Jackrabbits

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Black-tailed jackrabbit.

Rangelands of the Great Plains, Intermountain area, and the Southwestern deserts of western North America are inhabited by several species of large hares, commonly known as "jackrabbits" or jacks." These animals occur almost everywhere, except in the higher mountains and in wooded regions, from the 95th meridian west to the Pacific and from the plains of Saskatchewan southward over the tableland of Mexico to the Isthmus of Tehuantepec. The resemblance of their large ears to those of the well-known pack animal of the West is supposedly the origin of the name "jackrabbit." Beyond the Rio Grande these rabbits may be known as "liebres" and during the settling of the West, they became known by such exotic names as "narrow-gauge mules" and "jackass hares."

When the first settlers ventured west to establish the range livestock industry, they encountered great herds of American bison on the plains and pronghorns, mule deer, elk, and mountain sheep in selected environments. However, the mammal most frequently sighted by travelers on the California or Oregon trails was the jackrabbit. Today, if you take an extended trip by automobile through the rangeland states, it is most likely that literally you will run into this animal.

Quite obviously, jackrabbits are collectively major consumers of herbage in many rangeland environments, and their ecology and population dynamics are important factors in range management.

Taxonomy

Jackrabbits belong to the order Lagomorpha (pikas, hares, and rabbits). Though often called "rodents," species in this order differ from true rodents (Order Rodentia) by having four upper incisors (rodents have only two).

Collectively, rabbits and hares make up the Family Leporidae; true rabbits belong to the genus *Sylvilagus* and hares to the genus *Lepus*. Jackrabbits are not true rabbits at all, but are actually hares. The true rabbits are represented on western rangelands by three species of cottontail and the pygmy rabbit.

Hares differ from rabbits in their anatomy, life history, and habits. They have larger ears and hind legs than rabbits. Rabbits give birth to naked and blind young that are confined to the nest for a period after birth, wheras hares give birth to young that are fully clothed with hair, their eyes open and legs ready to run. They run with long strides, cover much country quickly, and use distance more than cover in escaping from danger. Rabbits, on the other hand, scurry to cover, artfully dodging obstacles. Finally, hares use only forms or surface nests, whereas most rabbits retreat to burrows when alarmed.

Eleven species of hares have been described from North America, seven of which are known as "jackrabbits." The two major species in the continental United States are black-tailed jackrabbits (*Lepus californicus*), with at least 15 subspecies, and white-tailed jackrabbits (*L. townsendi*), also known as "prairie hares." Black-tailed jackrabbits range from south-central Washington into Mexico, and from the Pacific Coast to Missouri. The white-tail ranges from southern Alberta to northern New Mexico, and from central Oregon to Wisconsin. Antelope jackrabbits *(L. alleni)*, the largest North American hares, range well into southern Arizona from Mexico. The only other jackrabbit ranging north of the Mexican border is the white-sided jackrabbit *(L. gaillardi)*, which is found only occasionally in extreme southwestern New Mexico.

Physical Description and Life History

Depending on the species, Jackrabbits weigh from 3 to 13 pounds when mature. The black-tails are the smallest spe-

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cies, average 3 to 7 pounds, while the white-tailed jackrabbits weight between 5 to 10, antelope jackrabbits from 6 to 13 pounds.

The "trademark" ears are long in all species, ranging from 5 to 8 inches. Black-tailed jacks have black tails, gray sides, and black-tipped ears. The white-tailed jackrabbit, in addition to having a white tail, has the distinction of being the only North American jackrabbit that undergoes two annual molts. This species is brownish-gray in summer and white or pale gray in winter and, thus, is often mistaken for its smaller cousin, the snowshoe hare. Antelope jackrabbits are "white-sided," with whitish hips as well.

Jackrabbits can produce up to 3 or 4 litters per year. The young (2 to 8 per litter) are born in early summer after a month-long gestation period. The form or simple nest is constructed without burrowing and consists of a single depression in the grass or beneath a low shrub. The young, which suckle and follow the mother for about a month, are agile little creatures and can run swiftly with clever shifts and dodges when only 5 to 6 inches long.

Adaptations

Jackrabbits are structurally, behaviorally, and physiologically adapted to arid environments. Their large ears are very efficient radiators of heat. In addition, jackrabbits are active primarily during the cool hours of late evening, night, and early morning. Also, they can survive without a supply of drinking water. They depend for their water supply primarily on the moisture content of the herbage they consume. White-tailed jacks, in particular, are noted for their use of prickly pear cactus as a water source.

Behavior

Although jackrabbits have a somewhat grotesque physical appearance, few animals are more graceful as they bound along. When running, the jackrabbit has a long, swinging gallop, and can leap more than 10 feet. When it is in the air, its feet are drawn together and downstretched; when it touches on the ground, it rebounds with remarkable elasticity. At full speed, the animals can reach up to 40 mph. The naturalist Ernest Thompson Seton rated white-tailed jacks next to the antelope as the most speedy animal of the northern plains.

In general, jackrabbits are not gregarious, although a particular factor of the habitat may cause large numbers to congregate at a given point. They have been known to migrate to brushy draws and cropland when drought and overgrazing deplete food supply elsewhere. Daily movements depend on food and shelter.

Habitat

Jackrabbits are found in a variety of habitats throughout their range. The black-tails are found in open to semi-open valleys up to 12,000 feet in elevation. They are also common in grasslands and sparsely vegetated deserts. Gulches or dry washes with relatively dense stands of *Atriplex* spp. are favorite habitats. They are common in sagebrush habitats as well.

White-tailed jacks range in the northern open, grassy or sagebrush plains and western mountains. In some areas white-tailed jacks and black-tails occur together, though white-tails are found primarily in the foothills and mountains (especially during summer), whereas black-tails are in the valleys. In general, white-tailed jacks prefer areas with higher densities of grass than do black-tails. Black-tailed jacks are spreading into areas formerly occupied by white-tails in Colorado. Similarly, white-tails in Nevada were once much more widely distributed. Antelope jackrabbits are found only in the Lower Sonoran Life Zone, at elevations from sea level to 4,000 feet, in a variety of habitats including grass, mesquite, catclaw, and creosote desert. However, they prefer grassy slopes at moderate elevations.

Food Habits

Jackrabbits consume the forage available, but generally one quarter to one half of their diet is composed of grasses. Most of the information available on food habits is for the black-tailed type. Grasses and forbs are the major diet components for this species. These are most important in spring, summer, and early fall. Shrubs, including saltbush (*Atriplex* spp.), winterfat (*Ceratoides lanata*), big sagebrush (*Artemisia tridentata*), greasewood (*Sarcobatus* spp.), and the namesake rabbitbrush (*Chrysothamnus* spp.) make up the bulk of their diet in winter. Black-tailed jackrabbits consume about 0.2 pounds of dry forage per day. The order of their preference for forage in a Utah study was similar to that of domestic sheep.

White-tailed jackrabbits also feed primarily on grasses and forbs with shrubs their most important wintér food source and big sagebrush a least preferred species. Antelope jackrabbits consume grasses and shrubs such as mesquite and cactus.

Depending on the location and season of study, anywhere from 6 to 31 black-tailed jackrabbits have been reported to consume as much forage as one domestic ewe, and from 55 to 392 of these animals consume as much as one cow. In Colorado, jackrabbits consume an estimated amount of forage that would produce $7.4 million worth of beef. In Arizona, jackrabbits at densities up to one per acre reportedly eat as much forage as 4 to 10 cattle per 640 acres. An estimated 46 to 171 antelope jackrabbits, the largest species, eat as much forage as one cow, depending on the extent of competition for forage.

Jackrabbits in the Pristine Environment

Many of the native Indian cultures of the sagebrush rangelands were essentially "rabbit cultures." The jackrabbit furnished both food and clothing to many of the Indians of the Great Basin. Among the descriptions of Indian rabbit drives is that published by Townsend in 1839 for a drive he witnessed near what is now Walla Walla, Washington: "The Indians kill them with arrows and in winter take them with nets. To do this some one hundred or two hundred Indians, men, women, and children, collect and enclose a large space with a slight net, about five feet wide, made of hemp; the net is kept in a vertical position by pointed sticks attached to it and driven into the ground. These sticks are placed about five or six feet apart, and at each one an Indian is stationed with a short club in his hand. After these arrangements are completed, a large number of Indians enter the circle, and beat the bushes in every direction. The frightened hares dart off towards the nets and, in attempting to pass, are knocked on the head and secured."

John C. Fremont reported that the Indians of western Nevada used similar techniques to collect jackrabbits. When he camped on the Truckee River, January 31, 1844, he noted the individual nets used by Paiutes were 30 to 40 feet long.

Major Charles Bendire, while returning from Deep Spring Valley to Camp Independence, California, in 1867, saw the Indians of Owens Valley engaged in a drive that netted 300 to 400 jackrabbits. F.V. Coville, the botanist of the Death Valley Expedition, learned that the Indian of Ash Meadows, Nevada, constructed their rabbit nets from hemp dogbane (*Apocynum cannabinum*). Bancroft reported that the Goshute Indians of western Utah made their rabbit nets of flax twine and dropped the 3-foot high nets over sagebrush plants where they served as entanglement snares.

Population Dynamics

Populations of jackrabbits are very cyclic. This was one of the first population characteristics reported by observers of the American west. Jackrabbits were extremely numerous and suddenly almost disappeared. Occasionally, 19th century observers happened upon areas where thousands of recently dead jackrabbits were visible. Many observers felt there was a 5 or 6 year cycle of population growth and sudden decline.

One of the causes of sudden crashes in jackrabbit population is tularemia, a disease caused by the organism *Bacterium tularense.* Tularemia or "rabbit fever" is an infectious, plague-like disease frequently fatal to rodents and rabbits. The mortality rate may reach 90% of the population. It is readily transferred to man by ticks and blood-sucking insects or by personal contact with diseased rabbits. In man, it is a debilitating, disabling, and sometimes a fatal malady, with death rate of 4%. The germ of tularemia can infect humans through the unbroken skin. However healthy a jackrabbit appears, if it is to be eaten it should be thoroughly cooked as a precautionary measure. More than 80% of the human cases of this disease occurred after the person dressed or dissected jackrabbits.

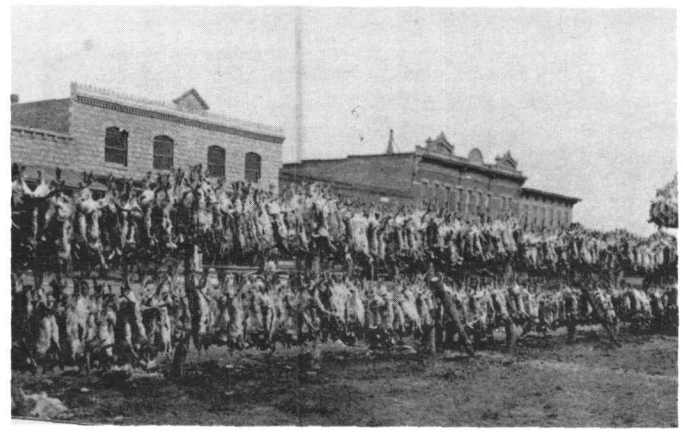
Crop Losses and Jackrabbit Drives

With the settlement of the West, cultivated crops furnished food that jackrabbits preferred and in much greater abundance than native rangelands furnished. Virtually every western state has gone through a period of severe depredation of crops by jackrabbits.

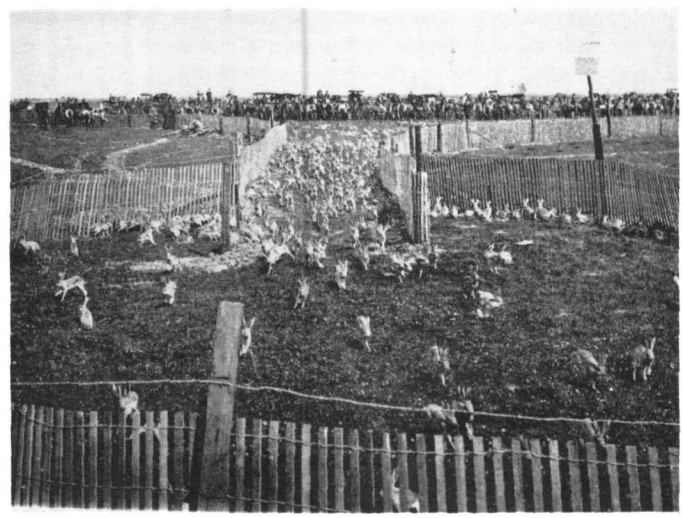
In 1888, the annual crop losses caused by jackrabbits in Tulare County, California, were estimated to be $600,000. As reclamation brought irrigation to the West, the lush crops grown in the middle of arid rangelands provided an inviting food source. Reports of jackrabbit depredation of crops came from such diverse geographical areas as Yakima County, Washington; Nampa, Idaho; Lamar, Colorado; and Prescott, Arizona.

In the environs of virtually every community where jackrabbits were a problem, jackrabbit drives were organized An estimate of the peak densities of jackrabbits can be obtained from reports of some of the 19th century drives. The *Chicago Tribune* of October 1, 1893, reported on one such drive near Fresno, California, which resulted in *20,000* dead jackrabbits.

In Modoc County, California, nearly 25,000 rabbits were killed over a 3-month period on a tract of land 6 by 8 miles in extent. Drives near Bakersfield, California, took place on a 640-acre ranch. The first drive on January 2, 1888, netted 1,126 jackrabbits. The field was redriven the same day and 796 more rabbits were killed in two drives of the same field. The Kern County Echo of March 8, 1888, stated that 40,000 jackrabbits were killed in the area from January 1 to March 1 of 1888. An estimated two-thirds of the rabbits were females that contained an average of three young.



19th century jackrabbit drives in (a) California.



19th century jackrabbit drives in (b) Colorado.

19th century jackrabbit drives in (c) Idaho.

Bounties

At least one county in virtually every western state experimented with bounties for jackrabbits. The usual result was a

bankrupt county treasury and no lasting reduction in jackrabbit numbers. For example, Nevada authorized the payment of bounties on rabbits for 2 years from January 1887 to February 1889. The rate was fixed at 5 cents, but no fewer than 100 scalps could be presented at one time. Nevada was in the depths of a post silver mining boom depression at the time, and cash money was scarce. Jackrabbit scalps became an accepted medium of exchange: 5 scalps for a drink, 10 scalps for a haircut, etc. When the counties were faced with bankruptcy, the law was repealed.

Natural Enemies of Jackrabbits

Several species of bird and mammal predators eat jackrabbits. Among the birds of prey that feed on jackrabbits are the barn owl, Audubon's caracara, prairie falcon, red-tailed hawk, great horned owl, and the golden eagle. Mammals that prey on jackrabbits include coyotes, foxes, bobcats, and mountain lions.

In much of the West, jackrabbits are the mainstay for coyotes. A study in Utah revealed that black-tailed jacks composed 75% of the coyote diet in winter. However, coyotes probably do not act as much of a check on jackrabbit populations. The relationship between coyotes and jackrabbits is probably similar to that described for predators and small rodents. Although coyotes might possibly maintain a jackrabbit population "low" for a longer time than would be expected without predation, apparently they are not effective in reducing jackrabbit numbers to a great extent during a cyclic peak. One reason for this is that coyotes do not have the same reproductive potential as jackrabbits. Also, coyote populations lag approximately one year behind those of jackrabbits, fluctuating from peak to peak in about 7 years. In other words, instead of coyotes controlling jackrabbits, jackrabbits may be a major factor controlling coyote populations.

Jackrabbits and Range Condition

Competition between jackrabbits and livestock for range forage, although less evident and less spectacular than jackrabbit crop consumption, is probably a more general and persistent problem. However, high jackrabbit densities are often a result of overgrazing rather than a causal agent. Jackrabbits seldom initiate the deterioration of rangelands. However, once the deteriortion has begun they may contribute to overgrazing and may be the primary cause of depletion in the final stages of deterioration. Jackrabbits thus may maintain such areas in a continual state of depletion.

Because black-tailed jackrabbits are distributed throughout the West, they probably cause more widespread damage than any other species. However, severe damage also can be caused by white-tailed jacks in the Great Plains and antelope jackrabbits in the Southwest.

Jackrabbits cause greatest problems during high populations and droughts. They often thwart seeding efforts by eating seedlings as soon as they emerge. On the positive side of the ledger, jackrabbits sometimes kill shrubs such as a sagebrush by stripping the bark and clipping off branches.

The long-eared jackrabbit is very much a part of range management in North America. ●

Renewable Natural Resources Center Funded

The Renewable Natural Resources Foundation (RNRF) has received a grant of $1 million from the Max C. Fleischmann Foundation to retire a land loan and start development of a resources center at Wild Acres, Washington, D.C.

Simultaneously, RNRF and the Society of American Foresters (SAF), co-owners of the 35-acre Wild Acres Tract, received the proceeds of a $1.2 million tax-exempt loan from the First National Bank of Maryland for construction of the first new office building at the Center. The 20,000 sq. ft. building will be part of the first-phase construction of a campus-like complex of interconnected buildings to house the national headquarters of various renewable natural resources societies. Ground breaking is scheduled for early fall 1980 with occupancy a year later.

The center facilities, in addition to office space, will include library, meeting rooms, computer, printing and mailing, and other shared services. There will also be exhibits and outdoor demonstrations of environmentally sound resource management techniques.

The RNRF objectives are to stimulate interdisciplinary cooperation among the resource professions and to provide a comprehensive source of scientific information on the physical, biological and social sciences, economics and the law relating to renewable natural resources. These resources include soil, water, air vegetation and animal life.

Present member organizations of the Renewable Natural Resources Foundation consortium are the American Fisheries Society, Society of American Foresters, Ecological Society of America, American Geophysical Union, The Wildlife Society, Society for Range Management, American Water Resources Association, The Institute of Ecology, American Association for Conservation Information, and Association of Interpretive Naturalists. A number of other organizations having scientific interest in the related natural resources are expected to join this consortium. Only about one-third of the Wild Acres tract will be devoted to office and related services. The major portion will be maintained in its natural, wooded state. The Grosvenor mansion, the family home of the late Gilbert H. Grosvenor of the National Geographic Society, will be peserved as part of the total complex.

In announcing the two-fold funding of the center development, RNRF Chairman H.R. Glascock, Jr. stated: "The Center will play a key role in preventing unnecessary shortages of renewable natural resources in the nation. It will make available at one location a scientific bank of talent and state-of-the-art information on resources production, management and use."