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RODENT CONTROL AIDED BY EMERGENCY CONSERVATION WORK

By Stanley P. Young, Chief, Division of Game Management

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Need for Rodent Control

The Emergency Conservation Work Program has been of inestimable value in the control of prairie dogs, ground squirrels, pocket gophers, kangaroo rats, rabbits, and porcupines. The citizens of the West have been forced to carry on campaigns for the control of these rodents since the settlers first staked out claims on the prairies. To the agricultural interests of the West the control of rodents is as vital as is the proper spraying of trees throughout the East to prevent damage by insects. These small mammals cover the western ranges by countless thousands, and control is necessary if crops are to be grown.

Rodent control is nothing new. Records indicate that as early as 1808, strychnine was shipped by boat around Cape Horn to the Santa Barbara Mission, Calif., in order that the early settlers might kill off the ground squirrels. A constant fight has been waged ever since, but unfortunately, while the landowners were willing to finance the killing of squirrels on their own holdings, the Federal Government provided inadequate funds to take care of the vast areas of public domain, national forests, Indian reservations, and other Federal holdings.

Federal, State, and Local Cooperation

When the Emergency Conservation Work Program came into being, the Forest Service, the Bureau of Indian Affairs, the Bureau of Reclamation, the Division of Grazing, and the Bureau of Biological Survey took the opportunity to treat a vast acreage that would have been treated years ago had funds permitted. During the three fiscal years 1934 to 1936 a total of almost 20,000,000 acres had been covered by E.C.W. for the control of these various rodent pests. On the statute books of several Western States rodent-control laws provide that landowners may establish rodent-control districts wherein all lands are treated simultaneously by paid crews working under the supervision of the Biological Survey. Never before the E.C.W. program were there adequate Federal funds to make these laws effective by taking proper care of infested public lands adjacent to private holdings.

The most concrete proof of the necessity of rodent control is found in the amount of money expended by private individuals throughout the West for this purpose. The Federal Government, while owning as much as 60 percent of the land in many of the Western States, contributes only about 25 percent of the total cost of rodent-control operations. During the fiscal year 1936, States, counties, and private individuals expended $665,785 for the purpose, while the Biological Survey was able to expend only $226,623 from regular appropriations. The E.C.W. program afforded the first opportunity of somewhere near meeting the Federal Government's obligations to the citizens of the West in the matter of adequately controlling the rodent pests that breed and range on public lands and from these strongholds infest and reinfest adjacent private holdings.

Training of E.C.W. Crews

Rodent control is one of the most popular projects with E.C.W. enrollees themselves as well as with the local people benefited. In many cases, crew foremen supplied by the Survey took boys who would not work satisfactorily on any other type of project and made real hands of them on rodent-control crews. The boys liked to work in these crews, as it afforded them opportunity to become acquainted not only with methods of rodent control but with the various habits of wildlife as well.

In order to employ proper methods and place all possible safeguards around poisoning operations for the protection of beneficial and harmless species, the Biological Survey has insisted upon approving the appointments of all men employed on the supervision of rodent-control work for its various cooperating agencies. This is for the reason that when poisoning campaigns are properly handled and carefully supervised, there is little danger of the accidental poisoning of other animals. The records indicate that there have been practically no cases of destruction of other forms of life through the E.C.W. rodent-control program. Naturally, the supervisors not only must know rodent control but also must be acquainted with the habits and status of wildlife in general, and in handling the crews they have imparted knowledge to the boys that will be of permanent benefit to them and to the Nation.

Educational programs were provided as regularly as possible, in order to tell the C.C.C. enrollees of various wildlife problems. The entire personnel of E.C.W. camps were shown films depicting the work of beavers, showing measures for the protection of elk, deer, and other big-game animals, and portraying the need of sane, sensible conservation methods, in order that the remnants of our fast-vanishing forms of valuable wildlife might be preserved. Mimeographed leaflets on wildlife management studies were made up by district agents of the Survey for the boys in order that they might be given as broad instructions as possible in the protection and preservation of species that are an asset rather than a liability to man's interest. It has been the attempt of the Biological Survey to make the rodent-control project a field laboratory for the education of the enrollees in natural history and wildlife management, and the popularity of the project among the boys attests to the wisdom of this course. In many camps more applications for places on rodent-control crews were received than there were places to fill.

Timeliness of Emergency Aid

Fortunately, the E.C.W. program came at the most opportune time. The extreme drought throughout the West had forced rodents from the open lands into adjacent irrigated valleys and mountain meadows, where they became especially objectionable in their competition with livestock for the available forage. Livestock and rodents together, during dry periods, have in many places almost entirely denuded the surface soil of its vegetation. This has caused the beginning of sheet erosion in areas where there would still be ample forage for livestock had it not been for the excessive numbers of rodents. On many areas, grazing by livestock and rodents combined has practically eliminated the native grasses, and these are now being replaced with weeds and poisonous plants. Damage in some instances has amounted to at least 75 percent of the available forage, and the average loss has probably been approximately 25 percent.

On some of the Indian reservations of the Southwest, the condition has been pitiful. On the Navajo Reservation, in particular, the Indians have carried on a losing fight against drought and rodents. It has often been necessary for them to replant their corn three and four times a season, since kangaroo rats and other native rodents dig up the kernels as rapidly as they are planted. Prior to the spring of 1936, there had been four years of drought, and this, coupled with rodent damage, had reduced corn production to the point where the Indians had barely enough for the spring seeding. All were clamoring for aid, and in order to save their last crop of corn it was necessary to detail a foreman with four or five E.C.W. Indians to go from farm to farm and conduct rodent-control operations.

Forest and Forage Protection

The Forest Service is endeavoring to carry on a reforestation program throughout much of the cut-over area in the Lake States and the Pacific Northwest. One of the chief problems to successful reforestation is the control of rodents, particularly the snowshoe hare. In the Olympic Forest in Washington, the snowshoe hare has destroyed as much as 40 percent and damaged 70 percent of the Douglas fir seedlings. In Michigan and Wisconsin, it was necessary to carry on extensive rodent-control operations to permit the seedlings to survive. Much of this work would never have been possible but for E.C.W. help.

In the open area, jack rabbits have become a serious pest. The Biological Survey, in 1934, received a petition bearing the signatures of more than 9,000 individuals of eastern Colorado, requesting Government aid in killing jack rabbits, which were ravaging the meager stocks of forage left after drought and wind had taken their toll.

The Forest Service recognized that rodent control would be essential if the Plains Shelterbelt program of planting trees from the Canadian border to Texas was to be effective, and in 1935 approximately one-tenth of its entire appropriation for the program was expended for rodent control under the supervision of the Biological Survey. Crews patrolled the planted areas constantly to prevent the gnawing of the seedlings by jack rabbits and pocket gophers.

Aid in Erosion Control

The permanent benefits accruing from the E.C.W. rodent-control program have been enormous from the standpoint of erosion control alone. An associate range examiner of the Forest Service has the following to say regarding the effect of rodents on erosion in the Boise watershed of Idaho:

"Rodents, numerous and spreading over nearly 80 percent of the Boise watershed, have undoubtedly been responsible for no small part of the present erosion. Wholly dependent upon the herbaceous plants for their food supply, their tremendous numbers, along with over-grazing by livestock and unfavorable climate, have been an important contributing factor in depleting this cover, and thus have greatly reduced the protection afforded the soil and subjected it the more to increased sheet erosion. Even light rains on rodent-infested areas are likely to start cutting, which may develop into destructive gulley erosion because of the almost immediate accumulation of run-offs in the myriads of burrows and channels which these animals construct just under the surface of the soil."

The control of rodents is vital to the successful operation of reclamation projects in the western third of the United States. Rodents, particularly pocket gophers, find the banks of irrigation canals an ideal location for their burrows and runways. These subterranean passageways frequently are the cause of serious breaks in canals, through which the flow of irrigation water is diverted and wasted to flood adjacent lands, destroying valuable crops, and indirectly ruining others by causing delays in delivery of water. Through the E.C.W. program, C.C.C. crews working under the direction of experienced foremen trained by the Biological Survey have greatly reduced this menace. In the past year alone half a million acres of canal banks and contiguous lands were treated by C.C.C. rodent-control crews with a thoroughness that will be of lasting benefit to the nation's reclamation projects.

Examples of Benefits Derived

A few concrete examples will illustrate the great good that has resulted from the E.C.W. rodent-control program. A group of farmers living at Springfield, Idaho, suggested to the camp superintendent there that the jack rabbit control work done by the E.C.W. crew during the summer of 1935 might pay the cost of the camp. It is estimated that not less than 600,000 rabbits were

killed by this crew on public lands adjacent to farming areas between American Falls and Moreland, Idaho. The work afforded protection to not less than half a million dollars worth of cultivated crops and to more than 75,000 acres of grazing lands.

The control work carried on by an E.C.W. crew near Weber Lake, Calif., in 1933 has been responsible for a 50 percent comeback of the grass on a large mountain meadow, which had been made a dust heap because of pocket gopher workings. The pocket gophers had honeycombed the surface of the ground, and sheep had trampled out most of the grass, while livestock grazing had been reduced to a negligible figure. The restoration in two years was due primarily to the elimination of the pocket gophers.

To control prairie dogs in Oklahoma, an area of 47,000 acres in Pawnee, Noble, and Kay Counties was treated through the medium of the E.C.W. The Indian lands here are interspersed with private lands, and the landowners were unable to make any progress in a general clean up because there were insufficient Federal funds to treat the Indian lands until the E.C.W. project afforded opportunity to carry on a systematic campaign over the entire area. A good piece of work was accomplished, and this, in conjunction with water developments, made the grass so much better over these old prairie dog towns in the spring of 1935 that the Indian Service officials at Pawnee received an increased rental of 25 cents an acre on their grazing lands. On areas where they received 50 cents an acre in 1934, they received 75 cents in 1935, a direct increase in receipts to the Federal Treasury.

The permanent benefit accruing to the Indians from E.C.W. rodent control is summed up as follows by an Agricultural Extension agent of the Indian Service, at Anadarko, Oklahoma:

"No little stress can be placed upon the financial value of the rodent-control project to the Indians. The Indian enrollees received the labor benefit on both Indian and deeded land throughout the reservation but still greater than the temporary labor relief, the Indian has received a lasting increase in the financial rental of his land. Due to such heavy prairie dog infestation of the allotted land it had become necessary to reduce the rental value of the grass land infested. Now that the prairie dogs have been controlled the rental value will be increased by approximately 10 cents or more per acre because the pastures will regrass and the carrying capacity will be increased. In comparing this increase in rental value with the cost of controlling the prairie dogs, the Indians will reap the financial benefit of the Government expenditures in two or three years. Therefore, this project has certainly been of utmost value to the reservation and the Extension Division in helping the Indian to help himself."

Safeguarding Harmless Species

Some persons uninformed as to the need for rodent control and the methods followed by the Biological Survey in carrying on the work have stated that control by use of poison and C.C.C. workers endangers the existence of other forms of wildlife. This, however, is not the case. The Biological Survey has

studied rodent-control methods for more than twenty years and in this period it has developed the most scientific and selective poisons possible. Scientific investigations conducted by the Bureau are bringing increasing knowledge of the habits of economically injurious species and of their physiological reaction to various baits. This has made it possible to use more and more specific control methods and so to select, prepare, and expose poison baits as not seriously to endanger animals other than those for which the baits are intended. When these scientific methods are carried out under direct supervision of trained personnel, the total number of beneficial species destroyed is negligible.

The Biological Survey is a conservation organization and will undertake no work that will be detrimental to any species of animal not interfering too greatly with the interests of man. Those conversant with actual conditions in the range States realize that if agriculture is to survive, the control of injurious rodents is as essential as is control of the corn borer, the chinch bug, the boll weevil, the grasshopper, the coddling moth, and numerous other agricultural pests. The Survey insists that in conducting work of this sort, the most careful supervision by trained technicians must be given. All cooperating agencies recognize the necessity for such supervision, and as a result a most worth-while program has been carried on during the past three fiscal years. The Biological Survey has entered into written cooperative understandings with the various governmental agencies under which rodent-control activities have been conducted. These agreements place the responsibility for technically supervising all rodent-control activities in the hands of the Bureau, leaving the cooperating agencies responsible for administration.

Control Work Illustrated

The illustrations on the following pages tell better than would volumes of written words, the story of rodent damage and of cooperative work to reduce this damage.

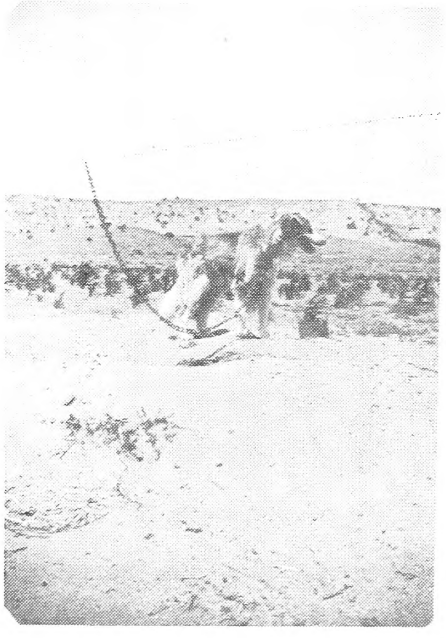
PRAIRIE DOGS

Four years experimental study in northern Arizona showed that prairie dogs destroy 60 percent of the wheat grass, 99 percent of the dropseed, and 83 percent of the grama grass, or 80 percent of the total potential annual production of forage. The possible destruction of four-fifths of the forage, or even a far smaller proportion, is serious enough at any time, but in periods of drought it is likely to be calamitous.

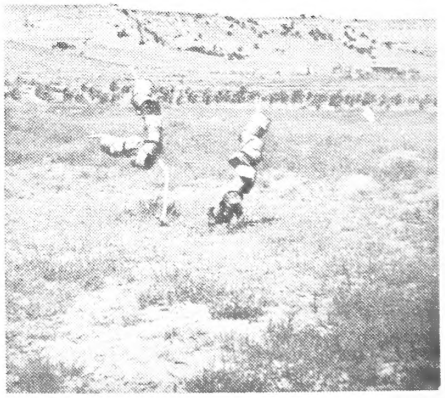
The following pictures show typical prairie dog infestation.

Prairie dog mounds on abandoned Indian farm, Southern Navajo Reservation, Arizona.

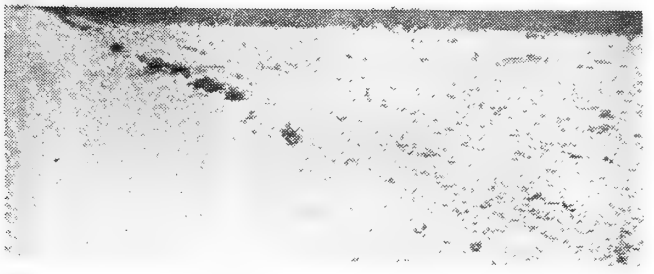
Area practically denuded of grass by prairie dogs - Mescalero Indian Reservation, New Mexico.



Dogs on leash and tin cans rattling in the wind are some of the primitive methods employed by Indians in futile attempt to save crops from ravages of prairie dogs in the Southwest.



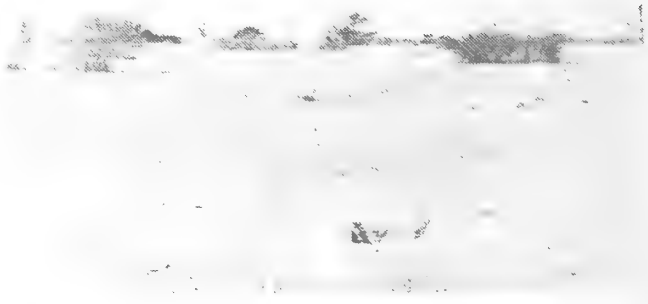
Indian cornfield totally destroyed by prairie dogs.



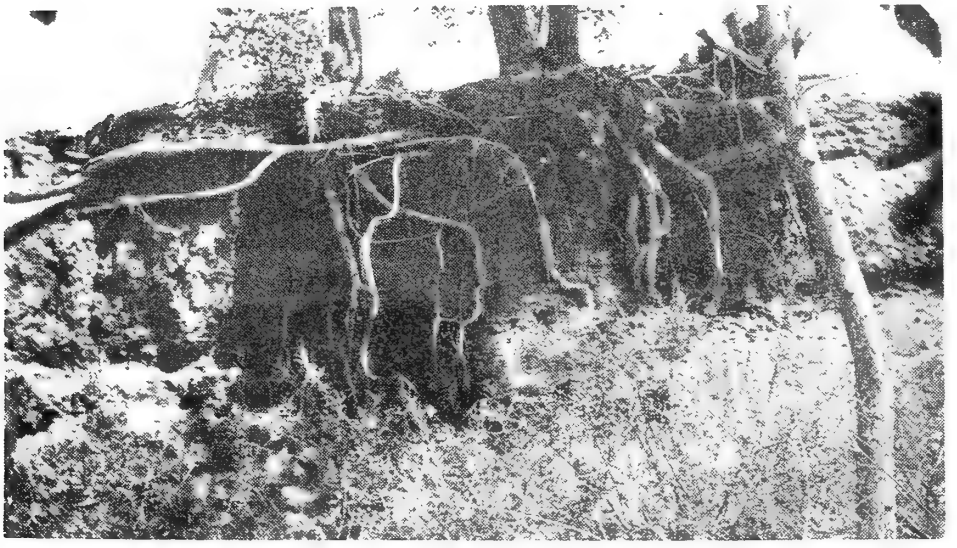
Cotton and corn fields damaged by prairie dogs in northwest Texas.

Side of basin denuded by prairie dogs -
devastation being rapidly completed by erosion.
Coohetopa Forest, Colorado.

Prairie dogs prepare an ideal condition for the start of sheet erosion on hillsides by denudation of vegetative cover. Note lack of vegetation. Erosion once started is accelerated by other factors as shown on page 11.

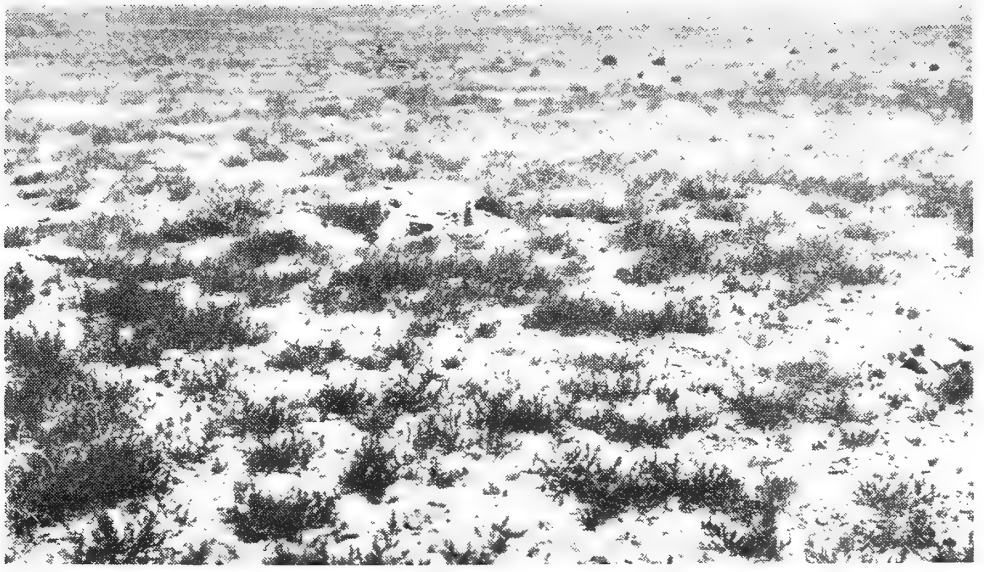


Overgrazing, wind, and flood -



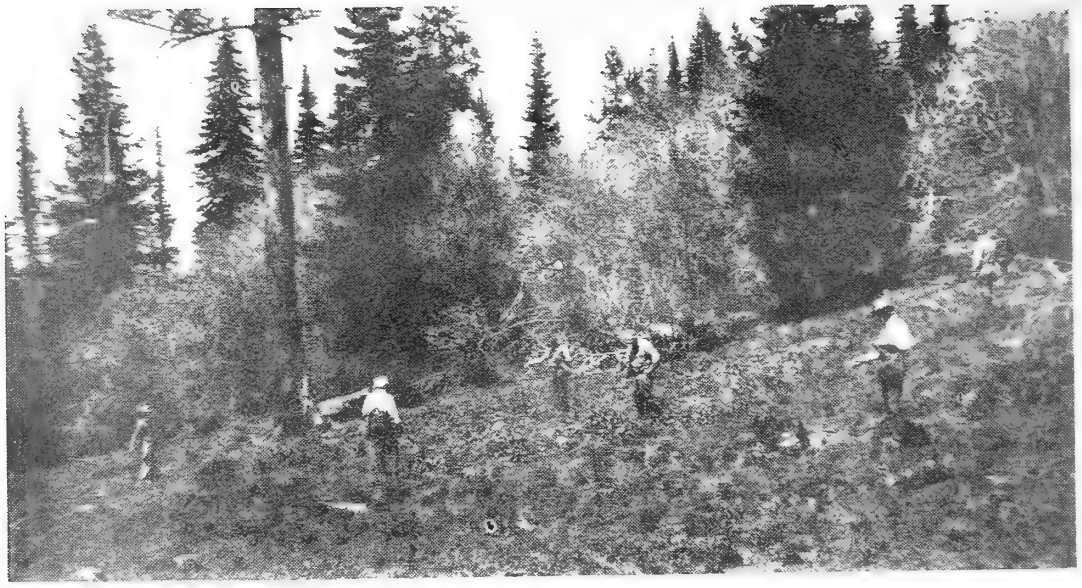
resulting in gullies and arroyos.

Interpreter explaining to Indian farmer in Arizona how to expose poisoned grain. The Indian, at the left, stated that he picked up 180 dead prairie dogs over an area estimated at about 200 acres around his 48 acre farm.

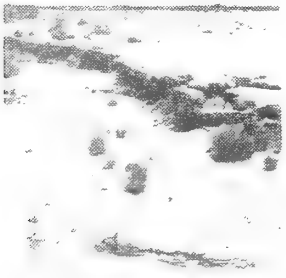


Ground squirrel damage. Semidesert type country.
Note squirrel at mouth of burrow.

E. C. W. ground squirrel control crew - Payette
National Forest, Idaho.



E. C. W. crew at work on Umatilla National Forest, Washington.



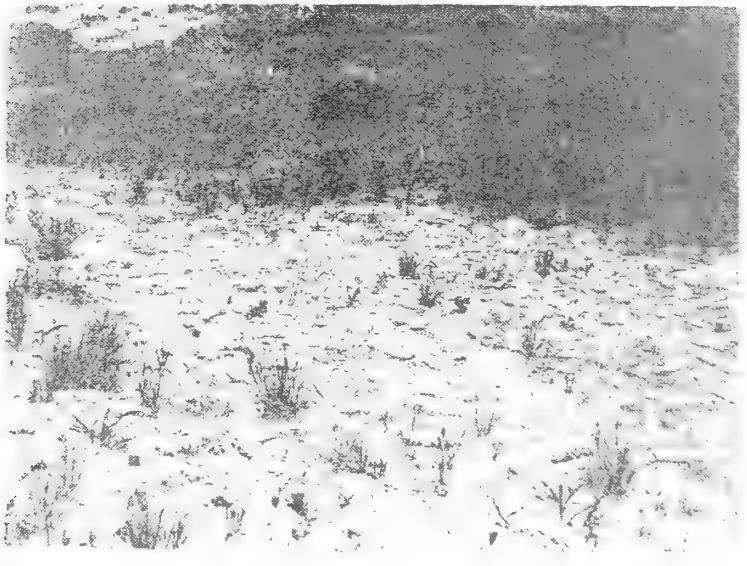
Ground squirrel burrows become waterways during a rain and are the beginning of this type of erosion.

Papago Indian Reservation,
Arizona.

Typical mountain range land, heavily infested with pocket gophers - Davis Lake, Oregon - before treatment.

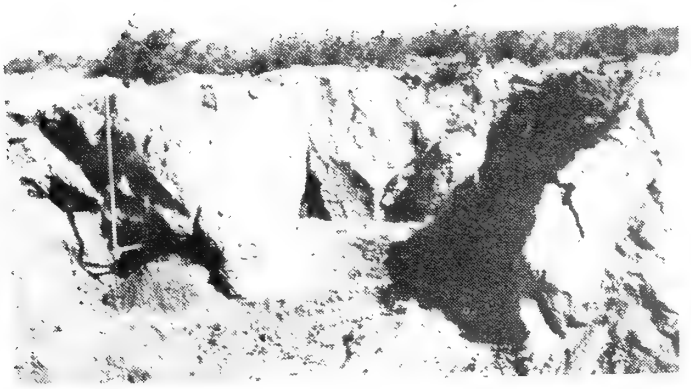
Same area one year later after pocket gophers were brought under control and native grases had had a chance to reseed.

Farm land infestation - Texas.
Mounds represent pocket gopher workings.



Mountain meadow in Utah. Picture taken just after snow had melted in spring. Ridges of dirt show extent of pocket gopher operations under snow in winter.

Pocket gopher infestation - Louisiana.



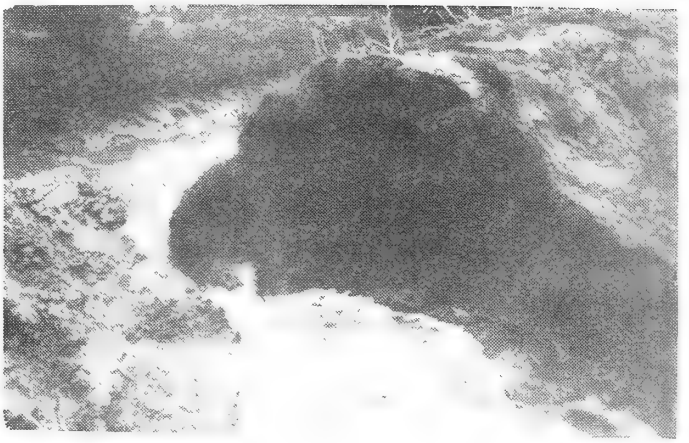
Break in terrace caused by pocket gophers burrowing through embankment.

Pocket gopher infestation along highway.

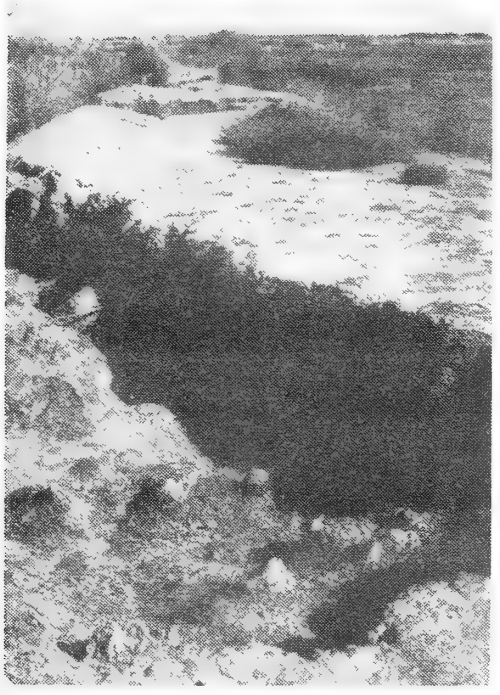
Flood water starting through a pocket gopher burrow passed under a cememt highway, -

Flooded the barrow pit on the opposite side of road, and poured into farmer's field, leaving a deep wash as a monument.

Damage starting from pocket gopher hole in irrigation canal bank.



Soon results in bad breaks causing expensive repairs and loss to crops through failure of irrigation water.



And is often responsible for start of gullies.

KANGAROO RATS

Kangaroo rats abound on millions of acres of desert and semidesert range and farm lands. On ranges that have been overgrazed, kangaroo rats must be controlled before reseeding can be accomplished, as they gather and store practically all of the seed within a radius of 100 yards from their burrows.

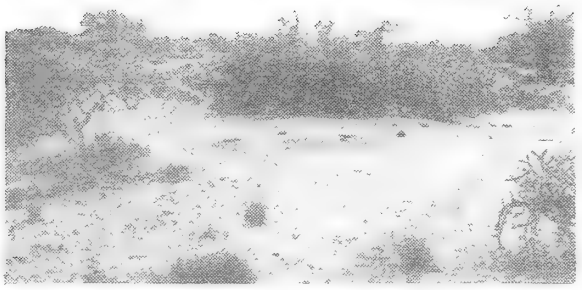
Close-up of typical kangaroo rat den.

Showing plot protected from both livestock and kangaroo rats.

Plot showing grazing by kangaroo rats - livestock being excluded.

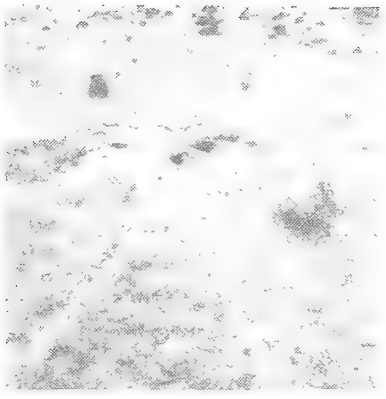
Area on left of fence subject to grazing by both livestock and kangaroo rats. On right of fence shows protectiom from both livestock and rodents.

Open range - note lack of native grasses.



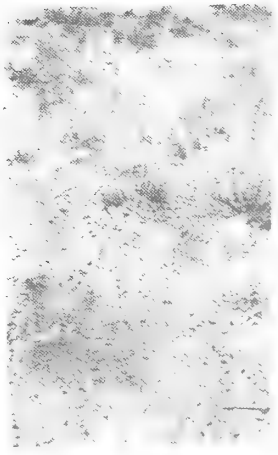
Kangaroo rat den around mesquite bush. Note lack of vegetation.

Typical kangaroo rat infestation.

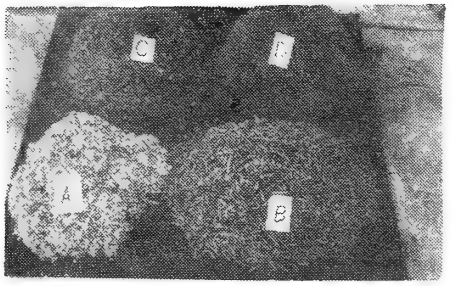


Trail leading from kangaroo rat den to feeding ground.

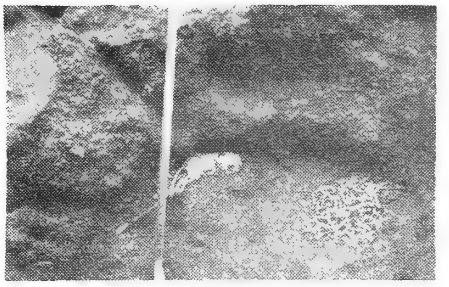
Close-up of feeding ground. Note rat pellets and close cropped grass.



Kangaroo rat den before excavating.



Cross section of den, showing storage chambers and stored grass seeds.



Seed heads taken from one kangaroo rat den -
A - Burrow grass seed.
B - Indian wheat heads.
C - Weed seeds.
D - Unidentified grass heads.

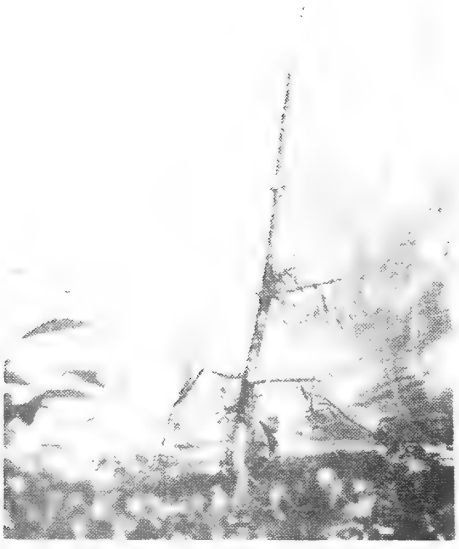
Kangaroo rat den before treatment (July 1, 1935),
Papago Indian Reservation, Sells, Arizona.

Same location as above two months later after eliminating
the kangaroo rats.

RABBITS AND HARES

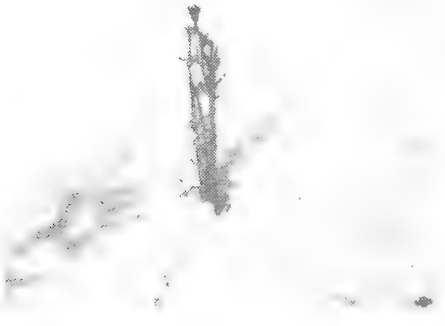
Reforestation is greatly hampered by rabbits in cut-over areas where intermittent fires have killed all seedlings over a period of years. In many areas the snowshoe hare will eat off as many as 40 percent of the seedlings and damage up to 70 percent of them.

Rabbit-infested reforestation area -
Olympic National Forest, Washington.



Damage to jackpine caused by snowshoe hares - Dukes, Michigan.

Healthy Norway pine. Snowshoe hare damage to pine and spruce seedlings at this stage of growth consists of nipping the terminal bud.

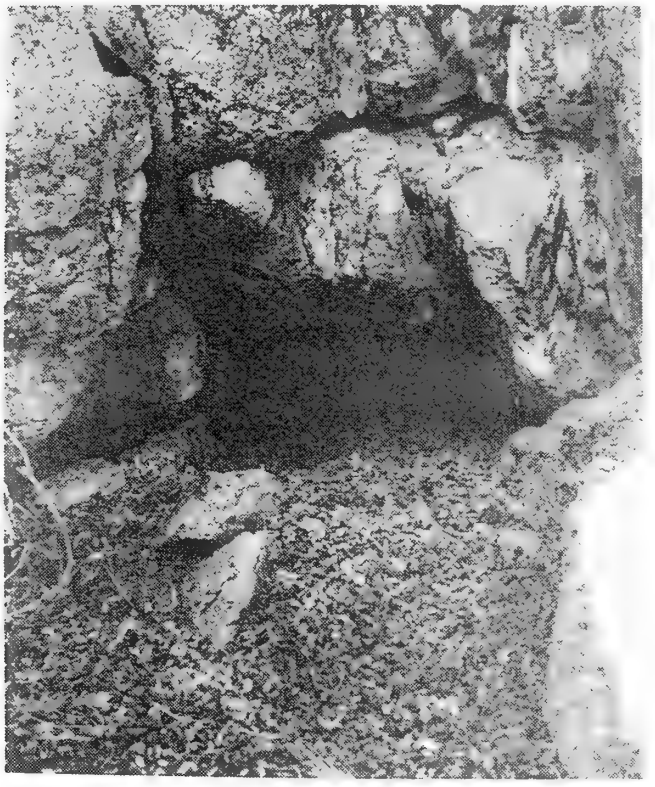


Spruce tree with lateral branches removed by snowshoe hares - Price County, Wisconsin.

Typical damage to cornfield by jack rabbits - Texas.

PORCUPINES

On many national forest areas the control of porcupines is imperative from the standpoint of timber reproduction. This is especially true on cut-over areas and where fires have destroyed all seedlings. Porcupines will often destroy up to 90 percent of the seedlings and, through continued girdling of young trees 15 to 25 years of age, will destroy all chance for commercial timber for many years to come.

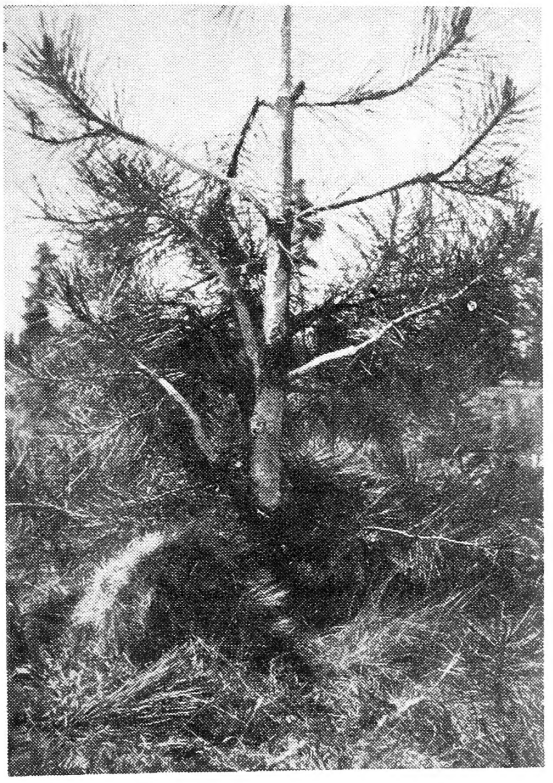


Typical porcupine den. Picture taken on Pike National Forest in Colorado, in area where porcupine control work was conducted under the Forest Service E. C. W. program.

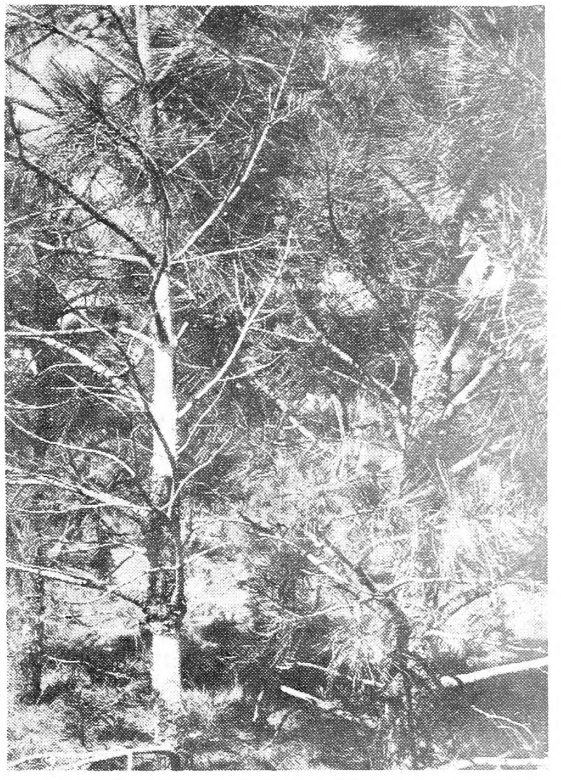
Porcupine at work girdling pine tree.

Showing one of 114 young pines damaged by porcupines on 15 acres.

Additional evidence on cut-over areas.



Porcupine at foot of tree probably 15 years old, which it has damaged beyond hope of recovery.



Complete girdling by porcupines about 12 inches above ground.

A TYPICAL E. C. W. CREW

E. C. W. crews have treated almost 12,000,000 acres of rodent-infested lands during the past three years, have done it carefully and well, and in so doing have been taught valuable lessons in wildlife management.