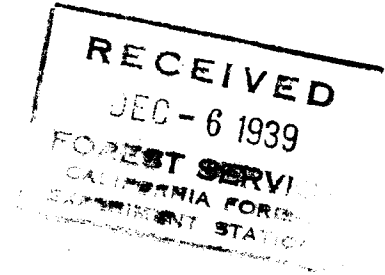


RR (G)
MANAGEMENT
Pine Ranges ✓

San Francisco, California
December 4, 1939



MODOC TAHOE
FOREST SUPERVISORS - SHASTA MONO
 LASSEN INYO
 PLUMAS

In order to assist the Experiment Station in the development of their range research program for the east-side ranges, it is desirable to go into an analysis of all possible problems. Accordingly, there is attached our idea of most of the problems of this area which are present at least in some localities.

We should like to have you go over this outline and also review the problems as you see them, and then point out to us which of those we have listed and any others that are problems on your Forest; the extent to which they are problems and the area to which they would apply; and advise us as to their priority, for study by the Station.

We should be glad to have your reply by December 15.

F. P. CRONEMILLER

F. P. CRONEMILLER,
Assistant Regional Forester.

Enclosure

RANGE MANAGEMENT PROBLEMS - EASTSIDE TYPES, REGION 5

The eastside Sierra ranges are made up of a number of major forage types mainly:

Timber - Eastside Pine
Sagebrush
Bitterbrush
Woodland - Juniper & Pinion
Wet meadows
Dry meadows
Moist Stringers - Stream bottoms

These ranges are in various stages of condition and the problems facing administration are whether under present stocking and management practices we are maintaining or building up these ranges to our major objective of perpetuating the forage resources. Briefly the problems are:

1. Seasons and intensities of grazing use on the major eastside forage types which will allow for the maintenance of the forage values in satisfactory condition or recovery of those in varying stages of depletion.
2. Management practices that are practical or feasible on the eastside ranges which will aid in securing more even use of the forage by control of livestock.
3. Restorative measures which can be economically developed to help rehabilitate depleted ranges.
4. Correlation of livestock grazing with other uses which are in conflict or competition.

To be more specific the problems in each of the above forage types which administration is concerned about are:

Eastside Pine timber types.

1. The relative increase in amount of forage after logging and the subsequent decrease as reproduction takes over.
2. Stocking and management practices to maintain grazing capacity on cutover land, and secure distribution and utilization by stock where intermingled with other types.
3. Effect of grazing on establishment of satisfactory timber reproduction.

Sagebrush and Bitterbrush Types.

1. In general there are problems of depletion in herbaceous and perennial grass vegetation, and bitterbrush not thrifty or reproducing. Stocking or protection needed for recovery of these types.
2. Restorative measures possible for rehabilitation of these types.

Woodland - Juniper and Pinion.

1. Low forage value types. Stocking and seasonal use to maintain or build up grazing values.
2. Management practices and developments to facilitate more even use of range.
3. Game winter range, competition with livestock.
4. Restorative measures to rehabilitate depleted areas.

Moist Stringers and Wet Meadows.

1. Generally problems of overuse. Stocking and seasonal use to maintain or permit recovery of forage values.
2. Management practices to prevent overuse and secure better distribution of stock on ranges of mixed types.
3. Erosion - Control and restorative measures for rehabilitation.

Dry Meadows.

1. Generally problems of overuse and wide fluctuation of forage production. Stocking and season of use to maintain or improve forage conditions and consideration of seasonal fluctuations.
2. Erosion - Control and restorative measures.
3. Management of stock to prevent overuse and secure better utilization of other types.

The following are some of the salient questions in connection with the above problems which need answers by research to work toward a solution of those problems.

Questions relative to Proper Stocking:

1. Utilization Standards

- (a) What are proper use factors for important forage species in all types.

- (b) Develop tangible measurements for determining utilization
- (c) Forage preference of stock by periods.

2. Season of Use.

- (a) What are plant requirements for growth and reproduction for key forage species.
- (b) What are nutritive values of forage plants by periods.

3. Fluctuations in Climate.

- (a) Effect of climatic factors on quantity of forage.
- (b) " " " " " forage values.
- (c) " " " " " vigor of plants.
- (d) How often to expect cycles of drouth.
- (e) What is the normal year on which to base grazing capacities.

4. Disturbance by logging, overgrazing, etc.

- (a) What is the response of forage in timber types after logging.
- (b) How rapidly is forage crowded out by timber reproduction on cutover land.
- (c) What use can be made of depleted areas and expect recovery by natural revegetation.
- (d) How rapidly will depleted areas recover by natural revegetation.

(1) Natural reproduction of forage plants

Seed production
" viability.

Questions of Stock Management.

1. Management of Cattle.

- (a) What is the natural behavior of cattle on the range without effort made to distribute them? What is the distance from water cattle will graze in different types and topography and utilization allowable for various distances?
- (b) Effectiveness of management practices in securing better distribution.

Salting
Riding

- (c) What is necessary to obtain more even utilization in combinations of types with cattle.
- (d) What then can be considered as usable area by cattle and how can these be determined.

2. Management of Sheep.

- (a) What is the effect of distance from water on utilization by sheep.
- (b) What is the effect of different herding systems on utilization and grazing capacity?

Questions relative to Range Rehabilitation.

1. Erosion Control.

- (a) What is the relative importance of the various factors causing accelerated erosion.

- Soil
- Cover
- Slope
- Aspect
- Grazing use.

- (b) What is the effectiveness and practical limitations of erosion control measures.

- (1) Natural revegetation

- (2) Artificial planting
 - Transplants and cuttings
 - Seeding

- (3) Structures
 - Checkdams and plugs
 - Water table dams

- (c) How coordinate 1, 2 and 3 above into an erosion control plan for individual area.

2. Artificial Reseeding

- (a) Where is artificial reseeding possible.
- (b) What species are best adapted to different sites.
- (c) What are the best methods of planting
- (d) When to plant
- (e) Practical limitations.

3. Natural Revegetation

- (a) Where can satisfactory range recovery be expected by natural revegetation.
- (b) How much time is required for satisfactory recovery.
- (c) What degree of stocking or protection is needed.
- (d) What is ultimate condition we can maintain with grazing use.

4. Water Spreading.

- (a) What is rate of improvement of range under irrigation.
- (b) What success can be had with artificial reseeding with irrigation.

Questions of Correlating Grazing with Other Uses.

1. Timber production.

- (a) What ^{effect} does livestock grazing (mainly sheep) have on establishment of young seedlings.

2. Wildlife

- (a) What are main forage species used by deer. Preference of food.
- (b) How to determine grazing capacity for deer - Proper use factor tables.
- (c) What is forage competition between deer and (1) cattle (2) sheep.

3. Watershed Protection.

- (a) How much vegetation should be left after grazing to protect soil and prevent water loss.

Economic Considerations.

- 1. What does conservative stocking mean in pounds of beef, dollars and cents.
- 2. What does it mean to calf crops.
- 3. " " " " in operating costs.

HP
Res. Prog.
Prob. and
Pine

RR (G)
MANAGEMENT - Tahoe
Pine Ranges

Nevada City, California
December 8, 1939.

REGIONAL FORESTER:

Reference circular of December 4, regarding east side ranges.

We have on the Tahoe (and on the Mt. Rose area of the Mono) the types listed on Page 1.

Under paragraph 1, numbers 3 and 1, in this order, are major problems:

East Side Timber Type

I

Under No. 1, we have a good idea, though not detailed observation notes on this phase.

M

Under No. 2, I believe we have a pretty clear understanding of what is necessary here and where we have complete control, are securing results. This is not true on private land as we have not been able to secure 100% compliance of owners in stocking and handling.

H

Under 3, we have very definite ideas here, also results and notes on specific areas.

Sage brush and Bitterbrush Types

A

No. 1. We need information on this that can only be obtained by a full time study. Occasional notes have not sufficed.

No. 2. Study on this needed in conjunction with No. 1.

Woodland Juniper

This type is a minor one on the Tahoe and is included as a sub-type in our sage areas on rocky spurs.

Moist Stringers, etc.

A

I believe this is most important on our high country. All the smaller wet types are going down hill - ~~either~~ drying up and becoming lodgepole thickets or willow types. Because they are often bordered by timber types with little or no feed, these types are overgrazed. This is true especially of the ranges along the crest of the mountains, along west side of Lake Tahoe and on north to Sierra Valley above 6000'. On some areas, changes of numbers and season do not secure needed betterment; closing only remedy.

Dry Meadows.

Not important problems with exception of one rather large area north of Truckee - Merrill Valley and Dry Creek - where erosion has resulted in a miniature grand canyon gully; and Dog Valley where erosion is ruining a large area formerly meadow.

Proper Stocking

Utilization Standards

(a) & (b) There has been considerable work done on this problem but we need a lot of field work and study for our bitterbrush types. Even with reduction in numbers, bitterbrush is on the down grade.

(c) This would be interesting. We have a lot of data, unorganized, no doubt, but observations of past years on this subject which should give us a lot of valuable data if organized. On our east side it would probably not be of more than scientific interest as amount of forage available is limiting factor and utilization covers nearly all species.

2. (a) & (b) May develop data that would cause us to stock a range on the basis of only a few species ignoring those of minor value.

3. It is believed that this factor plays a very important part in the range program. We know volume of feed varies but not how much with variations in moisture and temperature. This item should give us some good information. We can roughly gauge probable volume of feed to be expected from the weather in the early spring and on thru the season.

Disturbance by Logging, etc.

4. (a) We know this within certain limits but observations not properly written up to be of use.

(b) Pretty definite information on this is available as to what is happening but no program worked up for future guidance.

(c) & (d) Of value to our east side management.

(1) Seeds. Considerable information should be available on seed production and visability of different species on ranges under varying degrees of use. Division of Agronomy of University of California, College of Agriculture and University of Nevada have worked in germination of range grass seeds. Of value to use on any reseeding program.

Stock Management

1. (a) Not so important on this forest. Should be of importance on northern forests but not on east side of Tahoe. Distance to water minor factor here. Up north, stock have travelled four miles to water; on our cattle ranges, 1/2 mile is probably as far as any cattle have to travel.

M (b) Much has been said about salting and riding to solve distribution problems. I believe much has been said and written about these in a spirit of wishful thinking. A real study of this subject should yield some interesting information on rough ranges.

(c) A valuable study - badly needed on all ranges. On our east side country, feeding bone meal with the salt has resulted in much better distribution and better rustling on part of white-face cattle on at least one range.

(d) This can be answered by experienced range cowmen. Range usable by cattle depends primarily on the cowman and his knowledge and ability.

2. Sheep

This does not seem to be an important subject for our area.

(a) Weather is important.

(b) I believe we have pretty definite information on this already, at least definite opinions.

Range Rehabilitation

1. Erosion control.

K We have some definite ideas on this subject and the factors listed, but it would be a fine thing if this study could be initiated on our east side as erosion is seriously affecting our ranges.

(b) We need this information badly. We believe we know from past work done on the forest what is needed, but on some of the areas needing control work, the problem is one of engineering. *in erosion control work*

We would like to see a study embracing (these three subjects) undertaken on our east side as this is undoubtedly of major importance, in fact, should take precedence of other range studies on that area. *1. natural revegetation & artificial plantings and 2. structures*

2. Artificial Reseeding.

F We need more work on this subject and it no doubt could be carried on at same time as separate project to erosion studies. The Oregon Agricultural College is carrying on reseeding studies and have a pretty extensive set up. Their studies to date, however, do not make them very optimistic.

We should raise our own seed on each major area to be rehabilitated and not depend on commercial seed from areas with radically different climate.

3. Natural Revegetation.

Important but have we not a lot of information already on this subject (perhaps not in shape available for use).

4. Water Spreading.

Not of sufficient importance on our areas, as irrigation of most of country would be impossible. We do know, however, that water is often limiting factor in our reseeding attempts; temperature next. Where we have had subirrigation, we were successful in getting a good stand. We have brought back depleted meadows by irrigation but cost of water spreading on slopes is too great to be attempted.

Other Problems

1. Timber.

(a) We have very definite opinions and detailed information on this subject covering a number of ranges. A study of this subject for east side conditions would be of interest but is very minor to other problems listed.

2. Wildlife.

Energy preferences
(a) This varies for different areas or regions and seasons. We have some scattered observations on this subject in summer and winter but it is of sufficient interest and value to warrant being made a regular project.

Grazing capacity
(b) A very important subject not only on our east side ranges but on all areas. We should know more about this subject when trying to figure out domestic stock capacity of given areas.

(c) Competition. There has been considerable work done by various men on this problem. It is pretty important at this time with increased complaint by stockmen over use of ranges needed by cattle, by deer, etc. Evidence of deer grazing on some areas, such as east of Truckee, indicates that there is competition for forage between sheep and deer.

3. Watershed Protection.

(a) Very important. This ties in with problems under erosion control and should be a parallel job.

Economic Considerations

1. Not so important on east side ranges as few beef herds on forest ranges - mostly stock cattle and steers sold as feeders.

2. Very important subject, not only on east side.

We believe for the Tahoe that our pressing problems may be summarized as follows:

Mountain Meadows

Mountain meadows are of major importance even though relatively small areas.

Erosion of stream channels.

Drying out of meadows.

Thickening up of willow thickets; need for eradication; methods.

Taking over of drying meadows by lodgepole thickets of no value.

Erosion Control:

Meadows - larger ones - and sage flats.

Sheet and gully erosion on all east side areas (Nevada especially).

Reestablishment of Vegetation:

Reseeding and natural forage studies.

Deer vs. sheep and cattle.

Bitterbrush - life history and requirements.

DEWITT NELSON
Forest Supervisor

/s/ L. S. Smith
Associate Forester

RR (G)
MANAGEMENT
Pine Ranges
Lassen

Susanville, California

December 13, 1939

MEMORANDUM FOR REGIONAL FORESTER

Reference is made to your letter of December 4, 1939.

Priority of the problems listed for this Forest is as follows:

- (1) What is a normal year on which to base grazing capacities.
- (2) Effect of grazing on establishment of satisfactory timber reproduction.
- (3) The relative increase in amount of forage after logging and the subsequent decrease as reproduction takes over.

(4) Wildlife. These problems are set up for mule deer country and would be interesting to know; however, on this forest the Blacktail deer constitute our main game problem and we would like to see the following problems worked out in their regard:


- (a) Main forage species used by deer.
- (b) How to determine grazing capacity for deer.
- (c) What is forage competition between deer and
 1. cattle
 2. sheep

At the present time the Lassen has no particular deer problem on the east-side. However, it is entirely possible that eventually this might come to pass, as it has on the Modoc, and we feel that studies in connection with wildlife are well warranted. We feel that the work which has already been done at Burgess Springs has been very beneficial, not only to the Forest Service but to the stock men, and we would recommend strongly that this be continued.

We would like to see advance preparations made for the study of the effect of sheep grazing on Pine reproduction so that, should we have a good seed year, we would be in a position to start studies at once without having a great deal of preliminary work to accomplish before the studies could be started.

We are in favor of the Range Research Program; however, we do feel that there are a certain few outstanding problems that should be

tackled before the Station becomes involved in too great a quantity of problems, many of which are of lesser importance.


A. G. BRENNIS,
Forest Supervisor

RR (C)
MANAGEMENT
Pine Ranges
Mono

*Mr.
Mrs. Pugh
Pres. and
Pres.*

Reno, Nevada
December 13, 1939

REGIONAL FORESTER:

Your memorandum of December 4 is received enclosing the problem list for east side ranges.

The questions most in need of answer on this Forest are on page four of your outline, under "Questions Relative to Range Rehabilitation".

1. Erosion Control

b. What is the effectiveness and practical limitations of erosion control measures.

(1), (2), and (3).

The answers to these questions are of considerable importance throughout this entire Forest because of the high susceptibility to erosion, the immediate economic importance of preventing erosion, and the intensive use of the land by livestock which may have caused erosion.

2. Artificial Reseeding

Since artificial reseeded is already known to be successful on this Forest where water is available, questions b, c, d, and e seem important at this time.

3. Natural Revegetation (page five)

All questions listed under this heading should be answered for the Sweetwater area.

4. Water Spreading (page five)

In addition to a and b it would be very beneficial to have the answers to:

c. What effect has water spreading in headwaters upon stream flow?

The Little Walker water spreading project for example. Water spreading and reseeded artificially here has built up the range in excellent shape. However, the project is hampered by the water district

disallowing the use of water during August and September when it is most needed to maintain the project. It is quite generally felt that practices such as this are mediums of sustained regulated run off beneficial to irrigation use in the valleys below. Some facts for the selling of this practice are badly needed.

Inasmuch as the regulations of stream flow for late season irrigation is apparently one of the outstanding watershed problems of this Forest, this question seems to be of first priority as regards the other questions listed above. Other than that as far as priority is concerned they are listed in order of priority as nearly as you can do so.

D. M. TRAUGH
Forest Supervisor

14K
Res. Prog.
Barbados
Pine

RR (G)
MANAGEMENT
Pine Ranges

Bishop, Calif.
December 15, 1939

Inyo

REGIONAL FORESTER

The following comments are made in response to circular of December 4, which we hope may help to determine the most important things that need to be studied on the ranges of the Inyo.

K

First in importance, perhaps, is erosion in the Mount Whitney and White Mountain Districts; determination of means of erosion control and the effects on forage production and types by drainage of adjoining areas, and what can be done about it.

G

Determination of ways and means of measuring forage growth and production in relation to precipitation. The determination of the difference in quantities of forage produced during years of differing precipitation, and means of application of the data in grazing administration.

M

Studies of distribution of stock on the ranges; how may uniform distribution be accomplished to get uniform utilization other than by fencing.

J

Determination of utilization on browse ranges by domestic stock during spring and fall, in relation to the needs of deer for winter range.

Studies to determine if wider distribution of stock should be made on ranges, in view of increasing deer population and to determine distribution restrictions of domestic stock in regard to range needs of deer.

B

Check opening dates of ranges in relation to vegetative readiness, and closing dates in relation to utilization and capacity.

J

Studies concerning rodent eradication in relation to destruction of fawns by predators.

J

Studies of control and disposition of surplus of Tule Elk imported into Owens Valley.

/s/ H. H. Simpson
Assistant Forest Supervisor.

(2) Watershed protection.

- K* { (a) Should include a study of erosion on timbered areas after logging. *etc*
(b) Erosion, especially sheet erosion, on sage-brush - bitter brush types.

(3) Wild life management.

- J* (a) In addition to items listed, should include:
Should determine
(1) Census *methods*
(2) Size of herds required to furnish adequate hunting supply.
(3) Study of winter range - adjacent and/or within forest boundary.

L (4) Economics.

H (5) Timber production.

A (6) Utilization standards.

(7) Stock management.

Considerable information is now available on many of the problems listed in your memorandum. The big difficulty has been, and is, in administrative means to carry methods fully into effect. With adequate funds (justifiable under present returns in fees for grazing), and some means of acquiring certain controlling areas of private lands, or authorization for entering into cooperative agreement with land owners, such improvement in range use could be expected.

However, definite data from a study such as contemplated may aid in securing suitable means to put our knowledge into effect.

/s/ D. N. Rogers
Forest Supervisor.

RR (G)
MANAGEMENT
Pine Ranges

*RR
Res. Prog.
Prob. Anal.
Pine*

San Francisco, California
December 27, 1939

Order of priority for the range problems submitted by the six
Forests replying to the memorandum of December 4 is as follows:

- MODOC**
1. Utilization standards
 2. Study of juniper-sagebrush type
 3. Bitterbrush study
 4. Correlation of grazing use with wildlife
 5. Watershed protection
 6. Economic considerations
- LASSEN**
1. Fluctuations in climate
 2. Correlation of grazing use with timber production
 3. Correlation of grazing use with wildlife
- PLUMAS**
1. Range rehabilitation
 - (a) Erosion control
 - (b) Rodent control
 - (c) Reseeding - artificial and natural
 - (d) Water spreading
 2. Watershed protection
 3. Correlation of grazing use with wildlife
 4. Economic considerations
 5. Correlation of grazing use with timber production
 6. Utilization standards
 7. Stock management
- TAHOE**
1. Study of mountain meadows
 2. Erosion control
 3. Reseeding - artificial and natural
 4. Correlation of grazing use with wildlife
 5. Bitterbrush study, life history and requirements
- MONO**
1. Erosion control
 2. Artificial reseeding
 3. Natural revegetation
 4. Water spreading
- Shasta*
1. Erosion control
 2. Correlation of grazing use with timber production
 3. Economics
 4. Bitterbrush study
 5. Watershed protection
 6. Fluctuations in climate
 7. Mgt of cattle
- INYO**
1. Erosion control
 2. Fluctuations in climate
 3. Stock management
 4. Correlation of grazing use with wildlife
 5. Seasons in relation to utilization and capacity
 6. Rodent control in relation to fawn predation
 7. Tule elk management

The following specific proposals are given first priority by these Forests:

- MODOC - Utilization standards
- LASSEN - What is a normal year on which to base grazing capacities?
- PLUMAS - Range rehabilitation, involving erosion control, rodent control, reseeding, and water spreading.
- TAHOE - Mountain meadows; erosion, lowered water tables, invasion by willows and lodgepole pine.
- MONO - What is the effectiveness and practical limitations of natural revegetation, artificial planting and structures as erosion control measures?
- INYO - Means of controlling erosion in Mt. Whitney and White Mts. Districts and the effects on forage production.

Problems involving correlation of grazing with other uses are listed by 5 Forests. Questions relating to timber production are given priorities 2 and 3 by the Lassen, and 5 by the Plumas, ^{2 by Plumas} Watershed management rates priority 2 on the Plumas and 5 on the Modoc. Wildlife management problems are given priority 3 by the Plumas, 4 by the Modoc, Lassen ^{and Tahoe}, and 4 and 5 by the Inyo.

Range rehabilitation problems are listed by four Forests. The Plumas rates in first place all such questions, including rodent control and water spreading not mentioned in the outline. Erosion control is given first priority by the Mono ^{Chasta} and Inyo, and second place by the Tahoe. Artificial reseeding and natural revegetation problems are in second and third places for the Mono, and in third place for the Tahoe. Water spreading is given fourth place by the Mono.

Four Forests are concerned with problems relating to proper stocking. Utilization standards work is given highest priority by the Modoc and sixth place by the Plumas. No. 1 for the Lassen is a question relating to climatic fluctuations, as is No. 2 for the Inyo, *for Shasta*

Stock management is given third priority by the Inyo and seventh by the Plumas. *by Shasta*

Economic considerations appear as No. 4 on the Plumas list and No. 6 for the Modoc. *for Shasta*

A study of bitterbrush is listed in third place by the Modoc and in fifth place by the Tahoe. *and Shasta*

A study of mountain meadows is given highest priority by the Tahoe and one for the juniper-sagebrush type is in second place on the Modoc list. *4th place on Shasta and*

In fifth and sixth places for the Inyo are specific game management suggestions, *on the Inyo* one involving the possible relation of rodent control to game predation, and the other, management of the introduced elk.

F. D. DOUTHITT,
Asst. to Asst. Regional Forester.