

Ranch Management Plan

A Diamond Ranch

Introduction

The A Diamond Ranch is located in Pinal County, approximately 14 miles northwest of Kearny, Arizona. The northern boundary of the ranch is the Gila River adjacent to the Battleaxe Ranch; the southern and western boundaries are the Teacup Ranch. The eastern boundary of the ranch is the Rafter S Ranch. The ranch falls within Townships 4 and 5 south, and Ranges 12 and 13 east. Total acreage of the ranch is approximately 22,032 acres. The majority of the ranch is leased with State Trust Lands accounting for 14,157 acres; 7,000 acres of Bureau of Land Management; 798 acres of adverse deeded; and 73 acres of deeded land owned by the Vinson's around the ranch headquarters making up the rest of the ranch.

The A Diamond Ranch has passed through several owners in the past few decades. The ranch is currently owned by Gregg and Helen Vinson of Oracle, Arizona. The Vinson family has owned the ranch for approximately 4 years. The ranch is now being managed by Gary Vinson as a cow/calf operation.

A. J. Donaldson Morrow owned the ranch previous to the Vinsons for approximately 3 years. While under this ownership, the ranch was run as a cow/calf operation.

Jesse and Shirley Aldridge of Florence, Arizona retained ownership of the ranch for several years. While the Aldridges owned the ranch, they managed it as a cow/calf operation.

The Crowder family from Colorado bought the ranch from the Shumways. Calves were bought from Mississippi and turned out on the ranch. While under the Crowders' ownership, the ranch was basically run as a steer operation.

The Shumways owned the A Diamond and the LEN ranch which is located to the northwest, previous to the Aldridges. The ranch was split up from the LEN during this time.

Bill Dunn owned the ranch from 1974 to 1980. The Dunn family installed much of the improvements that are on the ranch today. In conjunction with the A Diamond Ranch, the Dunn family also owned the Battleaxe and Rafter 6 Ranches.

Rodgers and Shawber were the earliest known partnership that operated the A Diamond Ranch. Not much is known about how the ranch was run at this time.

Goals/Objectives

The goals for this ranch are to:

- To maintain a balance of livestock, vegetation, and wildlife on the land that allows for each to thrive.
- To maintain a permanent, stable and productive livestock operation which provides for efficient, sustained use of the forage crop.
- To prevent accelerated loss of soil, water, plant or animal resources.
- To maintain or improve the condition of the soil, water, plant and animal resources on the ranch.
- To maintain or improve human or recreational use and quality of life on the ranch.

In order to achieve these goals, objectives are to:

- Manage livestock grazing to improve upland condition. New fencing and watering facilities will be installed to begin an intensive management system.
- Manage livestock grazing by installing range improvements in a manner that provides adequate vegetative cover to prevent accelerated runoff and soil erosion, to insure compliance with water quality standards.
- Improve forage quality and quantity for livestock and wildlife.
- Maintain or improve livestock performance and overall health of the herd.
- Maintain or improve water quality and distribution of water for livestock and wildlife by establishing new water sources.

Range Improvements

Current Range Improvements

Current range improvements consist of several cross fences, wells, watering facilities, pipelines and developed springs. All current improvements are listed in Appendix A.

Proposed Range Improvements

Planned improvements consist of a well and watering facilities in the Ripsy Pasture, and fencing in the Zelleweger and Middle Pastures. Planned improvements are listed in Appendix A.

See map overlays and list in Appendix A.

Grazing Management

Numbers and Season of Use

Based on the Arizona State Land Department and Bureau of Land Management grazing leases, the carrying capacity of the A Diamond ranch is 300.9 animal units, or 3611 animal months. The breakdown by land status is as follows:

STATE	242.9	AU's	2915	AUM's
BLM	58	AU's	696	AUM's

A suggested carrying capacity was calculated for the ranch by using the Ecological Site guides and by actual clipped weights. It is important to note that these numbers vary considerably and the data that was used to calculate these numbers was collected in consecutive drought years. Numbers would change in better conditions.

See Carrying Capacity in Appendix E.

Grazing System

A Diamond ranch is involved in a high intensive management program and is currently grazed with two herds, although it is eventually planned to consolidate the herds into one. Herd 1 is located in the Ripsey pasture. This herd is grazed year-round and has approximately 60 mother cows, 3 bulls and 12 butcher weanlings. The 12 weanlings are part of the ranches beef marketing enterprise and will be shipped out in the fall.

Herd 2 will be rotated through out the remaining pastures as follows: Brahma Pasture is grazed in the winter months from November to April. Livestock will start out along the river and be moved up to the higher elevations at the end of the use period. From the Brahma Pasture, livestock will be moved to the Duke and Radio Tower Pastures in May. Use will start in the Duke Pasture and will be no longer than 12 days. From this pasture, they will be moved to the Radio Tower Pasture. Use will also be no longer than 12 days. Livestock will be moved out in mid May to the Middle pasture and grazed until July. From the Middle Pasture, livestock will be moved to the Zelleweger Pasture from August to October.

The Deep Well Trap, Road Tank Trap and the Corner Tank Trap will be used seasonally during gathering. Livestock will stay in these pastures no longer than 30 days. The River Pasture is currently being used for research on the effects of intensive management on native grasses.

See Grazing System in Appendix F.

Monitoring Studies

General

Study's will be used to evaluate the effects of livestock and wildlife use on the rangeland resource and to aid in management decisions necessary to maintain or improve rangeland condition.

Vegetative Information

The ranch lies in the Major Land Resource Areas (MLRA) of 40-1AZ, Upper Sonoran Desert Shrub and the 38-1AZ, Interior Chaparral. Most of the ranch is within the transition zone between both MLRA's but for consistency, will be mapped within the 40-1AZ. Ecological sites within the ranch consist mostly of Shallow Hills, Shallow Upland, Loamy Upland, Limy Upland, Sandy Bottoms, Granitic Hills and Gravelly Hills (Appendix C).

Inventory

Range Inventory is the systematic analysis of an area, which is needed to describe, characterize, or quantify a plant community. A range inventory is taken at a point in time and when referred back to can show apparent range trend by plant composition. Ecological sites are delineated. Annual production and percent composition of each species are estimated for each transect. Plant species are scored by percent presence and a percent climax. Each plant scored, whether they are grasses, trees, shrubs, or forbs; must be given a percentile which when combined, will total to 100 percent of the plant community. A similarity index is formed from the percent climax of individual species and conveys the likeness of the current site to its potential. This is compared to the maximum potential or the most diverse community that the site can achieve. Inventory points were established on each ecological site on the ranch. These inventory points are not permanent sites that are used to monitor vegetation year after year.

Key Areas

Study data will be collected within the key areas and will be used to guide the management of the ranch. Key Areas will be established at a later date. An Ecological Site Legend is attached in Appendix C and a map included.

Methods and Responsibilities

1. Actual Use (Appendix F)

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

2. Climate (Appendix B)

Rainfall records should be kept by producer.

3. Utilization

Utilization on key grass species will be measured using weight comparison for grazed versus ungrazed. Utilization will be measured by NRCS, AzSLD range personnel and the producer.

4. Trend

Trend in rangeland condition will be measured using the Pace Frequency Method.

Photographs will be taken at each trend location. General views of the site may serve as the appropriate photo recordation of trend.

Trend data will be collected by NRCS, AzSLD personnel and the producer.

Timetable for Data Collection

Data collection will occur every fall for the 1st three years and every 2 – 5 years thereafter. The first three years of data will serve as a base line for future trend analysis.

Location of Studies

Seven inventory points were established on the ranch. Data collected on each transect include production, composition, similarity indices and range health. Double sampling method was used to collect data for each transect. Locations for the sites are as follows:

TRANSECTS:

			UTM ZONE 12 NAD 83
T1	SW ¹ / ₄ SW ¹ / ₄ SEC 18	T4S R13E	494215e 3661075n
T2	SE ¹ / ₄ NE ¹ / ₄ SEC 19	T4S R13E	495027e 3659093n
T3	NE ¹ / ₄ SW ¹ / ₄ SEC 5	T5S R13E	496136e 3653742n
T4	SE ¹ / ₄ SE ¹ / ₄ SEC 2	T5S R13E	501454e 3653580n
T5	SW ¹ / ₄ SE ¹ / ₄ SEC 14	T4S R13E	501300e 3659962n
T6	NE ¹ / ₄ NE ¹ / ₄ SEC 29	T4S R13E	496824e 3658070n
T7	NW ¹ / ₄ SW ¹ / ₄ SEC 9	T4S R13E	497173e 3662091n
T8	SW ¹ / ₄ NE ¹ / ₄ SEC 14	T4S R13E	499821e 3657155n

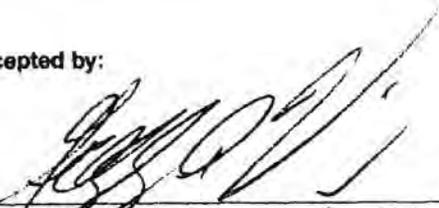
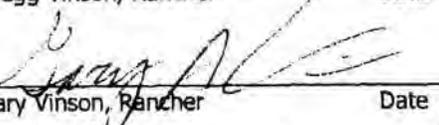
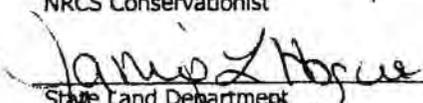
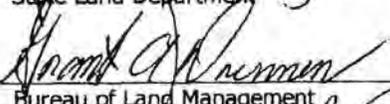
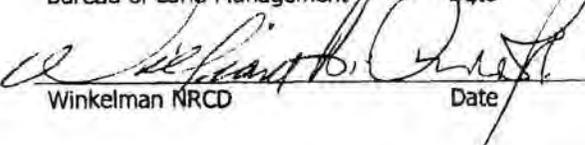
See Inventory Assessment in Appendix D.

Evaluation and Revision

A review of the plan will be conducted each year in cooperation with the producer. Data collected from the monitoring sites will be used to aid in management decisions.

Concurrence

Accepted by:

	10-3-07
Gregg Vinson, Rancher	Date
	
Gary Vinson, Rancher	Date
	9/25/07
NRCS Conservationist	Date
	8/3/07
State Land Department	Date
	9/12/2007
Bureau of Land Management	Date
	4/15/08
Winkelman NRCD	Date

APPENDIX A

Range Improvements: Existing

Wells:

1	BRAHMA WELL	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 13	T4S R12E
2	DUKE WELL	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 30	T4S R13E
3	ROAD WELL	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SEC 29	T4S R13E
4	ARTESIAN WELL	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 14	T4S R13E
5	HDQTS WELL	SW $\frac{1}{4}$ NW $\frac{1}{4}$ SEC 10	T4S R13E
6	DEEP WELL	SW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 6	T5S R13E

Troughs:

1	RIVER CORRAL TROUGH	SW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 1	T4S R12E
2	BRAHMA PIPELINE TROUGH	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 12	T4S R12E
3	BRAHMA WELL TROUGH	NSE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 13	T4S R12E
4	PILA SPRING TROUGH	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SEC 7	T4S R12E
5	GOLDEN BELL TROUGH	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 7	T4S R12E
6	BLM SPRING PIPELINE TROUGH	SW $\frac{1}{4}$ SE $\frac{1}{4}$ SEC 18	T4S R13E
7	BLM SPRING TROUGH	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SEC 18	T4S R13E
8	BLM SPRING PIPELINE TROUGH	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 18	T4S R13E
9	BLM SPRING PIPELINE TROUGH	NE $\frac{1}{4}$ NW $\frac{1}{4}$ SEC 17	T4S R13E
10	SEEP SPRINGS TROUGH	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 17	T4S R13E
11	DUKE (BLM) PIPELINE TROUGH	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SEC 19	T4S R13E
12	DUKE (BLM) PIPELINE TROUGH	NW $\frac{1}{4}$ NW $\frac{1}{4}$ SEC 30	T4S R13E
13	ZELLEWEGER PIPELINE TROUGH 1	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SEC 29	T4S R13E
14	ZELLEWEGER PIPELINE TROUGH 2	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SEC 20	T4S R13E
15	ZELLEWEGER PIPELINE TROUGH 3	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SEC 16	T4S R13E
16	ZELLEWEGER PIPELINE TROUGH 4	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 16	T4S R13E
17	DUKE WELL TROUGH	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 30	T4S R13E
18	ROAD TANK TROUGH	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 20	T4S R13E
19	HDQTS TROUGH	NW $\frac{1}{4}$ NW $\frac{1}{4}$ SEC 10	T4S R13E
20	ARTESIAN WELL TROUGH	NW $\frac{1}{4}$ NW $\frac{1}{4}$ SEC 14	T4S R13E
21	COTTONWOOD PIPELINE TROUGH	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 22	T4S R13E
22	RIPSEY CORRAL TROUGH	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 27	T4S R13E
23	COTTONWOOD PIPELINE TROUGH	NW $\frac{1}{4}$ SW $\frac{1}{4}$ SEC 27	T4S R13E
24	BURRO SPRINGS TROUGH	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SEC 35	T4S R13E
25	OLD ROAD PIPELINE TROUGH	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 32	T4S R13E
26	DEEP WELL TROUGH	SW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 6	T5S R13E
27	OLD ROAD PIPELINE TROUGH	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 5	T5S R13E
28	BATH SPRINGS TROUGH	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SEC 2	T5S R13E

Storages:

1	RIVER CORRAL STORAGE	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 1	T4S R12E
2	BRAHMA WELL STORAGE	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 13	T4S R12E
3	DUKE WELL STORAGE	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 30	T4S R13E
4	ARTESIAN WELL STORAGE	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SEC 14	T4S R13E
5	HDQTS STORAGE	NW $\frac{1}{4}$ NW $\frac{1}{4}$ SEC 10	T4S R13E

6	COTTONWOOD PIPELINE STORAGE	NW¼ SW¼ SEC 27	T4S R13E
7	RIPSEY CORRAL STORAGE	NW¼ NE¼ SEC 27	T4S R13E
8	ROAD WELL STORAGE	NE¼ SW¼ SEC 29	T4S R13E
9	ZELLEWEGER STORAGE	NE¼ SE¼ SEC 20	T4S R13E
10	DEEP WELL STORAGE	SW¼ NE¼ SEC 6	T5S R13E

Developed Springs:

1	SKUALE SPRING	NW¼ SE¼ SEC 10	T4S R13E
2	COTTONWOOD SPRING	SE¼ SE¼ SEC 28	T4S R13E
3	GOLDEN BELL SPRING	SW¼ NE¼ SEC 7	T4S R13E
4	PILA SPRING	NE¼ SE¼ SEC 7	T4S R13E
5	BLM SPRING	SE¼ SE¼ SEC 18	T4S R13E
6	SEEP SPRING	NE¼ NE¼ SEC 17	T4S R13E
7	BURRO SPRING	SE¼ SW¼ SEC 35	T5S R13E
8	BATH TUB SPRING	NW¼ NE¼ SEC 2	T5S R13E

Stock Ponds:

1	BLM TANK	SW¼ SE¼ SEC 18	T4S R13E
2	DUKE TANK	NW¼ NE¼ SEC 30	T4S R13E
3	ROAD TANK	SW¼ NE¼ SEC 29	T4S R13E
4	LITTLE ROAD TANK	NW¼ SE¼ SEC 32	T4S R13E
5	ZELLEWEGER TANK	NE¼ SE¼ SEC 21	T4S R13E
6	SEC 23 TANK	SW¼ NW¼ SEC 23	T4S R13E
7	SEC 23 TANK	NW¼ SW¼ SEC 23	T4S R13E
8	COTTONWOOD TANK	NW¼ SE¼ SEC 5	T5S R13E
9	AWFUL LATE TANK	SW¼ NE¼ SEC 4	T5S R13E
10	CORNER TANK	SW¼ SW¼ SEC 3	T5S R13E
11	WASH TANK	SW¼ SE¼ SEC 2	T5S R13E
12	WASH TANK	SE¼ SW¼ SEC 2	T5S R13E
13	WASH TANK	SE¼ SW¼ SEC 2	T5S R13E
14	WASH TANK	SE¼ SW¼ SEC 2	T5S R13E

Corrals:

1	RIVER CORRALS	SE¼ NE¼ SEC 1	T4S R12E
2	DUKE CORRALS	NW¼ NE¼ SEC 30	T4S R13E
3	HDQTRS CORRALS	SW¼ NW¼ SEC 10	T4S R13E
4	APACHE TRAILS CORRAL	SE¼ SW¼ SEC 33	T4S R13E
5	RIPSEY CORRALS	NW¼ NE¼ SEC 27	T4S R13E
6	ROAD TANK CORRALS	SW¼ NE¼ SEC 29	T4S R13E
7	ROAD WELL CORRALS	SE¼ SW¼ SEC 29	T4S R13E
8	DEEP WELL CORRALS	SW¼ NE¼ SEC 6	T5S R13E
9	CORNER TANK CORRAL	SW¼ SW¼ SEC 3	T5S R13E

Pipelines
(Functioning):

1	BURRO SPRING PIPE (NE)	SEC 2 & 35	T4S R13E
2	COTTONWOOD PIPELINE (NE)	SEC 22, 27 & 28	T4S R13E
3	GOLDEN BELL MINE PIPELINE (WEST)	SEC 7	T4S R13E
4	GOLDEN BELL MINE PIPELINE (WEST)	SEC 12	T4S R12E
5	BRAHMA PIPELINE (NORTH)	SEC 1, 2, 13	T4S R12E

Pipelines
(Nonfunctional):

1	DUKE (BLM) PIPELINE (NORTH)	SEC 13, 19, 24 & 30	T4S R13E
2	OLD ROAD PIPELINE (S & E)	SEC 29 & 30	T4S R13E
3	PEG LEG (WEST)	SEC 30 & 31	T4S R13E
4	BLM SPRING PIPELINE (NE)	SEC 17 & 18	T4S R13E
5	BLM SPRING PIPELINE (WEST)	SEC 18	T4S R13E

Range Improvements: Planned

Planned Fences:

1	DUKE WELL TO DEEP WELL	SEC 30, 31	T4S R13E
		SEC 6	T5S R13E
2	BRAHMA TO HOLDING TRAP	SEC 16, 17, 20	T4S R13E
3	ZELLEWEGER	SEC 10, 15, 16, 20, 21, 29	T4S R13E

Planned Wells:

1	UPPER RIPSEY	SW¼ SE¼ SEC 2	T5S R13E
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Planned Troughs:

1	UPPER RIPSEY	SW¼ SE¼ SEC 2	T5S R13E
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Planned
Storages :

1	UPPER RIPSEY	SW¼ SE¼ SEC 2	T5S R13E
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APPENDIX B

Climate:

Monthly Average Temperature (Degrees Fahrenheit)

The average maximum temperature for the area is 86 degrees Fahrenheit and the average minimum temperature is 53 degrees Fahrenheit. Below is a chart of monthly averages of two climate stations located near the ranch.

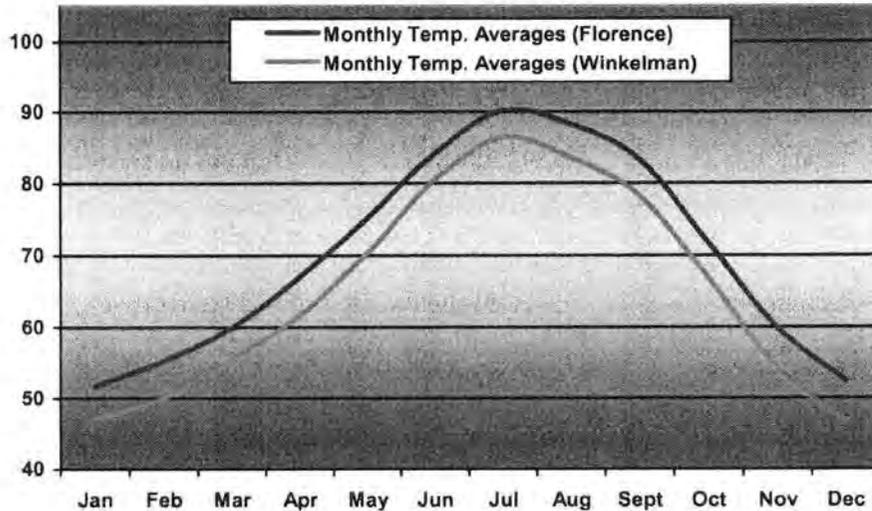


Figure 1. Monthly temperature averages for the Florence and Winkelman climate stations.

Precipitation Averages

Precipitation ranges between 10 to 13 inches annually. Approximately 57% of the areas precipitation falls between November and April, while 43% normally falls between May and October. Below are charts depicting precipitation records from two different stations for over a 100 year period. Numbers were derived from the monthly total precipitation records from both the Florence and Winkelman climate stations.

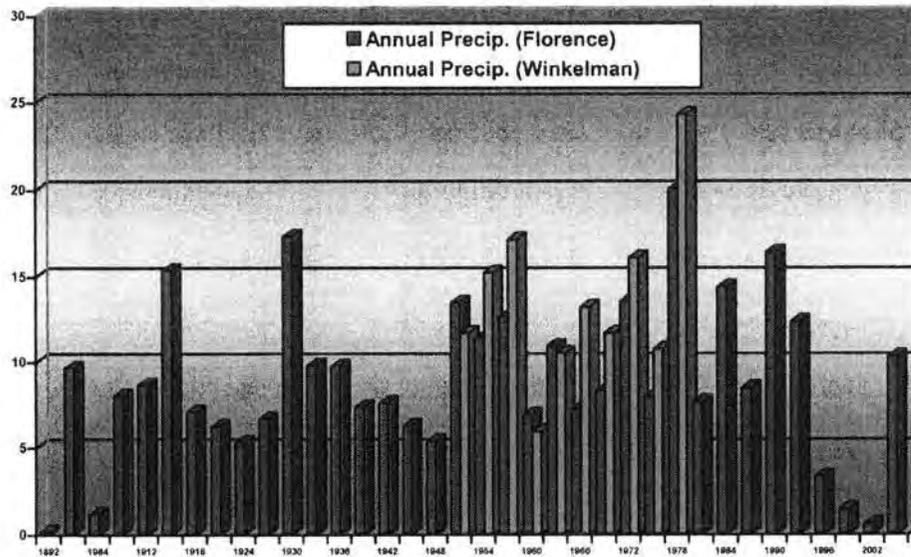


Figure 2. Annual precipitation totals for the Florence and Winkelman climate stations.

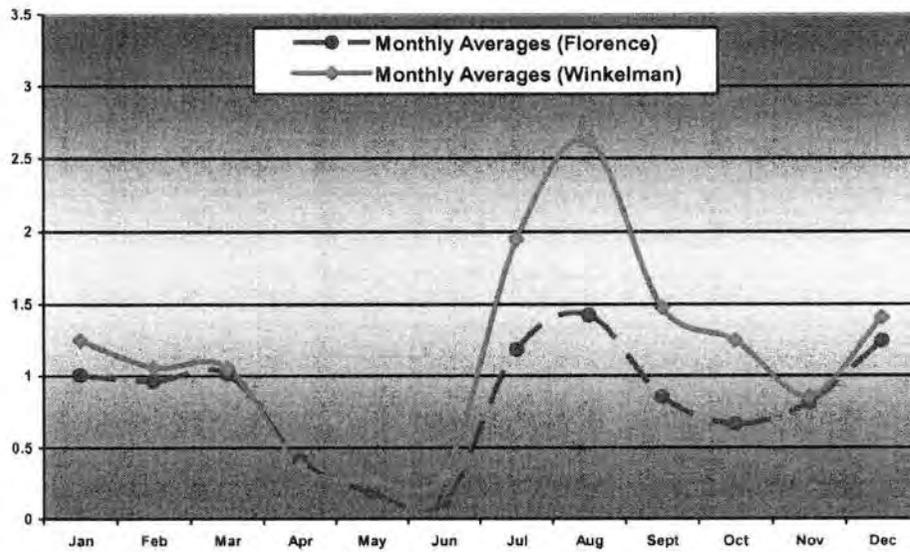


Figure 3. Monthly precipitation averages for the Florence and Winkelman climate stations.

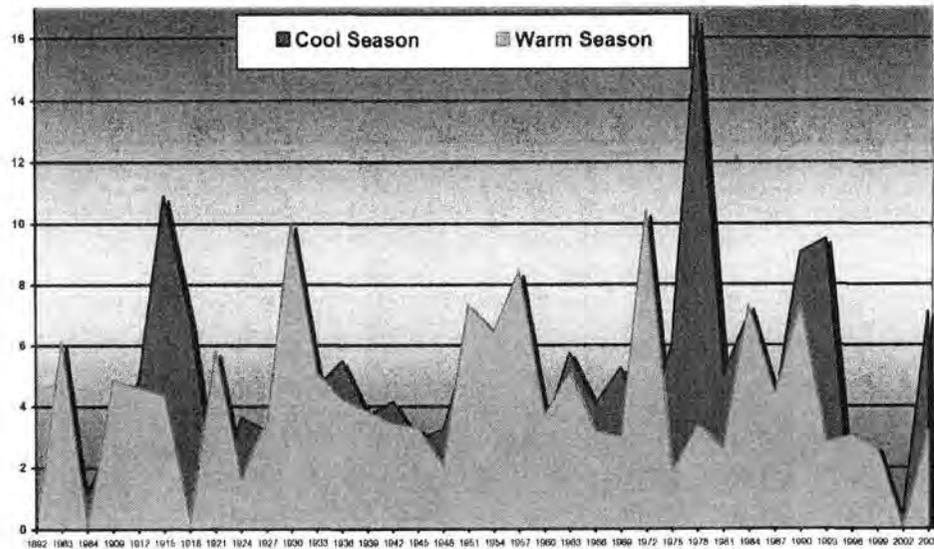


Figure 4. Cool season verses warm season precipitation averages from the Florence climate station.

Plant vigor and productivity has been affected by the prolonged drought. On certain sites, many of the plant species has been severely affected. Many species that are expected on sites have reduced production to basically maintain self preservation or dropped out completely. A suggested carrying capacity was estimated for this ranch using the site guides and estimates dependant on *usable* forage is impacted by the lack of production. Stocking rates in times of drought should be conservative and should be based on site health, livestock health and the producer's experience.

APPENDIX C

Major Land Resource Areas:

Major Land Resource Areas (MLRA) are broad geographical areas that are characterized by a particular pattern of physiographic features. Soils, climate, vegetative, water resources, and by land use are used to delineate the different land resource areas throughout the state. The MLRA's for the A Diamond Ranch were mapped in accordance with NRCS guidelines. There are two MLRA's on the ranch: 38- Arizona Interior Chaparral and 40- Sonoran Basin and Range. The majority of the ranch is within a transition zone between the two resource areas. For consistency purposes, the ranch was mapped in the 40-1 MLRA.

Ecological Sites:

The ecological concept of plant succession and historic climax plant community is the foundation by which universities, the NRCS, federal and state land owning agencies, and other landowners and managers evaluate rangelands. The concept of plant succession is based upon the process of vegetational development through time where an area is successively occupied by different plants of higher ecological order and greater species diversity. The historic climax plant community refers to the highest ecological development of plant community on a given site as determined by climate, soil and soil parent material, and by topographic, vegetative, fire and animal factors. Some species have greater genetic amplitude than others and may occur throughout the different plant successional stages. Sometimes the historic climax plant community is an impractical objective, such as where a naturalized plant community of non-native species becomes established.

The ecological site is the basic mapping unit used in this rangeland inventory. An ecological site is a distinctive kind of rangeland that has the potential to support a native community typified by an association of species different for that of other sites. Ecological site descriptions have developed within each MLRA. For this project, each ecological site was mapped in accordance with these guidelines. Non-native species are not included in the typical ecological site descriptions although descriptions are currently being written for naturalized plant communities.

The ecological site and condition survey for the ranch was conducted in the summer of 2005 by Gary Vinson and the Natural Resource Conservation Service (NRCS). Annual plant production was included in this survey. Many of the previous winter's annuals were present on the ranch at the time of the inventory and were lumped together in a general annual category. At a later time, it may be prudent to revisit each site to estimate production of individual annual species to get a better understanding of annual production.

Ecological sites within the ranch consist mostly of Shallow Hills, Shallow Upland, Loamy Upland, Limy Upland, Sandy Bottoms, Granitic Hills and Gravelly Hills. Some inclusions of other ecological sites occur within each of these sites but were too minute to include in the larger units. Data collected in 2005 is in a successive period of drought. Some of the numbers calculated on each of these sites may not reflect the absolute potential of production of each site. The data collected from each site should be looked at as base information during a droughty period for this plan.

40-1AZ; Upper Sonoran Desert Shrub

Description of Current State (Departure from Ecological Site Guides)

Data used to illustrate departure from ecological site guides was ocularly estimated and were not actually measured using any method.

Shallow Hills

The Shallow Hills ecological site is characterized by hillslopes and ridgetops with slopes that range between 15 to 75%. Elevations are from 2,200 to 4,000 feet. Soils are shallow and are formed on igneous parent material, are non-calcareous, coarse textured and have well developed covers of gravels and cobbles. Soils associated with this site are Cellar, Chimenea and Anklam.

The current plant community of this site is a diverse mixture of desert shrubs, trees, cacti, perennial grasses and forbs. Vegetative cover is roughly 60% shrubs, 10-15% sub-shrubs, 5% trees, 5-10% succulents, 5-10% forbs, and 1-2% perennial grasses. Cover is well dispersed throughout the site with few continuous areas of bare ground. A few plant species associated with the site is jojoba, turpentine bush, flattop buckwheat, palo verde, ocotillo, cacti, janusia, sideoats grama, stipa's and bush muhly.

Shallow Upland

The Shallow Upland site occurs on gently sloping to moderately steep pediments with slopes ranging from 1 to 15%. This site generally flanks mountain areas with elevations of 2,000 to 3,300 feet. Soils are shallow, non-calcareous and have developed in place on various types of bedrock parent material. Soils associated with this site include Chimenea, Cellar, Anklam, Gran, Granolite and Lajitas; all with slopes less than 15%.

The current plant community for this site is a diverse mixture of desert shrubs, trees, cacti, perennial grasses and forbs. Canopy cover is relatively 50-65% shrubs, 15% trees, 5-10% succulents, and 1-3% perennial grasses. Cover is well dispersed in this area. Plant species associated with this site are mesquite, palo verde, jojoba, turpentine bush, guajilla, bursage, flattop buckwheat, bush muhly and purple threeawn.

Loamy Upland

This site occurs on fan terraces, stream terraces, mesas and ridgetops with slopes of 1-15%. Elevations are from between 1,900 to 3,400 feet. Soils are deep which have formed in loamy alluvium of mixed origin. Soil textures are from very gravelly sandy loams to a loam with an argillic horizon near the surface. Soils associated with the Loamy Upland site are Pinaleno, Continental, White hills and Nahda. All have slopes less than 15%.

The current plant community has patchy stands of desert trees with an understory of low shrubs, few perennial grasses and forbs. Vegetative cover is irregular with approximately 60% cover occupying 10-15% of the area. Canopy cover is estimated at approximately 30%; 15% trees and shrubs, 8% sub-shrubs, 6% succulents, 1% grasses. Basal cover takes in approximately 2% of the area. Normal or above average precipitation will increase basal cover throughout site. Plants presently found on this site are palo verde, mesquite, catclaw, Spanish dagger, turpentine bush, bursage, guajilla, cacti, globe mallow and bush muhly.

Limy Upland

The Limy Upland site occurs on fan terraces, pediments, mesa tops and ridgetops with slopes from 1-15%. Elevations range from 1,900 to 3,500 feet. Soils are shallow and have formed on limy and gravelly, loamy alluvium of mixed origin, or in place on limy fan or conglomerate. Soils are calcareous throughout with lime pans occurring at shallow depths and on top of bedrock. Associated soils to this site include Cave, Del Norte, Tencee, Grey eagle, Pantano and Jaynes.

The present plant community on this site is a shrubland dominated by turpentine and creosote bush. Large shrubs make up approximately 15-20% canopy cover, trees are 2-5%, sub-shrubs are 2-5% cover, and succulents are 1-2% canopy cover. Plants currently found on this site are creosote, turpentine bush, bursage, ratany, desert zinnia, bush muhly, fluff grass and purple threeawn.

Sandy Bottoms

This site occurs on floodplains, stream terraces and alluvial fans. It benefits on a regular basis from extra moisture received from over bank flooding/runoff from adjacent upland sites. Slopes are 0 to 3%, with elevations from 1,900 to 3,300 feet. Soils are gravelly and sandy alluvium from mixed origin. They are deep and excessively well drained. Some soils that are associated with this site are Arizo, Anthony, Brazito and Vinton.

The current plant community is characterized by a diverse community of desert trees, shrubs, vines, grasses, and forbs. Canopy on this site is 40-50% with 10% tree canopy, 40% shrubs, 10% sub-shrubs, 10% perennial forbs and 2-5% perennial grass canopy. Annual production on the Sandy Bottom site regularly fluctuates dependant on precipitation. It is difficult to get a proper estimate on production because of the variability from year to year. Plant species presently found on this site are mesquite, palo verde, desert willow, burro brush, desert and netleaf hackberry, gourds, wild cucumber, bush muhly and spike dropseed.

Granitic Hills

The Granitic Hills ecological site is characterized by hill slopes, ridge-tops and mountains. This ecological site occurs at the lowest elevations of the interior chaparral zone in the Mogollon Transition area. Soils are shallow, are loamy textured and non-calcareous. Soil surfaces are well covered by gravels, cobbles and stone and are well drained. Soils associated with this ecological site are Oracle, Romero and Lampshire.

The present plant community of the Granitic Hills ecological site consists of a various mix of trees, shrubs, succulents, grasses and forbs. Vegetative cover for this site is roughly 5% trees, 15% shrubs, 5% sub-shrubs, 5% forbs and 2% grass and grasslike species. Vegetative characteristics changes depending on aspect. Some plant species currently associated with this site include jojoba, turpentine bush, flattop buckwheat, palo verde, ocotillo, cacti, fluff grass and threeawns.

Gravelly Hills

This site occurs on hillslopes and ridgetops with slopes from 15-70%. Elevations range from 2,200 to 4,000 feet. Soils are shallow, formed on schist and metamorphosed volcanic rock, breccia, and agglomerates. Soils are to some extent calcareous and have lime accumulations in fractures. Surfaces horizons are covered with gravels and channers, but lack cobble cover.

The current plant community is characterized by an assorted community of desert trees, shrubs, grasses, and forbs. Vegetative cover for this site is roughly 20% large shrubs, 10% trees, 5% sub-shrub canopy and 2-3% succulents. Plants associated with this site are dalea, twinberry, brittlebush, wolfberry, ocotillo, cacti, slim tridens and purple threeawn.

APPENDIX D

Inventory Assessment

Production

The Double Sampling method was used to collect production data on each inventory site. Trees, shrubs, sub-shrubs, cacti, perennial grasses and annual grasses and forbs were all included in the inventory. Larger plant species, such as trees and shrubs were estimated in 10, 1/100th acre plots. Size, height and/or number of individuals were counted in each plot. Tree and shrub weights are calculated by correlating the raw data to the average dry weights of individual plant species, which is found in the Range Production Tables from the 1963 Range Technical Note No. 52 (RTN 52). Weights of grasses, perennial forbs, annual forbs and annual grasses are estimated in 10, 9.6 square foot frames. Before assessment begins, individual plant species are clipped and weighed and used to estimate production of each species found in the 10 frames. When the plot is completed, 2 frames out of the 10 are clipped, dried and weighed for the dry weight. The dry weights of each of those species clipped are used as a correction factor for the estimated plots. The tree/shrub and grass/forb data combined will give estimated poundage per acre on a site.

<u>Inventory Point</u>	<u>Ecological Site</u>	<u>Production (Tree/Shrub/Grasses)*</u>	<u>Total Production (Tree/Shrub/Grasses/Forbs)*</u>
T 1	Shallow Uplands	200 lbs/ac	454 lbs/ac
T 2	Shallow Hills	834 lbs/ac	939 lbs/ac
T 3	Shallow Upland 70%, Loamy Upland 20%, Limy Upland 10%	591 lbs/ac	630 lbs/ac
T 4	Gravelly Hills	431 lbs/ac	610 lbs/ac
T 5	Granitic Hills 60%, Shallow Upland 40%	279 lbs/ac	347 lbs/ac
T 6	Shallow Hills 40%, Shallow Upland 60%	317 lbs/ac	422 lbs/ac
T 7	Granitic Hills	302 lbs/ac	356 lbs/ac
T 8	Sandy Bottom	400 lbs/ac**	600 lbs/ac**

* Production data maybe slightly over or under estimated in some cases. Data that is taken from RTN 52 is a rough estimate of the average production of individual plant species and may not be comparative to the actual production on individual sites.

**Production ocularly estimated. No actual clipping took place.

Similarity Index

From the total production data, we are able to derive similarity indices which convey the likeness of one site to its potential by finding the percent composition of each species on each site. The similarity index can be used as an assessment of the current plant community in relationship to the desired or climax plant community. Indices that are collected over time can depict the trend or direction of change the current plant communities are heading in relationship to the desired plant community. Management

practices are directly affected and may have to be adjusted or implemented to maintain or improve a declining state of a site in order to meet management goals.

Information from earlier Ecological Site Guides was used to determine the indices of each site on the A Diamond ranch. New site guides for the 40-1 MLRA will be available in the future and each site should be revisited using the new format. Trend data could be formulated using both techniques but, the newer format should probably be used as the base for analysis. Below is a summary of each similarity index formulated using the older Range 1 format.

<u>Inventory Point</u>	<u>Similarity Index</u>
T1	41
T2	54
T3	36
T4	46
T5	64
T6	63
T7	42
T8	83*

* Ocularly estimated using a Range 1 worksheet.
No actual clipping took place.

Range Health

Range Health was assessed on each ecological site. Attributes including Soil/Site Stability, Hydrologic Function and Biotic Integrity are evaluated and given a rating depicting site resemblance to a reference state. Reference states are a depiction of the proper functioning condition of a site. Each ecological site has a different reference state and desired states should help guide management goals and objectives. Management practices have an effect on the health of a site and should be adjusted according to the management goals. There are 17 indicators used for the evaluation and when combined give a qualitative assessment of the site. A summary of each site is listed below:

<u>Inventory Point</u>	<u>Ecological Site</u>	<u>Soil/Site Stability</u>	<u>Biotic Integrity*</u>	<u>Hydrologic Function</u>
T 1	Shallow Uplands	Stable	At Risk	Functioning
T 2	Shallow Hills	Stable	Intact	Functioning
T 3	Shallow Upland 70%, Loamy Upland 20%, Limy Upland 10%	Stable	Intact	Functioning
T 4	Gravelly Hills	Stable	At Risk	Functioning
T 5	Granitic Hills 60%, Shallow Upland 40%	At Risk	At Risk	At Risk

T 6	Shallow Hills 40%, Shallow Upland 60%	Stable	At Risk	Functioning
T 7	Granitic Hills	At Risk	At Risk	Functioning
T 8	Sandy Bottom	Stable	At Risk	Functioning

*Each attribute is affected by drought. Loss of organic material, decreased production and increase of invasive species all contribute to a low attribute rating.

Data Sheets will be included in the appendix.

APPENDIX E

Carrying Capacity

Carrying Capacity

Carrying capacity can be estimated for the entire ranch based on the information collected in the field. Two different methods were used in calculating capacity. The calculated outcome of each method should be looked at specifically and stocking rate should be adjusted based on user experience, climate fluctuations, overall welfare of livestock and the ranch.

The first technique that was used to estimate carrying capacity is from the earlier site guides. Percent climax or the similarity index is used to find the condition class of a particular range site. Condition classes range from poor, fair, good to excellent. Animal Unit Month's per Acre (AUM/Ac) are associated with each condition class. The AUM/Ac is multiplied by the total acreages of each ecological site to find an estimated stocking rate. The attached sheets show the estimated carrying capacity by pasture based on the ecological site guides.

The second technique that was used estimates *usable* forage by ecological site in each pasture. Percentages of accessibility (water distribution and slope) of each site, the actual clipping data (lbs/ac), total acreages of each ecological site and percent use are multiplied to get the total usable production of a pasture. This number is then divided by the total pounds required to maintain one lactating cow for a period of days to an entire year.

It is important to note that livestock in browse country verses grassland country have different forage needs. Different plant species have different usable nutrient values which will have an effect on how much a cow will consume to maintain body condition. This should be taken into account when estimating stocking rates. Different breeds of livestock have different use patterns, preferences and needs. Stocking rates should be adjusted for this to avoid over use in areas or lack of use in areas. The same should be kept in mind when there are areas with sensitive plant species.

APPENDIX F

Grazing Management

A grazing schedule is attached to show use in each pasture throughout the year. The grazing schedule for the first few years will be tentative and flexible. The ranch is currently being cross fenced and the grazing schedule will be revised to meet the goals of an intensive management system. It is important to keep a grazing schedule that has flexibility built into it. During certain years a ranch might experience favorable years then be followed by successive years with less than desirable conditions. It might be pertinent for the producer to use one pasture longer than expected when challenges like these arise.

Yr.	Pasture	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2006	1: Brahma Pasture												
2006	2: Zelleweger Pasture												
2006	3: Holding Trap	Used when shipping, 1 month period											
2006	4: Duke Pasture					12 days*							
2006	5: Radio Tower Pasture					12 days*							
2006	6: Middle Pasture												
2006	7: Deep Well Trap				6 days								
2006	8: Ripsey Pasture	Herd 1, year round											
2006	9: Corner Tank Trap	Seasonal Use when gathering											
2006	10: Road Tank Trap	Seasonal Use when gathering											
2006	11: River Pasture	Research Pasture											
2006	12: Peg Leg	No Use; Adverse Deeded											
* 100 AU's													