



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

November 7, 1975

Memorandum

To: District Manager, Bakersfield

From: Range Conservationist

Subject: Wells Meadow Allotment Evaluation,
Bishop Resource Area.

I visited the Wells Meadow Allotment on October 29, 1975, with Ben Collins, Resource Area Manager, and Brad Hines, Range Conservationist, at the former's invitation to "take a look at the AMP on the ground." This allotment, as you know, is under rest-rotation grazing management. It is located on a critical deer winter range where bitterbrush is a very important food plant for deer. Rest-rotation management of the allotment got under way in 1966 ten years ago.

In a recent memorandum to the area manager I made suggestions on management of the allotment. A copy of this memorandum written in the latter part of September 1975, inadvertently not dated, was sent to you. The subject was Wells Meadow Evaluation. My recent appraisal of the situation on the allotment reaffirms the suggestions I made in September.

In 1967, only one year after start of operations, there were indications that the degree of hedging desired on bitterbrush probably could not be obtained with the young cattle that were grazed on the allotment. In a memorandum to the district manager on May 12 of that year I wrote, "Grazing use by cattle was not as heavy as I would have liked. Perhaps closer use will be obtained in the future as the cattle become more familiar with the range. Also, Holstein cattle may not browse as heavily as the standard beef breeds. The fact that the animals were relatively young also may account for lighter grazing than anticipated."

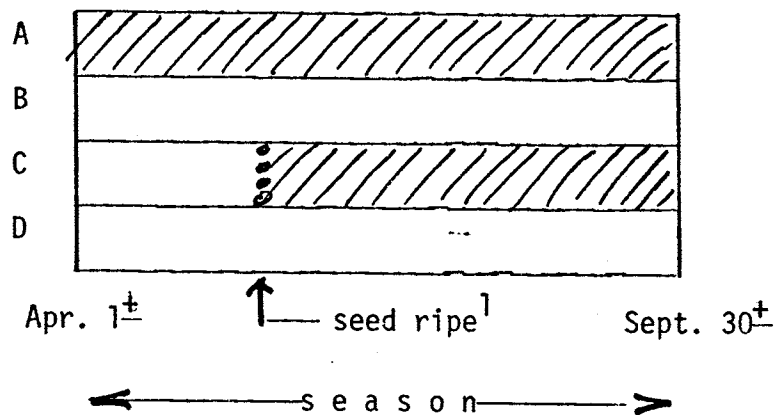
I recommended increasing stocking to get closer hedging. Heavy stocking was not obtained, however, until this year--eight years later. But even with greater stocking and heavy overall use of the vegetation, bitterbrush was not hedged perceptibly closer than before. It is clear, therefore, that ideal hedging cannot be

obtained with young cattle. Older animals, cows, are needed to accomplish this.

Although the hedging obtained with young cattle was not up to that desired it was beneficial. Plants grazed by cattle (and deer) are more vigorous and produce more usable herbage per unit of crown area in both grazed and rested conditions than plants grazed by deer alone. The plants remain in semi-open form and even in grazed condition provide considerable herbage to deer.

The original grazing formula for the allotment was written to get close hedging of bitterbrush as quickly as possible. It called for grazing three pastures out of four each year. Even with this use and heavy stocking desired hedging has not been obtained, however.

There is no need to continue to use three pastures. Hedging comparable to that obtained this year can be obtained with only two. I suggest changing the grazing formula to the one shown below



¹Base on *Sitanionhystrix*, *Oryzopsis hymenoides* or *Stipa speciosa* which ever ripens seed latest.

Stock the grazed pastures to get the intensity of vegetation use obtained in 1975.

This formula with heavy grazing will give as heavy use on bitterbrush as can be obtained with the kind of cattle now available. It provides more time for establishment vigor and reproduction of perennials, woody and herbaceous, than the original formula. It

should hasten the establishment of a full cover of perennial vegetation on the area. And very important, it provides more ungrazed vegetation for deer and other wildlife, double the amount provided heretofore.

I suggest the formula be applied this coming grazing season. In the meantime, the allotment management plan should be revised and evaluation procedures modified. I will be glad to help with these things.

The Wells Meadow Allotment is unique. It is an area on which use of cattle grazing to produce more food for deer and other wildlife is being demonstrated. It should be given greater attention than in the past. The setup leaves considerable to be desired. But it can be improved and can serve well as a demonstration area. The need for due and proper consideration of game and fish and other wildlife in land management planning is becoming increasingly important and urgent each day. Results from Wells Meadow can be exceedingly helpful in such planning.

P. L. Army

cc:
Bishop Resource Area
BFCollins
State Office, Resources
Denver Service Center, 300

P.S. In a few days I will send you a memorandum on bitterbrush seed planting and germination, deer observations, fence changes, etc.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Bishop Area Office
Rt. 2, Box 26
Bishop, California 93514

IN REPLY REFER TO

4115
(C-015.3)

A. L. Hormay
P. O. Box 245
Berkeley, CA 94701

NOV 14 1975

Dear Gus:

As per your request made on your Bishop trip of 10/29/75, I have tried to find a copy of the first written AMP on the Wells Meadow Allotment. I did find a somewhat incomplete brief description on the system (no date, however) and a memo from the California State Office dated September 1968 in which a critique of the Wells Meadow AMP is discussed and a reference to solicit your help is mentioned. I assume that this incomplete written plan correlates with the data collected by Jack Seley and Rodger Brubaker in May of 1965.

I've talked to Jack Seley in Casper and he indicated that he knew of no written AMP plan prior to your involvement on Wells Meadow. Jack did state that the original intent/objective of the Wells Meadow Allotment was to change the bitterbrush form and vigor through cattle grazing for the benefit of the deer.

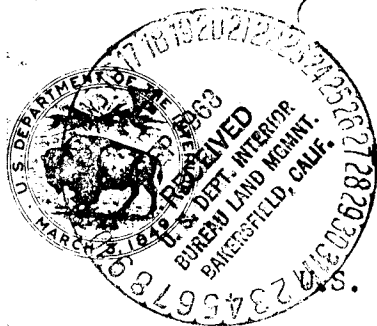
I'm sorry that this is all the information I could come up with. Jack Seley did say that he'd check his personal records and if he found anything, he would send it on to me.

Sincerely,

Brad Hines
Range Conservationist

Enclosures (2):

- Encl. 1 - Wells Meadow AMP (no date)
- " 2 - Sept. 1968 memo from S.D.
to D.M.



UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

STATE OFFICE

U.S. Courthouse & Federal Building - Room 4017
650 Capitol Mall
Sacramento, California 95814

IN REPLY REFER TO:

0491-C.03c
4112.15

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Memorandum

To: District Manager, Bakersfield

From: State Director

Subject: Wells Meadow Allotment Management Plan

The subject plan has been reviewed by the State Office. We find it very complete and well prepared. You and your range staff are to be complimented on the high quality work that has gone into preparation of the plan. We hope you are able to continue work through on the ground activation of the plan and in the interpretation of the results.

Our comments or critique of the plan are few and mostly on detail. These are:

1. Map

All range improvements proposed and existing should be on the map or overlay. We think it is well to consider indexing by number or letter the tabulated improvements in the report to the map.
2. Forage data including vegetative types, acreages, carrying capacity etc is well described but scattered over 3 or 4 parts of the report. In future plans it would simplify things to include all this data into one tabulation.
3. While it isn't so important in the Wells Meadow Plan in most of them it is necessary to tabulate the year long operation. That is, show where the livestock are for the full year. This is best shown in brief tabular form.
4. You have described one key species and one plant as being managed for (Bitterbrush). Still in the grazing system formula (form 4112-3), also in your objectives (p-12) and in the "B" and "C" treatments of the grazing system the improvement and propagation of Desert Needle grass carries almost the same emphasis as Bitter brush. This might justify the addition of Desert Needle grass as a key species. Mr. Hormay probably

is the most qualified to make this determination.

We are attaching the plan to these comments and when it is put in final form, request that a copy be supplied the State Office.

Attachment
Wells Meadow AMP


Acting

Wells Meadow Rest Rotation System

The Wells Meadow Allotment is a system of four pastures that encompass approximately 2,030 acres of critical deer winter range. Pastures 1, 3, and 4 are Federal land and pasture 2 is leased by the rancher from the City of Los Angeles.

The key browse plant for deer in this allotment is antelope bitterbrush, Purshia tridentata. Many of the bitterbrush plants have become decadent and in some instances the plant form has been altered to a tall tree-like plant with leader growth confined to the top of the plant. Heavy hedging by cattle interspersed with rest periods is reputed to maintain bitterbrush plants in a vigorous condition whereas browsing by deer alone creates the clubbed and tree-like plants common to deer winter ranges.

Objectives:

1. To improve the forage production for both deer and livestock.
2. To improve the vigor of the existing bitterbrush and related species.
3. To improve the reproduction potential of the major species.
4. To prove that cattle grazing is not detrimental to bitterbrush on deer winter ranges and that livestock and wildlife are compatible uses for the Federal range.
5. To provide forage for the G. B. Voget livestock operation.

To accomplish our objectives we have developed a rest rotation grazing system using four pastures. The key species managed for is bitterbrush, but consideration is given to other related species. The rest periods are arranged so that the bitterbrush plants will produce leader growth in one year with continued rest from livestock grazing until these leaders produce seed in the second year, thus promoting maximum seed production and providing the best opportunity for reproduction. Following seed production the plants are grazed heavily to produce a rounded plant form and to trample ripe grass seed into the soil for reproduction. The grazing formula for one pasture over a period of four years is attached.

Wells Meadow

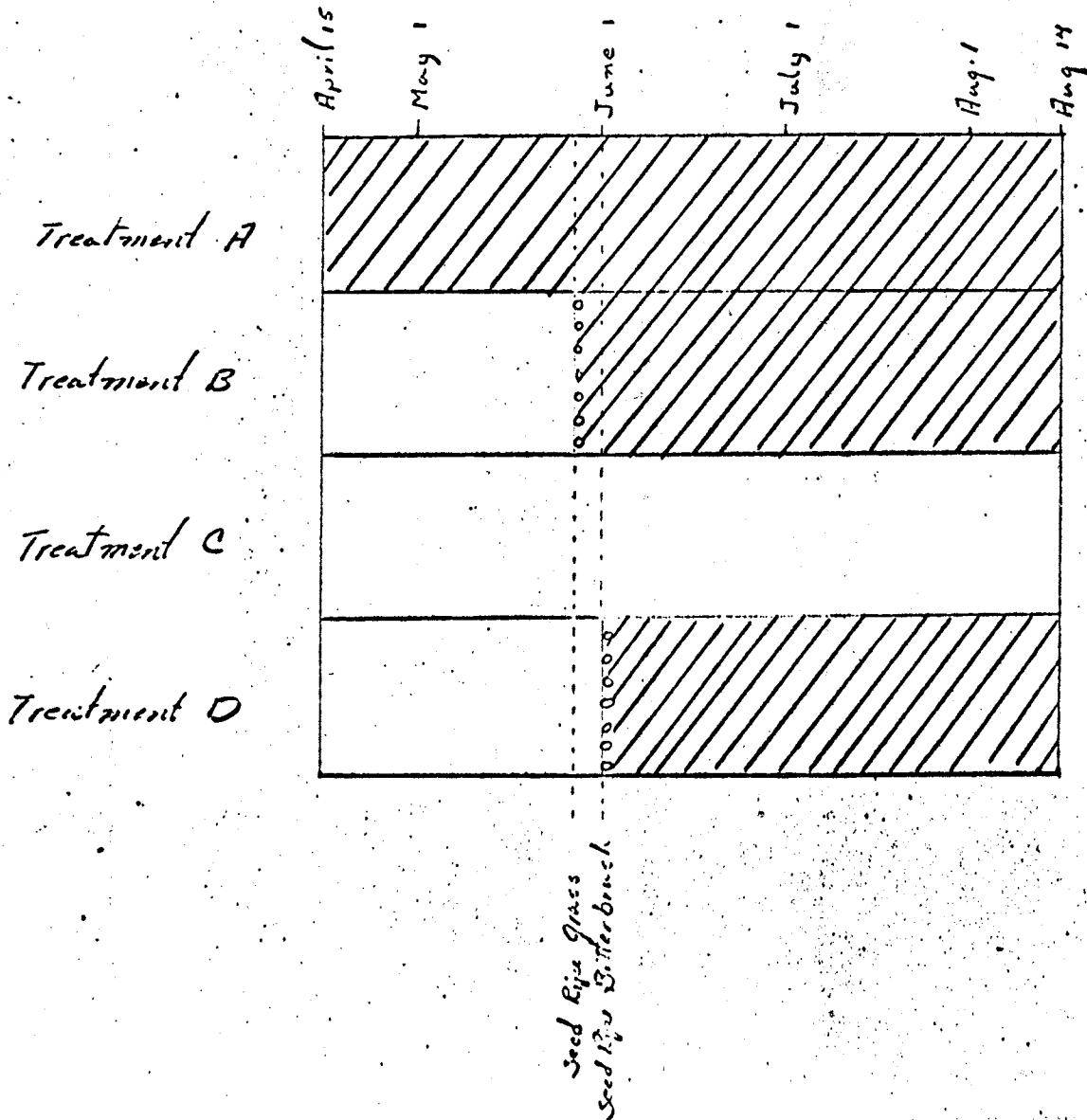
Rest Rotation Formula

Treatment A: Graze the range for maximum livestock and deer production and to alter the form of the Bitterbrush plants to that of a low compact shrub.

Treatment B: Rest until seed ripe time for grass for grass seed production and to increase plant vigor. Graze heavily after seed ripe to trample grass seed into soil, for livestock and deer production, and to produce low compact Bitterbrush plants.

Treatment C: Rest full season to increase vigor, establish grass seedlings and produce leader growth on the Bitterbrush.

Treatment D: Rest until seed ripe on Bitterbrush to insure seed production on last years leader growth. Graze heavily after seed ripe for livestock and deer production.





United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240*Berkeley*
Nov. 17 1975

MEMORANDUM

To: Manager, Bishop Resource Area

From: Range Conservationist

Subject: Management and monitoring procedures,
Wells Meadow Allotment

The following projects should be undertaken or considered this fall before the AMP is revised.

Bitterbrush seed line plantings

You probably have put in all these plantings by now. They are experimental and will probably be carried on only one more year. They should provide useful information for managing the allotment.

The plan for these plantings is as follows:

Planting locations, two

1. On the allotment, on the firebreak in pasture 2
2. Off the allotment, on the firebreak north of pasture 2

Planting methods

Plant seeds 1.50 to 1.75 inches deep in the soil at one foot intervals along 100 foot lines

Plant four lines in each location each with a different kind of seed. The seeds are

- (A) Unconditioned seeds, stored previously at 30°F for two years
- (B) Unconditioned fruits of seed lot (A). Stored as (A)
- (C) Conditioned seeds stored three years at 30°F
- (D) Conditioned seeds stored three years at 0°F

Plant 5 seeds at each foot mark in the case of seeds (A), (B) and (C) and one in the case of seed (D).

Establish the lines parallel to each other and 6 to 10 feet apart. Stake and mark clearly.

Records

Check the plantings regularly through winter to see if rodents bother the seeds.

Record germination in spring on Pt Form No. 1 (copies enclosed). Make four examinations, the first at the start of germination--late April or early May--and then three times thereafter at 3 or 4 day intervals. The germination period will last about 10 days.

At the end of the germination period account for germination results in 5 widely spaced spots along each line where no seedlings emerged. Lift the "spots"--soil and seeds--out with a shovel. Spread out each in a pan to examine. Record the number of seeds that germinated but failed to emerge. Give reason for result. Planted too deep? Unhealthy seed, root abnormal? etc. Record number of ungerminated seeds.

The total seeds in a sample (T) is the total of germinated and ungerminated seed and may be less than 5 in the case of seeds (A), (B), and (C). Some seeds in the spots may not be found.

Determine the total number of viable ungerminated seeds. The viability of seeds can be determined by observing the growth of excised embryos. The roots of viable embryos that have been freed of seed coats start growing in 36 to 48 hours at room temperatures--65^oF to 75^oF.

To excise an embryo first soak the seed in water for 12 to 18 hours. In the case of fruits, remove the husks from around the seeds before soaking. Then cut across the widest part of seed with a razor blade (single edge safest) and press down on the pointed end (of the seed) with a finger against a hard surface. The embryo will press out of the seed coats. Cutting off the ends of the seed (ends of the cotyledons) does not interfere with growth.

Germinate the embryos on moist filter paper in Petri dishes at room temperatures for five days. Record results on Pt Form No. 2 (copies enclosed).

An embryo is "germinated" when the root reaches a length of 2 to 3 mm. The roots will grow to a length of 6 to 10 mm in 3 days or less.

Distinguish between normal, healthy embryos and abnormal unhealthy ones on the record form. A normal, healthy embryo is creamy white in

color and has a smooth satiny sheen. An abnormal, unhealthy one has a grayish or glassy appearance. The root tip may be black or dark brown in color because of decay or the cotyledons may be deformed because of insect damage or abnormal development.

Use two thicknesses of filter paper in a dish. Moisten by covering the paper with water and pouring off the excess. Remoisten during the germination period as needed. Store the dishes in 2-pound coffee cans covered with plastic lids during germination to conserve moisture. Be sure each dish is properly identified-kind of seed, location, sample or spot number, date of sample, date into germination.

Bitterbrush Seed packet plantings

The purpose of these plantings is to determine the conditioning, germination and fate of bitterbrush seeds (and fruits) in the soil during winter. Observations of this kind, will be made each year, but probably on a smaller scale.

The seeds (and fruits) are enclosed in wire screen packets to protect them from rodents and larger insects. I am sending you two samples of the packets to guide you in making them up. The long wire attached to a packet is used to locate the packet in the soil and under snow and to withdraw it from the soil. The free end of the wire is attached to a lath stake used to locate the wire. A stake is driven into the soil 12 inches or so to one side of a packet.

The packets are planted in two locations, one on and one off the allotment near the 100 foot line plantings. Three kinds of seeds (A), (B), and (C) are planted in each location in parallel lines spaced 24 inches apart. Twenty-five seeds (or fruits) are enclosed in a packet. Select the larger and healthier looking seeds and fruits for this test. In seed (C) throw out all previously sprouted seeds. The dried roots are evident. Twelve packets are planted 1.50 to 1.75 inches deep in the soil and spaced 12 inches apart along each line. A total of 72 packets are needed.

A packet is taken at random from each line every two weeks throughout winter and early spring. A total of six packets will be observed each time.

The number of germinated seeds at the time a sample is taken is recorded on Pt Form No. 2. A seed is germinated when the root protrudes 3 mm or more outside the seed coats. Distinguish between normal and abnormal seeds (see form).

Determine the degree of conditioning of ungerminated seeds in a packet by soaking the seeds in water for 3 or 4 hours (fruit 48 hours)

and germinating the seeds for 5 days--at room temperatures. Record any additional germination. Then determine the viability of all ungerminated seeds. Account for all 25 seeds in a packet.

Install a minimum thermometer at seed packet depth at each of the two planting locations. Read and re-set the thermometers each time samples are taken. Record temperature on the form.

I am sending you a sample of excised embryos, two seed packets and most of the materials you need to carry out the germination and other tests.

Deer observations:

Do bitterbrush plants grazed closely by cattle in summer provide much if any forage for deer in winter? Do such plants provide more or less forage than those grazed by deer alone? To what extent are management objectives with bitterbrush being realized?

Systematic observations on the location of deer with respect to pastures, vegetation types, elevation zones, burned over areas, firebreaks and other factors in winter could be helpful in finding answers to these and other questions.

I believe more objective and systematic observations than have been made to date would be very much worthwhile. I suggest you get together with the Fish and Game Department and others and work up a program. I'd like to see observations begin as soon as possible this winter and made for a day at least every two weeks until deer go up hill in springtime.

Fencing

The pastures at Wells Meadow were not layed out in the best way to carry out rest-rotation management. All pastures should have been oriented up and down slope and arranged so stock could graze in and out of any one pasture without crossing another. This may still be accomplished, though not ideally, by building lanes among pastures and the ranch headquarters, a new fence between pastures 3 and 4 running up and down slope and still another across the deer enclosure (fig 1). The proposed new grazing formula can be applied this coming year without new fences and lanes if pastures 3 and 1 are used and treatment A is applied to pasture 3 and treatment C to pasture 1 (fig 2). By 1977, however, new fences and lanes would be needed. Pasture modifications should be given careful consideration this winter as the AMP is revised.

See Nov 7/75 Memo for suggested new formula

I am sending you a copy of California Forest and Range Experiment Station Research Note No. 34, Bitterbrush in California, by August L. Hormay June 1943. Perhaps it will give you further insight on the requirements of the plant and its management. The idea of rest-rotation management was not born when this paper was written. It came along in 1948 five years later.

You will be hearing from me sometime next month on revision of the AMP.

A. L. Hormay

Enclosures

cc:
DM Bakersfield
S.O. Resources
DSC 300

P.S. I am revising Pt Form No. 2. Will send you copies in a few days.

Enclosures:

NOV 1 1975

Mailed to: (11/19/75)


B. Collins - Research Note No. 34, Pt Form No. 1,
Fig. 1, Fig. 2, plus supply Pt Form No. 1.

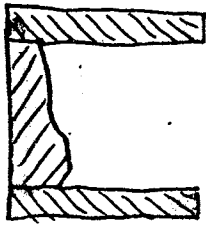
DM Bakersfield - Research Note. No. 34, ~~copy of~~
~~Pt Form No. 1~~, copies fig. 1 and 2.

S.O. Resources - Research Note No. 34, ~~copy of~~
~~Pt Form No. 1~~, copies fig. 1 and 2

DSC 300 - Research ~~Number~~ Note No. 34, ~~copy of~~
~~Pt Form No. 1~~, copies of fig. 1 and 2.

Figure 1
Proposed fence
changes

 New fence

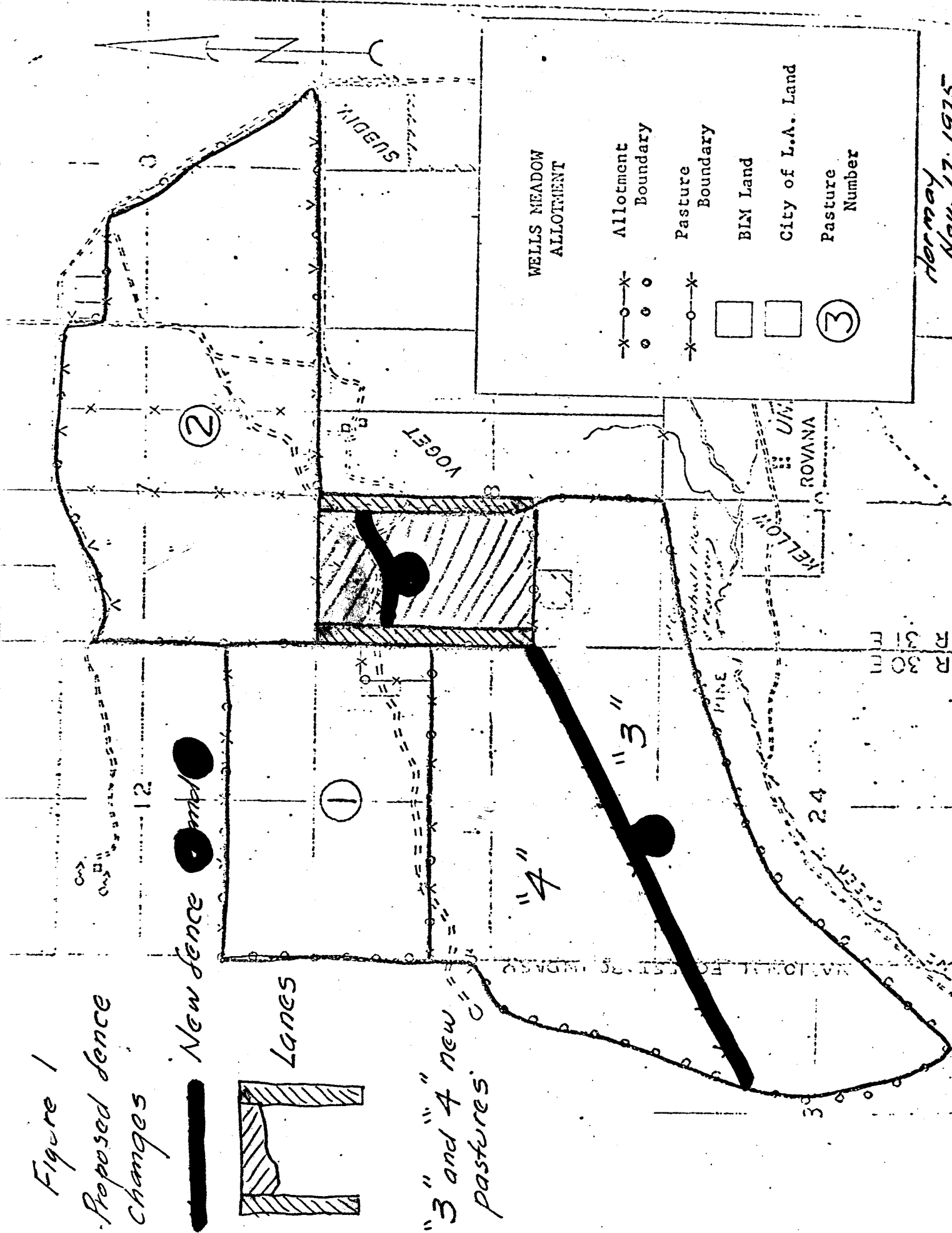


Lanes

"3" and "4" new pastures

"4"

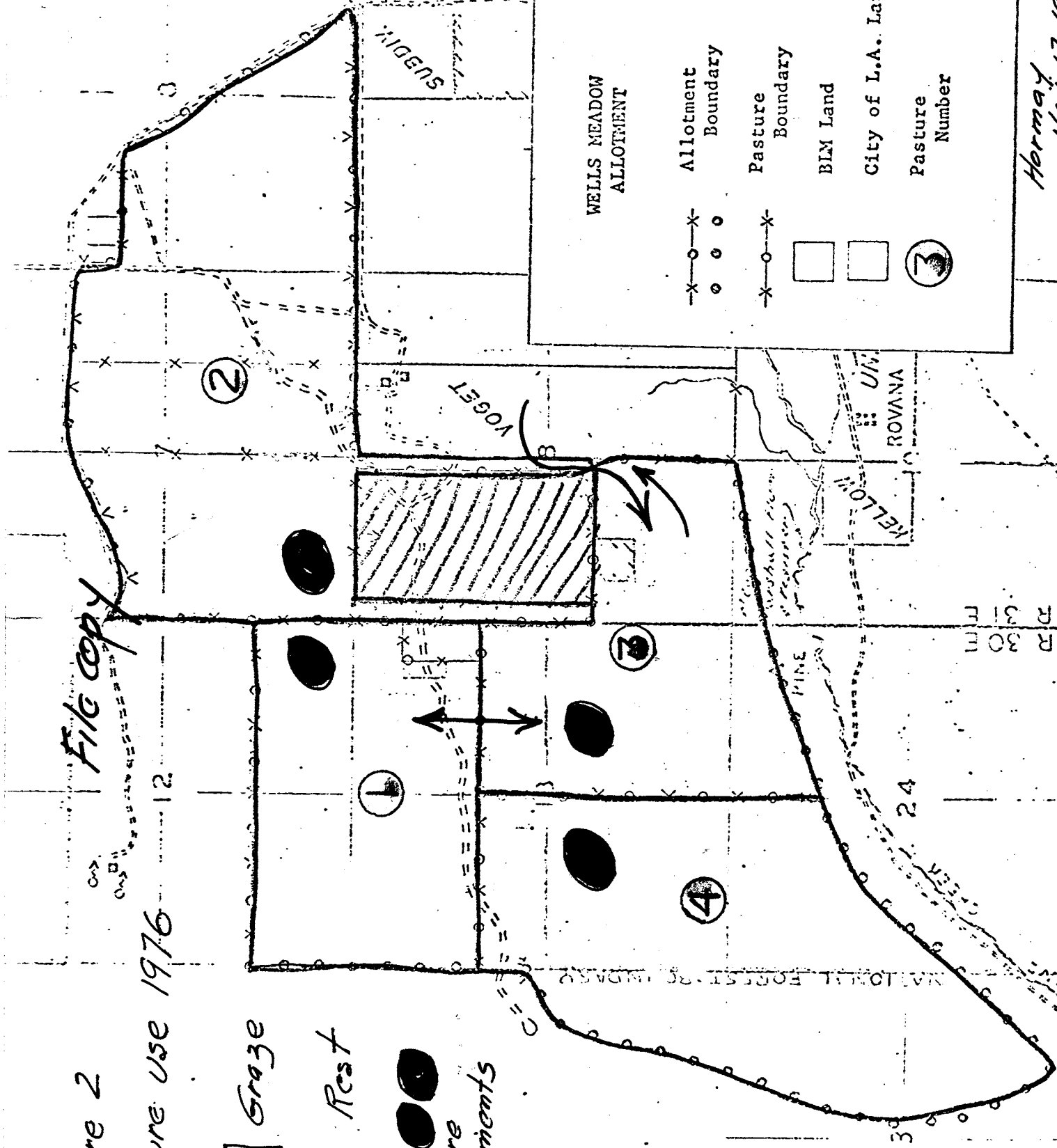
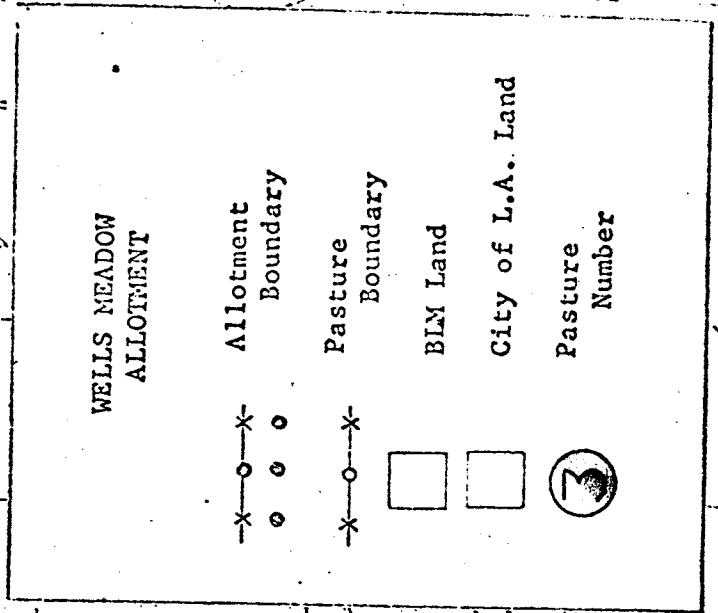
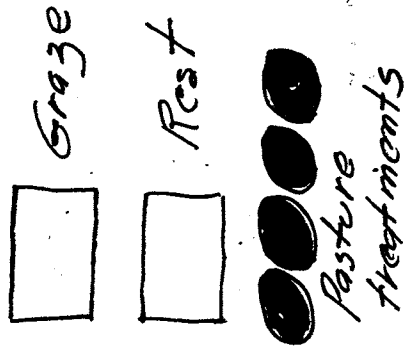
"3"



Hormay
Nov. 17, 1975

File copy

Figure 2
Pasture Use 1976



Horner
Nov 17 1975

R 30
F 30
M