TO RESTORE AND MAINTAIN THE RANGE

It is perfectly clear from the preceding discussion that the range resource—the forage and the soil on which it grows—is the key to all forms of use and hence to all the social and economic benefits which should flow from such uses.

The most urgent range resource problems are to stop further deterioration of forage and soil and start both on the upgrade. The ultimate objective is full restoration and permanent maintenance in full productivity. The means which must be employed to accomplish both purposes is to reduce excessive stocking to what the range can carry and improve, and to place all range lands under management.

If the range is to serve its greatest usefulness, plans for stopping deterioration, and for restoration and maintenance, must be formulated around the highest form or forms of use, whether for the grazing of domestic livestock, for the services which watersheds should render, for timber production, for the production of wildlife, or for recreation.

FOR LIVESTOCK PRODUCTION

One specific indication of the size of the job of halting further deterioration, of restoration, and of maintenance is the 728 million acres of range land which it must cover.

A specific indication of the size of the restoration job is the fact that the present grazing capacity of the range as a whole must be increased by about 110 percent to reach its original condition. Still further, as shown by Table 3, restoration must provide for more than 633 million acres now depleted more than one-fourth, nearly 390 million acres more than half, and nearly 120 million acres more than three-fourths.

Table 3.—The restoration job in terms of areas now depleted

<table>
<thead>
<tr>
<th>Depletion classes</th>
<th>Area depleted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000 acres</td>
</tr>
<tr>
<td>Moderate (0-25 percent)</td>
<td>94,825</td>
</tr>
<tr>
<td>Material (26-50 percent)</td>
<td>244,997</td>
</tr>
<tr>
<td>Severe (51-75 percent)</td>
<td>270,470</td>
</tr>
<tr>
<td>Extreme (76-100 percent)</td>
<td>117,904</td>
</tr>
<tr>
<td>Total</td>
<td>728,196</td>
</tr>
</tbody>
</table>
In brief, the specific lines of action required are:

1. First and by all odds most important, the reduction of stocking to the actual present grazing capacity. Since present stocking of the entire range area, now 17.3 million animal units, is 60 percent in excess of its estimated capacity, it will have to be reduced by about 6.5 million animal units.

The guiding principle should be stocking year after year with the number of animals which each unit will support each season without injury to the range. The outstanding need for restoration and the wide fluctuations of climate and hence of forage production require conservative stocking for satisfactory results, and this under most conditions should leave from 20 to 30 percent of the palatable growth of the important forage plants during average years. In addition, stocking should be low enough to prevent injury to watersheds and tree growth, and should be properly correlated with wildlife and recreational requirements.

The practical difficulties involved in such reductions are fully recognized, but the owners of private lands and managers of public lands should not overlook the possibility that actual returns will be greater in the long run from conservation than from continued overgrazing. They may be greater immediately. The reduction figures given are for the entire range. Not all ranges and individual holdings are overstocked. Many stockmen who have overstocked free public ranges in self-protection will undoubtedly welcome the opportunity to make reductions to actual grazing capacity when these ranges are placed under administration and the feed for their livestock is assured.

2. A judicious balance for range rehabilitation between natural and artificial revegetation.

The cheapest and most practical method of halting destruction and of restoration on about 6.5 million acres or 57 percent of the total range area is through the control of the stocking and the use of sound grazing systems. This means in essence merely giving the native forage a chance to come back under its own marvelous recuperative powers.

On about 3.5 million acres, or 5 percent, of the most completely depleted areas such as abandoned farm lands and those which are most critical from the standpoint of watershed protection, the choice lies between artificial revegetation, which has a great advantage in time, but will cost about $2.80 per acre, and waiting for natural processes, which according to the best information now available would require from about 20 years as a minimum to perhaps 50 years as a maximum.

3. Putting into effect on the ground the best available systems of grazing, including deferred and rotation grazing, continual moderate grazing, and alternate grazing, which are described in more detail elsewhere in the report. The use of these systems is required in both restoration and subsequent maintenance, as are all of the following lines of action.

Such systems are in effect on about 80 percent of the national forest ranges, possibly 40 or 45 percent of Indian lands, and 10 to 15 percent of private and State lands.

4. Adjustments of seasons of grazing to safeguard forage plant vigor and prevent damage to the soil.

Such seasonal adjustments have been made on at least 85 percent of the national-forest ranges and seasonal use is probably satisfactory on one-third to one-half of other ownerships.

5. Insuring the use of each range unit by the class of animals for which it is best suited. Where the wrong class of stock is grazed, special care in stocking and management will be required. On public lands, at least, the proper balance between livestock and game is necessary.

About 80 percent of the national-forest ranges are grazed with the proper class of livestock, but information on other ownerships is not available. This phase of management will be increasingly important as the need for greater efficiency in the use of available forage is recognized.

6. Employment of all practical means such as salt control, water development, herding, and in some cases fencing, to obtain the closest practical approach to even distribution of stock over the range and to reduce livestock handling costs.

Such means are in effect in varying degrees on a rather high percentage of national-forest ranges, on possibly half the private ranges, and on still lower percentages of other ownerships.

7. The preparation and use of practical range management plans, which for most private owners can be very simple. For the private owner, public assistance in their preparation should be made available through extension services.

Serviceable range management plans have been prepared for approximately 82 percent of the national-forest ranges and intensive plans for 48 million acres. Nearly 57 million acres, including intermingled lands, still need range surveys as a prerequisite for fully satisfactory plans. General plans have also been prepared or are in preparation for all Indian range lands, but 28 million acres require range surveys for intensive plans. Nearly 150 million acres of grazing districts and other Federal range lands will need surveys for management plans. Many private owners have sketchy plans for handling their ranges but only a small percentage have developed and applied plans adequate to prevent deterioration and insure rehabilitation of depleted ranges.

8. Animal husbandry is an essential part of the livestock enterprise. Despite rather marked progress, there is still room for improvement. Better practices such as the use of high-quality sires, limited breeding seasons, the culling of aged cows and ewes, supplemental feeding designed to offset mineral deficiencies in range feed, etc., should increase calf and lamb crops, improve the quality of the animals, and increase the prices received. Owners should then be able to obtain the same or greater income from smaller herds and to graze their ranges more conservatively.

FOR WATERSHED PROTECTION

For satisfactory watershed protection, a range service at least equal in value to that for livestock grazing, the following additional provisions are necessary:

1. If some necessary precautions are taken, restoration, and maintenance of plant cover adequate to meet watershed requirements satisfactorily on most ranges is possible under grazing.
and assistance of local users to the extent consistent with the protection of the public interest—the antithesis of bureaucracy.

The application of these principles requires a far greater development of research than has hitherto been possible, and the prompt and full use of the findings. The purpose of enhancing private opportunity on lands suitable for such ownership, and the still broader purpose of insuring the greatest possible social and economic stability of the dependent agricultural and other population, must underlie the entire administration of the public range resource.

NATIONAL FORESTS

The principles outlined, with occasional minor modifications to meet conditions, have been the basis for national forest administration for many years. The chief tasks of the future are:

1. A reduction in stocking averaging 6.5 percent to reach the present grazing capacity of the range (fig. 21). Restoration during the next 50 years should make it possible for these ranges to carry 20 percent more stock than the present grazing capacity of the range.

2. A strengthening of range management; including the preparation and use of intensive management plans on the 40 million acres not now so covered and periodic revision when necessary; seasonally, adjustments not satisfactorily solved on about 12 percent of range allotments; reseeding of about 750,000 acres; other special treatment for sage spots; improvements such as water developments and fencing, rodent control, etc.

3. Improvement in the basis for the distribution of the grazing privileges to assure a more effective tie with privately owned lands and to afford greater security to the small private operation dependent on and entitled to use public ranges.

4. Occasional changes for a better correlation of range uses.

Approximately half, or 43 million acres, of the national forest range area is forest land capable of producing commercial timber. On such lands timber production will have to be the dominant use because of the provisions of organic legislation and the general purposes for which the national forests were created. Grazing use will generally be possible but will have to be made contingent upon the protection of forest growth and continuous forest production. About 22 million acres additional is noncommercial forest in which the correlation required will be between livestock grazing and watershed protection.

Since organic national forest legislation provides for "maintaining favorable conditions of water flow" the handling of livestock grazing must insure watershed protection. On relatively limited areas special erosion-control measures are required.

GRAZING DISTRICTS, PUBLIC DOMAIN, AND OTHER FEDERAL

Practically the entire problem of placing the grazing districts and public domain under management lies ahead. The complexity and difficulty of the task is accentuated by the existing depletion of nearly 70 percent, by the fact that 93 percent is still on the down grade, by long-established traditions of use, by an extremely involved ownership pattern in some regions, and by private holdings of key areas in others.

To carry out such an essential measure as placing the remaining half of the public domain under administration and to insure permanence will require the modification of existing legislation.

To carry out other essential measures—such as an equitable distribution of grazing privileges; the reduction of stocking, which now exceeds grazing capacity by 43 percent (fig. 21), to insure coordinated use of all the range resources; to avoid the establishment of prescriptive rights; and to avoid a conflict between Federal and State authority—will require exceptionally favorable interpretation of the Grazing Act in the public interest, and probably its modification.

In addition to the reduction of stocking, essentials in the field of technical management include putting sound systems of range management in effect, making adjustments in seasonal use, artificial restoration on at least 18 million acres, the control of erosion on many millions of acres, surveys, preparation and putting management plans into effect for the entire area, and a large improvement program designed to aid technical management.

The measures proposed should increase the present grazing capacity of the grazing district-public domain range by 76 percent in 50 years. Or putting it in another way, 50 years' effort will be necessary to build the range up to the point where it can carry safely the livestock now being grazed.

Some provision should be made for the administration and management of the 21.6 million acres of available range on other reservations and withdrawals, preferably by the Secretary of Agriculture with the concurrence of the Secretary of primary jurisdiction.

Definite provision is necessary also to prevent further alienation of Federal lands unsuitable for private ownership. One prerequisite for transfer should be classification by the Department of Agriculture, which should appraise not only the suitability of the land for private ownership but also the size of the unit required.

INDIAN LANDS

The primary objective in range management on 48 million acres of Indian owned but federally controlled range land is the social and economic advancement and security of the Indians.

The major and most pressing task is the rehabilitation of depleted ranges. For all Indian lands an estimated reduction in stocking averaging 26 percent is required to reach grazing capacity (fig. 21), and a still higher reduction is necessary on the half of the Indian grazing land in the Southwest where the depletion is worst.

This is a difficult situation, for unless depletion is stopped the Indians face ruin through the loss of one of their most important resources, but drastic livestock reductions will create another difficult problem. Removal of white-owned livestock, more equitable distribution of grazing privileges among the Indians, the purchase of additional range, the initiation of work projects, and the development of supplemental industries are possible shock absorbers.
five ranges. Among the largest and most important of these are the far-reaching benefits from watershed protection. Of great importance also is the fact that range use can hardly be eliminated from western agriculture without wrecking the entire structure. Furthermore, range livestock production alone furnishes a livelihood for a large number of people. Other benefits in which both the Federal and State governments share are the sustained taxable value of related lands, income and other taxes, and direct and indirect returns from hunting, fishing, and recreational use.

Essentially the same considerations hold on State range lands as on Federal.

Despite radical readjustments and increased capital investments, the program proposed should work out to the financial advantage of the private owner. He should gradually be relieved of submarginal and high-public-value lands. His financial handicaps should be reduced. He should have the advantage of an increasing volume of cheap range feed, of increased unit livestock production, of decreased production costs, and of greater profits.

THE KEY TO REMEDIAL ACTION

In the complex range pattern, with its multiplicity of interrelated overlapping problems, which require a corresponding multiplicity of interrelated overlapping remedial measures, a clear-cut focal point—a center of responsibility—among public agencies is necessary in planning, initiating, correlating, and consummating action if public obligations are to be redeemed.

This is true of privately owned range lands and livestock, in which the maximum of self-help ordinarily depends on some measure of public leadership and aid to create conditions under which self-help can be effective or even start.

It is equally true of publicly owned range lands where, as already shown, the splitting of jurisdiction of this agricultural problem between different agencies almost inevitably means working at cross purposes, inefficiency, and excessive costs. Furthermore, public lands cannot be divorced from their surroundings. Such lands have a direct and vital bearing on the ranch owner and his welfare and must be handled in full recognition of this fact. This bearing extends far beyond private range lands and livestock to private croplands, and to the entire agricultural structure.

A check of the broader groups of problems and their solution will still further illustrate and emphasize this point of view.

Take for example the broad group of problems centering in the reversal of the range and soil-depletion process, and requiring such action as the removal of large numbers of excess stock.

Or take the equally broad group of ownership and use problems requiring large shifts from private to public ownership, or range restoration on mistakenly cropped lands, or the building of units of economic size.

Or the large number of additional problems of private ownership requiring the removal of financial handicaps or the recognition of the responsibility of stewardship.

Or the problems already referred to involving lands now in public ownership or those hereafter acquired.

Is REMEDIAL ACTION WORTH WHILE?

The program outlined for the solution of the range problem runs into very large sums of money which will constitute a heavy drain, particularly on Federal and State treasuries. Large as they are, these expenditures are only a part of the price which must be paid for the wasteful use and destruction of a great natural resource. Still another part of the price is the time over which the reconstruction effort must continue. It has taken little more than half a century to reduce the productivity of the range by about half, and it will probably take at least as long to bring it back to a grazing capacity equivalent to present stocking. The cost will be a heavy public burden, regardless of the possibility of direct returns that in the long run may make the enterprise self-liquidating.

Is restoration worth while? This question should be raised and squarely faced before a final decision is made. Perhaps the soundest decision can be reached by contrasting what will happen if the effort is not made, with the benefits if it is.

IF NO ACTION IS TAKEN

If drastic and immediate action to restore the range resource is not taken, it seems inevitable that depletion will continue. Whether it continues more or less rapidly than in the past, the end result is bound to be the same—the Great American Desert, once only a name, will become that in fact. If anyone questions the inexorable working of the cause and effect he need only examine the history of the semiarid pastoral countries of southwestern Asia and the Mediterranean. The more precarious range types of the Southwest and Intermountain region will merely be the first to qualify, but the other and more favorable types are certain to follow sooner or later.

The gradual destruction of the basic forage and soil resource will inevitably in time reach the point where the range livestock industry can no longer exist. The range alone can furnish the cheap feed
which is the most important competitive advantage in livestock production of all except one of the 11 far-western States. With the elimination of the range must consequently go the gradual elimination of the western livestock industry itself.

Along with the industry must go its contribution to the meat, wool, and hide, and other requirements of the country. The extent to which this might make the United States dependent on foreign supplies is uncertain, but there can be no question that it will place us in a less favorable position in which to meet future emergency requirements, such, for example, as that of the World War.

No distinction can be drawn between the dependence on the range of livestock and of wildlife. The flood and erosion situation on depleted ranges is rapidly becoming more and more serious, and this tendency would certainly continue and its effect would become more and more far reaching. Not least in importance will be reduction in the effective life of the irrigation reservoirs which depend upon watershed protection.

Crop agriculture is now so closely integrated with the use of the range that it is almost certain to suffer in other ways than impaired water supplies as range problems become more and more acute.

And whatever injures either or both will extend into communities, towns, and cities dependent upon a prosperous agriculture, and affect supply services, banking, transportation, and in fact all other industries which are a part of the existing western civilization. Reduced tax returns will curtail essential public activities.

The social wastage growing out of range depletion and the various maladjustments in the use of range lands has already been very large, but is inconsequential in comparison with the wastage which will be inevitable if any large part of the range is entirely destroyed.

THE BENEFITS FROM RESTORATION

An area of 728 million acres of restored and fully productive range cannot be otherwise than a source of perpetual wealth.

The maintenance of this range area would, according to the best information now available, carry at least 17.1 million animal units of domestic livestock 50 years hence, as compared to the 17.3 million units which are now rapidly depreciating the range, and the 10.8 million units which it can now carry in safety (fig. 22). The gain in the value of livestock production between the present and potential grazing capacity would undoubtedly justify the entire annual cost of restoration several times over.

Serious depletion was one of the primary causes of the 1934 Federal expenditure of $100,000,000 to purchase starving western-range livestock. The elimination or the drastic reduction of such expenditures, which range restoration should make possible, would make a major contribution to the cost of the program recommended. From the standpoint of broad public policy the choice lies between mere alleviation by periodic repetition, leaving the basic problem untouched, and striking directly and constructively at a primary cause in order to make such expenditures unnecessary in the future.

Erosion and destructive floods would gradually be reduced to a minimum, and the life of irrigation and other reservoirs greatly extended. The reduction in the annual flood-damage bill alone would

Figure 22.—Present and Potential Grazing Capacity.

The present grazing capacity of the available range area, estimated at 10.8 million animal units, could, if it is conservatively estimated, be increased to 17.1 million units in 50 years if the entire range area is placed under management in the immediate future. But even this increase would fall 0.2 of a million units short of what stockmen are now trying to carry on ranges whose productive capacity has already been reduced by more than half. How much longer would be required to reach the original capacity of 22.5 million units no man can say, but it might well be another half century. Aside from human inertia, the chief retarding factor in both instances would be the long, slow process of rebuilding the soil.

With such contrasts in probable losses and possible benefits a recommendation for affirmative action is the only one that can be made.