

THE RESULTS OF REST ROTATION
ON A NATIVE DESERT RANGE
AFTER ELEVEN YEARS
(1971 THROUGH 1981)

Cook Allotment
Cedar City District

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COOK ALLOTMENT

I. GENERAL INFORMATION

A. Location

In southwestern Utah between the towns of Milford and Lund.

B. Land Status and Acreage

<u>Land</u>	<u>Acres</u>	<u>Percent of Area</u>
Public Land	28,184	54
State Land	8,297	16
Private Land	<u>15,596</u>	<u>30</u>
TOTAL	52,077	100

C. Existing Resource Data

1. Topography and Elevation

Terrain gently slopes southeast from semidesert foothills to a desert alkali flat. Elevation ranges from 4,900 feet to 5,700 feet with an average elevation of approximately 5,100 feet.

2. Climate

Average annual precipitation over a 72-year period is 8.5 inches. About 50 percent of the moisture falls during the spring and summer months.

3. Soils

Dominant soils on the hills and fans are gravelly and cobbly, with alkali, saline, and silty clay loams occurring on the flood plain.

4. Vegetation

Allotment contains 15 different range sites and is divided into 47 site writeup areas. The six major vegetation subtypes are big sagebrush-grass, little rabbitbrush-grass, fourwing saltbush-grass, winterfat, shadscale, and greasewood. Palatable perennial plants furnishing the bulk of livestock forage are Indian ricegrass, curly grass, squirreltail, needle-and-thread, sand dropseed, winterfat, fourwing saltbush, and Nevada monnatea. Key species are winterfat and Indian ricegrass.

5. Ecological Condition and Trend

Current studies indicate the range is in the following condition:

<u>Condition</u>	<u>Percent</u>
Excellent	1
Good	45
Fair	48
Poor	<u>6</u>
TOTAL	100

A summary of trend on the allotment is as follows:

<u>Apparent Trend</u>	<u>Actual Trend</u>
1962 to 1966-Upward	1967 to 1971-Downward
	1971 through 1981-Upward

6. Utilization

Studies have been conducted on the allotment as follows:

<u>Year</u>	<u>Utilization</u>
1965	Slight to Light
1966	Light to Moderate
1968	Heavy
1969	Heavy
1970	Moderate to Heavy
1971	Moderate to Heavy
1972	Heavy
1981	Heavy in South Pasture and Slight to Light in Remaining Grazed Pastures

7. Wildlife Habitat

Approximately 50 antelope and 10 deer are present on the allotment during portions of the year.

D. Existing Range Improvements

Projects located on the allotment are as follows:

<u>Projects</u>	<u>Units</u>
Wells with Windmills	21 each
Reservoirs	20 each
Exterior Fences	61 miles
Interior Fences	9 miles
Corrals	9 each
Fourwing Saltbush Seeding	2,000 acres

E. Past and Present Livestock Operations

General area was grazed by sheep and cattle until 1943. General area grazed by cattle from 1943 through 1960. Existing allotment boundary established in 1961 and then utilized by steers.

<u>Years</u>	<u>Number and Kind</u>	<u>Season</u>	<u>Total AUM's</u>	<u>Grazing System</u>
1961	1,000 steers	3/1-2/28	8,420	--
1962	1,480 steers	4/5-5/31	2,810	--
1963 and 1964	non-use	--	--	--
1965 and 1966	590 steers	3/8-10/30	4,710	--
1967 through 1970	420 cow-calf	3/1-2/28	5,000	Two Pasture Deferred Four Pasture Rest Rotation Four Pasture Rest Rotation
1971 through 1975	420 cow-calf	3/1-2/28	5,000	
1976 through 1981	*600 steers	3/1-2/28	5,000	

*Steers are usually purchased at the Spanish Fork auction and placed on the allotment from November through February. By March 1 there are 600 steers which remain on the allotment through the end of September. They are then placed in a feedlot, usually in California, for about 90 days.

II. GRAZING SYSTEM

FOUR PASTURE REST ROTATION

A. Grazing Formula

TREATMENT	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
A	Grazed Yearlong for Livestock Production											
B	Rest for Seed Production				Grazed to Trample Seed							
C	Rest to Establish Seedlings											
D	Rest for Vicer		Grazed After Flowering									

III. EFFECTS OF GRAZING SYSTEM

A. Effects of Rest Rotation on Trend

Upward trend from 1971 through 1981 is based on six photo plots established in 1967 and one established in 1975.

Plot 1		
Species	Cover	
	1971	1981
Indian ricegrass	.49	.84
Winterfat	<u>.35</u>	<u>.42</u>
	.84	1.26
Species	Density	
	1971	1981
Indian ricegrass	3	3
Winterfat	<u>1</u>	<u>1</u>
	4	4
	1971	1981
	Cover	Cover
	.84	1.26
Density	<u>4.00</u>	<u>4.00</u>
	4.84	5.26

Plot 2		
Species	Cover	
	1971	1981
Indian ricegrass	1.80	1.19
Winterfat	<u>.70</u>	<u>1.89</u>
	2.50	3.08
Species	Density	
	1971	1981
Indian ricegrass	3	3
Winterfat	<u>1</u>	<u>1</u>
	4	4
	1971	1981
	Cover	Cover
	2.50	3.08
Density	<u>4.00</u>	<u>4.00</u>
	6.50	7.08

Plot 3		
Species	Cover	
	1971	1981
Indian ricegrass	1.96	5.25
Winterfat	<u>-</u>	<u>-</u>
	1.96	5.25
Species	Density	
	1971	1981
Indian ricegrass	7	5
Winterfat	<u>=</u>	<u>=</u>
	7	5
	1971	1981
Cover	1.96	5.25
Density	<u>7.00</u>	<u>5.00</u>
	8.96	10.25

Plot 4		
Species	Cover	
	1971	1981
Indian ricegrass	2.04	6.09
Winterfat	<u>-</u>	<u>-</u>
	2.04	6.09
Species	Density	
	1971	1981
Indian ricegrass	4	5
Winterfat	<u>=</u>	<u>=</u>
	4	5
	1971	1981
Cover	2.04	6.09
Density	<u>4.00</u>	<u>5.00</u>
	6.04	11.09

Plot 6		
Species	Cover	
	1971	1981
Indian ricegrass	.41	3.41
Winterfat	<u>6.50</u>	<u>5.27</u>
	6.91	8.68
Species	Density	
	1971	1981
Indian ricegrass	8	17
Winterfat	<u>22</u>	<u>22</u>
	30	39
	1971	1981
Cover	6.91	8.68
Density	<u>30.00</u>	<u>39.00</u>
	36.91	47.68
Plot 7		
Species	Cover	
	1975	1981
Indian ricegrass	1.60	4.75
Winterfat	<u>.85</u>	<u>.75</u>
	2.45	5.50
Species	Density	
	1975	1981
Indian ricegrass	8	9
Winterfat	<u>3</u>	<u>3</u>
	11	12
	1975	1981
Cover	2.45	5.50
Density	<u>11.00</u>	<u>12.00</u>
	13.45	17.50

B. Effects of Rest Rotation on Forage Production

1. Surveyed Grazing Capacities

<u>Year</u>	<u>Estimated Forage Production AUMs</u>	<u>Acres/AUM</u>	<u>Percent Increase In AUMs</u>
1962	2,750 and 3,377 in non-use	19	
1971	5,000	10.4	
1980	7,200	7.2	44 (1971 through 1980)

2. Grazing Capacity Comparisons of Adjacent Allotments

Based on 1980 range survey and five fenceline contrasts of four adjacent allotments.

<u>Allotment</u>	<u>Total Acres</u>	<u>Total Authorized AUMs</u>	<u>Acres/AUM</u>	<u>Total Licensed AUMs</u>	<u>Acres/AUM</u>	<u>Total 1980 Surveyed AUMs</u>	<u>Acres/AUM</u>
Cook	52,077	5,000	10	4,000 ²	13	7,200	7
Lund	45,753	3,626	13	3,135	15	2,940	16
Bull Spring	23,049	1,273	18	1,169	20	1,147	20
Blue Mountain	16,394	1,974	8	1,504	11	1,717	10
Burn Knoll	22,510	1,182	19	955	24	1,339	17

¹Based on 5-year average licensed use.

²Six year average actual AUMs utilized by steers after converting steers to animal units. However, Cook allotment was grazed at a rate of 10 acres per AUM under a cow-calf operation the first 5 years of the rest rotation grazing system.

One steer equals .8 of an animal unit.
 600 steers X .8 = 480 animal units
 480 X 8.333 months = 4,000 AUMs

Fenceline Contrast #1						
Cook Allotment				Burn Knoll Allotment		
Available pounds/acre:	192.5			Available pounds/acre:	77.5	
Acres/AUM:	4.2			Acres/AUM:	10.3	
<u>Composition Key Species</u>				<u>Composition Key Species</u>		
Indian ricegrass	33.0			Indian ricegrass	5.0	
Winterfat	19.2			Winterfat	9.3	
Allotment	Total Acres	Total Numbers	Season	Total Licensed AUMs	Acres Per AUM	Grazing System
Burn Knoll	22,510	127 C.	10/1-5/15	955	24	2-pasture deferred

Fenceline Contrast #2						
Cook Allotment				Burn Knoll Allotment		
Available pounds/acre:	104.1			Available pounds/acre:	77.5	
Acres/AUM:	7.7			Acres/AUM:	10.3	
<u>Composition Key Species</u>				<u>Composition Key Species</u>		
Indian ricegrass	21.0			Indian ricegrass	5.0	
Fourwing saltbush	4.2			Fourwing saltbush	3.0	
Allotment	Total Acres	Total Numbers	Season	Total Licensed AUMs	Acres Per AUM	Grazing System
Burn Knoll	22,510	127 C.	10/1-5/15	955	24	2-pasture deferred

Fenceline Contrast #3						
Cook Allotment				Blue Mountain Allotment		
Available pounds/acre:	192.5			Available pounds/acre:	100.3	
Acres/AUM:	4.2			Acres/AUM:	8.0	
<u>Composition Key Species</u>				<u>Composition Key Species</u>		
Indian ricegrass	33.0			Indian ricegrass	23.5	
Winterfat	19.2			Winterfat	15.0	
Allotment	Total Acres	Total Numbers	Season	Total Licensed AUMs	Acres Per AUM	Grazing System
Blue Mtn.	16,394	177 C.	10/16-6/30	1,504	11	4-pasture deferred

Fenceline Contrast #4						
Cook Allotment				Lund Allotment		
Available pounds/acre:	206.7			Available pounds/acre:	115.0	
Acres/AUM:	3.9			Acres/AUM:	7.0	
<u>Composition Key Species</u>				<u>Composition Key Species</u>		
Indian ricegrass	19.5			Indian ricegrass	27.8	
Winterfat	32.5			Winterfat	2.2	
Allotment	Total Acres	Total Numbers	Season	Total Licensed AUMs	Acres Per AUM	Grazing System
Lund	45,753	261 C.	1/1-12/31	3,135	15	5-pasture deferred

Based on trend photos and observations the cover and density of curly grass and squirreltail has increased since 1971. Fourwing salthush appears to be remaining static.

Weight estimate forage production studies conducted in 1980 show that certain vegetation types on the Cook Allotment are producing twice the available pounds/acre of forage as adjacent vegetation types are producing on four contiguous allotments.

The estimated forage production AUMs over a ten year period increased by 2,200 AUMs, an increase of 44 percent.

Steers gained an average weight of 1.7 pounds per day.

The existing grazing system is better suited for grasses than desirable shrubs.

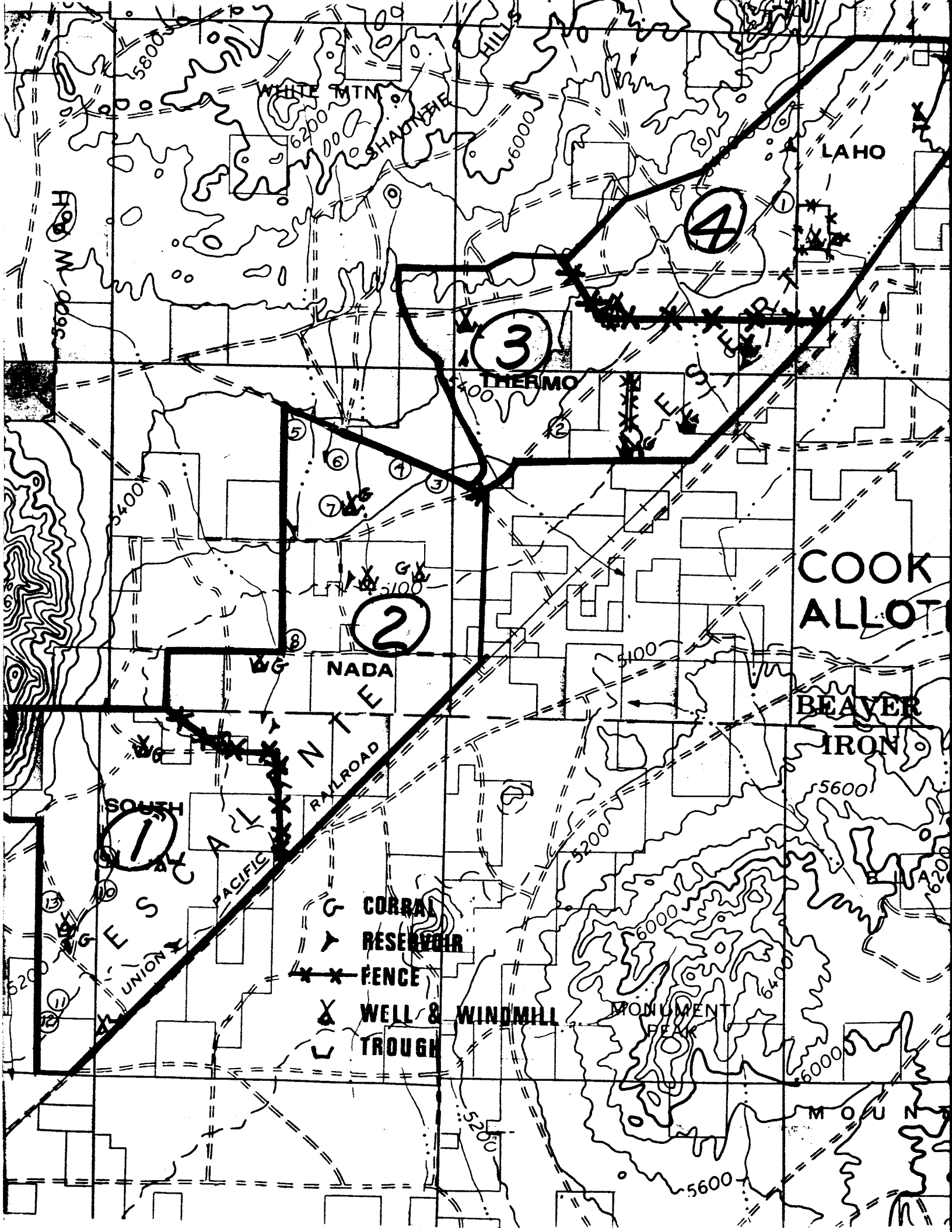
COOK ALLOTMENT

A. Grazing Formula

TREATMENT	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
A	Graze Yearlong for Livestock Production											
B	Best for Seed Production				Graze to Trample Seed							
C	Rest to Establish Seedlings											
D	Rest for Vigor		Graze After Flowering									

GRAZING SCHEUDLE

Year	Pasture			
	South	Thermo	Laho	Nada
82-83	B	C	D	A
83-84	C	D	A	B
84-85	D	A	B	C
85-86	A	B	C	D



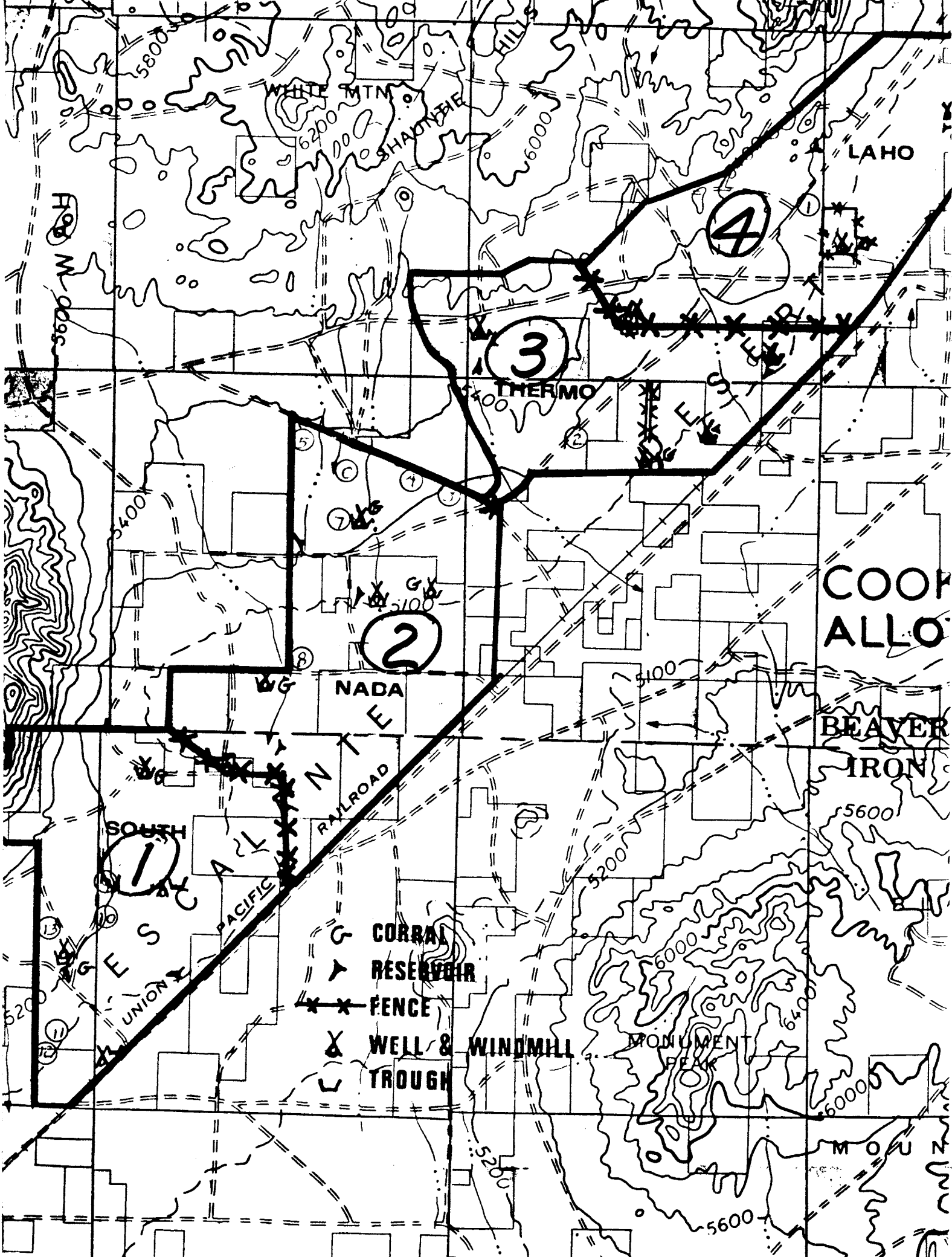
COOK ALLOTMENT

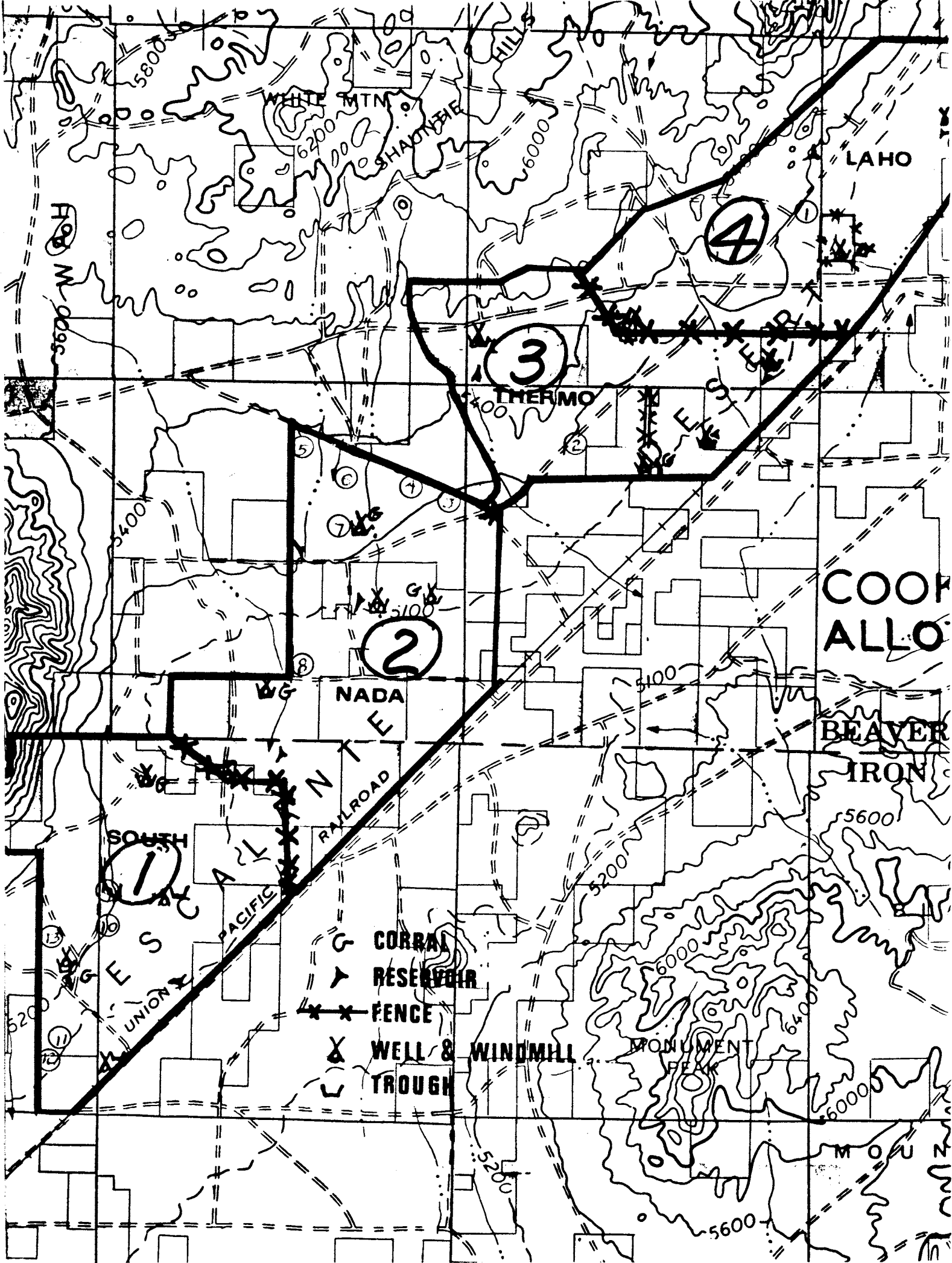
A. Grazing Formula

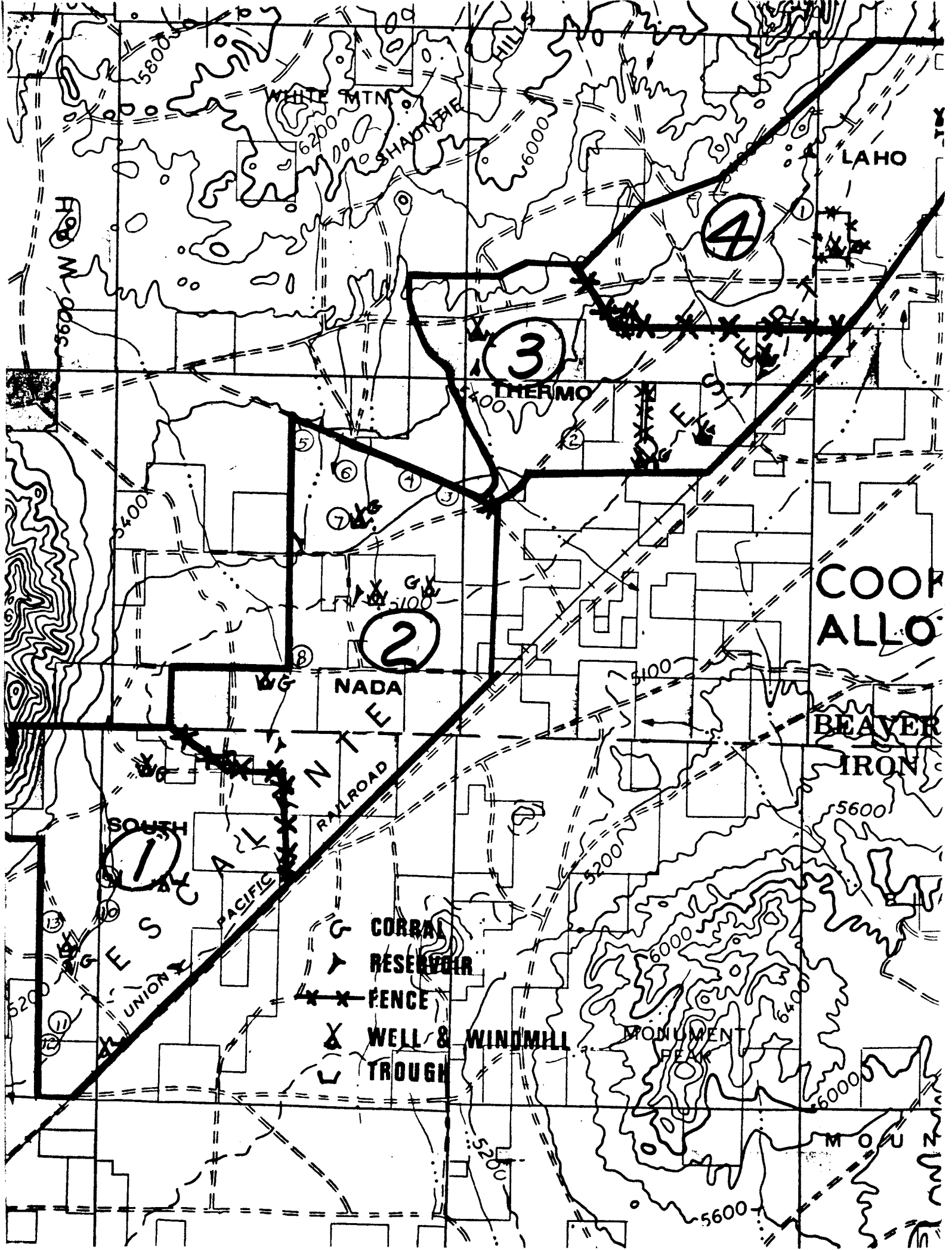
TREATMENT	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
A	Graze Yearlong for Livestock Production											
B	Best for Seed Production				Graze to Trample Seed							
C	Rest to Establish Seedlings											
D	Rest for Vigor		Graze After Flowering									

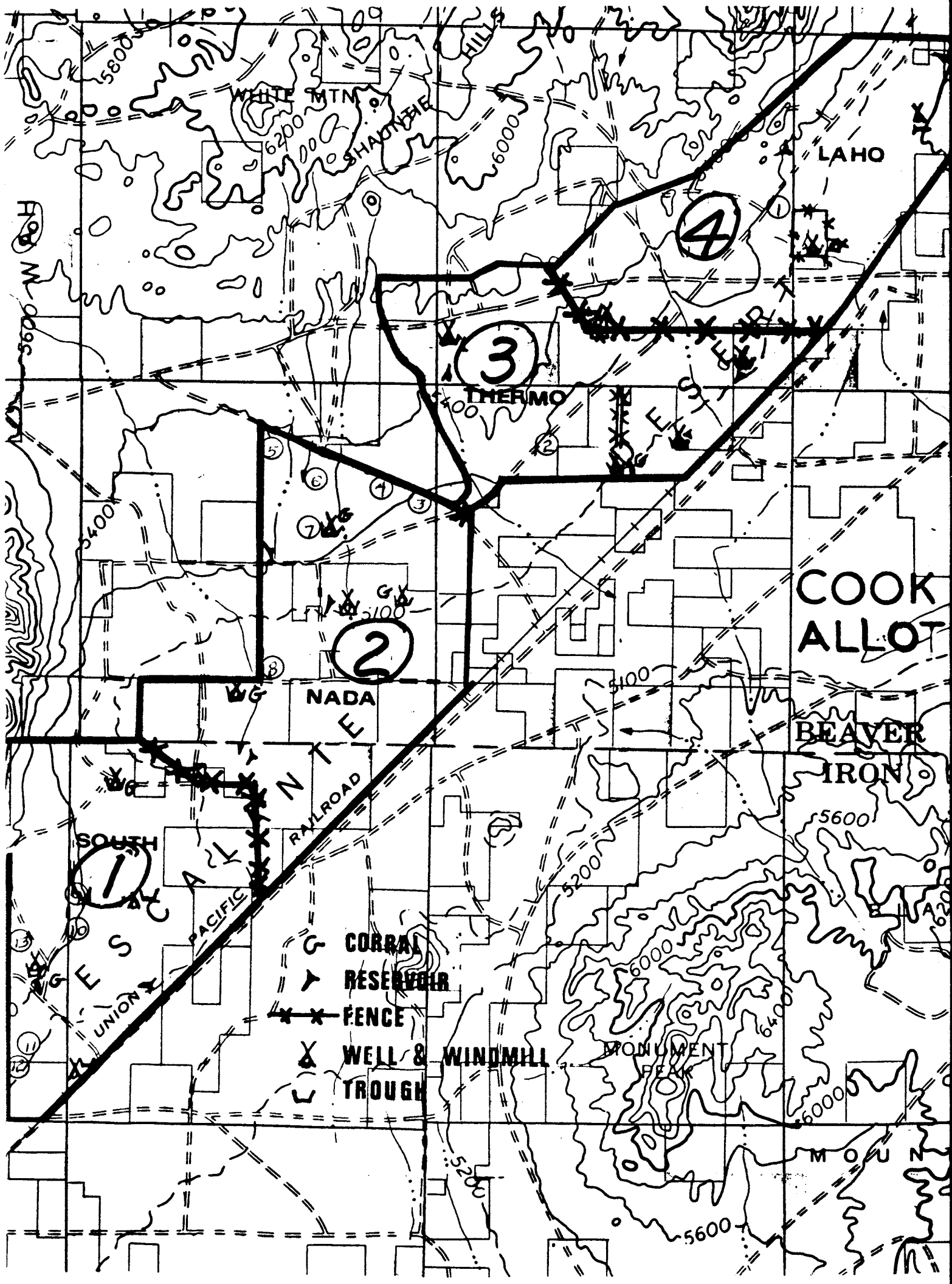
GRAZING SCHEUDLE

Year	Pasture			
	South	Thermo	Laho	Nada
82-83	B	C	D	A
83-84	C	D	A	B
84-85	D	A	B	C
85-86	A	B	C	D





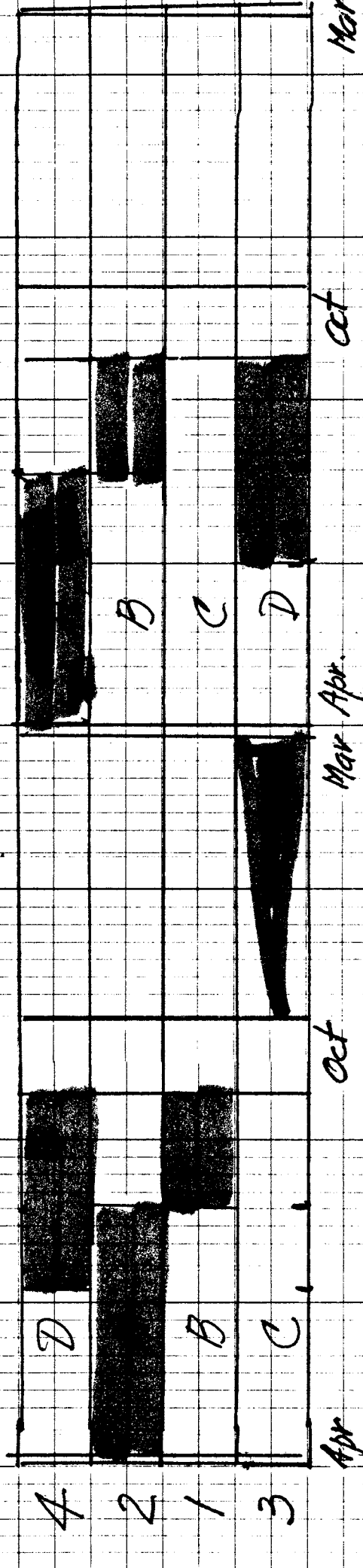




Cook Allotment Cedar City District BLM

Pasture grazing treatments consecutive years Present formula

Pasture



Pasture Names

1984-85

1 Labo (North)

2 Thermo

3 Nodg

4 South

1984-85

1985-86

1986-87

B

C

D

Schadela

Pasture

2

Treatments

A

B

C

3

C

D

A

4

D

A

B

1985-86

Oct

Mar

Oct

Apr

Mar

Cook Allotment Cedar City District BLM
 Pasture grazing treatments consecutive years Present formula

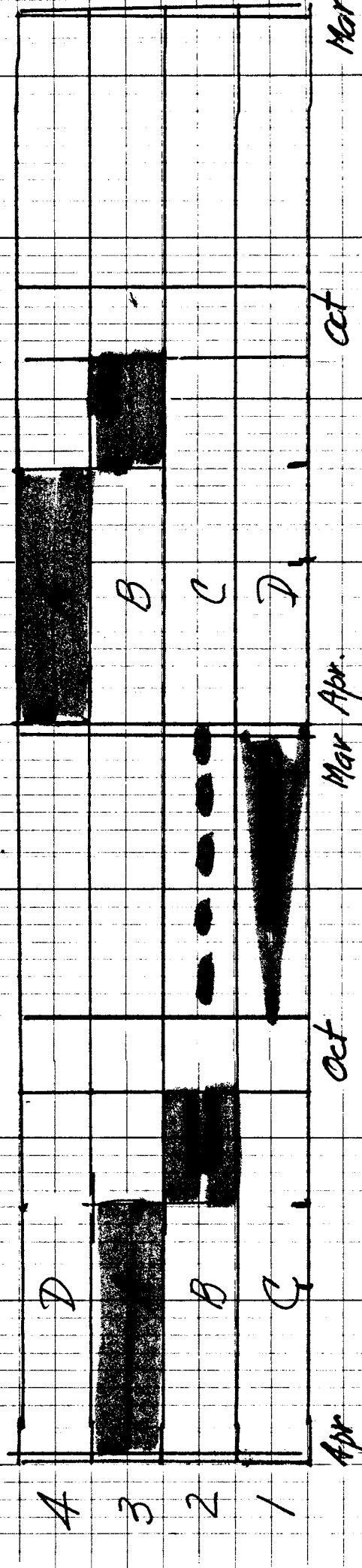
Pasture	Apr	Oct	Mar	Apr	Oct	Nov
4						
2						
1						
3						

1985-86

1986-87

Cook Allotment Cedar City District BLM
 Pasture grazing treatments consecutive years Proposed formula

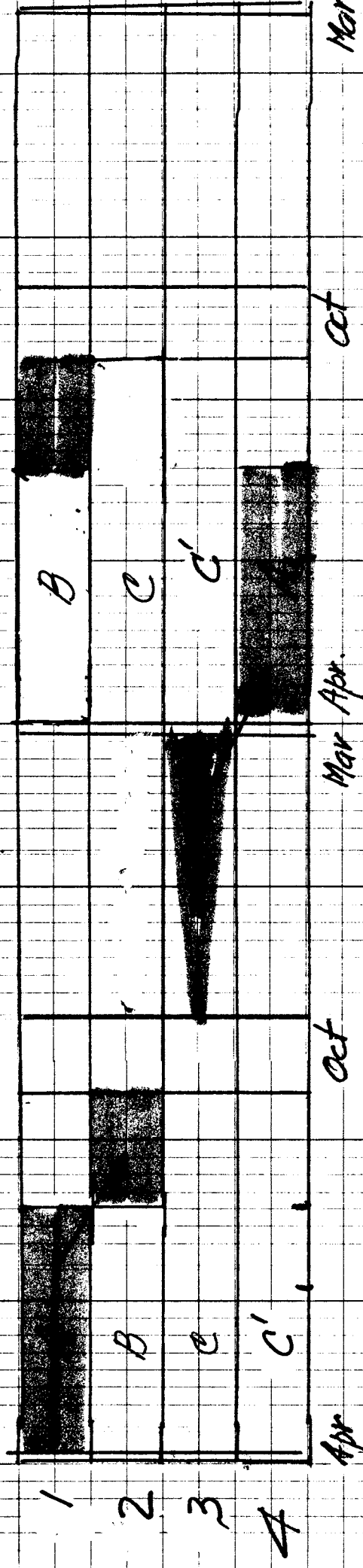
Pasture



Cook Allotment Cedar City District BLM

Pasture grazing treatments consecutive years Repeatability formula

Pasture



1985-86

1986-87

Cook Allotment Cedar City District BLM

Present

Counter clock

5
4
South

Pasture
3
Nada

2
Thermo

N 1
Labo

D

C

(A)

B

1984-85

(A)

D

B

C

1985-86

B

(A)

C

D

1986-87

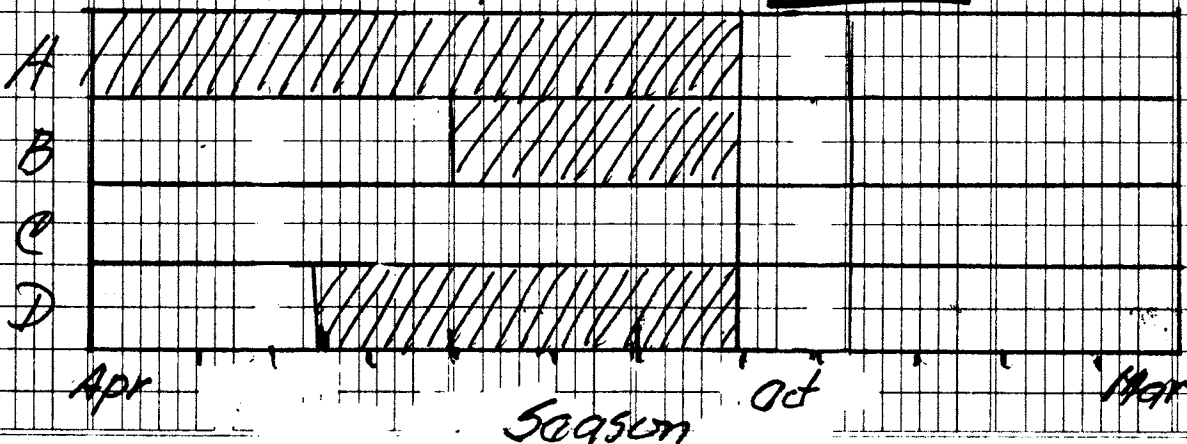
C

B

D

A

Grazing Formula (Present)



Cook Allotment Cedar City District BLM

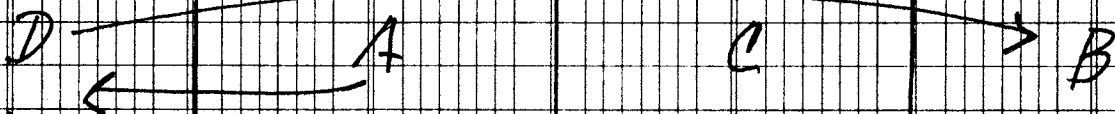
Present Clockwise

5
4
South

Pasture
3
Nada

2
Therma

N 1
Labo



K184-85



K185-86



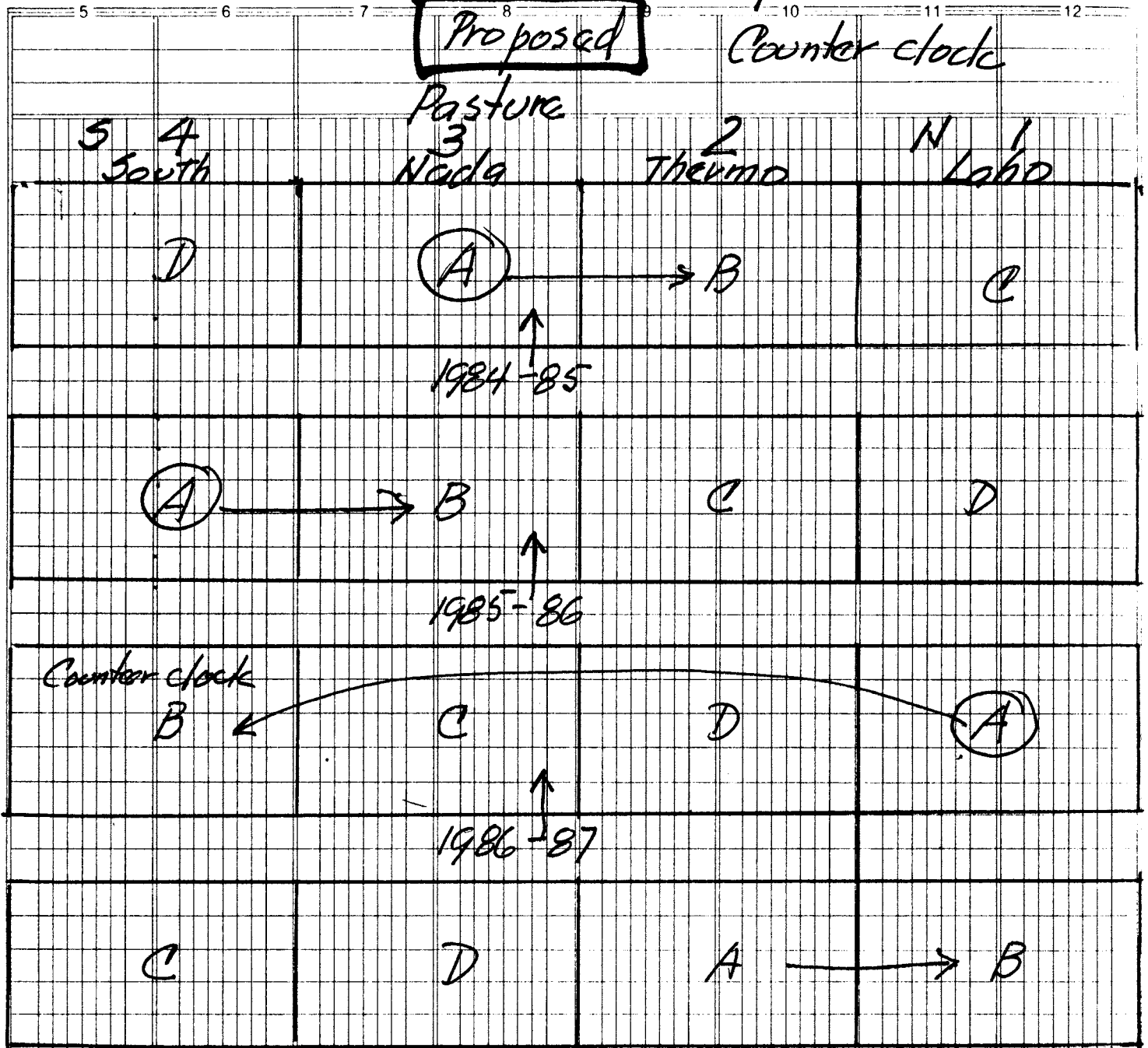
K186-87



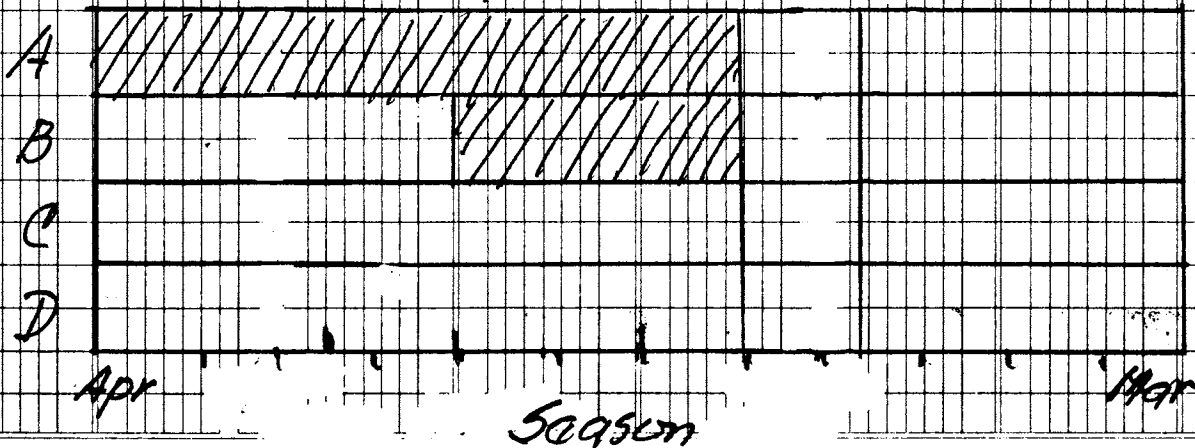
Cook Allotment Cedar City District BLM

Proposed

Counter clock



Grazing Formula (Proposed)



Cook Allotment Cedar City District BLM

Proposed

Clockwise

Pasture

5 4
South

3
Nada

2
Thermo

N 1
Labo

clock

D

C

B

(A)

↑
1984-85

(A)

D

C

B

↑
1985-86

B

(A)

D

C

↑
1986-87

C

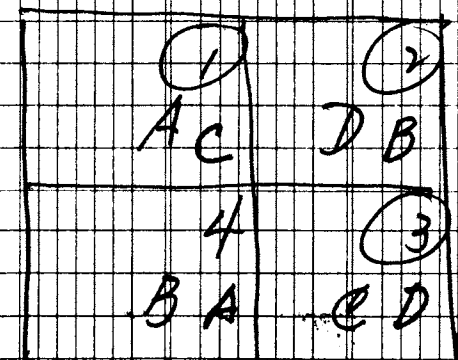
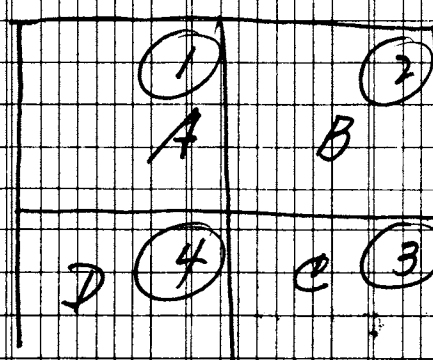
B

(A)

D

Clockwise

Counterclockwise



SO WHAT

The example of the Cook Allotment makes several things clear. First, it is possible to simultaneously improve range condition, forage production, and livestock production on Utah's desert land. Even previously degraded land in severe physical environments will respond to sound management.

Second, improvements can be accomplished by good classic range management principles; i.e., manipulation of the numbers and types of animals and the season of use. Expensive mechanical and chemical treatments are not always necessary or desirable to accomplish improvements on desert range. Rest rotation, reasonable stocking rates, grazing of steers instead of cow-calf pairs, and good water distribution can all contribute to success.

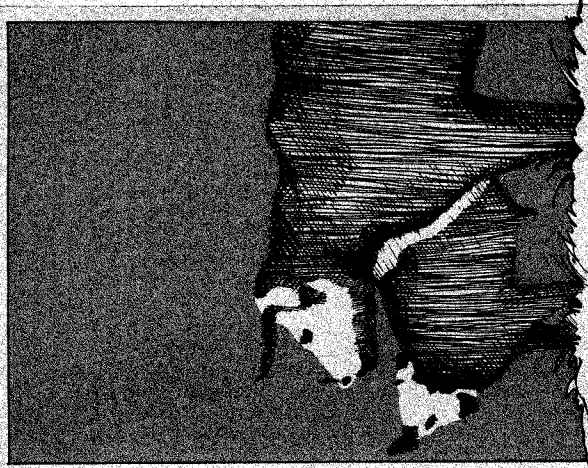
Most important, a system of grazing management is needed. Rest rotation works on the Cook Allotment and is one of the planned systems which might work. The key is careful evaluation of the grazing resource and development of a grazing scheme which best meets the needs of the resource, the animals, and the ranching operation.

Finally, there is no reason for an adversary relationship between ranchers and the federal land management agencies. The relaxed and congenial relationship that exists between the Cook permittees and the BLM personnel in the Cedar City district allows both the cattleman and the BLM managers to be more flexible with regard to decisions such as stocking rates and the timing of animal movements. That also plays a part in the success of the Cook Allotment operation.

The Cook Allotment should give a message of hope to many ranchers who are attempting to earn a living in tough environments and on land that they may not own. With good management, it is possible to survive as a livestock producer on Utah's desert ranges.

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GRASSES REVIVE WHILE STEERS THRIVE

The Cook Allotment—Successful Management on Utah's Desert Range

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Gene Grate

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COOPERATIVE EXTENSION SERVICE
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A HARSH LAND

In the late autumn of 1776, the Dominguez and Escalante expedition passed through western Utah in an attempt to find an overland route from Santa Fe to California. Tired, discouraged, buffeted by storms, intimidated by the desert and essentially lost, the two Spanish explorer-priests stopped in the valley south of the present town of Millard, Utah, and cast lots to determine if they should continue their effort or abandon it. The fates determined that they should give up and go home. The numerous deserted homesteads littering the desert valley which now bears Escalante's name are mute testimony that many others since that time have also found the area a difficult environment. It was, and it remains, a harsh land.

Much of the north and west side of the Escalante Valley is now included in a 92,000 acre parcel of rangeland which the Bureau of Land Management (BLM) refers to as the Cook Allotment. The allotment, which is a combination of federal, private, and state-owned land, stretches for 25 miles along the west side of the Union Pacific Railroad tracks between the towns of Millard and Lund.

The Cook Allotment was chosen as an example because it illustrates successful application of several management techniques in a situation which is similar to that confronted by many other Utah ranchers. Specifically, the allotment is characterized by a relatively severe physical environment, a range resource which had been seriously degraded by past abuse, and a mixed ownership pattern in which a majority of the acreage is federally owned and in which the BLM is significantly involved in management.

Even with these constraints, there have been dramatic improvements in range condition on the Cook Allotment. Since implementation of the rest-rotation grazing system in 1971, there has been a 44 percent gain in available forage, which translates into an additional 2,200 animal unit months. For low potential, slow-to-change desert ranges, that is a spectacular increase.

Of the management techniques employed on the Cook Allotment, three seem to be particularly significant and will be emphasized here. They are:

- 1) the use of a four-pasture rest-rotation grazing system,
- 2) the practice of grazing only steers on the allotment, at conservative stocking rates, and
- 3) the development of many water points.

THE COOK ALLOTMENT

Mrs. Rosalie Cook and foreman Hampton Burke, both of Millard, Utah, handle the routine management of the Cook Allotment. Mrs. Cook and her late husband, Howard, began running cattle there in 1935. Burke began working there in 1976, after many years of experience on Millard County ranches.



In many ways the history of the Cook Allotment reads like the history of most of the West's arid lands in microcosm. During the early settlement it was part of the unregulated "commons," used (and abused) as winter range by anyone who would take it. Very large numbers of both sheep and cattle are known to have grazed the area, beginning in the 1880's and continuing through passage of the Taylor Grazing Act in 1934.

In addition, the early 1900's brought numerous homesteaders who tried dry farming on patches of the Escalante Valley. Most of these farms failed and were soon abandoned. The area has largely returned to range use under the general administration of the BLM.

The Cook brothers, Howard, Jess, and Walter, for whom the allotment is named, were a part of that changing pattern of ownership and use. They homesteaded in 1912 and farmed until the early 1930's. They then converted to range livestock production and began acquiring additional parcels of grazing land (defunct homesteads and grazing permits) from 1935 to 1961. Currently, there are 28,184 acres of federal land in the allotment, while 16,596 are private and 8,297 are state-owned acres.



The allotment was purchased in 1961 by a man who stocked it with 2-3 times as many animals as are presently run and used it year-round. Range condition deteriorated, and he ultimately went bankrupt.

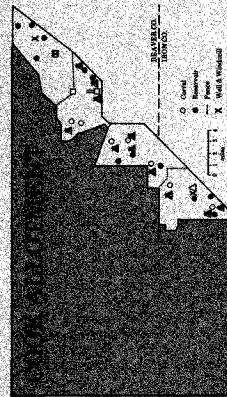
Jim Miner, the present owner of the cattle, grazing permits, and private land, acquired the allotment in 1970. The present cattle operation is part of his diversified agricultural corporation, called Agri-Empire, which is based in California. Miner employs Mrs. Cook and Hampton Burke to run the operation for him.

A DIVERSE DESERT ECOLOGY

The Cook Allotment is situated on gently sloping terrain which begins with semi-desert foothills at 5,700 feet on the north and west and tapers down to an alkali flat at 4,900 feet on the south and east. The average annual precipitation on the allotment over a 72-year period has been only 8.5 inches. About half of that moisture comes during the growing season.

The soils of the hilly portions are rather graveled or stony. Near the valley bottom the soils grade into silty clay loams which are frequently alkaline.

At different elevations and soil types there are, of course, different plant associations. The complex ecology of the allotment includes 15 identifiable ecological sites divided by the BLM into 47 site writeup areas. On the higher and more sloping ground, several shrub-grass associations occur. Depending on the site, Wyoming big sagebrush, fourwing saltbush, or little rabbitbrush may share dominance with the grasses. The most productive perennial grasses on the allotment are Indian ricegrass, bottlebrush squirreltail, curly grass, needle-and-thread, and sand dropseed. On the lower, flatter, or saltier sites, winterfat, shadscale, and greasewood all occur in extensive and nearly pure stands. Of the important forage species, the BLM has identified winterfat and Indian ricegrass as the key species on which to base their management, utilization, and trend assessment.

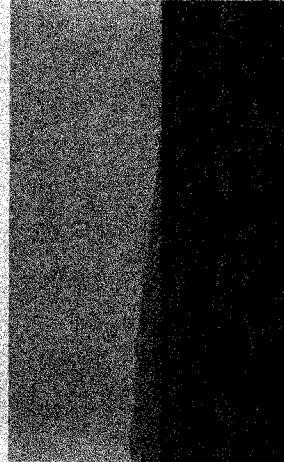


REST ROTATION

The rest-rotation grazing system is thought by both the private ranch managers and the BLM to be responsible for most of the improvement in range condition and trend that is evident on the allotment, and for the enhancement in vigor and productivity of the individual forage plant species. Rest rotation is a grazing system which has attracted its share of staunch advocates and some vehement critics since August Hornum developed it in the 1950's.

The essential features of the rest-rotation system are that the available rangeland is fenced into a number of pastures (usually four or five). Animals are then rotated among the pastures in a pattern such that, each year, one pasture is given a complete rest from grazing. In addition, the other pastures are deferred from grazing during the critical growing season at some point in the grazing cycle. The year-long rest and the deferments are intended to allow the plants to reseed themselves and to maintain their physiological vigor over time.

The grazing system as applied on the Cook Allotment is such that, in addition to the one complete year out of four that a given pasture is rested, each pasture is also deferred from grazing for most of the growing season in two additional years. Also, because the steers are removed from the range in September and restocking doesn't occur until November, there are about two full months when no livestock grazing occurs. If moisture is available during that time, some full regrowth is possible which also contributes to plant vigor.



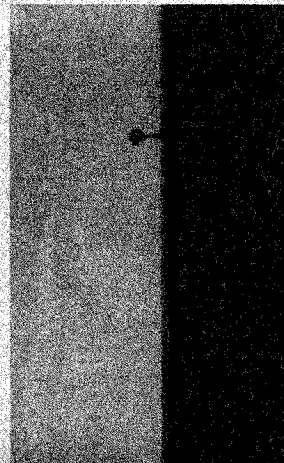
LIVESTOCK MANAGEMENT AND PRODUCTION

The steers on the Cook Allotment are purchased at the Spanish Fork Auction and represent ranches from the northern part of the state. They are taken to holding corrals on private land south of Alford for a two-week quarantine period. During this period they are dipped, branded, and vaccinated. From December through mid-March, the steers are fed a supplement of 1.5 pounds per day of a concentrate containing cottonseed meal, corn, bone meal, and salt.

The animals are purchased and turned onto the range in installments between November and February. From March to September there are about 600 steers on the allotment. The steers usually weigh 400-600 pounds when they are bought. They make an average weight gain of 1.7 pounds per day on the range and leave it in early October weighing an average of 825 pounds. The animals are then moved to California for about 90 days of finishing in a feedlot before final marketing and slaughter.

WATER DEVELOPMENTS

Considerable investment has been made to establish and maintain water developments on the allotment in addition to those that remain from the homesteading days. Numerous wells with windmills and small reservoirs are in place. One additional well and a pipeline extension are contemplated to lure livestock to areas which are at present, lightly utilized. The presence of so many water points on the allotment certainly facilitates good livestock distribution and contributes to successful management.



RANGE CONDITION AND TREND

Under rest rotation, range trend on the Cook Allotment has been consistently upward, even during droughts. In 1962, it took 15 acres to produce enough forage to support an animal unit for a month. By 1974 it required 10.4 acres per AUM. Now (1984) that animal unit can be supported on just seven acres per month.

There have been several positive responses by the forage plants during the period of rest-rotation management. The most dramatic of these has been the increase in the vigor and production of the main forage grasses. Indian ricegrass has increased an impressive 27 percent in density (number of plants/unit area). Amazing changes in cover have also occurred. Cover is a measurement that correlates with the size, general health, and forage production of the plants. In that category, Indian ricegrass increased a whopping 159 percent over a ten-year period. Other perennial grasses are not monitored as closely, but are believed to have attained similar gains.

Winterfat and the other slow-growing shrubs have not changed as much statistically. However, the winterfat stands on the Cook Allotment are probably among the most robust to be found on Utah's desert ranges. The winterfat areas produce as much as 1,000 pounds of highly nutritious forage per acre.

The BLM rates 45 percent of the allotment as being in good ecological condition and another 48 percent as being in fair condition relative to its potential. Though changes on desert lands are often slow and difficult to measure, the apparent range trend is strongly upward. This condition meets management objectives. The BLM gives high marks to the permittees for sticking to the rest-rotation plan even during periods of drought and other adversity. The Bureau believes most of the gains from such management are lost when the system is not consistently applied.

STEERS ONLY VS. COWS AND CALVES

Some persons have suggested that the exclusive use of steers, as opposed to lactating cows and their calves, is responsible for part of the observable improvement. The BLM rates a cow and her calf as an animal unit and a steer at 8 of that value. Whether those ratings accurately reflect forage utilization by the animals and their overall impact on the range is debatable. What is certainly not subject to argument is that grazing steers only makes management easier. There are none of the problems associated with breeding, calving, culling, and production of replacement heifers which are necessities in cow-calf operations.

State Utah
District Cedar City
Allotment Name Perry Well

Date 4-4-67

STATUS OF REST-ROTATION GRAZING ALLOTMENTS

Supplemental information on each rest-rotation allotment:

1. Is the rest-rotation system in operation? Yes X No .
2. Date of start of first grazing season March 1, 1966.
(Actual date for allotments under management. Planned date for allotments not yet in operation.)
3. Is the form of management in effect or to be applied the same as the one reviewed or suggested by Mr. Hormay?
Yes X No . If not, supply the following information:
 - a. Diagram of grazing formula in use or planned.
 - b. Map showing pasture layout.
 - c. Map diagrams showing movement of livestock between pastures for one grazing cycle.

In cases where rest-rotation grazing has been in effect for one year or more, please comment briefly on the prospects, merits or deficiencies of the system. It is a little too early to fully judge the system, but your comments will be helpful in pointing up future grazing training programs.

The grazing system being applied to the Perry Well allotment appears to have great merit for improving and/or maintaining ranges which are and must continue to be grazed during their growing seasons.

No deficiencies have been encountered; the permittee understands and is fully cooperating in the management system.

The Perry Well Allotment is being watched by the other stockmen in the area and we believe it is having a significant educational effect on them.

cc: Utah State Office

Encl. 1

RANGE INVENTORY, ANALYSIS, AND MANAGEMENT PLAN

Project Number _____ Compiler G. Staker & M. Jensen Date June 21, 1965

Allotment Perry Well Unit Mud Spring

District Cedar City State Utah

Name of Permittee Frank Milne

Field Examination (Date) 5/64; 5/65; 6/65

Personnel: NamePosition

Gordon Staker Range Conservationist

Morgan Jensen Range Manager

DESCRIPTION, INVENTORY AND ANALYSIS OF ALLOTMENT

Class of stock Cattle Stocking (AUs) 76 (AUMs) 912Season of grazing (Dates) 4/1 to 3/31 (yearlong)Character of topography Rolling bench land bisected by a large flat-bottomed drainageTable 1. Area of natural vegetation types and culturally treated areas grazed by livestock and by game

Vegetation types and culturally treated areas <u>1/</u>	Total area of type		Area grazed by livestock		Area grazed by game	
			At present	30 years from now <u>2/</u>	At present	30 years from now <u>2/</u>
(name)	(acres)	(per-cent)	(acres)	(acres)	(acres)	(acres)
Sagebrush	4378	41	All	All	All	All
Grassland	2747	26	"	"	"	"
Greasewood	1920	18	"	"	"	"
Half Shrub	665	6	"	"	"	"
Pinyon-Juniper	610	6	"	"	"	"
Saltbrush	257	2	"	"	"	"
Annuaals	63	1	"	"	"	"
Other						
Allotment Total	10,640	100	All	All	All	All

1/ List culturally treated areas under appropriate vegetation types.2/ Under improved management.

Key species for each vegetative type:

Sagebrush

Oryzopsis hymenoides
Hilaria jamesii

Grassland

Oryzopsis hymenoides
Hilaria jamesii

Greasewood

Sporobolus airoides
Agropyron smithii

Half Shrub

Oryzopsis hymenoides
Hilaria jamesii

Pinon-Juniper

Oryzopsis hymenoides
Hilaria jamesii

Saltbrush

Atriplex canescens
Oryzopsis hymenoides

Annuals

Oryzopsis hymenoides

Table 2. Composition, value, use and development of plant species in natural vegetation type or culturally treated area

Type or treated area (name) Perry Well Allotment

Species	Amount in cover	Forage value				Utili- zation ave.	Start growth	Flow- ering	Seed ripe	Regrowth Leaves -twigs	3/ Flower stalks
		Ex	Gd	Fr	Pr						
Grasses & Grass-like	2/ (percent)	Check one)				(Perc 't	(date)	(date)	(date)	(date)	(date)
Oryzopsis hymenoides	20	X				70	3/20	6/5	7/5	5/10	4/15
Hilaria jamesii	21	X				65	5/5	6/10	7/10	--	4/20
Aristida fendleriana	5				X	10	4/10	6/10	7/10	--	--
Stipa comata	7		X			40	4/1	6/10	7/10	5/1	4/15
Sporobolus airoides	4		X			70	5/1	6/10	7/10	--	4/20
Agropyron cristatum	1	X				80	3/15	6/1	7/10	5/15	4/15
Agropyron smithii	T		X			70	4/10	6/10	7/15	5/15	5/1
Sitanion hystrix	1	X				70	3/20	6/5	7/10	5/10	4/15
Total	59										
Forbs											
Phlox	1				X	5	4/1	5/20	6/25	--	--
Salsola kali	3			X		10	6/1	7/25	9/15	8/1	--
Mentzelia albicaulis	1			X		20	4/15	6/5	7/10	5/10	4/20
Sphaeralcea grossulariaefolia	1	X				80	4/1	6/10	7/5	6/1	5/1
Halogeton glomeratus	1				X	0	6/1	8/10	9/15	--	--
Total	7										
Shrubs and trees <u>1/</u>											
Eurotia lanata	1		X			50	3/1	7/1	8/10	5/1	4/20
Artemisia tridentata nova	7		X			15	3/1	7/25	9/15	5/15	--
Chrysothamnus viscidiflorus	14				X	2	4/10	8/20	10/1	--	--
Ephedra nevadensis	2				X	5	5/20	7/20	9/15	--	--
Grayia spinosa	1		X			80	3/1	6/5	7/5	5/15	4/10
Atriplex canescens	1	X				70	3/15	7/1	8/10	5/15	4/15
Sarcobatus vermiculatus*(cont.)	5				X	4	3/15	8/15	10/1	--	--
Total	34										
Grand Total	100										

1/ Including conifers2/ For trees and shrubs include estimates only for species that can be changed or removed in a range improvement program.3/ How late in spring can the species be grazed and still produce grazable leaves or twigs or seed-producing flower stalks?

*(continued)

Artemisia tridentata typica	3				Pr	4	3/25	8/20	10/1	--	--
Artemisia spinescens	T			Gd		60	3/15	7/10	9/1	--	--
Atriplex confertifolia	T			Gd		30	3/25	7/1	9/1	--	--

Table 6. Effect of planned cultural treatments on grazing capacity

Vegetation type to be treated (name)	Artificial reseeding						
	Area	Capacity at present		Capacity 30 yrs. hence due to:		Effect of cultural treatment (6) minus (4) AUMs (7)	
				Grazing management	Cultural treatment		
	Acres	Ac/AUM (1)	AUMs (2)	Ac/AUM (3)	AUMs (4)	Ac/AUM (5)	AUMs (6)
Sagebrush	4378	16	274	13	334		
Grassland	2747	6	458	5	587		
Greasewood	1920	18	107	14	137		
Half Shrub	665	18	37	12	53		
Saltbrush	257	13	20	9	27		
Annuals	63	16	4	8	8		
Total	10030	11	900	9	1146	--	--

Spraying or other treatment

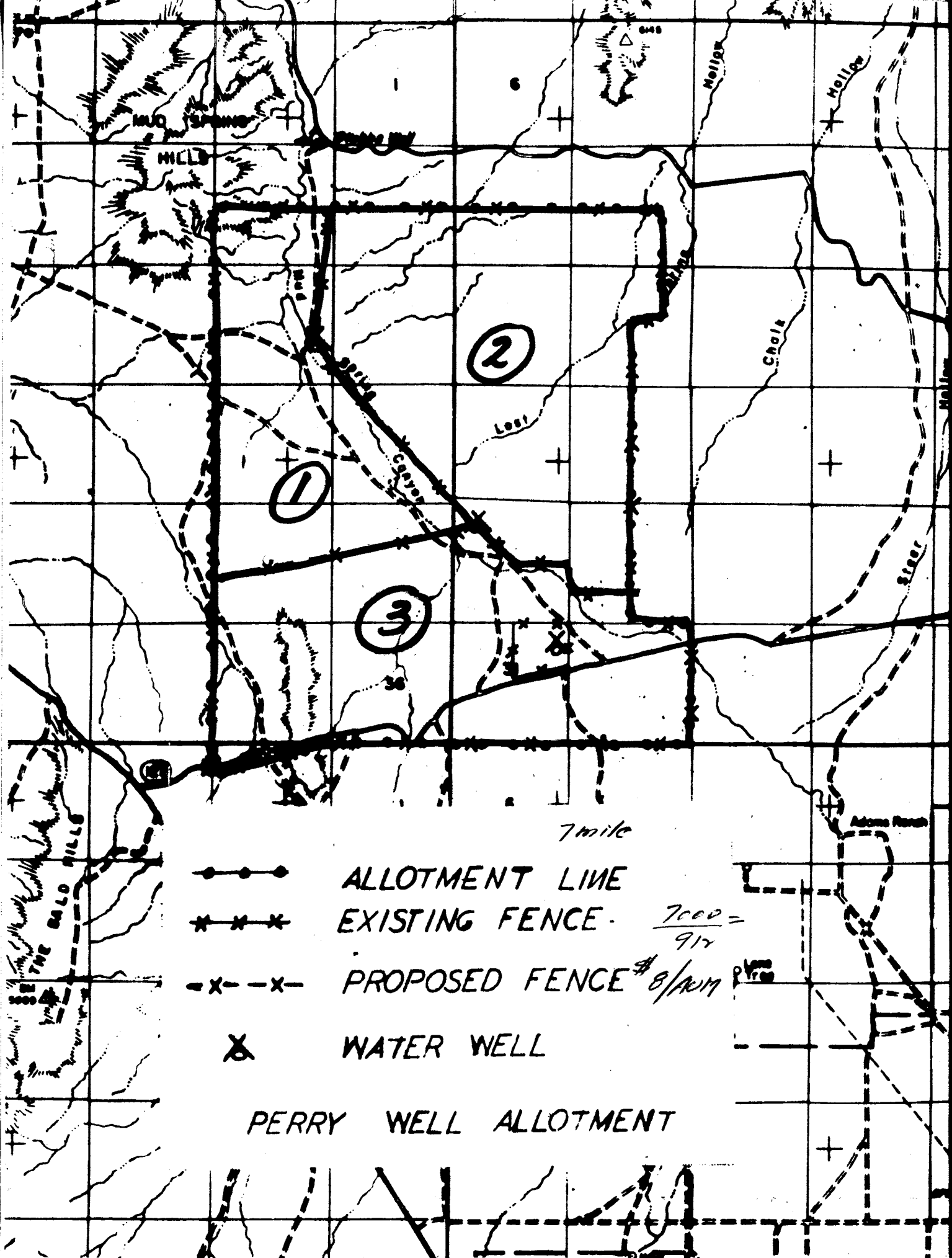
Pinyon-Juniper	610	40	15	30	20	6	101	81
Total	610	40	15	30	20	6	101	81

PERRY WELL ALLOTMENT

REST ROTATION GRAZING FORMULA

Pasture:	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1 A	:	:	:	:	:	:	12	///	///	///	///	///
2 B	A	///	///	///	///	///	///	:	:	:	:	///
3 C	C	:	:	:	:	:	:	:	:	:	:	:
1 A	C	:	:	:	:	:	:	:	:	:	:	:
2 B	A	///	///	///	///	///	///	:	:	:	:	:
3 C	///	:	:	:	:	:	B	///	///	///	///	///
1 A	:	:	:	:	:	:	B	///	///	///	///	///
2 B	A	///	///	///	///	///	///	:	:	:	:	///
3 C	C	:	:	:	:	:	:	:	:	:	:	:
1 A	A	///	///	///	///	///	:	:	:	:	:	:
2 B	C	:	:	:	:	:	:	:	:	:	:	:
3 C	///	:	:	:	:	:	B	///	///	///	///	///
1 A	C	:	:	:	:	:	:	:	:	:	:	:
2 B	///	:	:	:	:	:	B	///	///	///	///	///
3 C	A	///	///	///	///	///	:	:	:	:	:	:
1 A	C	:	:	:	:	:	:	:	:	:	:	:
2 B	///	///	:	:	:	:	B	///	///	///	///	///
3 C	A	///	///	///	///	///	///	:	:	:	:	:
1 A	:	A	///	///	///	///	///	:	:	:	:	:
2 B	///	///	:	:	:	:	B	///	///	///	///	///
3 C	C	:	:	:	:	:	:	:	:	:	:	:
1 A	A	///	///	///	///	///	///	:	:	:	:	:
2 B	C	:	:	:	:	:	:	:	:	:	:	:
3 C	///	:	:	:	:	:	B	///	///	///	///	///
1 A	C	:	:	:	:	:	:	:	:	:	:	:
2 B	///	:	:	:	:	:	13	///	///	///	///	///
3 C	A	///	///	///	///	///	///	:	:	:	:	:

Grazed ///





RANGE TYPE MAP
PERRY WELL ALLOTMENT

-  SAGEBRUSH
-  SALTBRUSH
-  ANNUALS
-  PINYON - JUNIPER
-  GRASSLAND
-  HALF SHRUB
-  GREASEWOOD

No respiratory paralysis

Loco must be grazed for some time
before symptoms are evident.

90% animals weaght in two months

370 % animal wt in 3 months = death

First symptoms 6 to 8 weeks after start
ingestion

Death 10 to 14 weeks

Head down

Abortion common

Inability eat drink

Ulceration pyloric orifice of abdomen.

Pregnant cow

edematous cond. fetal membranes

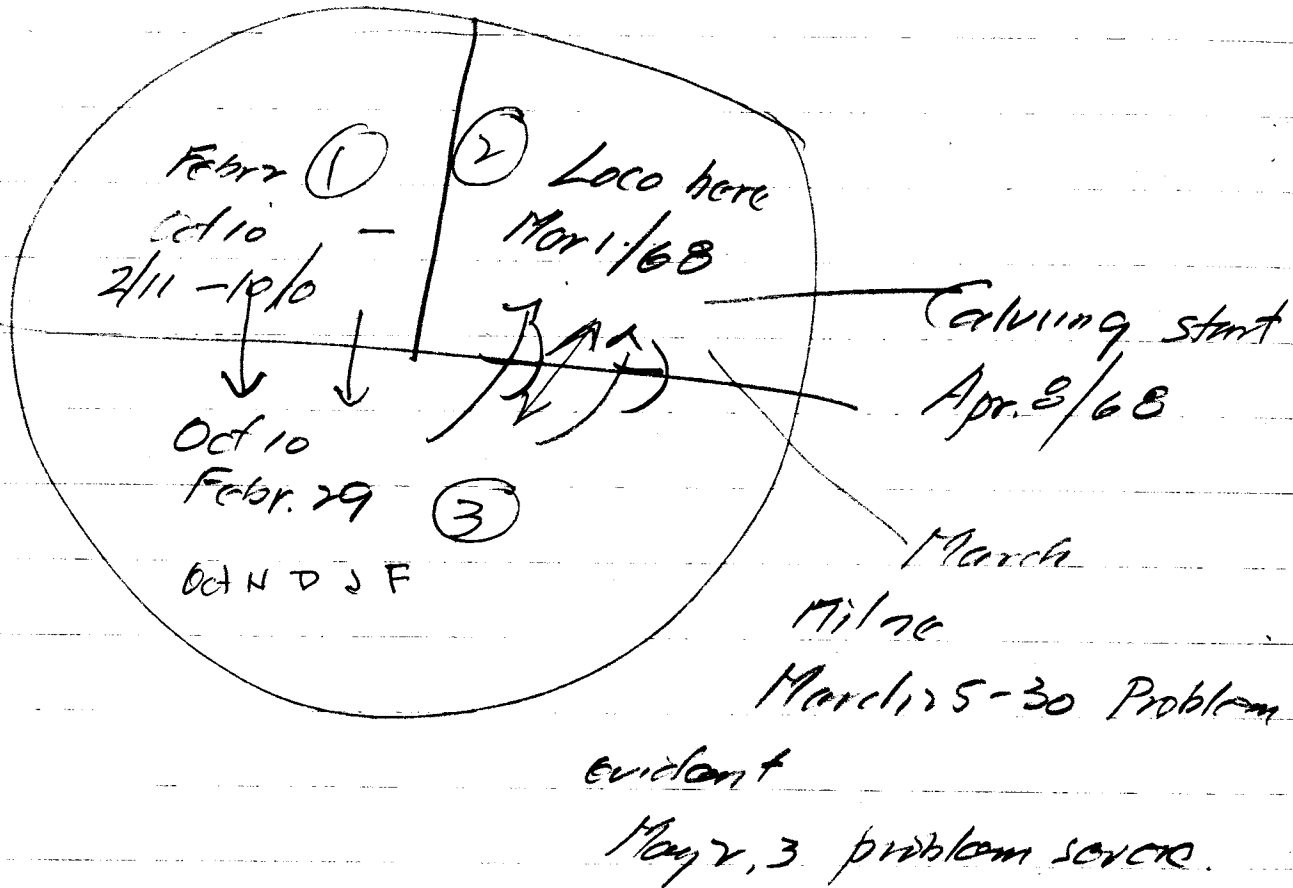
water belly

Fragmentation of Golgi cells

Most specific lesion 100% pos. only.

Use-

Febr 11/67 - Oct 10/67



May 15 ARS Annual Disease Experts
on allotment

Aschysolus lentiginosus. Toddie
bees poisoned by speckle/loco principle
"locaine" antenae

