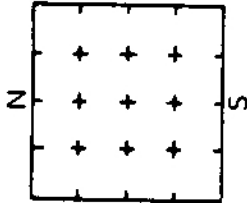
Potential Natural Vegetation

The soils in this area will support a plant community that is intermediate between the Mohave Desert Shrub and the Colorado Plateau mixed grass plains. Blackbrush dominates the upland soils that are shallow. Utah agave, winterfat, blue yucca, Mormon tea, fourwing saltbush, Utah juniper, singleleaf pinyon, cliffrose, buckwheats and cactus also occur in varying amounts. Upland soils support a mixture of both warm and cool season grasses including, desert needlegrass, needleandthread, New Mexico feathergrass, sideoats grama, black grama, indian ricegrass, slim and hairy tridens, bush muhly and bottlebrush squirreltail. The bottom soils are potentially dominated by midgrasses. The major grasses on bottom soils include New Mexico feathergrass, needleandthread, black grama, bush muhly and alkali sacaton. Dominant shrubs on bottom soils are fourwing saltbush, winterfat and blue yucca.



LIMY FAN RANGE SITE
RELICT AREA

GRAND CANYON NATIONAL PARK
May, 1981

PRODUCTION AND COMPOSITION RECORD
FOR NATIVE GRASSLANDSDATE 05-19-81 COUNTY MOHAVE STATE ARIZONA
DATA BY GARY BAIGGS, RICHARD KINGLOCATION LARGE SWALE, SOUTH END
OF ISOLATED MESA, GRAND CANYON, ARIZ
1 mile north of BARTON CANYONW E SEC 14
TWP 30N
RNG 14W

SAMPLE NUMBER		DATE		MAJOR LAND RESOURCE AREA		LAND SURVEY			N. LATITUDE			W. LONGITUDE			SOIL SURVEY SAMPLE NUMBER		CARD ID.
ID NO.	YR ST CNTY	NUMBER	SUBDIV.	S	TWP	RNG	DEG	MIN SEC	DEG	MIN SEC	DEG	MIN SEC	DEG	MIN SEC			
LOCATION																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
8	1	0	4	0	1	5	1	9	0	5	1	4	3	0	N	14	
SITE																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
SOIL TAXON																	
SOIL SERIES NAME																	
TEXTURE MODIFIER																	
TEXTURE TYPE																	
Y or N																	
CLIPPED PLOTS																	
CANOPY																	
OVERSTORY SPECIES																	
DETAILED OVERSTORY DESCRIPTION																	
Y or N																	
TOTAL NO. OF PLOTS SAMPLED																	
CARD ID.																	
MEASURE																	
WEIGHT																	
MEAS.																	
PLOT SIZE & SHAPE																	
CONV. FACT.																	
126																	
REMARKS 1																	
REMARKS 2																	
REMARKS 3																	

NOTES: Cooperator None SWCD BIG SANDY Field Office Kingman Area SOIVegetation Type (Kuchler) Blackbrush Site Name LINY FAN Site Number Soil Classification (Subgroup & Family) Fine loamy, mixed, mesic, ustollic CalcorthidsCurrent Season Precipitation 6 INCHES Vigor MEDIUM

KEY PUNCH CONTROL

(COL. 76-80)

1-6		7-12		13-17		18-22		23-27		28-32		33-37		38-42		43-47		48-52		53-57		58-62		63-67		68-72		73-75																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
PLANT NAME	SYMBOL	PLANT CHAR.	ESTIMATED OR CLIPPED WEIGHT PER SPECIES (CIRCLE PLOTS THAT ARE CLIPPED)										WT CLIPPED PLOTS		PCF	% DRY	WT ALL	AVG	PCT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
(1)	(2)	(3)	(P-1)	(P-2)	P-3	P-4	P-5	(P-6)	P-7	P-8	P-9	P-10	EST	CLIP	DRY	(7)	(8)	(9)	(10)	(11)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Indian ricegrass	PRHY	PNG	6	6	36	12	6				24	36	12	3		0.25	0.40	126	11	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
N.M. feathergrass	STNE2	PNG	42	16		4		40	8	12	32	24	98	94		0.26	0.40	170	58	12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
squirreltail	SIHY	PNG	21	4	32	49	56	7	49	1		10	32	36		1.12	0.35	229	80	17																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
black grama	BGER4	PNG	5	4	13			10			5		15	8		0.53	0.65	33	10	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
sand dropseed	SPCR	PNG	18	10	12	6	2		2	48	3	6	18	10		0.58	0.40	97	19	4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

_____, Arizona Field Office

LIMY FAN, 9-12" p.z.
RANGE SITE DESCRIPTION
Major Land Resource Areas:
D-35-5

Date: _____

Approved by: _____

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This site occurs as broad, old alluvial fans and terraces. It is in an upland position but may occur in old shallow basins which do not benefit significantly from run-in moisture. Slopes range from 0-4%. Elevations range from 4,200 to 5,800 feet.

2. Soils

a. These are shallow to moderately deep soils derived dominantly from calcareous sandstone and limestone. Surface textures include calcareous very gravelly loam, gravelly loam, and loam. The underlying layers include gravelly loam and loam. The pH ranges from 7.7 to 8.2. Coarse fragments can be present throughout the profile.

b. Major soils associated with this site are:

Soil Taxonomic Unit

~~loamy, mixed, mesic, shallow Ustollic Paleorthids~~
fine-loamy, mixed, mesic, Ustollic Calciorthids

Additional information may be found in Section II of the Field Office Technical Guide.

3. Climatic Features

a. This area receives an average annual precipitation ranging from 9 to 12 inches. The most predictable soil moisture is accumulated in the cool season months, October through April. Snow from winter storms is not uncommon but normally remains on the ground only a day or two. Winter storms come from moist air bodies moving in from the Pacific Ocean. This period receives 55 to 65 percent of the average annual precipitation. Warm season moisture, May through September, amounts to approximately 35 to 45 percent

of the average annual precipitation. Summer moisture generally comes from thunderstorms originating in the Gulf of Mexico.

- b. Mean temperatures for the hottest month (July) is 76° F. The coldest month is January when a mean temperature of 33° is experienced. Extreme temperatures of 108° F. for a high and -11° F. for a low have been recorded. Long periods when little or no effective moisture is received occur frequently. Frost free period ranges from 160 to 200 days.
- c. Cool season grasses generally initiate growth in February or March and set seed in late May or June. Warm season grasses will start growth in the spring but the primary growth period is July and August. Seed set occurs in late August or September with warm season grasses.

4. Native (potential or climax) Vegetation

- a. The native, potential plant community is a mixture of cold desert shrubs and mid-grasses. Forbs and annuals are a minor component.
- b. As the site deteriorates from improper use, snakeweed, red brome, and cheatgrass increase and may dominate the site.
- c. The following is a list of plants that are found in the potential plant community. Range condition of areas within this site is determined by comparing the present plant community with that of this potential plant community. Count as potential no more than the maximum percent shown on the guide for any species. Four condition classes are used to express this degree of comparison of the present plant community to that of the potential:

Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

Relative percentage of total plant community by weight:

<u>Grasses and Grasslike (45-60%)</u>	<u>Percent</u>
New Mexico feathergrass (STNE2)	15-30
needle-and-thread (STCO4)	
bottlebrush squirreltail (SIHY)	5-15
Indian ricegrass (ORHY)	1-10
black grama (BOER4)	10-20
bush muhly (MUPO2)	1-10
sand dropseed (SPCR)	5-15

burrograss (SCBR2)	] — 1-3	sixweeks fescue (FEOC2)	] — 0-1
Fendler threeawn (ARFE4)		Arizona bromegrass (BRAR4)	
blue grama (BOGR2)			
crested needlegrass (STCOD)			
desert needlegrass (STSP3)			
<u>Forbs (1-5%)</u>	<u>Percent</u>	<u>Forbs (1-5%)</u>	<u>Percent</u>
globemallow (SPPA2)	] — 1-5	Eriastrum (ERIAS)	] — 0-1
desert trumpet (ERIN4)		Whitedaisy tidytips	
hairy fleabane (ERPU2)		(LAGL5)	
heath aster (ASER3)		scorpion weed (PHALE)	
Colorado four o'clock (MIMU)		little desert trumpet	
dock (RUMEX)		(ERIOG)	
Lewis flax (LIPE2)		wild buckwheat (ERTR8)	
		Fremonts Phacelia	
		(PHFR2)	

Trees, shrubs, halfshrubs, succulents & woody vines (40-55%): Percent

fourwing saltbush (ATCA2)		10-20
winterfat (EULA5)		10-20
banana yucca (YUBA)		10-30
Anderson wolfberry (LYAN)	] —	1-10
green Mormon tea (EPVI)		1-8
pricklypear (OPER)		1-8
blackbrush (CORA)	] —	0-1
hedgehog (ECHIN3)		

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

The potential (climax) plant community has been determined by study of range relict areas, or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures and historical accounts have also been used.

5. Total Annual Production

In excellent condition this site will produce approximately the following amounts of air dry herbage per acre in:

Favorable year	1000	lbs.
normal year	700	lbs.
unfavorable year	300	lbs.

B. MAJOR USES

1. Livestock

a. Site factors influencing management

This site is accessible and provides suitable forage throughout the year for all classes of livestock. Fencing and water developments may be needed to facilitate proper use and management.

b. Guide to Initial Stocking Rate

The following stocking rates may be used as a guide to establish a safe starting stocking, but should be evaluated and livestock numbers adjusted based on actual use experience and climatic fluctuations.

Condition Class	Percent Climax Vegetation	AC/AUM	AUM/AC
Excellent	76-100	3-5	.2-.33
Good	51-75	4-7	.14-.25
Fair	26-50	6-10	.10-.17
Poor	0-25	10-20	.05-.10

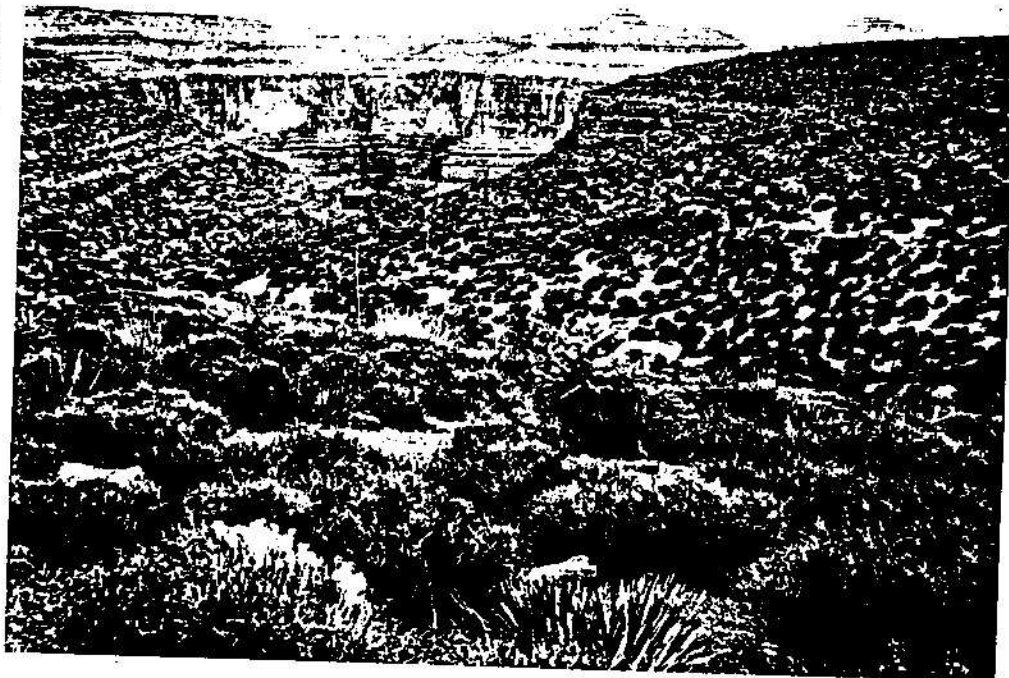
2. Wildlife

a. Site factors influencing wildlife

The site has good plant diversity and produces significant amounts of usable forage. Grassland wildlife are generally associated with this site.

b. Guide to site plant use by wildlife species.

Plant Species	Selected Wildlife Species & Plants				
	Cottontail	Mule Deer	Antelope	Sage Sparrow	Black-tailed jackrabbit
Needle & Thread	(X) foliage	(F) foliage		(G) seed	(X) foliage
Squirrel tail	(X) foliage	(P) foliage		(X) seed	(X) foliage
Indian ricegrass	(G) foliage	(G) foliage	(G) foliage	(G) seed	(G) foliage
Black grama	(G) foliage	(F) foliage	(G) foliage	(X) seed	(X) foliage
Bush muhly	(G) foliage	(F) foliage	(G) foliage		(X) foliage
Sand dropseed				(X) seed	(G) foliage
Globe mallow			(G) foliage		
Aster					



LIMESTONE HILLS RANGE SITE
RELICT AREA

HUALAPAI INDIAN RESERVATION
May, 1981

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

_____, Arizona Field Office

LIMESTONE HILLS, 9-12" p.z.
RANGE SITE DESCRIPTION
Major Land Resource Area
D35-5

Date: _____

Approved By: _____

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This site occurs on steep hillslopes and low mountains. It is dissected by many steep sided canyons and drainageways. The site contributes runoff moisture to adjoining sites and suffers from excessive runoff. Slopes range from 10 to 80 percent and elevations range from 4,200 feet to 5,800 feet.

2. Soils

a. These are very shallow and shallow soils derived dominantly from limestone and calcareous sandstone. Soil textures include calcareous extremely gravelly loam, very gravelly loam, and gravelly loam. The pH ranges from 7.8 to 8.2.

b. Major soils associated with this site are:

Soil Taxonomic Unit

Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents, Loamy-skeletal, mixed (calcareous), mesic Lithic Ustic Torriorthents.

Additional information may be found in Section II of the Field Office Technical Guide.

3. Climatic Features

a. This area receives an average annual precipitation ranging from 9 to 12 inches. The most predictable soil moisture is accumulated in the cool season months, October through April. Snow from winter storms is not uncommon but normally remains on the ground only a day or two. Winter storms come from moist air bodies moving in from the Pacific Ocean. This period receives 55 to 65 percent of the average annual precipitation. Warm season moisture, May through September, amounts to approximately 35 to 45 percent of the average annual precipitation. Summer moisture generally comes from thunderstorms originating in the Gulf of Mexico.

- b. Mean temperatures for the hottest month (July) is 76° F. The coldest month is January when a mean temperature of 33° F. is experienced. Extreme temperatures of 108° F. for a high and -11° F. for a low have been recorded. Long periods when little or no effective moisture is received occur frequently. Frost free period ranges from 160 to 200 days.
- c. Cool season grasses generally initiate growth in February or March and set seed in late May or June. Warm season grasses will start growth in the spring but the primary growth period is July and August. Seed set occurs in late August or September with warm season grasses.

4. Native (potential or climax) Vegetation

- a. This range site has a plant community dominated by shrubby vegetation. Grasses and forbs make up a relatively small portion of the total annual production. The grasses that are present are a mixture of cool and warm season midgrasses. Blackbrush is by far the dominant species. Utah agave is secondary in dominance. Grasses are more evident on north and east facing slopes and on lower slopes that have not been misused.
- b. This site has a low productive capacity for livestock. It is relatively stable against grazing pressure, but perennial grasses can be reduced in the plant community. Perennial grasses are usually replaced by annual grasses, particularly cheatgrass and red brome.
- c. The following is a list of plants that are found in the potential plant community. Range condition of areas within this site is determined by comparing the present plant community with that of this potential plant community. Count as potential no more than the maximum percent shown on the guide for any species. Four condition classes are used to express this degree of comparison of the present plant community to that of the potential:

Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Relative percentage of total plant community by weight:

<u>Grasses and Grasslike (2-5%)</u>	<u>Percent</u>
desert needlegrass (STSP3)	2-5
needle and thread grass (STCO4)	
New Mexico needlegrass (STNE2)	
sideoats grama (BOCU)	
black grama (BOER4)	
slim tridens (TRMU)	
hairy triden (TRPI2)	
indian ricegrass (ORHY)	

Percent

bush muhly (MUPO2)	
big galleta (HIRI)	
bottlebrush squirreltail (SIHY)	2-5
fendlers threeawn (ARFE4)	
Arizona fluffgrass (TRPU2)	
Arizona brome	
sixweeks fescue (FEOC2)	1
sixweeks grama (BOBA2)	

Forbs (3-5%)

smallflower globemallow (SPPA2)	
Colorado four o'clock (MIMU)	
desertstraw wirelettuce (STPA4)	
mariposhlily (CALOC)	
pink perezia (PEWR3)	
tufted rockspirea (PECA12)	3-5
milkvetch (ASTRA)	
gilia (GILIA)	
hairy fleabane (ERPU2)	
heath aster (ASER3)	
barestem larkspur (DESC)	
whitestem stickleaf (MEAL6)	

Trees, Shrubs, Halfshrubs, succulents and woody vines (90-95%)

black brush (CCRA)	60-65
Utah agave (AGUT)	10-15
green mormon tea (EPHED)	5-10
stansbury cliffrose (COME5)	
Mexican cliffrose (COME5)	
broom snakeweed (GUSA)	
threadleaf snakeweed (GUMI)	5
blue yucca (YUBA)	
flattop wildbuckwheat (ERFA2)	
creosote bush (LADI2)	
buckhorn cholla (OPAC)	
beavertail cactus (OPBA2)	
engelmann hedgehog cactus (ECEN)	
campus barrel cactus (ECAC)	1-2
multiplehead barrel cactus (ECPO2)	
Mohave prickley pear (ECPO2)	
Mohave thorn (CAHO3)	
whipple cholla (OPWH)	
pincushion cactus (MAMMI)	
pale wolfberry (LYPA)	
wright lippia (LIWR)	
rough twinberry (MESC)	1-5
desert sandwort (ARMA3)	
fragrant ash (FRCU)	

Percent

common gumseed (COSC)
 simpleleaf skunkbush sumac (RHIRS)
 desert princesplumb. (STPI)
 desert milkwort (POMA7)
 Arizona Carlwrightia (CAAR7)
 abertian wildbuckwheat (ERAB2)
 mariola (PAIN2)
 Mohave desertrue (THMO)
 bush encelia (ENFR)
 winterfat (EULAS)

1-5

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

The potential (climax) plant community has been determined by study of range relict areas, or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures and historical accounts have also been used.

5. Total Annual Production

In excellent condition this site will produce approximately the following amounts of air dry herbage per acre in:

favorable year	675	lbs.
normal year	550	lbs.
unfavorable year	350	lbs.

B. MAJOR USES

1. Livestock

a. Site factors influencing management

The site is suitable for use by all classes of livestock, but stocker cattle may utilize the steeper portions more effectively than cows and calves. The very steepest portions may be unusable by all classes of livestock. Fencing and water developments are necessary in order to make effective use of the site.

b. Guide to Initial Stocking Rate

The following stocking rates may be used as a guide to establish a safe starting stocking, but should be evaluated and livestock numbers adjusted based on actual use experience and climatic fluctuations.

Condition Class	Percent Climax Vegetation	AC/AUM*	AUM/AC*
Excellent	76-100	10-15	.07-.10
Good	51-75	12-20	.05-.08
Fair	26-50	15-30	.03-.07
Poor	0-25	20-40	.03-.05

* = Slopes exceeding 50 percent may be unusable or use should be adjusted according to class of livestock, season of use and distance from water.

2. Wildlife

a. Site factors influencing wildlife.

The site has fair potential for wildlife habitat but has low production of usable forage. Adjacent sites with more production of usable forage may be used along with this site.

b. Guide to plant use by wildlife species.

Plant Species	Selected Wildlife Species			
	Mule Deer	Antelope	Bushy Tailed Woodrat	Black Tailed Jackrabbit
needle & thread grass	F)foliage	---	---	X)foliage
sideoats grama	F)foliage	G)foliage	G)seeds	G)foliage
black grama	F)foliage	G)foliage	---	X)foliage
Indian ricegrass	G)foliage	G)foliage	G)seeds	G)foliage
squirrel tail	P)foliage	---	---	X)foliage
globe mallow	---	G)foliage	X)all parts	---
black brush	---	---	---	---
wild buckwheat	G)foliage	G)foliage	G)seed	G)foliage
winterfat	G)foliage	F)foliage	G)foliage	G)foliage
twinberry	G)foliage	G)foliage	G)seed	G)foliage
cliffrose	G)foliage	G)foliage	---	---
G=Good F=Fair P=Poor	X=Used but degree of utilization not known			

3. Recreation and Natural Beauty

- a. Land form - This site is located on steep hillslopes, low mountains and canyon slopes.
- b. Landscape quality - The relatively steep topography offers contrast in texture and form to adjacent sites.
- c. Climate - Very few days in the winter restrict outdoor activities. Hot afternoon temperatures from June through September can be expected.
- d. Activities - Hunting, hiking, photography and mountain climbing are the principal activities on the site.

4. Other Uses - None.

C. THREATENED OR ENDANGERED PLANTS AND ANIMALS

1. Plants -

2. Animals -

D. LOCATION OF TYPICAL EXAMPLE OF THE SITE

1. State location -

- a. Relict area, isolated mesa top, Hualapai Indian Reservation; Sec. 32, T29N, R13W.
- b. Relict area, isolated mesa top, Grand Canyon National Park; Sec. 14, T28N, R12W.

2. Field Office site location -

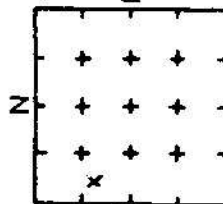
E. FIELD OFFICES

1. Kingman
2. Flagstaff
3. Fredonia



LOAMY BOTTOM RANGE SITE
RELICT AREA

GRAND CANYON NATIONAL PARK
May, 1981

PRODUCTION AND COMPOSITION RECORD
FOR NATIVE GRASSLANDSDATE 5-19-81 COUNTY Maricopa STATE ArizonaLOCATION North Rim - Grand Canyon
ONE MILE SOUTH OF BURNT CANYONE SEC 20
TWP 38 N
RNG 13 WDATA BY K. Gossion - W. Smith

SAMPLE NUMBER		DATE		MAJOR LAND RESOURCE AREA		LAND SURVEY		N. LATITUDE		W. LONGITUDE		SOIL SURVEY		CARD ID.																																																																																					
ID	YR	ST	CNTY	NUMBER	SUBDIV.	S	TWP	RNG	DEG	MIN	SEC	DEG	MIN	SEC	SAMPLE NUMBER																																																																																				
LOCATION		81	04	015	1905	5	20	30N	13W																																																																																										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
SITE		1	1	0	0	0	1	00	1	4600	NS	5	10	3	LOW																																																																																				
SOIL		UNKNOWN		TEXTURE MODIFIER		TEXTURE TYPE		DETAILED PROFILE DESCRIP.		Y or N		CARD ID.																																																																																							
MEASURE		1	E	9.65	0.10	2,5,8	CLIPPED PLOTS	CANOPY	OVERSTORY SPECIES	DETAILED OVERSTORY DESCRIP.	Y or N	TOTAL NO. OF PLOTS	CARD ID.																																																																																						
REMARKS 1		SITE, CLIPPED, IS A TRUE RELICT, LACK OF GRAZING OR FIRE HAS CAUSED.																																																																																																	
REMARKS 2		DECADENT GROWTH IN ACCUMULATED LACK OF SUMMER PRECIP. HAS STRESSED																																																																																																	
REMARKS 3		WARM SEASON PLANTS AND FAVORABLE GROWTH SEASON PLANTS.																																																																																																	

NOTES: Cooperator Grand Canyon Nat. Preswcd- Big Sandy Field Office Maricopa Area 001Vegetation Type (Kuchler) BLACK BRUSH Site Name LARRY BOTTOM Site NumberSoil Classification (Subgroup & Family) FINE LARRY MIXED MESIC USTALIC CAMBATHIDCurrent Season Precipitation 0 INCHES Vigor LOW

KEY PUNCH CONTROL

PLANT NAME (1)	PLANT SYMBOL (2)	PLANT CHAR. (3)	ESTIMATED OR CLIPPED WEIGHT PER SPECIES (CIRCLE PLOTS THAT ARE CLIPPED)										WT CLIPPED PLOTS			PCF			% DRY			WT ALL			PCT		
			P-1 (P-2) P-3 P-4 P-5 P-6 P-7 (P-8) P-9 P-10										EST			(7)			(8)			(9)			(10)		
			P-1 (P-2) P-3 P-4 P-5 P-6 P-7 (P-8) P-9 P-10										P-1 (P-2) P-3 P-4 P-5 P-6 P-7 (P-8) P-9 P-10			(7)			(8)			(9)			(10)		
Needle-and-thread	STC04	PNG																									
Black grass	B0ER4	PNG	45																								
Big galleta	HTRI	PNG																									
SpurceHail	STHY	PNG																									
Sand droosseed	SPCR	PNG																									
Indian ringgrass	ORHY	PNG																									
Crested Stipa	STC05	PNG																									
Big bluegrass	P0AM	PNG																									
Arizona Brime	B0AR4	ANG																									
Red bromz	B0RU2	ATG																									
Cheatgrass	B0TE	ATG																									
Sixweeks fescue	FE0C2	ANG																									
Desert Needlgrass	STSP3	PNG																									
New Mexico foxtail	STNE2	PNG	150	19	38	76	67	47	57	95	114	70	86	76	133	181	136	0.75	0.50	0.40	0.50	892	335	556	56	5	1
Locoweed	ASTRA	PNF	57	29	15	15	15	15	15	8																	
Desert popweed	LEMA2	PNF																									
Smallflower globeweed	SPPA2	PNF								15																	
Annual Pepperweed	LEPD0	ANF																									
Hairy fleabane	ERPU2	PNF								15																	
Heath aster	ASER3	PNF																									
Aster	ASTER	PNF																									
Colorado four-ohel	MDM4	PNF																									
Winterfat	EULR5	NH'S																									
Fourwing Saltbush	ATCA2	N.S	620							930	153	1240	1240	1530													
Blackbrush	C0RA	N.S																									
Hedgehog cactus	FE0N3	NS4S																									
Moore pricklypear	OPER	NS4S																									
Barroene yucca	YU0BA	NS	249																								
Threadleaf Suetwood	GU0T	NH'S																									
COMPOSITION TOTALS																											
RESIDUES	MULCH		113	13	132	113	181	310	153	91	181	246	191	132	358	692	1.93	1.00									
% COVERAGE	COVER		45	25	32	60	60	60	55	33	52	25	40	58													
% BARE GROUND	BA'E		55	75	68	40	40	40	45	67	48	75	60	42													
% ROCK COVER	ROCK		0	0	0	0	0	0	0	0	0	0	0	0													

* Includes both STPAS

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

_____, Arizona Field Office

LOAMY BOTTOM, 9-12" p.z.
RANGE SITE DESCRIPTION
Major Land Resource Areas:
D35-5

Date: _____

Approved By: _____

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This range site occurs in concave shaped drainage bottoms. It benefits from moderate amounts of run-on moisture from adjacent slopes and has moderate to rapid losses from runoff. Slopes range from 1 to 8 percent. The site appears stable in climax condition with little or no visible soil loss through sheet or rill erosion or gullying. Elevations for this site range from 4,200 to 5,800 feet.

2. Soils

a. These are moderately deep to deep soils derived dominantly from calcareous sandstone and limestone. The surface textures include calcareous fine sandy loam, gravelly loam, and loam. The underlying layers include calcareous very gravelly sandy loam, gravelly sandy loam, very gravelly loam, gravelly loam, loam, and gravelly clay loam. Tolerable salt accumulations are low and the pH ranges from 7.8 to 8.4. Coarse fragments can be present throughout the soil.

b. Major soils associated with this site are:

Soil Taxonomic Unit

Fine-loamy, mixed, mesic Ustollic Calciorthids, fine-loamy, mixed, mesic Ustollic Comborthids.

Additional information may be found in Section II of the Field Office Technical Guide.

3. Climatic Features

a. This area receives an average annual precipitation ranging from 9 to 12 inches. The most predictable soil moisture is accumulated in the cool season months, October through April. Snow from winter storms is not uncommon but normally remains on the ground only a day or two. Winter storms come from moist air bodies moving in from the Pacific Ocean. This period receives 55 to 65 percent of the average annual precipitation. Warm season moisture, May through September, amounts to approximately 35

to 45 percent of the average annual precipitation. Summer moisture generally comes from thunderstorms originating in the Gulf of Mexico.

- b. Mean temperature for the hottest month (July) is 76° F. The coldest month is January when a mean temperature of 33° F. is experienced. Extreme temperatures of 108° F. for a high and -11° F. for a low have been recorded. Long periods when little or no effective moisture is received occur frequently. Frost free period ranges from 160 to 200 days.
- c. Cool season grasses generally initiate growth in February or March and set seed in late May or June. Warm season grasses will start growth in the spring but the primary growth period is July and August. Seed set occurs in late August or September with warm season grasses.

4. Native (potential or climax) Vegetation

- a. The plant community is dominated by a mixture of both warm and cool season grasses with shrubs and forbs occurring in a scattered fashion.
- b. This site, where accessible, would be a favorable one for livestock because of the nearly level topography and abundance of palatable grasses and shrubs. When the grass component is depleted, the site is very susceptible to gully and sheet erosion and the increase or invasion of shrubs and annual grasses, primarily prickly pear, snakeweed, cheatgrass and redbrome. When severely channeled the site no longer receives the benefits from run-on moisture and may take on the appearance of a drier, less productive site.
- c. The following is a list of plants that are found in the potential plant community. Range condition of areas within this site is determined by comparing the present plant community with that of this potential plant community. Count as potential no more than the maximum percent shown on the guide for any species. Four condition classes are used to express this degree of comparison of the present plant community to that of the potential:

Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

Relative percentage of total plant community by weight:

Grasses and Grasslike (70-85%)

Percent

needle and thread (STC04)	}	40-60
New Mexico feathergrass (STNE2)		
black grama (BOER4)	}	15-25
bush muhly (MUPO2)		
big galleta (HIRI)	}	1-5
bottlebrush squirreltail (SIHY)		
sand dropseed (SPCR)	}	5-10
indian ricegrass (ORHY)		

	Percent
crested neddlegrass (STC05)	1-2
desert needlegrass (STSP3)	
big bluegrass (POAM)	2-5
Arizona brome (BRAR4)	
sixweeks fescue (FEOC2)	

Forbs (3-5%)

heath aster (ASTER3)	2-5
locoweed (ASTRA)	
smallflower globemallow (SPPA2)	
hairy fleabane (ERPU2)	
desert pepperweed (LEMO2)	1-2
Colorado four-o'clock (MIMU)	
annual pepperweed (LEPID)	
tansy aster (MATE)	

Trees, Shrubs, Half Shrubs, Succulents and Woody Vines (10-25%)

fourwing saltbush (ATCA2)	10-20
threadleaf snakeweed (GUMI)	1-5
winterfat (EULA5)	
blackbrush (CORA)	1-5
hedgehog cactus (ECHIN3)	
Mohave prickly pear (OPER)	
banana yucca (YUBA)	

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

The potential (climax) plant community has been determined by study of range relict areas, or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures and historical accounts have also been used.

5. Total Annual Production

In excellent condition this site will produce approximately the following amounts of air dry herbage per acre in:

favorable year	1,400	lbs.
normal year	1,150	lbs.
unfavorable year	800	lbs.

B. MAJOR USES

1. Livestock

a. Site factors influencing management

This site is suitable for yearlong use by either cows and calves or stocker cattle, and is easily traversed by all classes of livestock. Because of water availability and ease of access, these sites are often the most

overused. Special management is needed to maintain the plant cover.

b. Guide to Initial Stocking Rate

The following stocking rates may be used as a guide to establish a safe starting stocking, but should be evaluated and livestock numbers adjusted based on actual use experience and climatic fluctuations.

<u>Condition Class</u>	<u>Percent Climax Vegetation</u>	<u>AC/AUM</u>	<u>AUM/AC</u>
Excellent	76-100	1.5-2.5	.40-.66
Good	51-75	2.0-4.0	.25-.50
Fair	26-50	3.0-6.0	.17-.33
Poor	0-25	4.0-10.0	.10-.25

2. Wildlife

a. Site factors influencing wildlife

This site has moderate habitat diversity and produces a large amount of forage usable to grassland wildlife species. Potential for competition with cattle is high.

b. Guide to site plant use by wildlife species.

Plant Species	Selected Wildlife Species				
	Cottontail	Muledeer	Antelope	Sage Sparrow	Black-tailed Jackrabbit
needle & thread	X)foliage	F)foliage	---	G)Seed	X)foliage
black grama	G)foliage	F)foliage	G)foliage	X)Seed	X)foliage
squirreltail	X)foliage	P)foliage	---	X)Seed	X)foliage
sand dropseed	---	---	---	X)Seed	G)foliage
indian ricegrass	G)foliage	G)foliage	G)foliage	G)Seed	G)foliage
locoweed	---	G)foliage	G)foliage	---	---
globemallow	---	---	G)foliage	---	G)foliage
4-wing saltbush	---	F)foliage	G)foliage	---	G)foliage
winterfat	G)foliage	G)foliage	F)foliage	---	G)foliage
G=Good	F=Fair	P=Poor	X=Used but known	degree of utilization not	

3. Recreation and Natural Beauty

- a. Land Form - This site occurs in valley bottoms and swales.
- b. Landscape quality - The site often breaks the landscape dominated by shrubs with an abrupt edge. The grassland dominant in high ecological condition is aesthetically pleasing and offers a pleasing contrast in texture and form to adjoining sites.
- c. Climate - Summers are warm and dry and winters are cool and relatively damp. Recreational activities on the site are limited by periods of wetness.
- d. Activities - Wildlife observation, hiking and photography are the primary recreational activities.

4. Other Uses -

C. THREATENED OR ENDANGERED PLANTS AND ANIMALS

1. Plants -
2. Animals -

D. LOCATION OF TYPICAL EXAMPLE OF THE SITE

1. State location - Isolated mesa one mile south of Burnt Canyon, North Rim, Grand Canyon National Park; NW $\frac{1}{4}$ Sec 20, T30N, R13W.
2. Field office site location -

E. FIELD OFFICES

1. Kingman
2. Flagstaff
3. Fredonia



SANDSTONE HILLS RANGE SITE
RELICT AREA

GRAND CANYON NATIONAL PARK
May, 1981

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

_____, Arizona Field Office

SANDSTONE HILLS, 9-12" p.z.

RANGE SITE DESCRIPTION

Major Land Resource Area:

D35-5

Date: _____

Approved By: _____

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This range site occurs on moderately steep to steep hill slopes, on mesa tops, escarpments and on very steep canyon slopes. The area is cut by numerous deep narrow canyons. Is usually associated with numerous rock outcrops. Slopes are from 5 to 75%. Elevations range from 4,200 to 5,800 feet.

2. Soils

a. These soils are shallow and very shallow calcareous derived from sandstone. Surface textures include extremely gravelly loam, very gravelly loam and loam. The pH ranges from 7.9 to 8.3.

b. Major soils associated with this site are:

Soil Taxonomic Unit

Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents.

Additional information may be found in Section II of the Field Office Technical Guide.

3. Climatic Features

- a. This area receives an average annual precipitation ranging from 9 to 12 inches. The most predictable soil moisture is accumulated in the cool season months, October through April. Snow from winter storms is not uncommon but normally remains on the ground only a day or two. Winter storms come from moist air bodies moving in from the Pacific Ocean. This period receives 55 to 65 percent of the average annual precipitation. Warm season moisture, May through September, amounts to approximately 35 to 45 percent of the average annual precipitation. Summer moisture generally comes from thunderstorms originating in the Gulf of Mexico.
- b. Mean temperatures for the hottest month (July) is 76° F. The coldest month is January when a mean temperature of 33° F. is experienced. Extreme temperatures of 108° F. for a high and -11° F. for a low have been recorded. Long periods when little or no effective moisture is received occur frequently. Frost free period ranges from 160 to 200 days.

- c. Cool season grasses generally initiate growth in February or March and set seed in late May or June. Warm season grasses will start growth in the spring but the primary growth period is July and August. Seed set occurs in late August or September with warm season grasses.

4. Native (potential or climax) Vegetation

- a. This plant community is approximately 5 to 15 percent grasses, 3 to 5 percent forbs, and 75 to 85 percent shrubs based on air dry weight. Blackbrush usually dominates the plant community making up from 25 to 35 percent of the total annual production of the site; however, in a few areas Utah mormonia is equally dominant. Normally Utah agave and snake-weed are subdominant although cliffrose or singleleaf pinyon pine are subdominant in some areas. A relatively large variety of shrubs is characteristic of this site which adds to a variety of color and texture. Needlegrasses, fendler threeawn, slim tridens, cliffrose, green Mormon Tea, and desert sandwort are the dominant forage producing plants. However, this site is a relatively low producer of high value forage plants.
- b. As the site deteriorates from overuse snakeweed, cactus and agave increase. Cheatgrass is not native on the site, but will invade with overuse and increase significantly with continued overuse.
- c. The following is a list of plants that are found in the potential plant community. Range condition of areas within this site is determined by comparing the present plant community with that of this potential plant community. Count as potential no more than the maximum percent shown on the guide for any species. Four condition classes are used to express this degree of comparisons of the present plant community to that of the potential:

Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

Relative percentage of total plant community by weight:

<u>Grasses and Grasslike (5-15%)</u>	<u>Percent</u>	<u>Grasses and Grasslike (5-15%)</u>	<u>Percent</u>
desert needlegrass (STSP3)	5	Arizona brome (BRAR4)	1
needle and thread grass (STCO4)		sixweeks fescue (FEOC2)	
New Mexico needlegrass (STNE2)		sixweeks grama (BOBA2)	
black grama (BOER4)	1-5	fendler threeawn (ARFE4)	1-5
crested needlegrass (STCOD)		slim tridens (TRMU)	
hairy tridens (TRPI2)		Indian ricegrass (ORHY)	1-5
big bluegrass (POAM)		bush muhly (MUPO2)	
big galleta (HIRI)		sideoats grama (BOCU)	
		Arizona fluffgrass (TRPU2)	
		sand dropseed (SPCR)	

Forbs (3-5%)	Percent	Forbs (3-5%)	Percent
globemallow (SPLA)	3-5	Colorado four o'clock (MIMU)	3-5
hairy fleabane (ERPU2)		eriastrum (ERIAS)	
false pennyroyal (HEOB)		fleabane (EROX)	
deserttrumpet wildbuckwheat (ERIN4)		heath aster (ASER3)	
Indian paintbrush (CASTI2)		rockcress (ARPE2)	
lewis flax (LIPLI)		barestem larkspur (DESC)	
prickleleaf dogweed (DYAC)		whitestem stickleaf (MEAL6)	

Trees, Shrubs, Halfshrubs, Succulents, and Woody Vines (75-85%)

	Percent		Percent
blackbrush (CORA)	25-35	Utah mortonia (MOUT)	5-15
Utah agave (AGUT)	5	singleleaf pinyon pine (PIMO)	
green mormon tea (EPVI)	1-5	shrub liveoak (QUTU2)	
broom snakeweed (GUSA)	5-10	stansbury cliffrose (COME5)	
threadleaf snakeweed (GUMI)		mexican cliffrose (COME5)	
mohave desertrue (THMO)	1-5	sacahuista nolina (NOMI)	1-5
desert princesplume (SIPI)		abertian wildbuckwheat (ERAB2)	
Utah juniper (JUOS)		simpleleaf skunkbush sumac (RHTRS)	
fremont barberry (BEFR)		range ratany (KRPA)	1-2
douglas rabbitbrush (CHVI)		mariola parthenium (PAIN2)	
desert sandwort (ARMA3)	1-2	hedgehog cactus (ECHIN3)	
buckhorn cholla (OPAC)		multiple head barrel cactus (ECPO2)	
whipple cholla (OPWH)		barrel cactus (ECPOP)	
pincushion cactus (MAMMI)		campus barrel cactus (ECAC)	

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

The potential (climax) plant community has been determined by study of range relict areas, or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures and historical accounts have also been used.

5. Total Annual Production

In excellent condition this site will produce approximately the following amounts of air dry herbage per acre in:

favorable year	700	lbs.
normal year	575	lbs.
unfavorable year	400	lbs.

B. MAJOR USES

1. Livestock

a. Site factors influencing management

The site is suitable for use by all classes of livestock, but stocker

cattle may utilize the steeper portions more effectively than cows and calves. The very steepest portions may be unusable by all classes of livestock. Fencing and water developments are necessary in order to make effective use of the site.

b. Guide to Initial Stocking Rate

The following stocking rates may be used as a guide to establish a safe starting stocking, but should be evaluated and livestock numbers adjusted based on actual use experience and climatic fluctuations.

Condition Class	Percent Climax Vegetation	AC/AUM *	AUM/AC *
Excellent	76-100	10-15	.07-.1
Good	51-75	12-20	.05-.08
Fair	26-50	15-30	.03-.07
Poor	0-25	20-40	.03-.05

* Slopes exceeding 50 percent may be unusable, or use should be adjusted according to class of livestock, season of use and distance from water.

2. Wildlife

a. Site factors influencing wildlife.

The site has good diveristy of plants. It is adapted primarily for grass-land wildlife species, however, also serves a intermediate habitat between forest and grassland. Potential for competition with cattle is moderate.

b. Guide to site plant use by wildlife species.

Selected Wildlife Species and Plants				
Plants	Mule Deer	Antelope	Blue grosbeak	Black-tailed jackrabbit
Needle & Thread grass	(F) foliage		(X) seed	(X) foliage
Black grama	(F) foliage	(G) foliage	(X) seed	(X) foliage
Blue grama	(G) early fol.		(X) seed	(X) foliage
sand dropseed			(G) seed	(G) foliage
Indian ricegrass	(G) foliage	(G) foliage	(G) seed	(G) foliage
Globe mallow		(G) foliage		
wild buckwheat	(G) foliage	(G) foliage		(G) foliage
Black brush				
Cholla				
Cliffrose	(G) foliage	(F) foliage		
shrub liveoak	(P) foliage	(P) foliage		(P) foliage
G=Good F=Fair P=Poor X=Used but extent			unknown	

3. Recreation and Natural Beauty

- a. Land form - This site is located on hillslopes, mesa tops and canyon slopes.
- b. Landscape quality - The steeper portions of the site offer a contrast to the plains it may dissect. Colorful flowers are relatively abundant in wet springs.
- c. Climate - Very few days in the winter restrict outdoor activities. Hot afternoon temperatures from June through September can be expected.
- d. Activities - Hunting, hiking, photography and mountain climbing are the principal activities on the site.

4. Other Uses - Pinyon nuts and flagstone quarries.

C. THREATENED OR ENDANGERED PLANTS AND ANIMALS

1. Plants - Utah mortonia (Sensitive on National Heritage plant list).

2. Animals -

D. LOCATION OF TYPICAL EXAMPLE OF THE SITE

1. State location - Relict area, isolated mesa top, North rim Grand Canyon, 1 mile south of Burnt Canyon; NW $\frac{1}{4}$ Sec. 20, T 30N, R 13W.

2. Field Office site location -

E. FIELD OFFICES

1. Kingman
2. Flagstaff
3. Fredonia



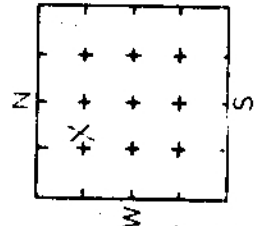
LIMY UPLAND RANGE SITE
RELICT AREA

HUALAPAI INDIAN RESERVATION
May, 1981

DATE 5-19-81 COUNTY Mohave STATE AZ
DATA BY Seery, Koster, KA

LOCATION Relict mesa top
Hualapai Indian Reservation
1/2 mi. S of Camp Verde

E SEC 32
TWP 29N
RNG 13W



LOCATION	SAMPLE NUMBER		DATE	MAJOR LAND RESOURCE AREA		LAND SURVEY			N. LATITUDE			W. LONGITUDE			SOIL SURVEY SAMPLE NUMBER	CARD ID.
	ID NO.	YR		ST	CNTY	NUMBER	SUBDIV.	S	TWP	RNG	DEG	MIN	SEC	DEG		
1	8	1	0	4	0	1	5									
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100																

NOTES: Cooperator- Hualapai Indian Tribe SWCD- Big Sandy Field Office- Kingman Area- 001
Vegetation Type (Kuchler)- Black Brush Site Name- Limy upland Site Number-
Soil Classification (Subgroup & Family)- F4e Idany, mixed, mesic, ustolic Calciorthis
Current Season Precipitation- 6 inches Vigor- medium

KEY PUNCH CONTROL

1-6		7-12		13-17		18-22		23-27		28-32		33-37		38-42		43-47		48-52		53-57		58-62		63-67		68-72		73-75	
PLANT NAME	PLANT SYMBOL	PLANT CHAR.	ESTIMATED OR CLIPPED : WEIGHT PER SPECIES (CIRCLE PLOTS THAT ARE CLIPPED)										WT CLIPPED PLOTS		PLOTS		YIELD		PCT										
(1)	(2)	(3)	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	EST	CLIP	DRY	PCF	WT	% DRY	WT ALL	YIELD	AVG	COMP							
BLACKBERRY	CORA	NS	-	21	21	18	33	33	39	57	45	57	54	40		.74	.6		324	144	46								
THORNAPPLE	GUMI	NHS																			T								
GREEN MANNA	EPVI	NS						24					24	24		1.0	.65		24	0	T								
MOHAWK	AGIT	NS																			T								
GLADE MALLOW	SPHAE	PNF						215					215	215		1.0	.4		215	2	1								
BUSH ENCELIA	ENFR	NS																		0	T								
CLIFFPOPE	COMES	NS																		0	T								
FLATTOP BUCKWHEAT	ERFAZ	NS	7	7	7	6	11	11	13	19	15	19	30	7		.23	.5		108	54	17								
WRIGHTS LIPPIA	LIWR	NS																		0	T								
SIMPLELEAF	RHTRS*	NS																		0	T								
SAUNDERS SUNAC	CLORADO	PNF																		0	T								
EAR O'CLOCK	MIMU	PNF																		0	T								
CHEATGRASS	ORTE	AIG	6	40	16	5	20	14	9	148	27	10	30	7			1.0		290	67	21								
AZ FLUFFGRASS	TRPUZ	PNG																		0	T								
SIDECATS GRAMA	BOCU	PNG																		0	T								
PUSH MANNY	MUPD	PNG																		0	T								
SLIM TAILDENS	TRMU	PNG																		0	T								
DESERT HERDE	STSP3	PNG																		0	T								
Mohave	THMD	NS																		0	T								
BANANA YUCCA	YUBA	NS				80							80	80		1.0	.55		80	44	14								
WIRELETUCE	STPA4	PNF																		0	T								
COMPOSITION TOTALS																													
RESIDUES	MULCH																												
COVERAGE	COVER																												
PERCENTAGE	PERCENTAGE																												
	10	20	15	30	50	70	85	0	35																			38%	
	15	10	16	10	20	10	5	25	10																			13%	
	25	20	70	10	30	20	25	25	55																			49%	

DRAFT
6/81

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

_____, Arizona Field Office

LIMY UPLAND, 9-12" p.z.
RANGE SITE DESCRIPTION
Major Land Resource Area:
D35-5

Date: _____

Approved By: _____

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This range site occurs in an upland position. It does not benefit from run in of moisture from adjacent areas, but does suffer from loss from runoff. Slopes range from 0 to 15 percent. It is located on broad terraces and gently rolling hills. It may also occur as ridgetops associated with steeper range sites. Elevations range between 4,200 and 5,800 feet.

2. Soils

- a. These are shallow to moderately deep soils derived dominantly from limestone. Surface textures include calcareous extremely gravelly loam, very gravelly loam, and gravelly loam. The underlying horizons include calcareous extremely cobbly loam, very cobbly loam, cobbly loam, very gravelly loam, gravelly loam, and gravelly clay loam. The pH ranges from 7.8 to 8.2.

- b. Major soils associated with this site are:

Soil Taxonomic Unit

Fine-loamy, mixed, mesic Ustollic Calciorthis, fine-loamy, mixed, mesic Ustollic Haplargids, loamy-skeletal, mixed, mesic shallow, Ustollic Paleorthis, loamy-skeletal, carbonatic, mesic Ustollic Paleorthis, loamy-skeletal, carbonatic, mesic Lithic Ustollic Calciorthis.

Additional information may be found in Section II of the Field Office Technical Guide.

3. Climatic Features

- a. This area receives an average annual precipitation ranging from 9 to 12 inches. The most predictable soil moisture is accumulated in the cool season months, October through April. Snow from winter storms is not uncommon but normally remains on the ground only a day or two. Winter storms come from moist air bodies moving in from the Pacific Ocean. This period receives 55 to 65 percent of the average annual precipitation. Warm season moisture, May through September, amounts to approximately 35 to 45 percent of the average annual precipitation. Summer moisture generally comes from thunderstorms originating in the Gulf of Mexico.

- b. Mean temperatures for the hottest month (July) is 76° F. The coldest month is January when a mean temperature of 33° F. is experienced. Extreme temperatures of 108° F. for a high and -11° F. for a low have been recorded. Long periods when little or no effective moisture is received occur frequently. Frost free period ranges from 160 to 200 days.
- c. Cool season grasses generally initiate growth in February or March and set seed in late May or June. Warm season grasses will start growth in the spring but the primary growth period is July and August. Seed set occurs in late August or September with warm season grasses.

4. Native (potential or climax) Vegetation

- a. The plant community is predominantly shrubs and cacti with blackbrush dominant on the site. Perennial grass cover is very sparse and annual grasses and forbs make up a small percentage of the potential plant community.
- b. The palatable forage production on this site is very low. Because of the dominance of blackbrush in the potential plant community, the site in most areas remains in a relatively high ecological condition, even with livestock use.
- c. The following is a list of plants that are found in the potential plant community. Range condition of areas within this site is determined by comparing the present plant community with that of this potential plant community. Count as potential no more than the maximum percent shown on the guide for any species. Four condition classes are used to express this degree of comparison of the present plant community to that of the potential:

Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Relative percentage of total plant community by weight:

Grasses and Grasslike (2-5%)

Percent

desert needlegrass (STSP3)
 needle and thread (STCO4)
 New Mexico needlegrass (STNE2)
 Indian ricegrass (ORHY)
 bottlebrush squirreltail (SIHY)
 burrograss (SCBR2)
 Arizona fluffgrass (TRPU2)
 fendlers threeawn (ARFE4)
 black grama (BOER4)
 big galleta (HIRI)
 bush muhly (MUPO)
 Arizona brome (BRAR4)
 sixweeks fescue (FEOC2)

1-5

1-3

Percent

Forbs (2-5%)

globemallow (SPAL)		
smallflower globemallow (SPPA2)		
whitestem stickleaf (MEAL6)		
Colorado four o'clock (MIMU)		
hairy fleabane (ERPU2)		2-5
heath aster (ASER3)		
pingue (HYRI)		
spurge (EUPHO)		
astragulus (ASTRA)		

Trees, Shrubs, Halfshrubs, Succulents, and Woody Vines (90-95%)

blackbrush (CORA)		70-80
green mormontea (ERUI)		
Mohave desertrue (THMO)		
fourwing saltbush (ATCA2)		
blue yucca (YUBA)		
Utah agave (AGUT)		1-5
threadleaf snakeweed (GUMI)		
winterfat (EULA5)		
bush encelia (ENFR)		
flattop buckwheat (ERFA2)		
wild buckwheat (ERIOG)		
buckhorn cholla (OPAC)		
whipple cholla (OPWH)		
beavertail cactus (OPBA)		
Mohave prickly pear (OPER)		1-5
engelmann hedgehog cactus (ECEN)		
campus barrel cactus (ECAC)		
pincushion cactus (MAMMI)		

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon abnormal precipitation or other climatic factors.

The potential (climax) plant community has been determined by study of range relict areas, or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures and historical accounts have also been used.

5. Total Annual Production

In excellent condition this site will produce approximately the following amounts of air dry herbage per acre in:

favorable year	525	lbs.
normal year	425	lbs.
unfavorable year	300	lbs.

B. MAJOR USES

1. Livestock

a. Site factors influencing management

Within large areas of this site are inclusions of more productive range sites. In these instances the entire area should be managed for the inclusions as they are producing the majority of the forage.

Forage production on this site is very low and management designed to maintain or improve the better sites, associated with and adjacent to, will benefit this site.

b. Guide to Initial Stocking Rate

The following stocking rates may be used as a guide to establish a safe starting stocking, but should be evaluated and livestock numbers adjusted based on actual use experience and climatic fluctuations.

Condition Class	Percent Climax Vegetation	AC/AUM	AUM/AC
Excellent	76-100	20-30	.03-.05
Good	51-75	25-35	.03-.04
Fair	26-50	30-40	.03
Poor	0-25	30-40	.03

2. Wildlife

a. Site factors influencing wildlife.

The site has low potential as habitat for most wildlife species. This site is used mostly as a transition between other adjacent sites.

b. Guide to site plant use by wildlife species.

Plant Species	Selected Wildlife Species			
	Mule Deer	Antelope	Bushy Tailed Woodrat	Black Tailed Jackrabbit
needle and thread	F)foliage	---	---	X)foliage
Indian ricegrass	G)foliage	G)foliage	G)seeds	G)foliage
squirreltail	P)foliage	---	---	X)foliage
black grama	F)foliage	G)foliage	---	X)foliage
globemallow	---	G)foliage	X)all parts	---
blackbrush	---	---	---	---
fourwing saltbush	F)foliage	G)foliage	G)all parts	G)foliage
winterfat	G)foliage	F)foliage	G)foliage	G)foliage
buckwheat	G)foliage	G)foliage	G)seeds	G)foliage
cliffrose	G)foliage	G)foliage	---	---
G=Good F=Fair	P=Poor	X=Used but	degree of utilization not known	

3. Recreation and Natural Beauty

- a. Land form - Terraces, rolling hills and ridges.
- b. Landscape quality - There is general lack of diversity in texture and form in the plant community when the site occurs in large open expanses.
- c. Climate - Summers are warm and dry and winters are cool and relatively damp. Recreational activities are generally not limited by climatic factors.
- d. Activities - Recreation activities are limited on the site.

4. Other Uses -

C. THREATENED OR ENDANGERED PLANTS AND ANIMALS

1. Plants -

2. Animals -

D. LOCATION OF TYPICAL EXAMPLE OF THE SITE

1. State location - Mesa top, one mile north of Clay Tank Canyon, Hualapai Indian Reservation; NW $\frac{1}{4}$ Sec. 32, T29N, R13W.
2. Field office site location -

E. FIELD OFFICES

1. Kingman
2. Flagstaff
3. Fredonia