TERRESTRIAL ECOSYSTEM SURVEY
CARTWRIGHT ALLOTMENT
CAVE CREEK RANGER DISTRICT
TONTO NATIONAL FOREST

Field Work Completed November, 1994
Report Completed May, 1995

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CARTWRIGHT ALLOTMENT

CAVE CREEK RANGER DISTRICT
TONTO NATIONAL FOREST

Field Work By:

Soil Scientists:
Norman Ambos
Contributions By:
Wayne Robbie
Ken Scalzone
George Robertson
Ron Stein

Hydrologists:
Grant Loomis
Lynn Mason

Range:
Patti Fenner
Beth Humphrey

Additional Data Collection:
Jason Douglas
Rich Martin
Delvin Lopez

Report Written By:

Norman Ambos

Editorial Assistance By:
Jason Douglas
Rich Martin
Lynn Mason
Wayne Robbie

GIS:
John Lovato

Cover:
Mike Ross

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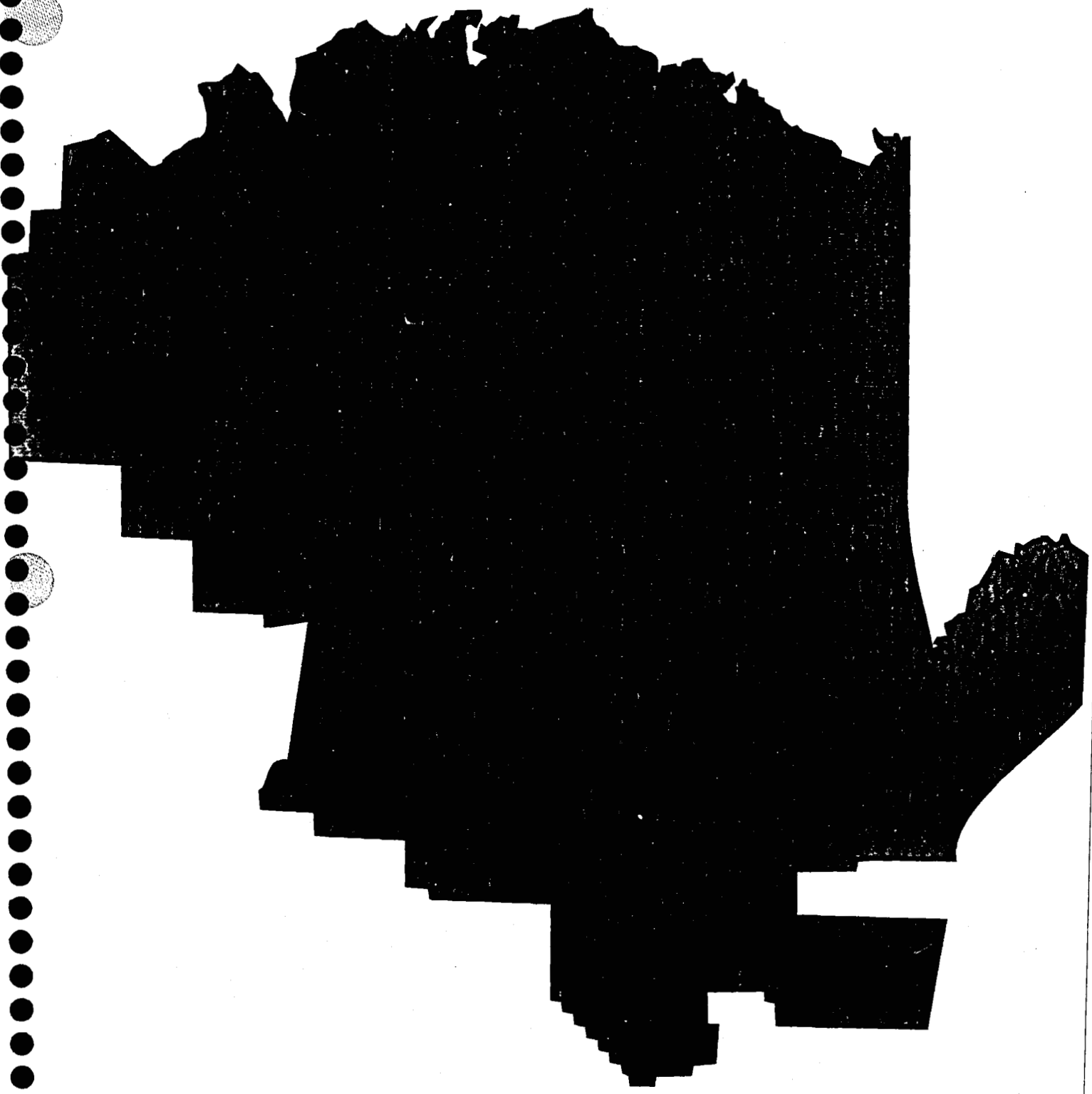

ure 1: Location Map

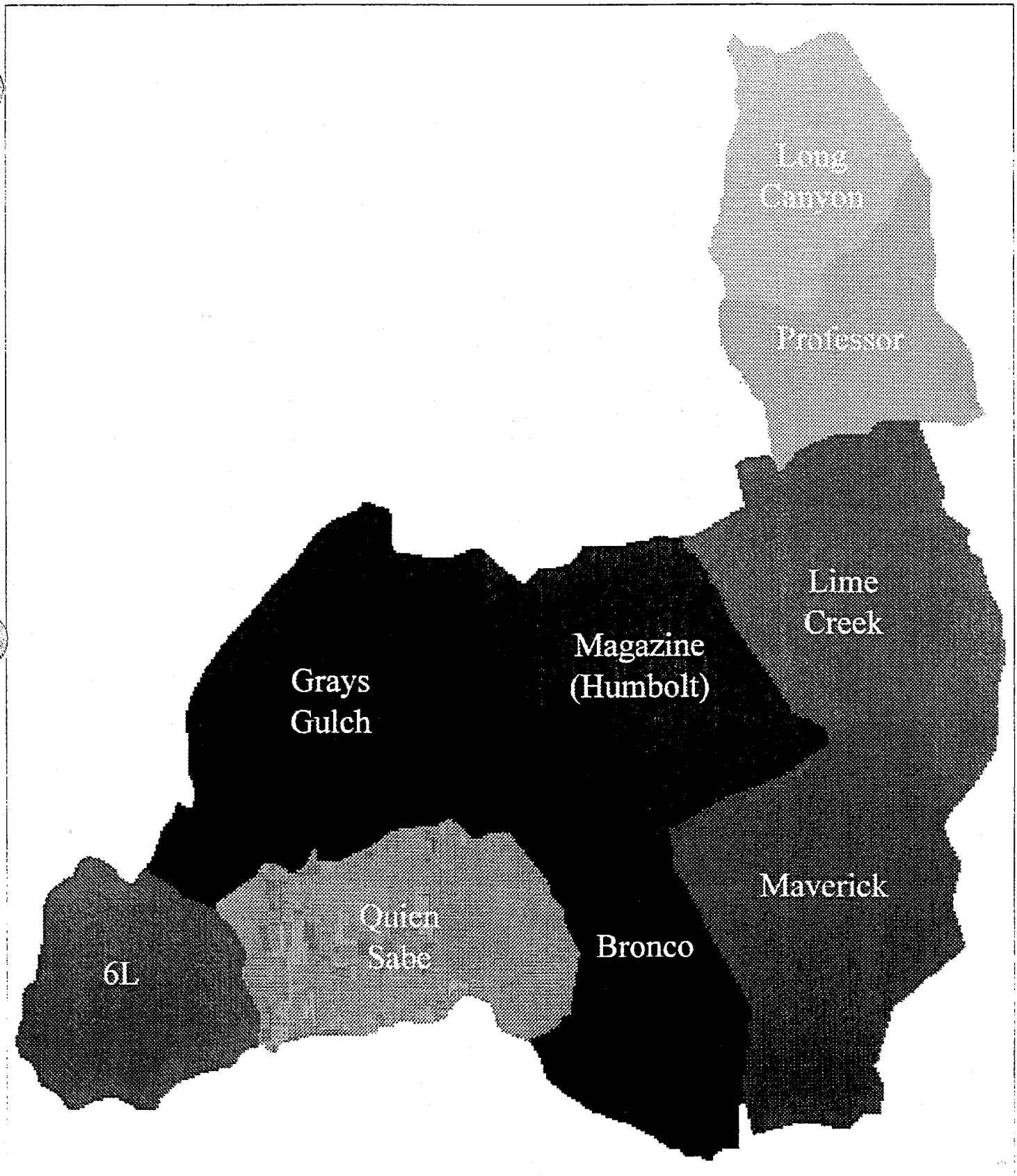

Figure 2: Pasture Map

Terrestrial Ecosystem Survey
of the
Cartwright Allotment, Tonto National Forest

This report contains information derived from a soil survey of the Cartwright Grazing Allotment, Cave Creek District of the Tonto National Forest. Most of the field data was collected from February through November 1994. A field inspection of the soil survey was conducted by Wayne Robbie, Soil Scientist, Regional Office, during the week of February 20, 1995.

How this Survey Was Made:
Mapping was done on 1:24,000 aerial photographs. This information was transferred to overlays on 1:24,000 scale ortho-photoquads and then digitized. Mapping units were delineated by stereoscopic examination of aerial photographs. The basis of delineations were differences in topography, geology and vegetation. Field documentation was made to identify map unit components and to verify accuracy of the delineations. The field documentation consisted of field notes, ground cover/vegetation transects and observations. Much professional judgement was used in identifying and classifying soils. As a result, 23 terrestrial ecosystems were recognized and mapped.

Explanation of Tables:
Table 1 contains the Map Unit Legend. The following information is found: The Map Symbol is used to identify the Map Unit on the map; The Map Unit Soil Taxonomic Name contains the name of the soil based on Keys to Soil Taxonomy, Soil Management Support Services Technical Monograph, Fifth Edition 1992.; Phase identifies surface soil texture, surface rock fragments, soil depth, and other criteria related to management. If no depth is given, the soil depth was too variable to rate or was not considered an important criteria at this level of mapping.; Climate Class gives information that pertains to life zones. (For further discussion of Climate Class, see the section of this report dealing with climate.) Vegetation, Taxonomic gives the Series or Subseries vegetation names. These names refer to the dominant overstory and/or understory plants which occur in the map unit and which are representative of the particular climate class. See Table 2 for an explanation of the plant symbols. Climax Class provides the best evaluation of properties controlling the terrestrial ecosystem. All terrestrial ecosystems meet a threshold for climatic limits. Deviation from a climatic climax is attributed to properties grouped with the following classes: Edaphic, Topographic, Fire, or Zootic. Often the controlling factor for a particular terrestrial ecosystem is a combination of properties. Slope % is self explanatory. Kind of Map Unit refers how map unit components relate to each other. If no listing is given in this column, the map unit is a Consociation in which the map unit is dominated by a single terrestrial ecosystem component. An Association (Assoc.) is a map unit consisting of two or more components that occur as areas large enough to be shown individually on maps but are shown as one unit because use and management does not justify separation. They are also shown together to reduce cartographic clutter. A Complex is a map unit consisting of two or more components so intermingled or so small that they cannot be shown separately at the scale of mapping. Acres and % of Area show the extent of the individual map units within the Cartwright Allotment.

Table 2 contains the Vegetation List of the plants contained within this report. It contains the plant Symbol, Scientific Name, and Common Name. The Symbol refers to the plant symbols found in the National List of Scientific Plant Names Vol. 1, USDA, SCS, SCS-TP-159.

Table 3 contains Soil Condition Ratings and Management Implications. At this point the ratings are tentative and are currently being submitted for comment. Classes are defined as follows:

1. Soil Condition - An evaluation and interpretation of soil quality in terms of factors which effect soil function. Categories of soil condition are satisfactory, impaired, unsatisfactory and unsuited.

   (a) Satisfactory - Soil condition indicates that the inherent productive capacity of the soil resource is being sustained with respect to soil function. Management practices do not reduce soil function. Proper soil function results in the ability of the soil to maintain resource values and sustain outputs.

   (b) Impaired - Soil condition indicates a reduction of the soil's inherent productive capacity with respect to soil function. The ability of the soil to function properly has been reduced. An impaired category should signal land managers that there is a need to evaluate existing management practices, take corrective actions where necessary, and to further investigate the ecosystem to determine the degree and cause in decline in soil function.

   (c) Unsatisfactory - Soil condition indicates that degradation exists. A loss of the soil's inherent productivity capacity has a occurred. Soil productivity is not being sustained with respect to soil function. A reduction of soil function results in the inability of the soil to maintain resource values and sustain outputs. Soils rated in the unsatisfactory category are a high priority for land managers to evaluate and change management practices.

   (d) Unsuited - Soil condition indicates that soils are inherently unproductive and/or unstable. Examples of those soils identified in the unsuited category are unstable soils occurring on very steep slopes, badlands, and other miscellaneous areas.

The Management Implications relate how range management is affected by the various conditions of the soils.

Table 4 contains Soil Capability and Production Ratings. The following information is included:

The Grazing Capability rating is based on the predicted soil loss rates from the Universal Soil Loss Equation (USLE). If existing soil loss is less than the tolerance soil loss, then the soil is rated as "full capability." If the existing soil loss is greater than the tolerance soil loss and the natural soil loss is less than the tolerance soil loss, the soil is rate as "potential capability." If the natural soil loss is greater than the tolerance soil loss, the soil is rated as "no capability." (See Section 22.14 of the Forest Service Handbook (FSH) 2509.22 "Soil and Water Conservation Handbook" and Section 20 of FSH 2209.21 "Range Analysis and Management Handbook.")

The Soil Condition rating is derived from the soil condition ratings being developed in the Southwest Region (R3). (See definitions listed above under Table 3, page 24.) A Satisfactory rating indicates that the soil's inherent productive capacity is being sustained. An Impaired rating indicates that the ability of the soil to function properly has been reduced. An Unsatisfactory rating indicates that a loss of the soil's inherent productivity has occurred. An Unsuited rating indicates the the soil is inherently unproductive and/or unstable.

The Erosion Hazard is based on the potential of the soil to erode when all vegetative ground cover (plants plus litter) has been removed.

The Forage Production ratings is an estimation in pounds per acre of the annual yield (air-dry/normal year) of herbaceous/woody plants that may provide food for grazing animals. The rating for Edaphic is the estimated ability of the soil in its natural condition, with little or no impact from man or grazing animals, to produce forage. The rating for Disclimax is the estimated ability of the soil to produce forage after it has been impacted by man or grazing animals. If the ratings for Edaphic and Disclimax are the same, it indicates that the production potential has not been impacted. The rating for Existing is an estimate of the current forage production.

Table 5 contains erosion table based on the Universal Soil Loss Equation (USLE). The following information is included:

The ratings are for: Potential (Pot.) soil loss which is the soil loss which would take place if all vegetative cover (plants plus litter) were removed, Natural soil loss which is the soil loss under natural conditions, Tolerance soil loss which is the soil loss which can occur and still allow the soil to retain its productivity, and Current soil loss which is the soil loss occurring under current conditions. Effective ground cover is the sum of plant basal area, mat forming vegetation in contact with the soil surface, and persistent litter. The parameter "K" is the erodibility of the soil. The term "SL" is the slope length in meters.

During the period when this study was being prepared, the Revised Universal Soil Loss Equation (RUSLE) became available for use in Region Three. Since the data collected and outputs generated were begun using USLE, it was decided to use this data and not switch to the RUSLE model. Field investigation revealed that where high soil loss rates were predicted by USLE there were definite signs of sheet and rill erosion.

Table 6 contains brief Soil Descriptions for the major soils of each map unit.

Table 7 has a summary of the acres in Soil Condition and Range Capability Classes as well as the acres by Vegetation Type.

Table 8 contains a list of the Potential Plant Communities for each map unit.

Climate And Setting:
The survey area occurs in the Basin and Range province of central Arizona. Elevations range from 2200 feet near where Lime Creek leaves the allotment to 5200 on the summit of Humbolt Mountain. The climate is characterized by hot summers and mild winters. There are two distinct seasons of precipitation,

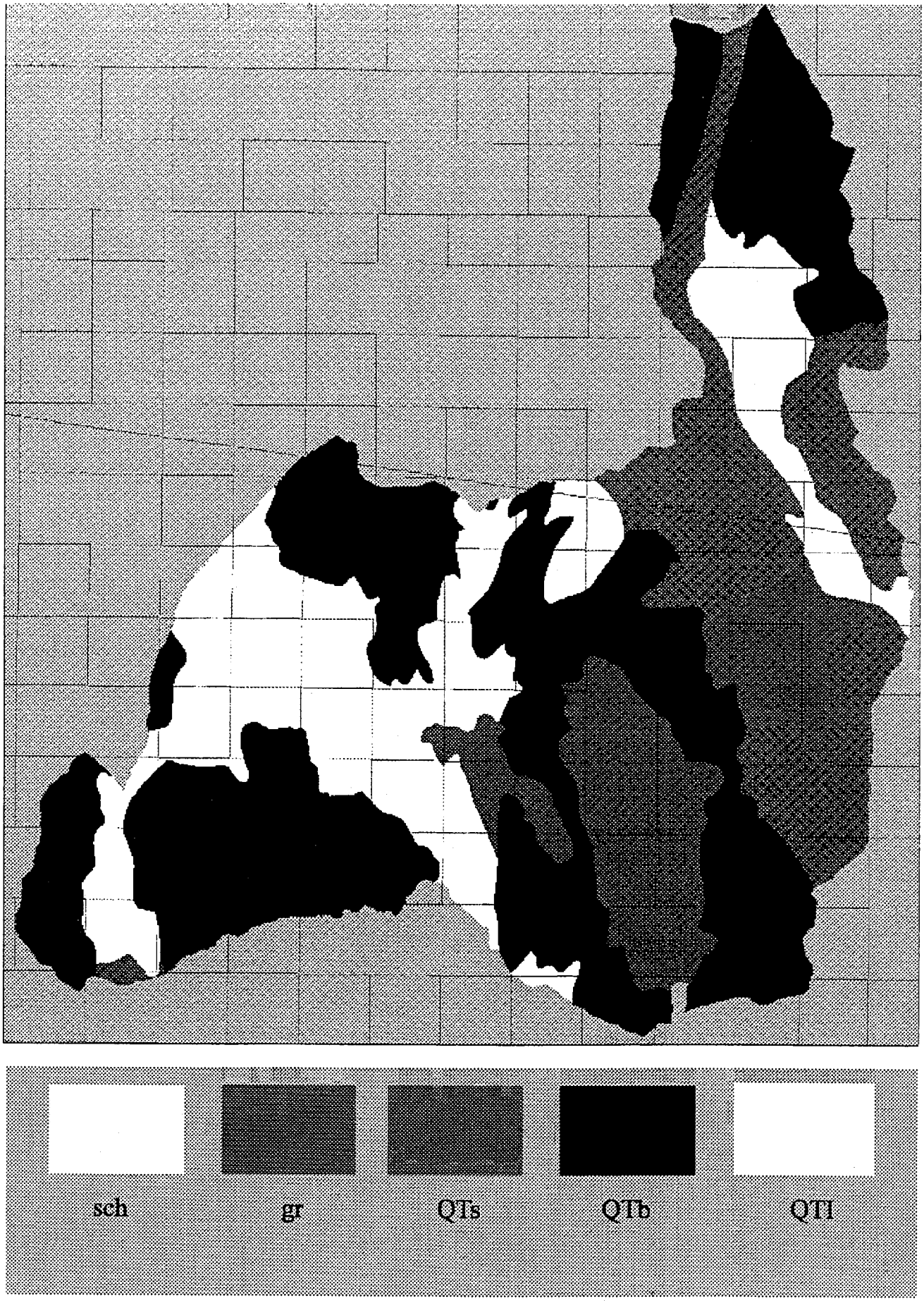

Figure3: Geology Map

the winter rainy season and the summer monsoons. About 55% of the precipitation falls between the period of 01 October through 31 March. Ashdale, at 3300 feet, near the center of the allotment, has a mean annual precipitation of about 15 inches and a mean annual air temperature of about 60 degrees F. 3/

TES Gradient Analysis:
The survey area is also located in the Low Sun Mild (LSM) climate class of the Terrestrial Ecosystems Gradient Analysis. The climate class locates the terrestrial ecosystem in one of four major climatic areas. These climatic classes are based on the following criteria:

Six month season with greater than one-half of the annual precipitation	Winter Temp.	Soil Temp. Regime (Ponderos pine forest)
HSM-High sun (HS) 01 April to 30 Sept.	Mild(M)	Mesic soil temp
HSC-High sun (HS) 01 April to 30 Sept.	Cold(C)	Frigid soil temp
LSM-Low sun (LS) 01 Oct. to 30 Sept.	Mild(M)	Mesic soil temp
LSC-Low sun (LS) 01 Oct. to 30 Sept.	Cold(C)	Frigid soil temp

Each portion of the gradient is subdivided into life zones (column numbers). Life zones 1 thru 6 exist for the LSM gradient. Column numbers 1 and 2 represent sub divisions of the Sonoran Desert; column 3, semi-arid grasslands; column 4, woodlands; column 5, ponderosa pine forests; and column 6, the mixed conifer zone. Each column number is further sub-divided by - 1, 0, or +1 notation. The -1 designation indicates a position near the warm/dry part of the column, 0 indicates the central concept of the column, while +1 indicates a position near the cool/moist part of the gradient. The gradient on the Cartwright Allotment ranges from LSM 2, +1 through 4, 0.

Example of LSM gradient:

Column No.	1	2	3	4	5	6
Community	Desert	Desert	Grassland	Woodland	Ponderosa	Mixed Conifer

Geology:
There are five geologic formations on the Cartwright Allotment which directly affect soil formation. (See figure 3.) The most extensive is Quaternary/Tertiary Basalt (QTb), while granite (gr) dominates the Lime Creek area. There is also a deposit of Quaternary and Tertiary age limestone (QTI) near Lime Creek. Schist (Sch) dominates the area surrounding Cramm Mountain while there are Quaternary/Tertiary fluvial sediments (QTs) scattered throughout the allotment. 2/

Current Conditions:
The Cartwright Allotment has been heavily impacted by livestock grazing for many years. There was little management until the Johnson Cattle Company took over operations in the early 1980's. Until this time, the Forest Service had attempted to correct a deteriorating situation with small cuts and various range improvements, but it was always in a reactive mode in response to a worsening situation. As a result, the conditions deteriorated to the point where the ecological status on much of the allotment was unacceptable. The soil and vegetation conditions were particularly bad in the areas most accessible to livestock. The most heavily used areas were the central, flatter portions of the allotment in the vicinity of FR 24. Other heavily used areas

Figure 4: Slope Map

Figure 4: Slope Map

were the flatter areas and the associated riparian areas near the larger drainages: Lime Creek, Long Canyon, and Cave Creek. (See the Slope Map, figure 4, page 8.) With exception of Skull Mesa, which had little water, nearly all areas on slopes of less than 15% were heavily impacted. Many areas were so heavily impacted that significant improvement is unlikely in the near future, even with complete rest.

Laycock (1991) 1/ talks of stable states and thresholds of range conditions in which environmental degradation may cause a formerly stable site to move to a new, less productive state which may not easily return to its former condition. Once a threshold is crossed to a more degraded state, improvement cannot be attained on a practical time scale without intervention on a large scale. Simple reduction or removal of grazing may not be enough to restore areas that have crossed a threshold. Multiple thresholds and steady states are possible for a given ecosystem. If a community is perturbed beyond a certain critical range, it will cross a threshold to degraded but stable state, one that is not likely to return to its former state. If stressed beyond the limits of this new stable state, it may cross another threshold to more degraded state which may be relatively stable and unable to return to a more productive state in a reasonable period of time. Many areas on the Cartwright Allotment appear to have been degraded to the point where they have crossed one or more thresholds to stable but degraded states. Reasons that, once degraded, a site may not improve on its own could be invasion by woody plants, loss of seed source, soil damage or a combination of these or other factors.

On the Cartwright Allotment, map units 390, 391, 400, and 401 represent important areas that have crossed one or more thresholds. Other map units may have crossed thresholds as well, but the above mentioned map units are the more important and/or dominant ones on the allotment. These are areas that were once among the most productive. They occupy the higher elevations of the semi-arid grasslands (LSM 3, +1) and the lower elevations of the woodland zone (LSM, 4,-1). Covering 11,000 acres, they are on gentle slopes and are dominant in the central, more easily accessible portions of the allotment but are also common in the more remote portions near Long Canyon and Lime Creek. These areas were once capable of producing 500 to 600 pounds of forage per acre but are now producing less than 50 pounds. The map units on 0 to 15% (MU 390, 400) slopes were impacted the most since they were easily accessible by cattle. These ares now lack the density and diversity of grasses that once occupied the sites. As a result, the seed sources for these plants are lacking. The soils suffered from erosion once the vegetation was removed with the resulting loss of much of the original "A" horizon. The soils, which contain large amounts of expanding clay, were easily compacted (increased bulk density) when cattle gathered on them when the soils were wet. The compaction of the surface horizons vastly reduced the soils ability to infiltrate rainfall. As a result the soils became drier as less water infiltrated. This made it more difficult for the remaining grasses to compete and allowed deep rooted vegetation such as catclaw and snakeweed to thrive. These areas have crossed a threshold to a drier, less productive community. Simply reducing or eliminating grazing may not be enough to restore these sites to their former productivity. Because of the lack of a seed source, the native perennial grasses may be difficult to reestablish. The degraded soil condition may also be difficult to correct. Certain factors, such as the compacted soil layers, may improve with rest as the shrinking and swelling of the clay cause the soil bulk density to decrease to near pre-disturbance level. However, completely restoring the soil's

ability to infiltrate water will be difficult. Without adequate vegetation cover, raindrop impact will still cause some minor compaction problems and cause plugging of surface pores. Vegetation will not be able to trap moisture and slow runoff. The low amount of organic matter in the soil makes it difficult for the soil to form the healthy structural aggregates that allow good infiltration. The lessened ability of the soil to infiltrate water leads to higher erosion rates which make rebuilding of the "A" horizon more difficult. Once degraded beyond a certain point, these many factors make rehabilitation difficult.

Map Unit 401 contains examples of multiple steady states resulting from varying amounts of disturbance.

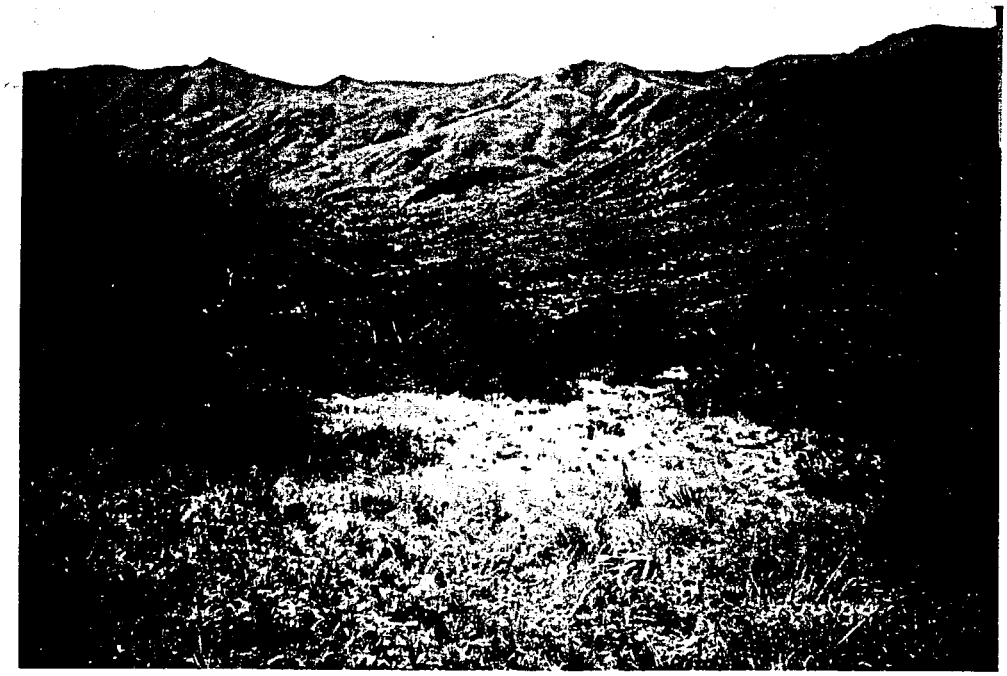

Photo 1: Map Unit 401, Slight Disturbance.

Photo 1, MU 401, shows an area that has had slight disturbance but not enough for the area to have crossed a threshold to a degraded state. There has been a slight increase in snakeweed and an increased density of grasses resistant to grazing such as curly mesquite, but nearly all components of the potential plant community remain intact. There appears to be some slight soil compaction and minor erosion, but the soil has retained most of its ability to function properly. With reduced grazing pressure, this site could regain nearly all of its pre-disturbance productivity. There are relatively few areas on the Cartwright Allotment that have retained this potential to quickly return to pre-settlement conditions.

Photo 2, MU 401, shows an area that has had enough disturbance to cross a threshold to a new stable but less productive state. This area has a heavy invasion by snakeweed and curly mesquite, a grass which is highly resistant to

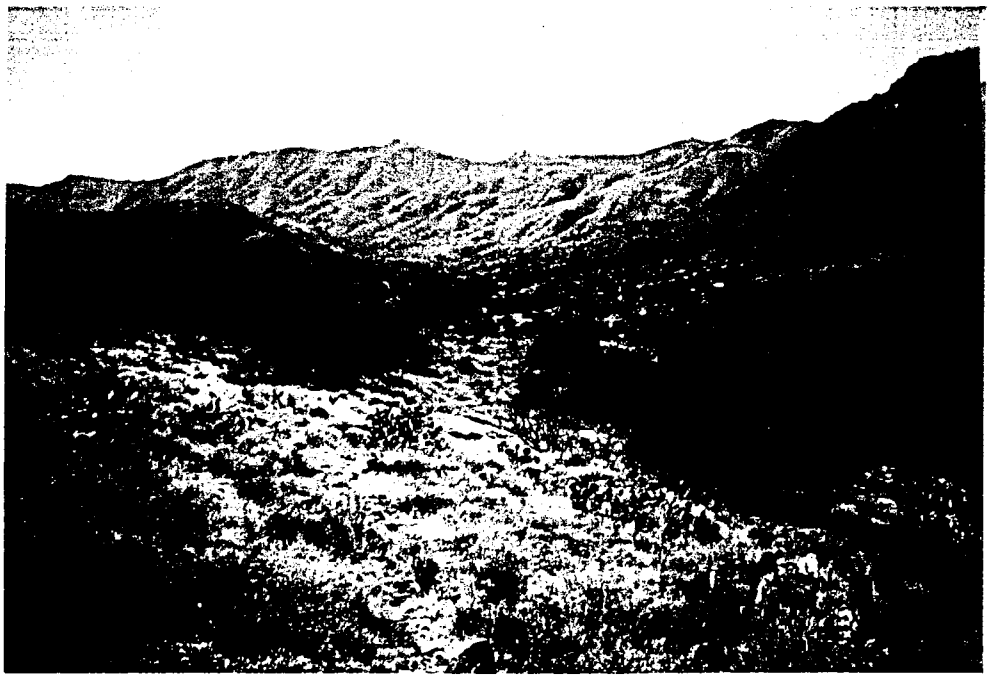

Photo 2: Map Unit 401, Heavy Disturbance.

grazing, and is by far the dominant grass. Significant soil erosion has taken place and the soil is compacted enough to affect infiltration. Sites such as this can withstand fairly heavy grazing pressure without being further degraded to a less productive state. These sites, however, respond slowly to rest. Because of the large amounts of snakeweed and curly mesquite, these plants will continue to dominate the site for years. Also, the seed source for other grasses that formerly occupied this site are scarce or absent.

Photo 3: Map Unit 401, Severe Disturbance

Photo 3, 401 shows an area that has had even more disturbance than the site mentioned above and has crossed another threshold to a more degraded condition. The site has a heavy invasion of snakeweed and catclaw acacia. Only a small amount of curly mesquite remains while the other grasses that formerly occupied the site are absent or occur only in protected areas. The soils are compacted and much of the original "A" horizon has been lost through erosion. Because of compaction and lack of ground cover, less water is able to enter the soil. Increased runoff results. This causes the soil to become drier, favoring deep rooted plants such as the snakeweed and catclaw over grasses. Once these invasive plants have become established, they will continue to dominate the site for decades. The lack of a seed source for the perennial grasses will make grass re-establishment difficult. Improvement cannot be obtained on a practical time frame without much greater intervention by management. Grazing control alone may not allow significant improvement.

Other map units on the Cartwright Allotment have also crossed ecological thresholds and have been degraded to the degree where they are not likely to return to their pre-disturbance productivity in the near future. Map units 300 and 301 have lost most of their original grass covers and have suffered from soil erosion and compaction. They will be very difficult to rehabilitate. Map units 416, 417, 418, 451 and 452 represent areas that contain varying densities of chaparral species. In the most part, the chaparral component of these units are healthy, but the interspaces between shrubs are depauperate of grasses. It is thought that these interspaces once had a luxuriant understory of grass. At present, there are few grasses left in the interspaces. It will be difficult to reestablish the grass component of these ecosystems.

Many of the ecosystems on the Cartwright Allotment have been significantly degraded from past disturbances. They are not likely to return to their pre-disturbance productivity in a reasonable period of time with rest alone.

Soil Compaction:

Many of the heavily used soils on the Cartwright Allotment have been compacted. The major cause of compaction appears to be concentrated hoof action by cattle, especially on wet soil. Soils have low strength when wet and are thus more easily compacted. Another possible source of compaction is raindrop impact on bare soil. The actions of raindrop impact, however, are not likely to compact the soil as deeply as hoof action. Signs of compaction include a hard surface that is difficult to penetrate with a shovel or probe, a platy structure instead of a granular or crumb structure, and few pores. Photo 4 shows the difference in soil structure between an open space with little vegetative cover and a protected soil beneath catclaw acacia. The soil surface in a healthy grassland is comparable to the soil beneath the catclaw. A major effect of compaction is the reduced ability of the soil to allow infiltration of rainfall. Compacted soils may have an infiltration rate that is reduced by 50% or more. Another effect is the poor physical environment for the establishment of grass seedlings caused by the hard soil surface.

Photo 4: Soil Compaction

On the left is a compacted soil with platy structure from an open area with little ground cover. On the right is a soil with granular structure from beneath a catclaw acacia.

Pre-settlement Conditions:
While it is somewhat difficult to determine the exact pre-settlement conditions of an area, it is possible to infer those conditions by looking at early descriptions of the area and by examining similar ecosystems that have received little disturbance.

It is likely that most of the central part of the Cartwright Allotment was a productive grassland. This area was once referred to as grass valley. It probably looked somewhat like Dutchwoman Butte north of Roosevelt Lake. Like much of the Cartwright Allotment, Dutchwoman Butte lies in a transition zone between the semi-arid grasslands and the woodland zone (LSM 3,+1 to LSM 4,-1) and contains many plants that are common in both zones. Dutchwoman Butte has a mean annual precipitation of about 17 inches while the average for the Cartwright Allotment is around 15 inches. Both areas have similar but not identical soils. Dutchwoman Butte is inaccessible to livestock and is a healthy grassland with a few scattered junipers. It is interesting to compare the current plant communities of a typical area of the Cartwright Allotment with that of Dutchwoman Butte:

Photo 5: Undisturbed grassland on Dutchwoman Butte (See data below.)

Photo 6: Cartwright Map Unit 401, Long Canyon (See data below.)

	Dutchwoman %Canopy	Cartwright %Canopy 4/
Shrubs/Trees		
Acacia angustissima	0.1	---
Acacia gregii	1.2	15
Agave parryi	1.5	---
Calliandra eriophylla	11.6	T
Dasylirion wheeleri	P	---
Echinocereus sp.	0.2	T
Eriogonum wrightii	4.7	T
Gutierrezia sarothrae	P	15
Juniperus erythrocarpa	2.5	10
Nolina microcarpa	P	P
Opuntia phaecantha	1.4	2
Opunita chlorotica	P	---
Prosopis velutina	P	T
Quercus turbinella	P	---
Rhamnus crocea ilicifolia	P	---
Yucca bacata	2.8	T
Graminoids		
Aristida sp.	1.5	1
Bothriochloa barbinodis	0.4	---
Bouteloua curtipendula	12.0	1
Bouteloua hirsuta	10.8	---
Digitaria californica	P	---
Eragrostis intermedia	7.4	---
Hilaria belangeri	2.2	4
Hilaria mutica	---	T
Koeleria pyramidata	1.1	---
Muhlenbergia emersleyi	P	---
Leptochloa dubia	1.0	---
Leptochloa filiformis	P	---
Lycurus phleoides	P	---
Sitanion hystrix	1.2	P
Setaria macrostachya	P	---
Sporobolus cryptandrus	0.2	---
Total Gram.	37.8	6

T = Trace amounts (Occurs in most plots but less than 1% canopy cover.)
P = Present (Does not occur in most plots, occasionally found.)

Dutchwoman Butte has a 38% canopy cover of perennnial grasses while the area on the Cartwright Allotment has about 6%. Also the canopy coverage of invasive species such as cactclaw acacia and snakeweed occupy about 1% on Dutchwoman while they cover about 30% on Cartwright.

It is reasonable to believe that much of the Cartwright Allotment was once as productive as Dutchwoman Butte. Years of overuse have left much of the Cartwright in poor ecological condtion so that it only retains a fraction of the productivity it once had.

The following shows other comparisons between Dutchwoman Butte and typical areas of the Cartwright Allotment.

Photo 7: Undisturbed grassland on Dutchwoman Butte

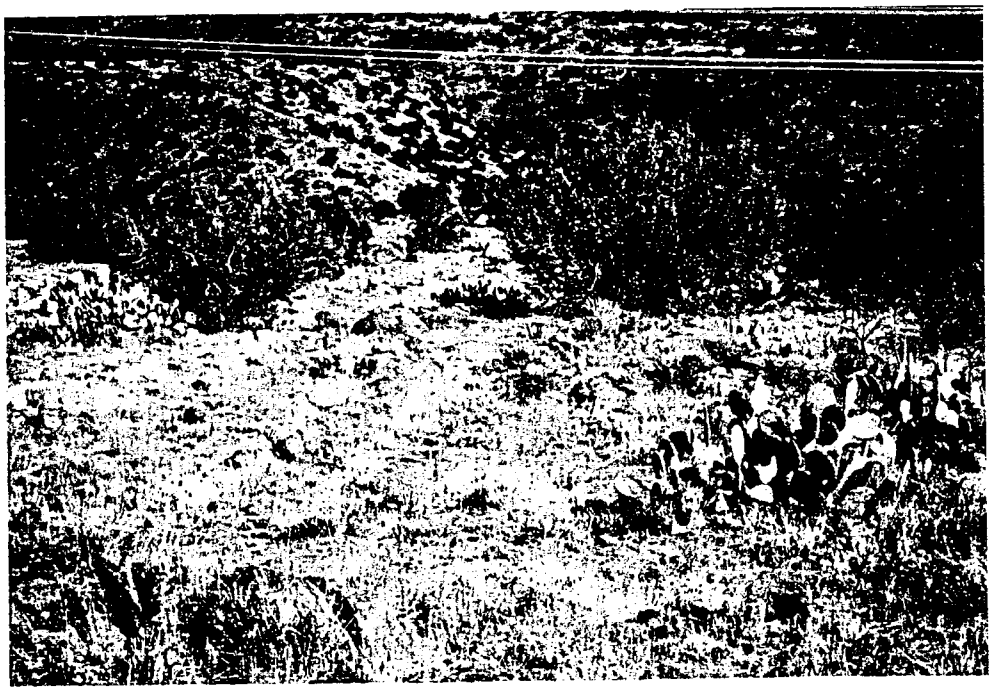

Photo 8: Cartwright Map Unit 400, Grays Gulch Pasture

Photo 9: Undisturbed grassland on Dutchwoman Butte

Photo 10: Cartwright Map Unit 390 Bronco Pasture

1/ Laycock, W.A. 1991. Stable States and Thresholds of Range Condition on North American Rangelands: A Viewpoint. Journal of Range Management 44 (5), September 1991.

2/ Geology information is from Arizona Highway Department, Arizona Materials Inventory for Maricopa and Yavapai Counties.

3/ Climate is from Sellers, W.D. Arizona Climate 1931-1972.

4/ NE, SE, Sec 35, T. 9 N., R. 5 E. (Stop 3) MU 401, Long Canyon Pasture

Table 1: Map Unit Legend

Map Symbol	Map Unit Name Soil Taxonomic	Phase	Climate Class	Vegetation Taxonomic	Climax Class	Slope % Kind of Map Unit	Acres	% of Area
12	Ustic Torrifluvents, --- --- thermic	deep --- --- ---	LSM 2	Prve	Topo-edaphic	0-15	155	0.3
73	Fluventic Ustochrepts, --- --- thermic	deep --- --- ---	LSM 3-4	Prve-Juer	Topo-edaphic	0-15	455	0.8
239	Ustic Toriorthents, --- --- thermic	--- cbx sl ---	LSM 2	Cegi	Edaphic	40-120 Assoc.	6811	12.2
	Aridic Ustorthents, --- --- thermic	--- cbx sl ---	LSM 3	Prve	Edaphic			
	Rock Outcrop	---	---	---	---			
291	Ustollic Haplargids, --- clayey-skeletal, mont., thermic	--- stv cl ---	LSM 2 +1	Cegi/Sich	Edaphic-Zootic	15-40 complex	962	1.7
	Ustollic Haplargids, --- fine, montmorillonitic, thermic	--- cbv cl ---	LSM 2 +1	Cegi/Sich	Edaphic-Zootic			
292	Ustollic Haplargids, --- --- thermic	--- cbx sl ---	LSM 2 +1	Cegi/Sich	Edaphic	40-120 complex	1144	2.1
300	Aridic Haplustalfs, --- fine, montmorillonitic, thermic	--- cb l compacted	LSM 3 -1	Prve/Sich/ Hibe	Edaphic-Zootic	0-15 complex	894	1.6
	Vertic Haplustalfs, --- fine, montmorillonitic, thermic	--- cb cl compacted	LSM 3 -1	Prve/Sich/ Hibe	Edaphic-Zootic			
301	Aridic Haplustalfs, --- fine, montmorillonitic, thermic	--- stv cl ---	LSM 3 -1	Prve/Sich/ Hibe	Edaphic-Zootic	15-40 complex	1882	3.4
	Aridic Haplustalfs, --- clayey-skeletal, mont., thermic	--- cbv cl ---	LSM 3 -1	Prve/Sich/ Hibe	Edaphic-Zootic			
304	Lithic Ustochrepts, calcareous --- thermic	--- cbx l ---	LSM 3 -1	Cegr/Pust/ Dafo	Edaphic	15-80 Assoc.	915	1.6

Map Symbol	Map Unit Name Soil Taxonomic	Phase	Climate Class	Vegetation Taxonomic	Climax Class	Slope % Kind of Map Unit	Acres	% of Area
	Lithic Camborthids,	---	LSM	Cegi/Pust/	Edaphic			
	calcareous	cbx	2	Sich				
	---	l	+1					
	thermic	---						
352	Aridic Haplustalfs,	---	LSM	Prve	Edaphic	40-120	6373	11.5
	---	cbx	3					
	---	sl						
	thermic	---						
381	Lithic Ustochrepts,	---	LSM	Erwr/Caer/	Edaphic	15-40	1386	2.5
	---	grx	3	Juer				
	loamy-skeletal, mixed,	sl	+1					
	thermic	---						
382	Lithic Ustochrepts,	---	LSM	Erwr/Caer/	Edaphic	40-80	1300	2.3
	---	grx	3	Juer				
	---	sl	+1					
	thermic	---						
390	Aridic Haplustalfs,	---	LSM	Prve/Juer/	Edaphic-	0-15	985	1.8
	---	grv	3	Hibe	Zootic	complex		
	fine, montmorillonitic,	l	+1					
	thermic	compacted						
	Vertic Haplustalfs,	---	LSM	Prve/Juer/	Edaphic-			
	---	cb	3	Hibe/Hean3	Zootic			
	fine, montmorillonitic,	cl	+1					
	thermic	compacted						
391	Aridic Haplustalfs,	---	LSM	Prve/Juer/	Edaphic-	15-40	1605	2.9
	---	cbv	3	Hibe	Zootic	complex		
	fine, montmorillonitic,	cl	+1					
	thermic	---						
	Aridic Haplustalfs,	---	LSM	Prve/Juer/	Edaphic-			
	---	stv	3	Hibe	Zootic			
	clayey-skeletal, mont.,	cl	+1					
	thermic	---						
400	Typic Haplustalfs,	---	LSM	Juer/Prve/	Edahpic-	0-15	3973	7.1
	---	cbv	4	Hibe	Zootic	Complex		
	fine, montmorillonitic,	l	-1					
	thermic	compacted						
	Vertic Haplustalfs,	---	LSM	Juer/Prve/	Edaphic-			
	---	cb	4	Hibe/Hean3	Zootic			
	fine, montmorillonitic,	cl	-1					
	thermic	compacted						
401	Typic Haplustalfs,	---	LSM	Juer/Prve/	Edaphic-	15-40	4842	8.7
	---	cbv	4	Hibe	Zootic	Complex		
	fine, montmorillonitic,	l	-1					
	thermic	---						
	Typic Haplustalfs,	---	LSM	Juer/Prve/	Edaphic-			
	---	stv	4	Hibe	Zootic			
	clayey-skeletal, mont.,	l	-1					
	thermic	---						

Map Symbol	Map Unit Name Soil Taxonomic	Phase	Climate Class	Vegetation Taxonomic	Climax Class	Slope % Kind of Map Unit	Acres	% of Area
402	Typic Haplustalfs, --- --- thermic	--- cbx sl ---	LSM 4 -1	Juer/Prve	Edaphic	40-120	10,742	19.3
415	Typic Ustifluvents, --- --- thermic	deep grx sl ---	LSM 4 -1	Qutu2/Rhtr/ Beha	Topo- Edaphic- Fire	0-15 Assoc.	320	0.6
	Fluventic Ustochrepts, --- --- thermic	deep cbv loam ---	LSM 4 -1	Qutu2/Rhtr/ Beha	Topo- Edaphic- Fire			
416	Typic Haplustalfs, --- clayey-skeletal, mont., thermic	--- stv sl ---	LSM 4 -1	Juer/Qutu2/ Cemo2/Hibe	Topo- Edaphic- Zootic	15-40	425	0.8
417	Typic Haplustalfs, --- --- thermic	--- stv sl ---	LSM 4 -1	Juer/Qutu2/ Cemo2/Hibe	Topo- Edaphic- Zootic	40-120	2178	3.9
418	Lithic Ustochrepts, --- loamy-skeletal, mixed, thermic	shallow grx sl ---	LSM 4 -1	Juer/Qutu2/ Cegr/ARIST	Edaphic- Zootic- Fire	0-40 Complex	413	0.7
	Typic Ustochrepts, --- loamy-skeletal, mixed, thermic	m.deep grx sl ---	LSM 4 -1	Juer/Qutu2/ Cegr/ARIST	Edaphic- Zootic- Fire			
431	Lithic Haplustalfs, --- clayey, montmorillonitic, thermic	shallow stx cl ---	LSM 4 -1	Juer/Prve/ Himu2	Edaphic	0-15 complex	544	1.0
	Vertic Haplustalfs, --- fine, montmorillonitic, thermic	deep cobbly cl	LSM 4 -1	Juer/Prve/ Himu2	Edaphic			
451	Typic Haplustalfs, --- loamy-skeletal, mixed, mesic	--- grv sl ---	LSM 4 0	Qutu2/Cegr	Topo- Edaphic- Fire	15-40	1070	1.9
452	Typic Haplustalfs, --- --- mesic	--- stv l ---	LSM 4 0	Qutu2/Cegr	Topo- Edaphic- Fire	40-80	6255	11.2

Table 2: Vegetation List

Symbol	Scientific Name	Common Name
Shrubs/Trees		
Acan	Acacia angustissima	White-ball acacia
Acgr	Acacia greggii	Catclaw acacia
Acco2	Acacia constricta	White-thorn acacia
AGAVE	Agave sp.	Agave
Beha	Berberis haematocarpa	Red barberry
Caho3	Canotia holacanatha	Crucifixion-thorn
Caer	Calliandra eriophylla	False mesquite
Cegr	Ceanothus greggii	Desert ceanothus
Cefl2	Cercidium floridum	Blue palo-verde
Cemi2	Cercidium microphyllum	Littleleaf palo-verde
Cemo2	Cercocarpus montanus	Mountain mahogany
Cegi	Cereus giganteus	Saguaro
Dafo	Dalea formosa	Feather dalea
Dawh	Dasylirion wheelerii	Desert spoon
Enfa	Encelia farinosa	Brittle-bush
EPHED	Ephedra	Mormon-tea
Erwr	Eriogonum wrightii	Wright buckwheat
FEROC	Ferocactus sp.	Barrel cactus
Fosp2	Fouquirria splendens	Ocotillo
Gawr3	Garrya wrightii	Wright silktassel
Gusa2	Gutierrezia sarothrae	Snakeweed
Juer	Juniperus erythrocarpa	Redberry juniper
Krpag	Krameria parvifolia gl.	Range ratany
Latr2	Larrea tridentata	Creosote-bush
Mibi3	Mimosa biuncifera	Catclaw mimosa
Nomi	Nolina microcarpa	Beargrass
Opch	Opuntia chlorotica	Pancake-pear
Opfu	Opuntia fulgida	Cholla
Opph	Opuntia phaecantha	Engelmann prickly-pear
Opwh	Opuntia whipplei	Whipple cholla
Prve	Prosopis velutina	Velvet mesquite
Pust	Purshia stansburiana	Cliffrose
Qutu2	Quercus turbinella	Turbinella oak
Rhcri2	Rhamnus crocea ili.	Buck-thorn
Rhov	Rhus ovata	Sugar sumac
Rhtr	Rhus trilobata	Skunkbush sumac
Sich	Simondsia chinensis	Jojoba
Yuba	Yucca baccata	Banana yucca
Forbs		
Arlu	Artemisia ludoviciana	Sage
ASTER	Aster sp.	Aster
ASTRA	Astragalus sp.	Astragalus
Bapt	Baccharis pteronioides	Yerba-de-pasmo
CIRSI	Cirsium sp.	Thistle
Enfa	Encelia farinosa	Brittlebush
Erci6	Erodium cicutarium	Filaree
EUPHO	Euphorbia sp.	Spurge
HAPLO2	Haplopappus sp.	Goldenrod
Hean3	Helianthus annuus	Sunflower
Lori3	Lotus rigidus	Deer vetch
PENST	Penstemon sp.	Penstemon
PLANT	Plantago sp.	Indian-wheat
SHPAE	Sphaeralcea sp.	Globe-mallow

Symbol	Scientific Name	Common Name
Graminoids		
ARIST	Aristida sp.	Three-awn
Boba3	Bothriochloa barbinodis	Cane beardgrass
Bocu	Bouteloua curtipendula	Sideoats grama
Boer4	Bouteloua eriopoda	Black grama
Bogr2	Bouteloua gracilis	Blue grama
Bohi2	Bouteloua hirsuta	Hairy grama
Dica8	Digitaria californica	Airizona cottontop
Erin	Eragrostis intermedia	Plains lovegrass
Hibe	Hilaria belangeri	Curly mesquite
Himu2	Hilaria mutica	Tobosa
Kopy	Koeleria pyramidata	Junegrass
Ledu	Leptochloa dubia	Green sprangletop
Lefi	Leptochloa filiformis	Red sprangletop
Lyph	Lycurus phleoides	Wolftail
Muem	Muhlenbergia emersleyi	Bullgrass
Mupo2	Muhlenbergia porteri	Bush muhly
Paob	Panicum obtusum	Vine mesquite
Pofe	Poa fendlerana	Mutton bluegrass
Scsc	Schizachyrium scoparium	Little bluestem
Sihy	Sitanion hystrix	Squirreltail
Spcr	Sporobolus cryptandrus	Sand dropseed
Stco4	Stipa comata	Needle and thread grass
Stsp3	Stipa speciosa	Desert stipa
Trmu	Tridens muticus	Slim tridens

Table 3: Soil Condition Ratings and Management Implications 1/

MU 12: This map unit has Satisfactory soil conditions.

MU 73: This map unit has Satisfactory soil conditions.

MU 239: This map unit is rated Unsuited because of steep slopes and naturally erosive soils. There are signs of current sheet erosion.

MU 292: This map unit shows signs of excessive erosion, appears to be inherently unstable, and therefore is rated Unsuited. It is, however, in fair ecological condition but too steep to effectively manage.

MU 300: Nearly all of this map unit is rated Unsatisfactory because of past erosion, little current ground cover, and soil compaction. Additionally, the current erosion on component .2 (Vertic) is excessive.

MU 301: Nearly all of this map unit is Unsatisfactory because of current soil erosion. Futhermore, there is a lack of ground cover. The flatter portions of this map unit also have compaction problems.

MU 304: Most of this map unit is Unsatisfactory because of lack of ground cover and excessive soil erosion.

MU 352: Most of this map unit is Unsuited because of excessive erosion and steep slopes. There are signs of unstable slopes, pedestaling of plants, and erosion on cattle trails. A few portions of this map unit may be Satisfactory where slopes are less than 50% and range condition is "fair" or better.

MU 381: Although current erosion is within tolerance limits in most of this unit, there is evidence of past erosion. Plant diversity, especially the grass component, is low. Since the soil's ability to function properly appears to have been reduced, this unit is rated as Impaired.

MU 382: Most of this map unit is Unsuited because of excessive erosion and steep slopes. A few portions of this map unit may be suitable where slopes are less than 50% and the range condition is "fair" or better.

MU 390: Nearly all of the of this map unit is in Unsatisfactory condition because of soil compaction, past erosion which has removed much of the original "A" horizon, and little vegetative cover. Because of sustained heavy use in the past, soils in this map unit have lost much of their inherent productivity.

MU 391: Most of this map unit is Unsatisfactory. Current erosion exceeds tolerance levels, much of the original "A" horizon has been lost because of past erosion, and there is little vegetative ground cover. In addition, there is little diversity of grasses. The flatter portions of this map unit also suffer from compaction. There are a few polygons of this map units where conditions are acceptable. These are areas where the range is in "Fair" condition or better, typically steeper slopes far from water.

MU 400: Nearly all of the of this map unit is in Unsatisfactory condition because of soil compaction, past erosion which has removed much of the original "A" horizon, and little vegetative cover. Most soils in this map unit, because of heavy use in the past, have lost much of their inherent productivity.

MU 401: Much of this map unit is in Unsatisfactory condition. In the Unsatisfactory areas, erosion exceeds tolerance levels, much of the original "A" horizon has been lost because of past erosion, and there is little vegetative ground cover. In addition, there is little diversity of grasses. The flatter portions of this map unit suffer from compaction. However, there are significant portions of this map unit where soils conditions are better because impacts in the past were lighter. In these cases the soil has retained more or its inherent productivity but the soil's ability to function has been somewhat reduced. These areas show signs of past erosion which as removed part of the original "A" horizon and there is some soil compaction. These soils are rated as Impaired. Most of the soils in this category occur in the Lime Creek and Long Canyon areas on slopes that are somewhat inaccessible or far removed from water. In

this portion of the allotment there are also portions of this map unit where the soil conditions are fully Satisfactory. These are in areas that were so inaccessible or so far removed from water that they rarely received heavy use. The range conservationist and soil scientist should work together to help identify the soils in these various condition classes. In general the soils rated Unsatisfactory correspond with those areas rated as being in "very poor" range condition. Those soils rated Impaired generally show range in "poor" condition. Ranges in "fair" condition or better are normally on soils rated Satisfactory.

MU 402: Most of this map unit is Unsuited because of excessive erosion and steep slopes. There are signs of unstable slopes, pedestaling of plants and erosion on cattle trails. A few portions of this map unit may be suitable where slopes are less than 50% and range condition is "fair" or better.

MU 415: Most of this map unit has Satisfactory soil conditions. Sheet and rill erosion are slight. There is a heavy canopy of shrubs and also much litter covering the soil. Because of the position of this map unit on the landscape, gully erosion may be a slight problem.

MU 416: Most of this map has Unsatisfactory soil conditions. The openings between shrubs have excessive soil erosion and lack perennial plant cover. These openings between shrubs occupy about 65% of the area in this map unit. The soil condition under the canopy of shrubs is satisfactory since the soil is protected by litter. This protected soil only occupies a small part of the map unit.

MU 417: Most of this map has Unsatisfactory soil conditions. The openings between shrubs have excessive soil erosion and lack perennial plant cover. These openings between shrubs occupy about 65% of the area in this map unit. The soil condition under the canopy of shrubs is Satisfactory since the soil is protected by litter, however, this only occupies a small part of the map unit.

MU 418: The overall soil conditions in this map unit are Unsatisfactory. While the area beneath the shrub cover is Satisfactory, it only occupies about 40% of the unit. The open areas between shrubs have only about a 5% effective cover and there is much evidence of soil erosion: sheets, rills, small gullies, and a buildup of sediment behind plants and rocks. There are almost no perennial grasses in the openings.

MU 431: This map unit, which occurs only on Skull Mesa, has Satisfactory soil conditions. Because of difficult access and the distance from water, this area has received only light use from cattle. This unit, however, is probably "no capacity" range because of the distance to water.

MU 451: Most of this unit has Satisfactory soil condition. The dense overstory of shrubs (60-70%) and the litter cover beneath the shrubs provides protection from erosion. However, the openings between the shrubs have little ground cover and there is evidence of excessive erosion in these areas. While most of this map unit is Satisfactory, up to 30% may be Unsatisfactory because of the excessive erosion in the openings.

MU 452: The areas of this map unit that have slopes less than about 50% have Satisfactory soil condition. These areas have enough litter to protect the soil from erosion. However, the slopes steeper than about 50% have a higher erosion hazard and should be rated Unsuited.

Management Implications:

A Satisfactory rating indicates that past and current management have allowed to soil to retain its inherent productivity and the soil is functioning properly. Changes in management should be evaluated to determine their effect on the soil.

An Impaired rating indicates that the ability of the soil to function properly has been reduced. Existing management practices need to be evaluated to determine if the current management practice is causing the problem. In many cases the current practices are not causing the problems. In these cases the degradation was caused by past practices. In any case, management must be evaluated and conditions monitored to ensure that conditions are improving. Practices that cause static or downward trends are not acceptable. In the case of grazing, utilization should be set low enough to

allow residual cover at the end of the grazing season. This will allow a build up of litter to increase soil organic matter and protect the soil from erosion. In many cases, the Impaired rating is partially or totally due to soil compaction. In these cases, allowing heavy use when the soils are wet and most susceptible to compaction can cause further problems. Soils which are susceptible to compaction (medium textured soils low in rock fragments and fine textured soils) should be grazed when the soils are relatively dry. In most cases, grazing can be a suitable activity on soil with an Impaired rating but must be evaluated to determine if it allows for improved conditions.

An Unsatisfactory rating indicates that a loss of the soil's inherent productivity has occurred. These soils have crossed an environmental threshold. 2/ Rest alone is not likely to allow these soils to regain their natural productivity in a reasonable period of time. Decades or centuries may be required before they become fully productive unless intensive restoration projects are undertaken. Management activities that cause any type of degradation should not be allowed. In the case of grazing, the allowable use should be set very low so that a build up of litter can occur and grasses can set seed. A large number of soils in the Unsatisfactory category have severe compaction problems. Livestock management should be designed to minimize further compaction. These soils should only be grazed when relatively dry. Compacted soils, when rested, can be restored to an uncompacted state. Soils with an Unsatisfactory rating often reach this state because they are in positions on the landscape where cattle activity is greatest. Pastures with a high percentage of Unsatisfactory soils are difficult to manage since these soils tend to be favored and overused by cattle while the surrounding areas are underused. Getting proper use on those soils in better condition while not overusing the Unsatisfactory is a challenge. Unsatisfactory ratings do not mean "no capability range," but situations that require close monitoring. In some cases no grazing will be the prefered management.

An Unsuited rating indicates that the soil is inherently unproductive and/or unstable. In most cases these soils occur on steep slopes and are highly susceptible to erosion. These ares are unsuited for most activities. Intensive grazing is normally not recommended on these slopes. However it is recognized that light use may be appropriate on the more stable portions of these areas as long as the use does not contribute to erosion. Areas where use is allowed should be carefully evaluated. It is recognized that cattle may use steep slopes at various times. To set allowable use at 0% may not be practical, however use should be kept to a minimum such as around 10%.

1/ The ratings are based on the draft Soil Condition Classes developed on March 3, 1995 and currently being tested by Region 3. The condition classes are: Satisfactory, Impaired, and Unsatisfactory. A fourth class, Unsuited, represents for soils that are naturally unstable or unproductive.

2/ Laycock, W.A. 1991. Stable states and thresholds of range condition on North American rangelands: A viewpoint. Journal of Range Management 44 (5). In this paper, the subject of thresholds are discussed. The idea being that once a threshold is crossed to a more degraded state, improvement cannot be attained on a practical time scale without a much greater intervention or management effort than simple grazing control.

Table 4: Soil Capability and Production Ratings. 1/

MU Comp.	Grazing Cap.	Soil Condition	Ersion Hazard	Forage Production Edaphic	Forage Production Disclimax	Forage Production Existing	
12	FC	SAT	SLIGHT 2/	--TOO VARIABLE TO RATE--			
73	FC	SAT	SLIGHT 2/	--TOO VARIABLE TO RATE--			
239.1	NC	UNSUITED	SEVERE	100	100	100	
239.2	NC	UNSUITED	MOD	175	175	175	
291.1	NC	UNSAT	SEVERE	150	75	25	
291.1	NC	UNSAT	SEVERE	150	75	25	
292	NC	UNSUITED	SEVERE	150	150	100	
300.1	FC	UNSAT	MOD	300	100	15	
300.2	NC	UNSAT	MOD	300	75	15	
301.1	PC	UNSAT	MOD	300	125	50	
301.2	PC	UNSAT	MOD	300	150	50	
304.1	NC	UNSAT	SEVERE	125	75	75	
304.2	NC	UNSAT	MOD	100	50	50	
352	NC	UNSUITED	SEVERE	350	300	200	
381	FC	IMPAIRED	MOD	325	275	100	
382	NC	UNSUITED	SEVERE	300	275	100	
390.1	FC	UNSAT	MOD	550	150	10	
390.2	PC	UNSAT	MOD	550	100	10	
391.1	PC	UNSAT	MOD	550	150	25	
391.2	PC	UNSAT	MOD	550	150	25	
400.1	FC	UNSAT	MOD	650	200	50	
400.2	PC	UNSAT	MOD	650	150	25	
							VP P F
401.1 3/	PC	UNSAT	MOD	550	200	75	50-125-225
401.2	PC	UNSAT	MOD	500	250	100	50-125-225
402	NC	UNSUITED	SEVERE	450	350	200	
415.1	FC	SAT	SLIGHT 2/	200	175	50	
415.2	FC	SAT	SLIGHT 2/	200	175	50	
416 (Overall)4/	PC	UNSAT	MOD	400	200	100	
416 (Openings)	PC	UNSAT	MOD	---	---	100	
417 (Overall)4/	PC	UNSAT	SEVERE	400	200	100	
417 (Openings)	NC	UNSAT	SEVERE	---	---	5	
418.1 4/	FC	SAT	MOD	350	175	75	
418.1(Openings)	PC	UNSAT	MOD	---	---	5	
418.2 4/	FC	SAT	SLIGHT	375	175	75	
418.2(Openings)	FC	UNSAT	SLIGHT	---	---	5	
431	FC	SAT	SLIGHT	125	125	125	
431	FC	SAT	SLIGHT	350	350	350	
451	FC	SAT	MOD	350	300	175	
452	PC	SAT 4/	SEVERE	350	300	175	

1/ The Grazing Capability rating is based on the predicted soil loss rates from the Universal Soil Loss Equation (USLE). If existing soil loss is less than the tolerence soil loss, then the soil is rated as "full capability" (FC). If the existing soil loss is greater than the tolerence soil loss and the natural soil loss is less than the tolerence soil loss, the soil is rate as "potential capability" (PC). If the natural soil loss is greater than the tolerence soil loss, the soil is rated as "no capability" (NC). (See Section 22.14 of the Forest Service Handbook (FSH) 2509.22 "Soil and Water Conservation Handbook" and Section 20 of FSH 2209.21 "Range Analysis and Management Handbook".)

The Soil Condition rating is derived from the soil condition ratings being developed in the Southwest Region (R3). A Satisfactory rating indicates that the soils inherent productive capacity is being sustained. An Impaired rating indicates that the ability of the soil to function properly has been reduced. An Unsatisfactory rating indicates that a loss of the soil's inherent productivity has occurred. An Unsuited rating indicates the the soil is inherently unproductive and/or unstable.

The Erosion Hazard is based on the potential of the soil to erode when all vegetative ground cover (plants plus litter) has been removed.

The Forage Production ratings is an estimation in pounds per acre of the annual yield (air-dry/normal year) of herbaceous/woody plants that may provide food for grazing animals. The rating for Edaphic is the estimated ability of the soil in its natural condition, with little or no impact from man or grazing animals, to produce forage. The rating for Disclimax is the estimated ability of the soil to produce forage after it has been impacted by man or grazing animals. If the ratings for Edaphic and Disclimax are the same, it indicates that the production potential has not been impacted. The rating for Existing is an estimate of the current forage production.

2/ While these map units have only a slight sheet and rill erosion hazard, they are susceptible to gully erosion.

3/ Because of the variable range conditions found within this map unit, existing forage production ratings are given for range in very poor, poor, and fair condition as well as the overall average for the map unit.

4/ The overall rating for these map units is an average for the soil beneath shrub canopy and the open spaces in between. The rating for the openings is for only the open spaces between the shrubs.

5/ This map unit is satisfactory for slopes up to about 50%. Slopes steeper than 50% become unstable and are unsuited for most uses.

Table 5: Soil Loss (USLE) 1/

MU Comp.		Pot.	Natural	Tolerance	Current	K	Slope % SL
12	Erosion (t/ha/yr)	-----This map unit is too variable to rate.----					
	Effective Cover	---	---	---	---		
73	Erosion (t/ha/yr)	-----This map unit is too variable to rate.----					
	Effective Cover	---	---	---	---		
239.1	Erosion (t/ha/yr)	18.0	6.2	4.5	8.9	.04	50 15M
	Effective Cover	0	25	35	15		
239.2	Erosion (t/ha/yr)	24.2	7.0	6.7	8.4	.04	50 15M
	Effective Cover	0	30	32	25		
291.1	Erosion (t/ha/yr)	14.9	5.1	4.5	8.8	.10	25 15M
	Effective Cover	0	25	28	10		
291.2	Erosion (t/ha/yr)	14.9	5.1	4.5	8.8	.10	25 15M
	Effective Cover	0	25	28	10		
292	Erosion (t/ha/yr)	18.0	6.2	4.5	8.9	.04	50 15M
	Effective Cover	0	25	35	15		
300.1	Erosion (t/ha/yr)	9.5	5.1	6.7	5.4	.20	8 30M
	Effective Cover	0	25	8	15		
300.2	Erosion (t/ha/yr)	6.4	3.5	2.2	4.2	.20	6 30M
	Effective Cover	0	25	36	10		
301.1	Erosion (t/ha/yr)	20.0	6.9	6.7	9.8	.10	25 15M
	Effective Cover	0	25	25	15		
301.2	Erosion (t/ha/yr)	20.0	6.9	6.7	9.8	.10	25 15M
	Effective Cover	0	25	25	15		
304.1	Erosion (t/ha/yr)	17.3	7.9	4.5	10.0	.10	35 15M
	Effective Cover	0	25	50	15		
304.2	Erosion (t/ha/yr)	12.9	8.9	4.5	11.4	.10	35 15M
	Effective Cover	0	25	36	10		
352	Erosion (t/ha/yr)	30.2	10.4	6.7	14.9	.05	50 15M
	Effective Cover	0	25	40	15		
381	Erosion (t/ha/yr)	10.3	3.0	4.5	3.5	.04	25 25M
	Effective Cover	0	30	18	25		
382	Erosion (t/ha/yr)	24.2	7.0	4.5	8.4	.04	50 15M
	Effective Cover	0	30	40	25		
390.1	Erosion (t/ha/yr)	7.1	2.1	6.7	4.8	.15	8 30M
	Effective Cover	0	30	0	10		
390.2	Erosion (t/ha/yr)	4.8	1.4	2.2	3.8	.15	6 30M
	Effective Cover	0	30	25	5		
391.1	Erosion (t/ha/yr)	20.0	5.9	6.7	10.2	.10	25 15M
	Effective Cover	0	30	28	15		
391.2	Erosion (t/ha/yr)	20.0	5.9	6.7	10.2	.10	25 15M
	Effective Cover	0	30	28	15		
400.1	Erosion (t/ha/yr)	8.5	2.0	6.7	4.7	.15	8 30M
	Effective Cover	0	35	4	15		
400.2	Erosion (t/ha/yr)	3.8	1.0	2.2	2.4	.10	6 30M
	Effective Cover	0	35	12	10		

MU Comp.		Pot.	Natural	Tolerance	Current	K	Slope % SL
401.1	Erosion (t/ha/yr)	26.0	6.1	6.7	10.4	.11	25% 15M
	Effective Cover	0	35	32	20		
401.2	Erosion (t/ha/yr)	26.0	6.1	6.7	10.4	.11	25% 15M
	Effective Cover	0	35	32	20		
402	Erosion (t/ha/yr)	35.8	8.4	6.7	12.1	.05	50% 15M
	Effective Cover	0	35	40	25		
415.1	Erosion (t/ha/yr)	1.0	0.1	6.7	0.1	.02	5% 30M
	Effective Cover	0	60	0	50		
415.2	Erosion (t/ha/yr)	1.0	0.1	6.7	0.1	.02	5% 30M
	Effective Cover	0	60	0	50		
416	Erosion (t/ha/yr)	23.7	3.4	6.7	7.0	.10	25% 15M
	Effective Cover	0	50	25	25		
416 Openings	Erosion (t/ha/yr)	23.7	5.9	6.7	19.0	.10	25% 15M
	Effective Cover 2/	0	35	30	5		
417	Erosion (t/ha/yr)	35.8	4.4	6.7	10.7	.10	50% 15M
	Effective Cover	0	50	40	25		
417 Openings	Erosion (t/ha/yr)	35.8	13.4	6.7	29.0	.10	50% 15M
	Effective Cover 2/	0	35	50	5		
418.1	Erosion (t/ha/yr)	5.9	0.7	4.5	1.0	.05	16% 20M
	Effective Cover	0	50	0	40		
418.1 Openings	Erosion (t/ha/yr)	5.9	3.6	4.5	6.2	.05	16% 20M
	Effective Cover 2/	0	30	15	5		
418.2	Erosion (t/ha/yr)	5.9	0.7	6.7	1.0	.05	16% 20M
	Effective Cover	0	50	0	40		
418.2 Openings	Erosion (t/ha/yr)	5.9	3.6	6.7	6.2	.05	16% 20M
	Effective Cover 2/	0	30	5	5		
431.1	Erosion (t/ha/yr)	0.6	0.2	4.5	0.3	.06	5% 30M
	Effective Cover	0	25	0	15		
431.2	Erosion (t/ha/yr)	1.4	0.3	2.2	0.5	.15	5% 30M
	Effective Cover	0	35	0	25		
451	Erosion (t/ha/yr)	23.7	1.8	6.7	2.6	.10	25% 15M
	Effective Cover	0	60	20	50		
452	Erosion (t/ha/yr)	87.7	6.5	6.7	9.5	.15	50% 10M
	Effective Cover	0	60	60	50		

1/ The soil loss is calculated using the Universal Soil Loss Equation (USLE). The ratings are for: Potential (Pot.) soil loss which is the soil loss which would take place if all vegetative cover (plants plus litter) were removed, Natural soil loss which is the soil loss under natural conditions, Tolerance soil loss which is the soil loss which can occur and still allow the soil to retain its productivity, and Current soil loss which is the soil loss occurring under current conditions. Effective ground cover is the sum of plant basal area, mat forming vegetation in contact with the soil surface, and persistent litter. The parameter "K" is the erodibility of the soil. The term "SL" is the slope length in meters.

2/ Erosion rates were calculated for both an overall average of the terrestrial ecosystem component (open spaces and areas under canopy) and the open spaces alone.

Table 6: Soil Descriptions

The following are brief descriptions of the major soil components of the map units found on the Cartwright Allotment. Since the map units are fairly broad, these descriptions are not site specific but represent typical profiles.

MU 12 - The soils in this map unit occur along stream channels at the lowest elevations within the allotment. The soils are derived from recent alluvium and tend to be highly variable. The soils are normally coarse textured and contain varying amounts of rock fragments but typically contain more than 35% rock fragments. The soil moisture also varies widely. Only those soils within a few feet of perennial water are wet enough to produce anaerobic conditions. The soils further removed from the active channel are drier. The soils on higher benches may be somewhat droughty.

MU 73 - The soils in this map unit occur along stream channels at higher elevations than those in MU 12. The soils are derived from recent alluvium and tend to be highly variable. The soils are normally coarse textured and contain varying amounts of rock fragments but typically contain more than 35% rock fragments. These soils are normally moister than those in MU 12 but the soil moisture also varies widely. Only those soils within a few feet of perennial water are wet enough to produce anaerobic conditions. The soils further removed from the active channel are drier. The soils on higher benches may be somewhat droughty.

MU 239 - This map unit occurs on steep to very steep mountain slopes, scarps, and canyons. The parent material is variable but the dominant material is derived from granite or schist. This map unit is an association of two soils plus rock outcrop. The drier soils on south facing slopes have a Aridic soil moisture regime (desert soils) while those on north aspects have an Ustic moisture regime (semi-arid). The rock outcrop occurs randomly throughout the unit. Because of steep slopes, dry conditions, and the type of parent material, most soils have poor profile development. The soils typically have an extremely cobble sandy loam surface horizon. The subsoil shows little development and is typically a sandy loam containing large amounts of rock fragments.

MU 291 - This map unit occurs on moderately steep hill slopes. The soils are formed from basalt or colluvium derived from basalt and granite. Component .1 has a very stony clay loam surface grading to a clay loam or clay subsoil containing more than 35% rock fragments. Component .2 has a very cobbley clay loam surface over a clay or clay loam subsoil containing fewer than 35% rock fragments.

MU 292 - This map unit occurs on steep to very steep mountain slopes, scarps, and canyons. The soils are variable but typically contain an extremely cobbley sandy loam surface over a finer textured subsoil. Soils typically contain more than 35% rock fragments in the subsoil.

MU 300 - This map unit occurs on nearly level to strongly sloping elevated plains. The soils are derived from basalt. Component .1 has a cobbley loam surface over a clay loam or clay subsoil. Component .2 has a cobbley clay loam surface over a clay subsoil. Because of the large amount of expanding clay in component .2, deep, wide cracks extending from the surface to a depth of 20 inches or more form when the soil is dry. Both components have fewer than 35% rock fragments in the subsoil.

MU 301 - This map unit occurs on moderately steep hill slopes. The soils are formed from basalt, Quaternary/Tertiary sediments, or colluvium derived from basalt and granite. Component .1 has a very cobbley clay loam surface grading to a clay loam or clay subsoil containing fewer than 35% rock fragments. Component .2 has a very stony clay loam surface over a clay or clay loam subsoil containing more than 35% rock fragments.

MU 304 - This map unit occurs on moderately steep to steep hill and mountain slopes. The soils are derived from Quaternary/Tertiary limestone deposits. This map unit is an association of two soils. Component .1 occurs on north facing slopes and has an Ustic moisture regime (semi-arid). Component .2 occurs on south facing slopes and has an Aridic moisture regime (desert soils). Both components have weakly developed soils less than 20 inches deep to limestone bedrock. The surface is an extremely cobbley loam over a loamy subsoil. The soils are calcareous throughout the profile.

MU 352 - This map unit occurs on steep to very steep mountain slopes, scarps, and canyons. The soils are variable but typically contain an extremely cobbley sandy loam surface over a finer textured subsoil. Soils typically contain more than 35% rock fragments in the subsoil.

MU 381 - This map unit occurs on moderately steep hill slopes. The soils are derived form schist. Because of the resistant nature of the schist, the soils tend to be shallow and poorly developed. The soils have an extremely gravelly sandy loam surface over a sandy loam subsoil which contains more than 35% rock fragments. The soils are less than 20 inches deep to bedrock.

MU 382- This map unit occurs on steep to very steep mountains. The soils are derived from schist. Because of the steep slopes and the resistant nature of the schist, the soils tend to be shallow and poorly developed. The soils are somewhat variable but typically have an extremely gravelly sandy loam surface over a sandy loam subsoil. The subsoil typically has greater than 35% rock fragments. The soils are less than 20 inches deep to bedrock.

MU 390 - This map unit occurs on nearly level to strongly sloping elevated plains. The soils are derived from basalt. Component .1 has a very gravelly loam surface over a clay loam or clay subsoil. Component .2 has a cobbley clay loam surface over a clay subsoil. Because of the large amount of expanding clay in component .2, deep, wide cracks extending from the surface to a depth of 20 inches or more form when the soil is dry. Both components have fewer than 35% rock fragments in the subsoil.

MU 391 - This map unit occurs on moderately steep hill slopes. The soils are formed from basalt, Quaternary/Tertiary sediments, or colluvium derived from basalt and granite. Component .1 has a very cobbley clay loam surface grading to a clay loam or clay subsoil containing fewer than 35% rock fragments. Component .2 has a very stony clay loam surface over a clay or clay loam subsoil containing more than 35% rock fragments.

MU 400 - This map unit occurs on nearly level to strongly sloping elevated plains. The soils are derived from basalt. Component .1 has a very cobbley loam surface over a clay loam or clay subsoil. Component .2 has a cobbley clay loam surface over a clay subsoil. Because of the large amount of expanding clay in component .2, deep, wide cracks extending from the surface to a depth of 20 or more inches form when the soil is dry. Both components have less than 35% rock fragments in the subsoil.

MU 401 - This map unit occurs on moderately steep hill slopes. The soils are formed from basalt, Quaternary/Tertiary sediments, or colluvium derived from basalt and granite. Component .1 has a very cobbley loam surface grading to a clay loam or clay subsoil containing fewer than 35% rock fragments. Component .2 has a very stony clay loam surface over a clay or clay loam subsoil containing more than 35% rock fragments.

MU 402 - This map unit occurs on steep to very steep mountain slopes, scarps, and canyons. The soils are variable but typically has an extremely cobbley sandy loam surface over a finer textured subsoil. Soils typically contain more than 35% rock fragments in the subsoil.

MU 415 - This map units occurs on nearly level to moderately sloping valley plains. The soils are derived from recent alluvium, are poorly developed, and highly variable. Component .1 occurs near the active stream channel. It is a deep soil with an extremely gravelly sandy loam surface over a sandy loam or loamy sand subsoil. Component .2 occurs on a higher terrace and is more stable. It is a deep soil with a very cobbley loam surface over a medium textured subsoil.

MU 416 - This map unit occurs on moderately steep hill slopes. The soils are derived from basalt or Quaternary/Tertiary sediments. They have a very stony sandy loam surface over a clay loam or clay subsoil. The subsoil normally has greater than 35% rock fragments.

MU 417 - This map unit occurs on steep to very steep mountain slopes, scarps, and canyons. The soils are derived from basalt, Quaternary/Tertiary sediments or colluvium derived from mixed sources. The soil surface is a very stony sandy loam over a loamy or clayey subsoil. The subsoil normally contains more than 35% rock fragments.

MU 418 - This map unit occurs on nearly level to moderately steep plains and hills. The soils are derived from Quaternary/Tertiary sediments and have little profile development. Component .1 has a extremely gravelly sandy loam surface over a sandy loam subsoil. The subsoil has more than 35% rock fragments and the soil is less than 20 inches deep to bed rock. Component .2 is similar to .1 except that component .2 is greater than 20 inches deep.

MU 451 - This map unit occurs on moderately steep hill slopes. The soils are derived from basalt, Quaternary/Tertiary sediments, schist, or mixed colluvium. They have a very stony sandy loam surface over a loam or clay loam subsoil. The subsoil normally has greater than 35% rock fragments.

MU 452 - This map unit occurs on steep to very steep mountain slopes, scarps, and canyons. The soils are derived from basalt, Quaternary/Tertiary sediments, colluvium derived from mixed sources, or schist. The soil surface is a very stony sandy loam over a loamy or clay loam subsoil. The subsoil normally contains more than 35% rock fragments.

TABLE 7: Summary of Acres: Soil Condition, Range Capability, Vegetation Type

From Soil Condition Classes:

	Acres	% of Area
Satisfactory	8,795	15.8
Imapired	1,385	2.5
Unsatisfactory	19,072	34.3
Unsuited	26,369	47.4

From Range Capability Classes:

	Acres	% of Area
Full Capability	4,322	7.8
Potential Capability	5,704	10.3
No Capability	45,600	82.0

Acres by Broad Vegetation Type:

	Acres	% of Area
Riparian	610	1.1
Desert Scrub (LSM, 2)	5,969	10.7
Grassland (LSM, 3)	18,288	32.9
Juniper Savanna (LSM, 4, -1)	20,101	36.1
Chaparrall (LSM, 4)	10,661	19.2

Table 8: Potential Plant Community

The following table provides information concerning the potential plant communities of each map unit. Potential communities are given for Edaphic Climax, which is the community that would occur on an undisturbed site, and Disclimax, which reflects the potential of the site after it has been subject to disturbance.

For a detailed list of the vegetative communities of map units 12 and 73 see information contained in Tonto Riparian Inventory Method (TRIM) survey reports. These reports are available for portions of Cave Creek and Lime Creek.

MU 239
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	T	T
Beha	2	2
Caer	2	2
Cefl2	T	T
Cemi2	5	5
Cegi	1	1
Cegr	3	3
Dawh	1	1
Enfa	T	T
Erwr	1	1
FEROC	T	T
Fosp2	T	T
Gusa2	T	1
Juer	P	P
Opph	1	1
Prve	T	1
Sich	2	2
Yuba	1	1
Forbs		
HAPLO2	1	1
Graminoids		
ARIST	1	1
Boba3	T	T
Boer4	T	T
Bocu	1	1
Dica8	T	T
Erin	1	1
Hibe	T	T
Himu2	T	T
Mupo2	3	3
Paob	T	T
Sihy	T	T
Stsp3	3	3
Trmu	1	1

MU 239
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acan	T	T
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	8	4
Cegr	T	T
Dawh	T	T
Erwr	4	8
FEROC	T	T
Enfa	T	T
Gusa2	T	4
Juer	T	T
Mibi3	T	1
Opch	T	T
Opph	1	2
Prve	T	1
Qutu2	P	P
Rhov	T	T
Sich	T	T
Yuba	1	1
Forbs		
ASTRA	T	T
ASTER	P	T
Bapt	T	1
HAPLO2	1	1
CIRSI	P	T
Lori3	T	T
PENST	T	T
SPHAE	T	T
Graminoids		
ARIST	1	1
Boba3	1	1
Boer4	T	T
Bocu	5	5
Bogr2	T	T
Bohi2	4	4
Dica8	P	P
Erin	2	2
Hibe	1	1
Himu2	T	T
Kopy	1	1
Ledu	1	1
Lefi	P	T
Lyph	P	P
Muem	T	P
Paob	T	T
Pofe	T	T
Sihy	1	1
Spcr	1	1

Notes: Because of steep slopes, this map unit has not been impacted by grazing as much as most areas on the Cartwright Allotment. With proper management, improvement can be expected.

MU 291

Potential Plant Community (canopy cover)	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	T	T
Beha	2	2
Caer	2	2
Cefl2	T	T
Cemi2	5	5
Cegi	1	1
Cegr	3	3
Dawh	1	1
Enfa	T	T
Erwr	1	1
FEROC	T	T
Fosp2	T	T
Gusa2	T	5
Opph	1	1
Prve	T	1
Sich	2	2
Yuba	1	1
Forbs		
CIRSI	T	T
HAPLO2	1	1
Graminoids		
ARIST	1	1
Boba3	T	T
Boer4	T	T
Bocu	1	T
Dica8	T	T
Erin	1	T
Hibe	2	T
Himu2	T	T
Mupo2	4	T
Paob	T	T
Sihy	T	T
Stsp3	4	T
Trmu	2	T

Notes: The range condition on most of this map unit is very poor or poor. Most areas have crossed an ecological threshold to a degraded state. In many cases rest alone will not allow the vegetation to return to its natural state in a reasonable period of time. The areas in the worst condition will show very slow improvement. Those areas in better condition may have slightly more rapid improvement, however, complete recovery in these areas is not expected to occur in the near future because of limited rainfall, soil damage, and loss of vegetative diversity.

MU 292

Potential Plant Community (canopy cover)	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	T	T
Beha	2	2
Caer	2	2
Cefl2	T	T
Cemi2	5	5
Cegi	1	1
Cegr	3	3
Dawh	1	1
Enfa	T	T
Erwr	1	1
FEROC	T	T
Fosp2	T	T
Gusa2	T	1
Juer	P	P
Opph	1	1
Prve	T	1
Sich	2	2
Yuba	1	1
Forbs		
CIRSI	T	T
HAPLO2	1	1
Graminoids		
ARIST	1	2
Boba3	T	T
Boer4	T	T
Bocu	1	1
Dica8	T	T
Erin	1	1
Hibe	2	2
Himu2	T	T
Mupo2	4	4
Paob	T	T
Sihy	T	T
Stsp3	4	4
Trmu	2	2

Notes: Because of steep slopes, this map unit has not been impacted by grazing as much as most areas on the Cartwright Allotment. With proper management, improvement can be expected.

MU 300
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acco2	T	T
Acgr	1	2
AGAVE	1	1
Beha	1	1
Caer	10	1
Cegr	T	T
Dawh	T	T
Erwr	5	1
FEROC	T	T
Gusa2	T	10
Juer	P	P
Krpag	1	T
Latr2	P	P
Mibi3	T	1
Opph	1	4
Prve	T	4
Sich	P	P
Yuba	1	1
Forbs		
CIRSI	P	T
Erci6	T	1
HAPLO2	1	1
Hean3	P	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	1
Boba3	T	P
Bocu	4	T
Bogr2	T	P
Bohi2	2	P
Dica8	T	P
Erin	1	P
Hibe	2	4
Himu2	4	4
Lefi	P	T
Lyph	T	P
Mupo	3	P
Paob	T	T
Sihy	1	T
Spcr	T	P
Stsp3	2	P
Trmu	T	P

MU 300
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acco2	T	T
Acgr	1	2
AGAVE	1	1
Beha	1	1
Caer	10	1
Cegr	T	T
Dawh	T	T
Erwr	5	1
FEROC	T	T
Gusa2	T	12
Juer	P	P
Krpag	1	T
Latr2	P	P
Mibi3	T	1
Opph	1	5
Prve	T	4
Sich	P	P
Yuba	1	1
Forbs		
CIRSI	P	T
Erci6	T	1
HAPLO2	1	1
Hean3	T	1
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	T
Boba3	T	T
Bocu	4	T
Bogr2	T	P
Bohi2	2	P
Dica8	T	P
Erin	1	P
Hibe	2	3
Himu2	4	3
Lefi	T	T
Lyph	P	P
Mupo	3	P
Paob	1	T
Sihy	1	T
Spcr	T	P
Stsp3	T	P
Trmu	T	P

Notes: Nearly all of this map unit has been severely impacted by grazing. Most of the grass species that originally occurred on this unit can now only be found in protected areas. In addition, the soil has been compacted and a significant portion of the original "A" horizon has been eroded. This plant community has crossed an ecological threshold to a degraded state. Rest alone will not allow it to return to its natural state in a reasonable period of time.

MU 301
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acco2	T	T
Acgr	1	2
AGAVE	1	1
Beha	1	1
Caer	8	3
Cegr	T	T
Dawh	T	T
Erwr	4	2
FEROC	T	T
Gusa2	T	8
Juer	P	P
Krpag	1	T
Latr2	P	P
Mibi3	T	1
Opph	1	4
Prve	T	4
Sich	P	P
Yuba	1	1
Forbs		
CIRSI	P	T
Erci	T	1
HAPLO2	1	1
Hean3	P	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	1
Boba3	T	T
Bocu	4	1
Bogr2	T	T
Bohi2	2	T
Dica8	T	T
Erin	1	T
Hibe	2	5
Himu2	4	5
Lefi	P	T
Lyph	T	P
Mupo2	3	T
Paob	T	T
Sihy	1	T
Spcr	T	P
Stsp3	2	T
Trmu	T	T

MU 301
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acco2	T	T
Acgr	1	2
AGAVE	1	1
Beha	1	1
Caer	8	4
Cegr	T	T
Dawh	T	T
Erwr	4	2
FEROC	T	T
Gusa2	T	10
Juer	P	P
Krpag	1	T
Latr2	P	P
Mibi3	T	1
Opph	1	5
Prve	T	4
Sich	P	P
Yuba	1	1
Forbs		
CIRSI	P	T
Erci	T	1
HAPLO2	1	1
Hean3	T	1
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	1
Boba3	T	T
Bocu	4	2
Bogr2	T	T
Bohi2	2	T
Dica8	T	T
Erin	1	T
Hibe	2	6
Himu2	4	6
Lefi	T	T
Lyph	P	P
Mupo2	3	T
Paob	1	T
Sihy	1	T
Spcr	T	P
Stsp3	T	T
Trmu	T	T

Notes: The range condition on most of this map unit is very poor or poor. Most areas have crossed an ecological threshold to a degraded state. In many cases rest alone will not allow the vegetation to return to its natural state in a reasonable period of time. The areas in the worst condition will show very slow improvement, while those in better condition may have slightly more rapid improvement. However, complete recovery is not expected to occur in the near future because of soil damage and loss of vegetative diversity.

MU 304
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	T	T
AGAVE	T	T
Beha	2	2
Caer	5	3
Caho3	T	T
Cegr	5	5
Dafo	1	1
EPHED	T	T
Erwr	1	1
FEROC	T	T
Gusa2	T	5
Juer	P	P
Krpag	T	T
Latr2	T	T
Mibi3	T	T
Opph	1	1
Prve	T	T
Pust	2	2
Sich	P	P
Yuba	1	1
Forbs		
CIRSI	P	T
Erci6	T	T
HAPLO2	1	1
PENST	P	T
SPHAE	P	T
Graminoids		
ARIST	5	2
Bocu	2	1
Bogr2	T	T
Bohi2	1	T
Dica8	T	T
Lyph	T	P
Mupo2	1	T
Sihy	1	T
Spcr	1	P
Stco4	5	2
Trmu	2	T

MU 304
Component .2
Potential Plant
Community (canopy cover)

	Edaphic Climax	Disclimax
Shrubs/Trees		
Acgr	T	T
AGAVE	T	T
Beha	2	2
Caer	5	2
Cefl2	T	T
Cemi2	2	2
Dafo	T	T
Cegi	1	1
Cegr	3	3
Dawh	T	T
Erwr	1	1
Fosp2	T	T
Gusa2	T	5
Opph	1	1
Pust	2	2
Sich	2	2
Yuba	1	1
Forbs		
Enfa	T	T
HAPLO2	1	1
Graminoids		
ARIST	3	1
Boer4	1	T
Bocu	1	T
Dica	T	T
Mupo2	1	T
Sihy	T	T
Stco4	4	1
Trmu	2	T

Notes: Most of this map unit is in poor ecological condition. Many of the herbacious species associated with unit have been depleted. Also, this is naturally a harsh site and improvement of the understory will be difficult.

MU 352

Potential Plant Community (canopy cover)	Edaphic climax	Disclimax
Shrubs/Trees		
Acan	T	T
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	8	4
Cegr	T	T
Dawh	T	T
Erwr	4	8
FEROC	T	T
Gusa2	T	4
Juer	T	T
Mibi3	T	1
Opch	T	T
Opph	1	2
Prve	T	1
Qutu2	P	P
Rhov	T	T
Sich	T	T
Yuba	1	1
Forbs		
Arlu	T	T
ASTER	P	T
Bapt	T	1
CIRSI	P	T
EUPHO	P	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	2
Boba3	1	1
Boer4	T	T
Bocu	8	6
Bogr2	T	T
Bohi2	7	5
Dica8	P	P
Erin	4	2
Hibe	1	2
Himu2	T	T
Kopy	1	1
Ledu	1	1
Lefi	P	T
Lyph	P	P
Muem	T	P
Paob	T	T
Pofe	T	T
Sihy	1	2
Spcr	1	1

Notes: Because of steep slopes, this map unit has not been impacted by grazing as much as most areas on the Cartwright Allotment. With proper management, improvement can be expected.

MU 381

Potential Plant Community (canopy cover)	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	T	T
Beha	T	T
Caer	5	4
Cegr	2	2
Dawh	T	T
Erwr	15	15
FEROC	T	T
Gusa2	T	3
Juer	1	1
Krpag	1	1
Mibi3	T	T
Opch	T	T
Opph	1	2
Opwh	T	T
Prve	T	T
Qutu2	1	1
Rhov	T	T
Rhcri	T	T
Sich	1	1
Yuba	1	1
Forbs		
Arlu	T	T
Bapt	T	T
CIRSI	P	T
Erci6	T	T
HAPLO2	T	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	2	3
Boer4	2	1
Bocu	4	3
Bogr2	T	T
Bohi2	3	1
Dica8	P	P
Erin	1	T
Hibe	T	T
Kopy	1	1
Ledu	1	T
Lyph	P	P
Muem	T	T
Mupo2	3	1
Pofe	T	T
Sihy	1	1
Spcr	1	1

Notes: The shallow, rocky soils with low nutrient status in this map unit tend to favor woody vegetaion.

MU 382

Potential Plant Community (canopy cover)	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	T	T
Beha	T	T
Caer	5	4
Cegr	2	2
Dawh	T	T
Erwr	15	15
FEROC	T	T
Gusa2	T	3
Juer	1	1
Krpag	1	1
Mibi3	T	T
Opch	T	T
Opph	1	2
Opwh	T	T
Prve	T	T
Qutu2	1	1
Rhov	T	T
Rhcri	T	T
Sich	1	1
Yuba	1	1
Forbs		
Arlu	T	T
Bapt	T	T
CIRSI	P	T
Erci6	T	T
HAPLO2	T	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	2	3
Boer4	2	1
Bocu	4	3
Bogr2	T	T
Bohi2	3	1
Dica8	P	P
Erin	1	T
Hibe	T	T
Kopy	1	1
Ledu	1	T
Lyph	P	P
Muem	T	T
Mupo2	3	1
Pofe	T	T
Sihy	1	1
Spcr	1	1

Notes: The shallow, rocky soils with low nutrient status in this map unit tend to favor woody vegetaion.

MU 390
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acan	T	T
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	10	T
Cegr	T	T
Dawh	T	T
Erwr	5	10
Gusa2	T	10
Juer	T	T
Mibi3	T	1
Opph	1	4
Prve	T	1
Qutu2	P	P
Rhov	T	T
Yuba	1	1
Forbs		
Arlu	T	T
ASTER	P	T
CIRSI	P	T
EUPHO	P	T
Hean3	P	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	3
Boba3	1	T
Bocu	12	3
Bogr2	T	T
Bohi2	11	T
Dica8	P	P
Erin	7	P
Hibe	2	5
Himu2	T	T
Kopy	1	T
Ledu	1	T
Lefi	P	T
Lyph	P	P
Muem	T	P
Paob	T	T
Pofe	T	T
Sihy	1	2
Spcr	T	1

MU 390
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acan	T	T
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	10	T
Cegr	T	T
Dawh	T	T
Erwr	5	8
Gusa2	T	12
Juer	T	T
Mibi3	T	1
Opph	1	5
Prve	T	1
Qutu2	P	P
Rhov	T	T
Yuba	1	1
Forbs		
Arlu	T	T
ASTER	P	T
CIRSI	P	T
EUPHO	P	T
Hean3	T	1
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	1
Boba3	1	T
Bocu	11	1
Bogr2	T	T
Bohi2	9	T
Dica8	P	P
Erin	4	P
Hibe	4	8
Himu2	T	T
Kopy	1	T
Ledu	1	T
Lefi	1	1
Lyph	P	P
Muem	T	P
Paob	1	1
Pofe	T	T
Sihy	2	1
Spcr	T	T

Notes: Nearly all of this map unit has been severely impacted by grazing. Most of the grass species that originally occurred on this unit can now only be found in protected areas. In addition, the soil has been compacted and a significant portion of the original "A" horizon has been eroded. This plant community has crossed an ecological threshold to a degraded state. Rest alone will not allow it to return to its natural state in a reasonable period of time.

MU 391
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acan	T	T
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	10	T
Cegr	T	T
Dawh	T	T
Erwr	5	10
Gusa2	T	10
Juer	T	T
Mibi3	T	1
Opph	1	4
Prve	T	1
Qutu2	P	P
Rhov	T	T
Yuba	1	1
Forbs		
Arlu	T	T
ASTER	P	T
CIRSI	P	T
EUPHO	P	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	3
Boba3	1	T
Bocu	12	3
Bogr2	T	T
Bohi2	11	T
Dica8	P	P
Erin	7	P
Hibe	2	5
Himu2	T	T
Kopy	1	T
Ledu	1	T
Lefi	P	T
Lyph	P	P
Muem	T	P
Paob	T	T
Pofe	T	T
Sihy	1	2
Spcr	T	1

MU 391
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acan	T	T
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	10	T
Cegr	T	T
Dawh	T	T
Erwr	5	8
Gusa2	T	12
Juer	T	T
Mibi3	T	1
Opph	1	5
Prve	T	1
Qutu2	P	P
Rhov	T	T
Yuba	1	1
Forbs		
Arlu	T	T
ASTER	P	T
CIRSI	P	T
EUPHO	P	T
Lori3	T	T
PENST	P	T
PLANT	P	T
SPHAE	P	T
Graminoids		
ARIST	1	3
Boba3	1	T
Bocu	12	3
Bogr2	T	T
Bohi2	11	T
Dica8	P	P
Erin	7	P
Hibe	2	5
Himu2	T	T
Kopy	1	T
Ledu	1	T
Lefi	P	T
Lyph	P	P
Muem	T	P
Paob	T	T
Pofe	T	T
Sihy	1	2
Spcr	T	1

Notes: The range condition on most of this map unit is very poor or poor. Most areas have crossed an ecological threshold to a degraded state. In many cases rest alone will not allow the vegetation to return to its natural state in a reasonable period of time. The areas in the worst condition will show very slow improvement while those in better condition may have slightly more rapid improvement. However, complete recovery is not expected to occur in the near future because of soil damage and loss of vegetative diversity.

MU 400
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	1	T
Caer	10	T
Cegr	T	T
Erwr	5	10
Gusa2	T	10
Juer	12	12
Mibi3	T	2
Opph	1	4
Prve	T	T
Qutu2	T	T
Rhov	P	T
Rhtr	T	T
Yuba	1	2
Forbs		
Arlu	T	T
Hean3	P	T
PENST	P	T
Lori3	T	T
Graminoids		
ARIST	1	T
Boba3	1	T
Bocu	10	4
Bogr2	T	T
Bohi2	10	T
Dica8	P	P
Erin	5	P
Hibe	3	10
Kopy	1	T
Ledu	1	P
Lefi	P	T
Lyph	P	P
Muem	T	P
Paob	T	T
Pofe	1	T
Sihy	2	2
Spcr	T	P

MU 400
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	1	T
Caer	10	T
Cegr	T	T
Erwr	5	8
Gusa2	T	10
Juer	8	8
Mibi3	T	2
Opph	1	5
Prve	T	T
Qutu2	T	T
Rhov	P	T
Rhtr	T	T
Yuba	1	2
Forbs		
Arlu	T	T
Hean3	T	1
PENST	P	T
Lori3	T	T
Graminoids		
ARIST	1	T
Boba3	1	T
Bocu	10	2
Bogr2	T	T
Bohi2	8	T
Dica8	P	P
Erin	4	P
Hibe	3	7
Kopy	1	T
Ledu	1	P
Lefi	1	1
Lyph	P	P
Muem	T	P
Paob	1	1
Pofe	1	T
Sihy	2	2
Spcr	T	P

Notes: Nearly all of this map unit has been severely impacted by grazing. Most of the grass species that originally occurred on this unit can now only be found in protected areas. In addition the soil has been compacted and a significant portion of the original "A" horizon has been eroded. This plant community has crossed an ecological threshold to a degraded state. Rest alone will not allow it to return to its natural state in a reasonable period of time.

MU 401
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	1	T
Caer	5	T
Cegr	T	T
Erwr	10	10
Gusa2	T	8
Juer	16	16
Mibi3	T	2
Opph	1	4
Prve	T	T
Qutu2	T	T
Rhov	T	T
Rhtr	T	T
Yuba	1	2
Forbs		
Arlu	T	T
PENST	P	T
Lori3	T	T
Graminoids		
ARIST	1	T
Boba3	1	T
Bocu	8	4
Bogr2	T	T
Bohi2	7	T
Dica8	P	P
Erin	5	P
Hibe	3	10
Kopy	1	T
Ledu	1	P
Lefi	P	T
Lyph	T	P
Muem	T	P
Paob	T	T
Pofe	1	T
Sihy	2	2
Spcr	T	T

MU 401
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	1	T
Caer	5	T
Cegr	T	T
Erwr	10	10
Gusa2	T	7
Juer	20	20
Mibi3	T	2
Opph	1	5
Prve	T	T
Qutu2	1	1
Rhov	T	T
Rhtr	T	T
Yuba	1	2
Forbs		
Arlu	T	T
PENST	P	T
Lori3	T	T
Graminoids		
ARIST	1	1
Boba3	1	1
Bocu	7	7
Bogr2	T	T
Bohi2	6	3
Dica8	P	P
Erin	3	1
Hibe	2	6
Kopy	1	T
Ledu	1	P
Lefi	T	T
Lyph	T	T
Muem	T	T
Paob	T	T
Pofe	1	1
Sihy	2	2
Spcr	T	T

Notes: The range conditions on this map unit vary from very poor to fair. The areas in very poor condition are accessible to livestock and are near water. The portions in fair condition are in the more inaccessible areas and areas far removed from water. The areas in very poor condition have crossed an ecological threshold to a degraded state. Rest alone will not allow it to return to its natural state in a reasonable period of time. Areas in poor condition will improve slowly with proper management but complete recovery will be difficult. Areas in fair condition can be expected to improve more rapidly with better management and have the capability of reaching their natural potential.

MU 402
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	1	1
AGAVE	1	1
Beha	1	1
Caer	5	T
Cegr	1	1
Erwr	5	5
Gusa2	T	2
Juer	22	25
Mibi3	T	2
Opph	1	2
Prve	T	T
Qutu2	1	1
Rhov	T	T
Rhtr	T	T
Sich	T	T
Yuba	2	3
Forbs		
Arlu	T	T
Lori3	T	T
PENST	P	T
Graminoids		
ARIST	1	1
Boba3	1	1
Bocu	8	6
Bogr2	T	T
Bohi2	5	3
Dica8	P	P
Erin	4	2
Hibe	1	2
Kopy	1	1
Ledu	1	1
Lefi	P	T
Lyph	T	T
Muem	T	T
Paob	T	T
Pofe	1	1
Sihy	2	2
Spcr	T	T

Notes: Because of steep slopes, this map unit has had less impact from grazing than most areas on the Cartwright Allotment. With proper management, improvement can be expected.

MU 415
Component .1
Potential Plant
Community (canopy cover)

Topo-edaphic-fire climax		Disclimax
Shrubs/Trees		
Acgr	T	1
AGAVE	T	T
Beha	2	2
Caer	T	T
Cegr	T	T
Cemo2	T	T
Erwr	2	2
Gusa2	T	1
Juer	1	1
Mibi3	1	3
Opph	T	T
Prve	T	T
Qutu2	45	50
Rhov	T	T
Rhtr	15	20
Yuba	T	T
Forbs		
Arlu	T	1
CIRSI	T	T
Lori3	T	T
PENST	T	T
Graminoids		
ARIST	1	T
Boba3	T	P
Bocu	5	1
Bogr2	1	T
Bohi2	T	T
Erin	T	P
Hibe	P	P
Kopy	2	T
Ledu	T	P
Muem	T	P
Pofe	1	T
Sihy	2	1
Spcr	T	T

MU 415
Component .2
Potential Plant
Community (canopy cover)

Topo-edaphic-fire climax		Disclimax
Shrubs/Trees		
Acgr	T	1
AGAVE	T	T
Beha	2	2
Caer	T	T
Cegr	T	T
Cemo2	T	T
Erwr	4	4
Gusa2	T	1
Juer	2	2
Mibi3	2	4
Opph	T	T
Prve	T	T
Qutu2	35	40
Rhov	T	T
Rhtr	15	20
Yuba	T	T
Forbs		
Arlu	T	1
CIRSI	T	T
Lori3	T	T
PENST	T	T
Graminoids		
ARIST	1	T
Boba3	T	P
Bocu	7	1
Bogr2	1	T
Bohi2	1	T
Erin	1	P
Hibe	T	P
Kopy	2	T
Ledu	1	P
Muem	T	P
Pofe	1	T
Sihy	2	1
Spcr	1	T

Notes: This map unit has a dense overstory of Quercus turbinella and Rhus trilobata of around 70%. Most of the soil in this map unit is protected by a litter layer of oak leaves and is in satisfactory condition. The open spaces between shrubs have little herbaceous cover. The potential for herbaceous growth however is limited by the dense shrub overstory.

MU 416

Potential Plant
Community (canopy cover)

Topo-edaphic-climax		Disclimax	
Shrubs/Trees			Shrubs/Trees
Acgr	T	1	
AGAVE	T	T	
Beha	T	T	
Caer	T	T	
Cegr	12	12	
Cemo2	2	2	
Erwr	4	4	
EPHED	T	T	
Fosp2	T	T	
Gusa2	T	2	
Juer	2	2	
Mibi3	1	1	
Nomi	T	T	
Opfu	T	1	
Opph	1	1	
Prve	T	1	
Qutu2	10	10	
Rhcri2	T	T	
Rhov	T	T	
Rhtr	1	1	
Yuba	1	1	
Forbs			
Arlu	T	1	
CIRSI	T	T	
Lori3	T	T	
PENST	T	T	
Graminoids			
ARIST	1	T	
Boba3	1	P	
Bocu	5	1	
Bogr2	1	T	
Bohi2	3	T	
Erin	2	P	
Hibe	1	1	
Kopy	2	T	
Ledu	1	P	
Muem	1	P	
Pofe	3	T	
Scsc	1	T	
Sihy	2	T	
Spcr	1	T	

Notes: This map unit has a fairly open overstory of shrubs with a canopy cover of shrubs of around 35%. The soil beneath the shrubs is protected by a litter layer of leaves and is in satisfactory condition. However, the large interspaces between the shrubs show signs of accelerated erosion. The herbaceous component of the interspaces has been depleted. The current cover of grass is sparse with most grasses occuring only in protected areas.

MU 417

Potential Plant Community (canopy cover)	Topo-edaphic-climax	Disclimax
Shrubs/Trees		
Acgr	T	1
AGAVE	T	T
Beha	T	T
Caer	T	T
Cegr	12	12
Cemo2	2	2
Erwr	4	4
EPHED	T	T
Fosp2	T	T
Gusa2	T	2
Juer	2	2
Mibi3	1	1
Nomi	T	T
Opfu	T	1
Opph	1	1
Prve	T	1
Qutu2	10	10
Rhcri2	T	T
Rhov	T	T
Rhtr	1	1
Yuba	1	1
Forbs		
Arlu	T	1
CIRSI	T	T
Lori3	T	T
PENST	T	T
Graminoids		
ARIST	1	T
Boba3	1	P
Bocu	5	1
Bogr2	1	T
Bohi2	3	T
Erin	2	P
Hibe	1	1
Kopy	2	T
Ledu	1	P
Muem	1	P
Pofe	3	T
Scsc	1	T
Sihy	2	T
Spcr	1	T

Notes: This map unit has a fairly open overstory of shrubs with canopy of shrubs of around 35%. The soil beneath the shrubs is protected by a litter layer of leaves and is in satisfactory condition. However, the large interspaces between the shrubs show signs of accelerated erosion. The herbaceous component of the interspaces has been depleted. The current cover of grass is sparse with most grasses occuring only in protected areas.

MU 418
Component .1
Potential Plant
Community (canopy cover)

Edaphic-fire climax		Disclimax
Shrubs/Trees		
Acgr	T	1
AGAVE	T	T
Beha	T	T
Caer	T	T
Cegr	12	12
Cemo2	2	2
Erwr	1	1
EPHED	T	T
Fosp	T	T
Gusa2	T	5
Juer	3	3
Krpag	4	4
Mibi3	1	2
Nomi	T	T
Opfu	T	1
Opph	1	1
Prve	T	4
Qutu2	7	7
Rhcri	T	T
Rhov	2	2
Rhtr	1	1
Yuba	5	5
Forbs		
Arlu	T	1
CIRSI	T	T
PENST	T	T
Lori3	T	T
Graminoids		
ARIST	1	T
Boba3	1	P
Bocu	3	T
Bogr2	1	T
Bohi2	2	P
Erin	1	P
Hibe	T	P
Kopy	3	T
Ledu	1	P
Muem	1	P
Pofe	2	T
Scsc	1	P
Sihy	2	T
Spcr	1	T

MU 418
Component .2
Potential Plant
Community (canopy cover)

Edaphic-fire climax		Disclimax
Shrubs/Trees		
Acgr	T	1
AGAVE	T	T
Beha	T	T
Caer	T	T
Cegr	10	10
Cemo2	2	1
Erwr	1	1
EPHED	T	T
Fosp	T	T
Gusa2	T	5
Juer	5	5
Krpag	4	4
Mibi3	1	2
Nomi	T	T
Opfu	T	1
Opph	1	1
Prve	T	6
Qutu2	3	3
Rhcri	T	T
Rhov	2	2
Rhtr	1	1
Yuba	5	3
Forbs		
Arlu	T	1
CIRSI	T	T
PENST	T	T
Lori3	T	T
Graminoids		
ARIST	1	T
Boba3	1	P
Bocu	5	T
Bogr2	2	T
Bohi2	3	P
Erin	2	P
Hibe	T	P
Kopy	3	T
Ledu	1	P
Muem	1	P
Pofe	2	T
Scsc	1	P
Sihy	2	T
Spcr	2	T

Notes: This map unit has a fairly open overstory of shrubs with a canopy cover of shrubs of around 40 to 50%. The soil beneath the shrubs is protected by a litter layer of leaves and is in satisfactory condition. However, the large interspaces between the shrubs show signs of accelerated erosion with many areas showing rills, shallow gullies, and pedestalling of plants. The herbaceous component of the interspaces has been depleted. The current cover of grass is sparse with most grasses occuring only in protected areas.

MU 431
Component .1
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	2	2
AGAVE	P	P
Cegr	P	P
Erwr	4	4
Gusa2	T	3
Juer	5	5
Mibi3	2	2
Opph	1	1
Prve	3	3
Qutu2	T	T
Yuba	P	P
Forbs		
ASTER	T	T
CIRSI	T	T
EUPHO	T	T
PENST	P	T
Lori3	T	T
Graminoids		
ARIST	3	T
Boba3	1	T
Bocu	3	4
Bogr2	T	T
Bohi2	3	T
Erin	T	T
Hibe	5	10
Himu2	2	2
Kopy	1	T
Ledu	1	P
Lefi	P	T
Lyph	T	P
Paob	T	T
Pofe	T	T
Sihy	1	2
Spcr	T	T

MU 431
Component .2
Potential Plant
Community (canopy cover)

	Edaphic climax	Disclimax
Shrubs/Trees		
Acgr	2	2
AGAVE	P	P
Cegr	T	T
Erwr	5	5
Gusa2	T	4
Juer	2	2
Mibi3	2	2
Opph	1	1
Prve	5	5
Qutu2	P	P
Yuba	P	P
Forbs		
ASTER	T	T
CIRSI	T	T
EUPHO	T	T
PENST	P	T
Lori3	T	T
Graminoids		
ARIST	3	3
Boba3	T	T
Bocu	1	1
Bogr2	T	T
Bohi2	T	T
Erin	P	P
Hibe	T	T
Himu2	35	35
Kopy	T	T
Ledu	P	P
Lefi	T	T
Lyph	T	T
Paob	10	10
Pofe	T	T
Sihy	1	1
Spcr	P	P

Notes: The range condition on most of this map unit is "fair" or better. Because of difficult access and distance to water this map unit has received little use from livestock.

MU 451

Potential Plant Community (canopy cover)	Topo-edaphic-fire climax	Disclimax
Shrubs/Trees		
AGAVE	T	T
Caer	T	T
Cegr	20	20
Cemo2	5	5
Erwr	1	1
EPHED	T	T
Gawr3	1	1
Gusa2	1	1
Juer	1	1
Mibi3	T	T
Nomi	T	T
Opph	1	1
Qutu2	30	30
Rhcri2	1	1
Rhov	5	5
Rhtr	1	1
Yuba	T	T
Forbs		
Arlu	T	T
CIRSI	T	T
PENST	T	T
Lori3	T	T
Graminoids		
ARIST	T	T
Boba3	T	P
Bocu	5	1
Bogr2	1	T
Hibe	T	T
Kopy	2	T
Muem	T	P
Pofe	3	T
Sihy	2	1
Spcr	1	T

Notes: This map unit is heavily dominated by shrubs with a total shrub canopy of normally 60 to 70%. The soil beneath the shrubs is protected by a litter layer of leaves and is in satisfactory condition. However, the interspaces between the shrubs show signs of accelerated erosion. The herbaceous component of the interspaces has been depleted. Most graminoids in this map unit occur only in protected sites.

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Potential Plant Community (canopy cover)	Topo-edaphic -fire climax	Disclimax
Shrubs/Trees		
AGAVE	T	T
Caer	T	T
Cegr	20	20
Cemo2	5	5
Erwr	1	1
EPHED	T	T
Gawr3	1	1
Gusa2	1	1
Juer	1	1
Mibi3	T	T
Nomi	T	T
Opph	1	1
Qutu2	30	30
Rhcri2	1	1
Rhov	5	5
Rhtr	1	1
Yuba	T	T
Forbs		
ARLU	T	T
CIRSI	T	T
PENST	T	T
Lori3	T	T
Graminoids		
ARIST	T	T
Boba3	T	P
Bocu	5	1
Bogr2	1	T
Hibe	T	T
Kopy	2	T
Muem	T	P
Pofe	3	T
Sihy	2	1
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