Memorandum

To: State Director, Nevada

From: Director, Denver Service Center

Subject: Review of paper written by Dr. Richard E. Eckert, Jr. - Rest-Rotation Grazing Management -- A Critical Evaluation

There are many premises, assumptions and conclusions of Richard A. Eckert's recent paper circulated with Information Memo No. NSG 74-1 that need serious questioning. Basically, Mr. Eckert would benefit from training and an indepth study of the principles of rest-rotation grazing management. He would first learn that, overall, it is not a system -- a "system" having the connotation of a fixed arrangement of components. With proper application of the principles of rest-rotation grazing management, each grazing management plan developed is influenced by local conditions and objectives that have been established for the specific area concerned. Mr. Eckert refers so consistently to 3-pasture systems one gets the impression that rest-rotation grazing is a 3-pasture arrangement only. Maybe he has been unduly influenced by the Nevada AMP program in which 3-pasture systems predominate.

The basic principle of rest-rotation grazing is rest. In his pamphlet, Hormay says "Maintenance and improvement of the resource is accomplished almost entirely by timely resting of the range from use. A pasture or unit of range is rested from use after a period of grazing to: (1) Allow plants opportunity to make and store food -- to recover vigor; (2) Allow seed to ripen; (3) Allow seedlings to become established; and (4) Allow litter to accumulate between plants. The amount of rest needed for these purposes depends on the plants involved, character of the range, and objectives of management, so it (the amount of rest) is determined for each range individually."

Other details regarding the significance and determination of the amount of rest required by particular plants and ranges are described on pages 16 and 17 of Mr. Hormay's bulletin, "Principles of Rest-Rotation Grazing and Multiple Use Management." These should be read, re-read and understood by everyone involved in the application of management to rangelands.

Some of the aspects of the significance of rest can be summarized by three more of Hormay's statements: "Usually 1 or 2 years of rest is adequate to restore plant vigor. The key plant in deciding the amount of rest needed is the species that needs the most rest to regain vigor after it has been
completely defoliated during the critical green period. The number of treatments in a formula depends on the amount of rest needed at various times." These statements, plus some concerning the amount of rest needed to assure the establishment of seedlings, describe the knowledge of particular plants and particular ranges necessary in determining how many treatments are needed. These may vary from two to eight. The number of treatments necessary dictates that a corresponding number of pastures be provided.

The above discussion pertains to the general criticism interwoven throughout the text of Mr. Eckert's evaluation of rest-rotation grazing. Some of his specific statements on certain attributes warrant specific comments. The comments below correspond to quotes or paraphrased statements in his text.

1. Page 1, last sentence of first paragraph, Mr. Eckert says, "However, it is time to take a critical look at the rest-rotation system to see if it is really a panacea for all range management problems." No responsible manager has claimed rest-rotation management to be a panacea, but where rest-rotation grazing has been properly designed and followed according to plan, improvement in the range ecosystem has occurred.

2. Page 2, his numbered items 1, 2 and 3. Eckert's comments pertained to the dissimilarities of the Nevada environment and those of Harvey Valley, California, where the rest-rotation grazing concept was developed:

This statement has been made many times in the last ten years by those not familiar with Harvey Valley. In spite of the high, cool mountain valley aspect in which a person automatically thinks of deep fertile soil conditions favorable to lush vegetative growth, about one-half of 23,000 acres is conifer timber land, the areas along the minimal water courses is a rather productive meadow type and about 11,000 acres has a soil type conducive to either Carex or Artemesia. Because of continuous year-after-year grazing for many years, the Carex was killed out and big sage invaded. So much topsoil was eroded away in this process that most of the area formerly favorable to a climax stand of Carex is now not capable of supporting Carex. Deep rooted plants, i.e., Artemesia and Eriogonum and other species, i.e., Stipa and Sitanion are more adapted to the site.

Underlying much of the valley there is a thick, impermeable caliche layer about 14 inches below the surface that imposes severe restrictions on vegetative types and modifies the effectiveness of 18" of precipitation. Additional impacts were imposed by the construction of elevated road systems with deep borrow pits on both sides. The dredging of the borrow pits broke through the caliche layer, and the borrow pits themselves effectively drained Harvey Valley, converting it from a hydric or mesic site to a xeric site with a corresponding change in the type of plant that could exist there.
In Harvey Valley where overgrazing progressively reduced the density of Carex, probably the amount of organic matter and colluvial material so common at high altitudes was diminished by erosion and lack of litter replenishment. In such a situation precipitation as high as that common to Harvey Valley, 18" annually, is almost more of a detriment than an asset, because the site has lost moisture retention capacity and the water runs off rapidly rather than being retained to be slowly released later.

3. In regard to Eckert's Item 2, Page 2, where he says the concept was developed in the pine and grassland types where big sagebrush is only a minor component:

At one time there was only a fringe of sage between the Carex and timber areas of Harvey Valley. Overgrazing and soil and moisture modification made it possible for sage to invade the former Carex sites and become the dominant vegetation for a number of years.

4. Eckert's Item 3, Page 2, relating to development of the concept from clipping studies rather than from a grazing study of rest-rotation grazing:

Hormay was stimulated into thoughtful application of the results of clipping studies to grazing by livestock and trying to determine if by manipulation of livestock, desirable vegetation could be benefitted. His efforts represent progressive scientific advancement and it is commendable that someone had the imagination to try to apply the results of probably 1000's of man-years of clipping studies to something practical, simple, logical and useful! Benjamin Franklin flew the kite with a key on it, long before the first electrical generating plant was built.

5. Page 2, at the bottom of the page, Mr. Eckert says the range is rested from grazing for three specific reasons. He should have also included the production of litter. Litter is important for increasing soil fertility, reducing soil erosion, and increasing moisture retention capability.

6. In the paragraph starting at the fourth line from the top of Page 3, Mr. Eckert questions vigor restoration and the speed of recovery of a range:

If vigor restoration is not as rapid as it should be, obviously a 3-treatment, 3-pasture formula is not the proper formula. Maybe a 4, or up to an 8-treatment formula is needed. Recovery is, of course, strongly dependent on the site capabilities and amount of site and vegetative degradation that has occurred.

7. In the same paragraph on Page 3, Mr. Eckert comments on little or no recovery after four years of rest on an area which had been continuously clipped for four years:

Four years of continuous clipping (or grazing) ignores the importance of periodic rest during critical growth stages. The objective of rest-rotation
grazing is to get away from this type of management. Even more significant than four years of continuous clipping is the research work showing that *Agropyron spicatum* was killed by continuous clipping during only one growing season of highly favorable growing conditions. Paradoxically, the November 1973 Journal of Range Management, Pg. 452-453, has an article revealing that some crested wheat seedlings-of-the-year were benefitted by clipping/grazing, or at least were not always harmed.

8. In the middle of Page 3, Mr. Eckert says, "I doubt that the three basic steps in rest-rotation management can function to increase the density of desirable species in most ecosystems in Nevada."

It is assumed Mr. Eckert is again referring to a 3-treatment, 3-pasture arrangement; there are many areas where three treatments are insufficient. However, there are many ongoing 3-pasture systems that are achieving established objectives, including increasing density of desirable species.

9. In the same paragraph in the middle of Page 3, Mr. Eckert restricts the usefulness of rest-rotation grazing to areas having only one palatable life form:

A properly designed grazing plan is based on the physiological needs of desirable vegetative species including grasses, forbs and shrubs and also the vulnerable aspects of undesirable vegetative species so that the various treatments needed to improve an area can be designed into the grazing management plan. Properly designed and functioning plans force utilization on unpalatable life forms, also.

10. In the same paragraph, but near the bottom of Page 3, Mr. Eckert makes the statement, "As stand density increases, less and less seed is produced and fewer and fewer seedlings will establish, and finally the community will be closed to further seedling establishment because all the environmental factors are fully utilized by the resident vegetation."

Mr. Eckert's comments here pertain to primarily a level of vegetative stability approaching, or at a climax stage. If so, new seedlings could only be established when one of the existing plants dies and leaves an open space in which a new seedling could become established. It is true that in a climax situation, there is less 'going on' than in a seral community where the optimum vegetative density and composition has not been achieved.

A less-than-climax seral stage is nearly always the case where livestock grazing is occurring because the grazing animals become a dominating factor of the ecosystem. It is not the objective of our management to manage for climax on our livestock ranges. Productivity of a climax ecosystem is less than on a lower seral stage. In a climax situation, there is much negative net photosynthesis because of the effect of shading which results in the energy produced by photosynthesis to be shifted to non-producing areas of the plant. Also in climax communities, many inefficient senescent
plants exist. Livestock grazing reduces the density of vegetation and prevents accumulation of senescent plants. As a result reproductive processes -- seeding, tillering and growth of rhizomatous material -- and production of young and active organs are accelerated.

11. In the second sentence of the paragraph starting at the top of Page 4, Mr. Eckert says, "Concepts of the method and logic suggest that the system will not work in ecosystems with two life forms -- one herbaceous and palatable, the other shrubby and unpalatable":

Composition of vegetation growing on a particular site is ultimately dependent upon the vegetative capability of that site. This aspect has been discussed somewhat in comment No. 2 above. If the site is only capable of supporting deep, tap-rooted plants that is what can and will grow there. One needs to review and consider the processes of soil formation and successional stages from parent rock material to the stage where it achieves an approximate equilibrium with all the incidental factors of the environmental complex, the climax. The vegetation supported through these various seral stages may range from lichens and mosses to vascular plants, but the specific vegetation is affected by soil, moisture, heat, exposure, etc.

In the case of the competition between an herbaceous, palatable species and a shrubby, unpalatable species the grazing management should provide all of the physiologic requirements of the plant desired -- rest, opportunity to produce seed, opportunity for seedlings to become established and production of litter. If the site is more adapted for the production of the palatable herbaceous species, that species will flourish and condition the site even more favorably for increasing its density and the unpalatable shrubby species will become a secondary species, perhaps even be extirpated from the site.

There is an interesting discussion of this aspect in Wildland Shrubs -- Their Biology and Utilization, USDA Forest Service-General Technical Report INT-11972 Ppg 153-164. However it relates more to winter grazing and the adverse effects of early spring grazing, particularly on a year-after-year basis.

12. On Page 4, nine lines from the bottom, Mr. Eckert says, "Relate these principles (the four principles of range seeding) to the operation of a 3-pasture rest-rotation system in the sagebrush-grass type."

If it has been correctly determined that a 3-pasture rest-rotation system is right for an area, then one has to assume there is adequate rest from grazing use to (1) replenish food reserves and vigor of desired plants, (2) provide for ripe, viable seed, (3) provide sufficient opportunity for seedlings to become established, and (4) allow litter to accumulate. If these events are not occurring, the system is either based on incomplete or inaccurate information or is designed wrong.

There are numerous examples on national resource lands as evidence that the premises detailed above are working. If there are areas where reseeding
is not occurring, the grazing plan and/or compliance with it needs to be evaluated. It should be recognized that because of prevailing site conditions all of this may not occur rapidly; where the site has been seriously deteriorated it will take many years.

13. On Page 5, nine lines from the top, Mr. Eckert speaks for having brush control immediately:

Under the principles of rest-rotation grazing, the range should be managed for a few years before applying cultural treatments. Even plants thought to no longer exist have appeared in response to rest. In addition, with a few years of management, the exact area needing treatment can be determined and the required work can be planned to protect esthetic and other multiple-use values.

Probably an important cause of our range problems is that we have been too quick to substitute cultural practices for proper management of ranges in accordance with the needs of plants. We have substituted spraying, plowing, grubbing, chopping, seeding, etc. for management, and then, following treatment have still failed to initiate the management necessary to retain the vegetative cover desired.

We should also consider the physical and economic limitations of artificial revegetation. Of the 728 million acres of western range lands only a small percentage is susceptible to treatment except perhaps for aerial application of herbicides. The cost per acre of treatment represents a sizeable investment of funds. There should be no soil disturbance in many of the fragile watersheds; no destruction of any existing vegetation. In addition, there is great public concern over use of herbicides, creation of single-use monocultures and dedication of public lands and public funds to private livestock interests. These aspects must be given serious consideration on public lands.

In answer to the many statements Mr. Eckert makes on pages 4, 5 and 6, one must say that his thoughts and expressions are not in accord with the favorable results being achieved on range areas in many places.

14. On Page 6, Mr. Eckert says, "Under a 3-pasture system, the fourth principle of reseeding (proper management) is not followed."

Providing adequate rest from grazing to assure the establishment of seedlings is a primary consideration in devising the grazing management plan. Vegetative species, soil types and climatic factors affect seedling establishment and must be considered.

15. On Page 6, Mr. Eckert says, "In summary, attempts to increase the density of desirable species by natural reproduction under rest-rotation management are in opposition to the basic principles of range-seeding techniques."

Natural reproduction worked for 1000's of years; rest-rotation grazing attempts to duplicate the condition under which it was successful.
16. In the last paragraph of Page 6, Mr. Eckert says, "Acceptance of a long-time base for a management response to occur may be unrealistic." He then discusses aspects of initiation of rest-rotation grazing in Harvey Valley and says that after 13 years, objectives have not been achieved. The following explanation is in order:

The first rest-rotation grazing plan was established in Harvey Valley in 1954. It was a five-treatment, five-pasture system. Some slight adjustments were made, but the system operated through two cycles, 10 years. Then in 1963, the treatments and their sequences were changed around to be more effective. So perhaps during the first two cycles, 10 years, desired results were not achieved, the plan was changed and the evaluation made in 1967, after three years with the revised plan, was a bit early to perceive noticeable effects.

17. In the paragraph starting near the top of Page 7, Mr. Eckert starts a discussion on the effects of rest-rotation grazing on hydrology, wildlife and livestock performance by saying that "Hormay favors fairly heavy grazing under rest-rotation in order to obtain greater use of less palatable forage species and of less accessible grazing areas. Therefore, in a 3-pasture system, two thirds of the allotment could be exposed to erosion each year...":

Because of their grazing habits and selectivity and the palatability of the plants, distribution of livestock grazing has been and always will be a problem. Because of terrain, availability of water and palatability of plants, there is heavier use of the more accessible areas and the more palatable plants. Moderate, even use over the whole grazing unit would be more desirable from vegetative, watershed and esthetic standpoints. Hormay's remarks regarding degree of use have been taken out of context many times. He does not advocate, as has been said, heavy use; he has said that under rest-rotation grazing the range can sustain heavy use. He does, as Mr. Eckert states, want more even distribution of grazing use over the whole grazing unit. But, he has also said that if this use is so heavy that erosion is occurring, then livestock numbers must be reduced.

18. On the bottom of Page 7, Mr. Eckert recommends two additional forage measurement and utilization studies. The pros and cons of these subjects are frequently discussed at our workshops and have been for many years, along with stratification, proper location, frequency, how to do it, etc. It is agreed closer evaluation and better management of grazing lands is needed. Also more plant physiology information for all species is needed and hopefully our research people can dig into these problems and provide the resource managers with the needed data.

19. On the last page, Page 8, Mr. Eckert says, "Finally, there is a tendency to credit all range improvement to management alone although fencing, water development, brush control and reseeding may be included in the allotment." "This practice gives a biased and unrealistic value to rest-rotation grazing management."

We have been conducting the practices referred to for many years and particularly since World War II when herbicides and many new types and more versatile mechanical equipment became available. However, until we started
applying the principles of rest-rotation grazing management to livestock grazing we saw little improvement of a promising permanent nature on the range lands.

Mr. Eckert gives the impression that rest-rotation grazing management is not worthwhile, perhaps even causing greater degradation of the western range lands. Our experience in BLM does not substantiate this pessimistic observation and so far, no one has come forward with a better method. However, it is good that we receive a critique such as Mr. Eckert has provided us. Such an inquiry causes us to give serious thought to our management procedures and methods.

It is suggested this review be circulated to those who received Eckert’s evaluation of rest-rotation grazing management.

cc: Gus Hormay
Information Memorandum No. NSO 74-1
Expires 6/30/74

To: District Managers, Nevada
From: State Director, Nevada

Subject: Rest-Rotation Grazing Management - A Critical Evaluation

Enclosed is a paper written by Dr. Richard E. Eckert, Jr. on the above title.

At various times Dr. Eckert has expressed his views on rest-rotation grazing. We requested that he prepare this paper so his views could be shared with Bureau people in Nevada. We suggest that each of your people have an opportunity to read his paper.

1 Enclosure (one to ea. addressee)
   Paper Encl. to library

Distribution (w/one encl.)
WO-412 - 2
D-700 - 2
WO-330 - 2
D-330 - 2
CA-020 - 1
N-930 - 1
N-930.3 - 1
REST-ROTATION GRAZING MANAGEMENT -- A CRITICAL EVALUATION

Richard E. Eckert, Jr.

Rest-rotation grazing management, or a modification of this system, will be imposed on millions of acres in Nevada. A management system that includes periodic rest from grazing is a vast improvement over past management. However, it is time to take a critical look at the rest-rotation system to see if it is really a panacea for all range management problems.

The purpose of this critique is to examine the concepts of the rest-rotation system as developed by A. L. Hormay and as used in Nevada. I hope these comments will enable the land manager to effectively interpret results of this management system; that is, to recognize conditions under which a range ecosystem will or will not respond to management and the speed of response, particularly in relation to conditions under which response will be very slow or nonexistent. By recognizing limitations of the system, the land manager can temper his statement of objectives, his expectations of attaining objectives, and consider other techniques to accomplish objectives.

1/ Response to a request by the Bureau of Land Management, Reno, Nevada to comment on rest-rotation management systems.

Some of the difficulty in interpreting results from rest-rotation management under Nevada conditions may arise because of the following dissimilarities between our environment and that in which the rest-rotation concept was developed:

1. The concept was developed in northeastern California where annual precipitation is 18 inches.

2. The concept was developed in the pine and grassland types where big sagebrush is only a minor component of the vegetative composition.

3. The concept was developed from the responses of various shrub, grass, and forbs to season-long grazing and clipping. It was not developed from a grazing study of rest-rotation management itself.

The theory of rest-rotation is based on the premise that improvement of bunchgrass range depends on restoration of vigor in desirable species and establishment of new plants of desirable species by natural reproduction. Numerous new plants indicate that parent plants are producing abundant viable seed, forage cover is thickening and grazing capacity is increasing. Under these circumstances, litter and soil conditions can be expected to improve and erosion slowed down or arrested. One could also speculate that wildlife habitat would be improved.

To obtain this reproduction, the range is rested from grazing for three specific reasons: (1) to restore plant vigor; (2) to insure seed production, and (3) to insure seedling establishment. The
increase in range condition under rest-rotation management and therefore the speed with which multiple-use objectives are fulfilled will be determined by the functioning of these three steps.

I believe rest-rotation will more or less improve vigor of desirable forage plants and will maintain a given range condition. One could question the speed of vigor restoration in a 3-pasture system, however. Horn may points out that 4 years of rest after 4 years of continuous clipping resulted in a little or no recovery of basal area of four species studied. With respect to range condition, do we want only to maintain fair or poor range?

I doubt that the three basic steps in rest-rotation management can function to increase the density of desirable species in most ecosystems in Nevada. Where will rest-rotation improve range condition? Concepts of the method and logic suggest that rest-rotation will work in ecosystems with a species composition composed of one palatable life-form. In Nevada, examples include: crested wheatgrass seedlings, mountain meadows, and brush control areas with a good residual stand of native grass. Since the one life form in these examples is also the basic forage for livestock, grazing will be uniform and any competitive advantage equalized. The following year seed is produced and trampled into the soil. In the third year, seedling establishment is dependent upon the number of safe sites provided in the ecosystem. As stand density increases, less and less seed is produced and fewer and fewer seedlings will establish, and finally the community will be closed to further seedling establishment because all
available environmental factors are fully utilized by the resident vegetation. Additional safe sites are available only when a plant dies or in a year with above-normal precipitation.

Where will rest-rotation not effectively improve range conditions? Concepts of the method and logic suggest that the system will not work in ecosystems with two life forms -- one herbaceous and palatable, the other shrubby and unpalatable. This combination of plants is represented by the sagebrush-grass ecosystem that is widespread in Nevada and the most important vegetative type with respect to livestock grazing. Livestock will not utilize sagebrush to the extent required to equalize competition between brush and the herbaceous understory. What effect will the unequal competition between brush and grass and forbs have on range improvement under rest-rotation? Since range improvement under rest-rotation depends on natural reseeding, let us restate the four principles of range seeding: (1) weed control; (2) adequate quantity of high quality seed; (3) proper seeding methods, and (4) proper management of seeded stands. Relate these principles to the operation of a 3-pasture rest-rotation system in the sagebrush-grass type. In the use year, the palatable understory grasses and forbs are grazed while the unpalatable sagebrush is mostly ungrazed. Sagebrush, therefore, attains a competitive advantage over the understory species each year a pasture is grazed. Extent of the competitive advantage will depend on degree of utilization of the understory. Some recent work has shown that a 1% increase in big sagebrush cover reduces yield of crested wheatgrass by 4%. Yield reduc-
tion of less competitive native species might be at least twice that of crested wheatgrass or 8 to 10% for each 1% increase in sagebrush cover. So you can see an increase in sagebrush cover from 8 or 12% (sagebrush cover on good to excellent condition range) to 20 or 30% can drastically reduce the vigor and productivity of native grasses. When vigor and productivity are reduced, there is less herbage cover and root mass for watershed protection and for litter deposition, less forage for livestock and wildlife, and reduced number of seed stalks. Without some brush control, the first principle of reseeding (weed control) is ignored. This problem could be solved by at least partial brush control on adapted sites with severe brush competition. The second principle of reseeding (adequate quantity of quality seed) is also violated since under severe competition from sagebrush, the understory species cannot produce an abundance of high quality seed. An increase in the quantity of high quality seed could be accomplished by weed control or by additions of seed produced under cultivation.

Dissemination of seed by livestock is similar to broadcasting, itself a minimal method of seed dispersal. Trampling of seed into the soil by livestock is a poor substitute for drilling in that seed may not be placed at the optimum depth for germination and emergence. In addition, on many soils in Nevada, trampling merely places the seed in a vesicular crust that is extremely unfavorable for germination and emergence. Seeding under rest-rotation (trampling at seed ripe) in July and August is not the recommended time for planting seed. Late summer and early fall precipitation followed by a dry
period could result in seed germination and subsequent death of seedlings. Therefore, application of the third principle of reseeding (proper seeding methods) is minimal. Interseeding with high-quality seed of native or introduced species could rapidly increase stand density on very depleted sites.

Under a 3-pasture system, the fourth principle of reseeding (proper management) is not followed. Grazing a new crested wheatgrass stand is not recommended until at least the end of the second growing season. Yet in a 3-pasture system, new seedlings are subjected to grazing at the start of the second growing season. Establishment of weak seedlings of native species under such short deferment and in competition with the resident vegetation will be difficult. Some weed control or longer deferment would promote better seedling establishment on sites where a rapid increase in plant cover is necessary to meet multiple-use objectives.

In summary, attempts to increase the density of desirable species by natural reproduction under rest-rotation management are in opposition to the basic principles of range-seeding techniques.

Acceptance of a long time base for a management response to occur may be unrealistic. For example, a 5-pasture rest-rotation system was initiated in Harvey Valley, California in 1954. The expectation was to double the grazing capacity in 20 years. After 13 years (in 1967), there was still a long way to go to reach the original objective. This system was used under much more favorable conditions than
we have in Nevada -- 18 inches annual precipitation, sites of high potential, less competitive vegetation, and with 5 pastures.

The effects of rest-rotation management on hydrology, wildlife, and livestock performance need comment. Horman favors fairly heavy grazing under rest-rotation in order to obtain greater use of less palatable forage species and of less accessible grazing areas. Therefore in a 3-pasture system, two-thirds of the allotment could be exposed to erosion each year depending on degree of herbage utilization and the incidence of high-intensity precipitation. I believe moderate use would be more appropriate since research has shown that more erosion damage occurs when ground cover is reduced. The choice is between less uniform utilization of all forage species and the loss of top soil if a high-intensity storm strikes a heavily grazed pasture. Moderate utilization would benefit wildlife since at least some forage would be available after livestock use. Moderate use would also be an advantage in terms of animal performance. However, with moderate use, the manager should expect reduced use of the less palatable species and, in time, unequal competition between the palatable and less palatable species.

Two additional measurements or estimations would improve interpretation of results from trend studies. First, the degree of utilization of forage would indicate whether or not a specific management treatment was actually in operation over an entire pasture. If not, additional livestock distribution techniques can be employed. Second, knowledge of the amount of unpalatable shrubs would allow the land
manager to evaluate vigor response, seed production, and seedling establishment in light of the amount of competitive vegetation present. Then the manager has the option, for example, of reducing shrub cover by chemical or mechanical means to obtain more livestock forage or maintaining a shrub cover suitable for wildlife habitat. Under the first option, wildlife habitat may be reduced. Under the second option, reproduction of grasses and forbs may not occur and range condition may not improve as rapidly as desired.

Finally, there is a tendency to credit all range improvement to management alone although fencing, water development, brush control, and reseeding may be included in the allotment. The benefits derived from all these practices invariably make the new grazing system better than anything previous. In order to make a valid evaluation, total ranch outputs such as calf crop, weaning weights, etc., and profits should not be attributed only to the grazing system as has been done in the past. This practice gives a biased and unrealistic value to rest-rotation grazing management.
NOTIFICATION OF PERSONNEL ACTION
(EMPLOYEE — See General Information on Reverse)

1. NAME (CAPS) LAST — FIRST — MIDDLE
   HORMAY, AUGUST L.
2. (FOR AGENCY USE)
   SF-52
   ST-74-53
3. BIRTH DATE
   05-10-07
4. SOCIAL SECURITY NO.
   560-64-0772

5. VETERAN PREFERENCE
   1

6. TENURE GROUP
   1

7. SERVICE COMP. DATE
   03-28-30

8. FEGLI
   1

9. CODE
   1

10. RETIREMENT
    1

11. (FOR CGS USE)

12. NATURE OF ACTION
    721
    B Reassignment - CAO
    02-03-74
    Reg 335,102

13. EFFECTIVE DATE
    (MM, DD, YYYY)

14. CIVIL SERVICE OR OTHER LEGAL AUTHORITY

15. FROM
    POSITION TITLE AND NUMBER
    Range Conservationist
    08-330-1206

16. PAY PLAN AND OCCUPATION CODE
    GS-04540
    (51)

17. (a) GRADE OR LEVEL
    14

18. SALARY
    06
    pa 28,287

19. NAME AND LOCATION OF EMPLOYING OFFICE
    Office of Assistant Director - Resources
    Division of Range
    Washington, D.C.
    d.s. Berkeley, California

20. TO
    POSITION TITLE AND NUMBER
    Range Conservationist
    52-330-1309

21. PAY PLAN AND OCCUPATION CODE
    GS-04540
    (51)

22. (a) GRADE OR LEVEL
    14

23. SALARY
    06
    pa 28,287

24. NAME AND LOCATION OF EMPLOYING OFFICE
    Service Center
    Division of Standards & Technology
    Range Staff

25. DUTY STATION (City—county—State)
    Berkeley, Alameda, California

26. LOCATION CODE
    06-0340-001

27. APPROPRIATION

28. POSITION OCCUPIED
    1—COMPETITIVE SERVICE

29. APPORTIONED POSITION
    1—EXCEPTED SERVICE

30. REMARKS:

31. SEPARATIONS: SHOW REASONS BELOW AS REQUIRED, CHECK IF APPLICABLE

32. OFFICE MAINTAINING PERSONNEL FOLDER (If different from employing office)
    Idg 50, DFC, Denver, Colorado 80225

33. CODE EMPLOYING DEPARTMENT OR AGENCY
    NR

34. SIGNATURE (If applicable) AND TITLE
    Management Assistance Team Leader
    Richard L. Eakin

35. DATE
    02-01-74

1. EMPLOYEE COPY
N. J. MIROV
BERKELEY DEPARTMENT OF GEOGRAPHY
4756 Antonia Court
Sacramento, Ca. 95820
February 4, 1974

Dear Gus! Once more I want you to help me. Jean and I wrote a 35,000 word MS, The Story of Pines, and it has been accepted for publication. Where we discussed life in a pine forest I said that—"In northern pine forests cattle are not an important ecological component. In the South grazing is practical when no better pastures are available".

Do you think this general statement is correct? We cannot go into details. Please let me know soon.

And if you ever pass through Sacramento, stop to see the old, retired forester and his co-author wife, Jean.
FEB 11 1974

Mr. Paul C. Guilkey, Acting Director
Pacific Southwest Forest and Range
  Experiment Station
P.O. Box 245
Berkeley, California  94701

Dear Mr. Guilkey:

This is in response to your letter of January 16, 1974 concerning our plans for Mr. Gus Hormay.

We anticipate no change in Mr. Hormay's duty station or his need for office space and secretarial services. We appreciate the assistance you have given us in this matter, and hope that you can continue to provide Mr. Hormay with these services.

Sincerely yours,

Ed Hasley

Assistant Director

cc:
500
Gus Hormay
DSC (D-600)
  Range (330)
  AD-Resources (300)

PRF
531:EJNICHOLSON:ams  2/7/74
To: Gus Hormay
From: Hugh Harper
Subject: Indian Jake Allotment

Now several weeks ago

After our most recent conversation, I reviewed some of the past correspondence and plans on Indian Jake. Copies of this information are attached.

Your letter of October 6, 1971 spelled out details of the seeding effort the Boise District is now involved in. The way I read it, they are following your plan very closely.

Here is what has transpired:

a. Grass seed was drilled in portions of Plot #1 and Plot #2 in latter September, 1973.

b. Grass seed and bitterbrush seed were broadcasted onto portions of Plot #2 on January 4, 1974. Cows went into this pasture during week of January 7. Temperature had warmed to 69° and considerable rain fell after the broadcasting.

c. Cattle go into the pasture containing Plot #1 in mid-May, treatment "D".

Gus: I wrote the above several weeks ago and here it is February 12, and below are some more thoughts:

I think that my acting as a go-between on this project is muddying the waters and creating
Memorandum

To: Director

From: Director, DSC

Subject: Role of Gus Hormay in the Bureau's program

With the transfer of Gus Hormay to the Division of Standards and Technology in the Denver Service Center on 2/3/74 it was the understanding of the Chief of the Division that Mr. Hormay's responsibilities would be to work with the members of the eleven staffs to teach and demonstrate rest-rotation grazing principles in all aspects of multiple use management. It was also expected that he would assist the field in designing especially difficult grazing systems where critical wildlife or wild horse and burro problems were involved and that he would also conduct specialized courses in rest rotation for non-range conservationist types.

In discussions with Mr. Hormay he has indicated that at this time he has no interest in working with staff people who are not in policy-making positions or in decision-making roles involving actual on-the-ground management. He has requested the opportunity to meet with the Director and the Assistant Director for Resources in Washington to explain his principles and planning alternatives for more effectively incorporating rest-rotation grazing into the Bureau's on-going program. He also has requested the opportunity to meet with the State Directors either collectively or individually for the same type of discussions. We believe such discussions would be beneficial and provide a better top-down full understanding for more effective resource management.

If you agree with Mr. Hormay's request we would like to work out a meeting schedule convenient to you and the State Directors.

If Mr. Hormay's understanding of his role is not what was anticipated by the Directorate with his transfer to the Service Center then we need to be so advised. Having Mr. Hormay in Berkeley is a most awkward and difficult supervisory situation. Since we now have Mr. Hugh Harper in the Division of Standards and Technology to teach normal rest-rotation grazing training sessions, and with Mr. Hormay firm in his convictions that he should only be talking to personnel in policy and decision-making positions, we have
somewhat reached an impasse. We believe that having Gus stationed in Berkeley is going to be unworkable in terms of effectively utilizing his services in his new role, as we understand it, in the Service Center.

We would appreciate an early reply as to how the Directorate visualizes Mr. Hormay's role.

cc: Kay Wilkes (330)
    Gus Hormay

Garth H. Rudd
Berkeley
February 14, 1974

Mirov

Dear Nick:

I was so glad to hear from you. You are as energetic — and youthful as ever. A 35,000 word manuscript. Great.

By northern pine forests I gather you mean all forests not located in the South. The open pine forests in the western United States, for example ponderosa and jeffreyi, are heavily grazed by cattle — at one time by both cattle and sheep. Denser pine types — mixed conifer — are grazed quite closely after cutting. High grazing values hold up for 20 years or more before trees take over again.

Over the West, as a whole, grazing does not appear to have interfered with natural regeneration of trees, in fact it appears to have aided it by trampling of seeds and reducing plant competition.

Grazing is of no great importance in dense pine types, such as P. contorta even after cutting because trees quickly reclaim the site and forage is not of very high quality.

Attached is some information from the Western Range Survey Report which may provide you with more ideas for framing your general statement.

Thanks for the invitation. Will drop in at the first opportunity.

Best regards,

Gus
P. strobus

seraling
taeda
tamang

P. virginiana

Washington

Lake States NE & Canada
Appalachian

SE coast of Florida
South

Calif

Appalachian

Gulf NE; NW Nov.
Memorandum

To: Director

From: August L. Hormay, Range Conservationist, Berkeley

Subject: Role of Gus Hormay in the Bureau's Program

I received a copy of Garth Rudd's memorandum of February 14, 1974 to you yesterday. I had but a brief discussion of the subject with Glenn Fulcher on the telephone. I am afraid he misinterpreted some of my remarks.

I have been with the Bureau six years and still have not had an opportunity to explain and demonstrate my ideas on rest-rotation multiple use land management. I would appreciate the opportunity greatly.

Time is running out for me. In another three years I will be forced to retire. Before then I would like to see a few areas in the Bureau set up under rest-rotation management under my guidance. These would be demonstration areas. Perhaps only one area should be set-up at first so people could judge the merits and practicability of this type of management.

I could train the people involved in this effort. I suggest those most directly involved with management of the demonstration areas be trained first, and others later, so management could be put in force as quickly as possible. I'm hopeful that funds could be made available to implement one or more of the plans.

I have been seeking consideration of my proposal by the Directorate and hence my comment that I would like to talk first to personnel in policy and decision-making positions. I have explained why I feel I should not start a training program with staff members at this time.

Many of the problems confronting the Bureau in renewable resource management will be resolved, I'm confident, with demonstration of good land management practices. I will do whatever I can to help make this a reality.

cc: Garth Rudd, Denver Office
Malcolm Schn itk er Berkeley
Cascade Area Manager Febr. 27, 1974
Memorandum
Boise Dist E-208-342-2711 Ext. 582
To: Jens Jensen, Range Division, Boise Idaho
From: A.L. Hermay Range Conservationist, Berkeley
Subject: Bitterbrush seeding Indian Lake Allotment

The bitterbrush seedings planned for the allotment this spring are to be done by hand for adequate control of planting time and planting depth and for control of number of seeds planted which is the basis of determining percent germination. The purpose of plantings is two-fold:
1. to determine the effectiveness of a seed treatment designed to break dormancy in the seed and promote germination in spring plantings and 2. to determine the feasibility of establishing bitterbrush by spring seeding in chest grass types under rest rotation grazing management.

See seeding plan attached! I am sending you the seed (treated and untreated Tuesday February 26, 1974).
Bitterbrush Seeding Plan
Indian Lake Allotment
Boise District, Idaho.

Planting locations
Grazed pasture (#a)
Restored pasture (the one getting treatment B)

Planting times
Early spring - February 26th
Late spring - March-April when gramin is definitely under way.

Early and late spring seedings should be made in each pasture

Planting methods and plans
Furrows - line transects 1000 feet long
Steep transects 6 inches wide, 1000 feet long

Kinds of seeds
Treated (to break dormancy)
Untreated.

These plantings can be made in the vicinity of the grass seedings in January 1974 or in another location. The planting in the grazed pasture should be in a location getting moderately heavy to heavy

(2)
Grazing Use.

The line and belt transect plots should be staked at 100 and 50 feet points - for example at 0, 50, 150, 200, 250, 300, and numbered accordingly.

Color code planting times and kind of seeds and show kind of transect by letter.

Legend: (a) stake colors, letters, and numbers;

- **Planting times**
  - Early spring
  - Late spring

- **Kind of plot**
  - Line transect
  - Belt transect

- **Kind of seed**
  - Treated
  - Untreated

Colors:
- White
- Orange
- Green
- Black

Number transect:
- L
- B
Example of stake markings

- Transsect number
- Planting time color - white or orange
- Distance along line
- Kind of seed color - green or black
The transects should be spaced about 10 feet apart and in the arrangement shown below.

<table>
<thead>
<tr>
<th>Transect No</th>
<th>Treatments (See legend)</th>
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<tbody>
<tr>
<td>1</td>
<td>B, T, ES</td>
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<td>L, U, ES</td>
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<td>L, T, ES</td>
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<td>B, T, LS</td>
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</table>
Plant the seeds on the line transects 1 inch deep as nearly as possible. Stretch a 100 foot tape between stakes. Cut a furrow 1 inch deep along side the tape with a trowel. Drop 5 seeds into each 1 foot segment of furrow. Put soil back in furrow covering seeds. Compact soil over the seeds by tamping with hoe blade.

On the best transect drop 5 seeds on each 6" x 12" segment. (Broadcast planting)

It is possible plant immediately after a rain or snow storm while soil moisture is high. Do not plant when ground is frozen.
Code designations of bitterbrush
seeds sent to Malcolm Schnitker
for late spring planting on the Indian Lake Allotment

② H 34-48-30 = Harper stratified
@ 34°F. dried 48hrs lab 7. Stored at 30°F

④ 1/2 G 30-4-30 = 1/2 gallon jar stratified
@ 30°F, dried 4hrs lab 7. Stored at 30°F
JP Seed Exp 0 30°F strat
Dec 26/73 - Feb 20/74

② H 34
④ V 30
GERMINATION RECORD

Species ____________________ Date Planted ____________________ State ____________________

Dist ____________ Allotmt ____________ Pasture No. ____________ Name ____________________

Transect: No. ____________ Type: Line or belt (circle one). Subunit: No. ____________ Colors ____________

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February 22, 1974

A. L. Hormay  
U. S. Department of the Interior  
Bureau of Land Management  
P.O. Box 245  
Berkeley, Ca. 94701

Dear Gus:

I hadn't seen or heard much of you in the past few months and thought you might like to know of some of our activities.

First of all, the Coeur d'Alene Wildland Management Seminar is finally bearing fruit. Our foresters are actually asking for grazing use on plantations instead of excluding them. No complaints to date.

A grazing program is being designed on Harris Ridge. The area is to be fenced this year (availability of materials permitting) and a grazing system designed for the area.

Our Fish Creek Program on private, USFS and state lands just east of Whitebird Hill in Idaho County is working very well. The Forest Service is asking the permittees to turn out more cattle to properly utilize the forage. This is an excellent example of cooperation and communication between the ranchers and the agencies. The Soil Conservation Service people are doing a great job here, acting as coordinator.

The project I am very enthusiastic about involves about a million acres in Northern Idaho on the North Fork of the Clearwater River. It involves about 250,000 acres of state land and the balance belongs to private timber companies, principally Potlatch Forests, Inc., and Diamond Match Company.

We have pretty well sold the companies on the income potential of livestock grazing. Now, I fear they may, in their haste to realize this income, want to move into grazing programs before they are thoroughly researched and planned.
There could be a potential capacity as high as 25,000 head of cattle on lands which have never been grazed. These lands have mostly been logged within the past ten years. The topography consists largely of long, broad ridge tops with sharp-bottomed canyons. These canyons should serve as natural barriers.

Our plan at present is to identify manageable units and develop a grazing system for the units that will consider:

1. Wildlife habitat
2. Forest regeneration
3. Maintaining an open forest
4. Fire and erosion hazard reduction
5. Livestock production
6. Cutting circle, logging frequency and access.
7. Forage needs for both large and small livestock operators
8. Hunter and recreation access
9. Livestock access

This area is located near the sites the Fish and Game Department and U.S.F.S. are burning off the timber to encourage red-stem ceanothus. I want to develop a system that will maintain the big game browse in good condition, but will also allow timber production. True multiple-use.

Another problem which must be faced is that of the small or part-time farmer who is jealous that the large operator gets all the forage and there is none for him. We plan to develop community pastures near small communities where, for a fair rental, the fellow with two cows or a horse can turn them out.

Also, a number of units will be used as alternate units where livestock may be shifted for a limited time if conditions warrant. This could be because of drought or if a logging program suddenly came about, or if a fire burned considerable forage in another unit.

We have two or three units almost ready to go. Operators of good reputation will be given these areas and, since these will actually be demonstration areas, the knowledgeable ranchers will help us to develop criteria for use on future units.
Perhaps later this summer, when we get one or two of the allotments going, you might be able to look the area over and offer some suggestions. My main concern is that the Fish and Game Department, preservationist groups and the lumber and livestock interests will become so polarized that we will be forced to set priorities. I contend that all these values are available if we plan and manage wisely and flexibly.

I may have bitten off more than I can chew, but if we don't get too much interference in the next two years or so, I think we can demonstrate that the program will work. Your observations and comments would be very welcome, Gus.

Please let me hear from you. If you have made plans to come to Idaho this season, perhaps we could visit then.

Very truly yours,

FOR THE COMMISSIONER

DAVID P. TIDWELL
Division Chief, Range Management

DPT:vp
Memo.
To Ross Ferris, BLM Reno, Nevada
From Gus Hermank, Berkeley
Subject: Bitterbrush Seeding

Dear Ross

Following is a plan for the bitterbrush seeding I talked to you about over the telephone a few days ago. The purpose of the seeding is to determine whether bitterbrush can be established by spring seeding and under rest-rotation grazing and whether a seed treatment designed to break dormancy is effective.

I am sending the seed to you today under separate cover. The treated seed is pinkish red and the untreated grayish purple.

The plan:
The seeding is to be done by hand to insure firm control of plant procedure. It should be done on bitterbrush sites. No bitterbrush need be growing on the sites at present. The sites should have only a light stand of shrubs or trees or none at all.
A. Overseed pastures when 80% of the perennials have been killed.

1. Overseeding:
   - In areas where the pastures have been disturbed mechanically - plowed or disked.
   - Overseed in late fall, early spring, or late winter.

2. Planting dates:
   - Early spring
   - Late winter

3. The weather warming up and growing
   - Planted in 1974

4. Rested in 1975

5. This area was burned in 1975 to help restore the grass.
   - Grass was growing about February 28.
   - The spring growing season is limited due to the burned ground.

6. Winter growth is poorer.
   - Planted in mid-winter.

7. The area was burned in late January of 1976.

8. The area was burned in 1975.

Note: Ground cover is desired to

not harm pastures. Two pastures

are desired - one area is

plowed or disked.
3. Kinds of plots
   a) Line transects 500 to 1000 feet long
   b) Belt transects 6 inches wide and 500 to 1000 feet long.
locate The plots on areas that will be moderately heavy to heavily grazed.
4. Kinds of seeds
   a) Treated - to break dormancy (T)
   b) Untreated (U)

Plots layout

Stake The transects at 50 feet and 100 feet points, for example at 0, 50, 100, 150, 200, 250 feet points. Mark The stakes as follows:

Planting date
   Early spring (ES) White paint
   Late spring (LS) Orange paint
Type of plot
   Line transect Letter L
   Belt transect " B
Kind of seed
Treated (T)    Green point
Untreated (U)  Block point
Distance along transect Numbers 0 to 1000
Transect number 1 to 8

Example of stake markings

Transect number (1 to 8)
Planting date (ES or LS) white or orange
Distance along line
Type of transect (L or B)
Kind of seed (T or U) green or black
Space the transects 10 feet apart and arrange in the following order on the ground.

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<tr>
<th>Transsect Number</th>
<th>Treatment</th>
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Plant the seeds on the line transects 3/4" deep. Stretch a 100' tape between stakes. Cut a furrow 3/4" deep along side the tape with a hoe. Drop 5 seeds in each 1 foot segment of furrow. Cover seed with soil. Compact soil over seed with blade of hoe.

On the belt transects broadcast 5 seeds on each 6" X 12" segment of the belt. Plant when the soil is wet if possible. Do not plant in wet gum ground.
Plant 1/4 of each of the two seed lots I am sending you at each planting time (ES or LS) in each pasture. Plant the transplants 4 100 foot segments at a time. The first 100 feet on all transplants first. Then the second 100 feet and so on until the supply of seed is exhausted or the entire 1000' are planted.

I will send you a form for recording results in a few days. You may expect germination about two weeks after growth starts accelerating.

Good luck. And thanks for the effort.

Gus.

Excuse the longhand, no secretary.
February 28, 1974

Memorandum

To: Denver Service Center

From: August L. Hormay, Range Conservationist, Berkeley

Subject: Additional Copies of Office Directory

Please send me two copies of the latest edition of the Bureau of Land Management Office Directory, which includes the Washington Office, Denver Service Center, Boise Fire Center, State and District Offices, and Outer Continental Shelf Offices.

Thank you.