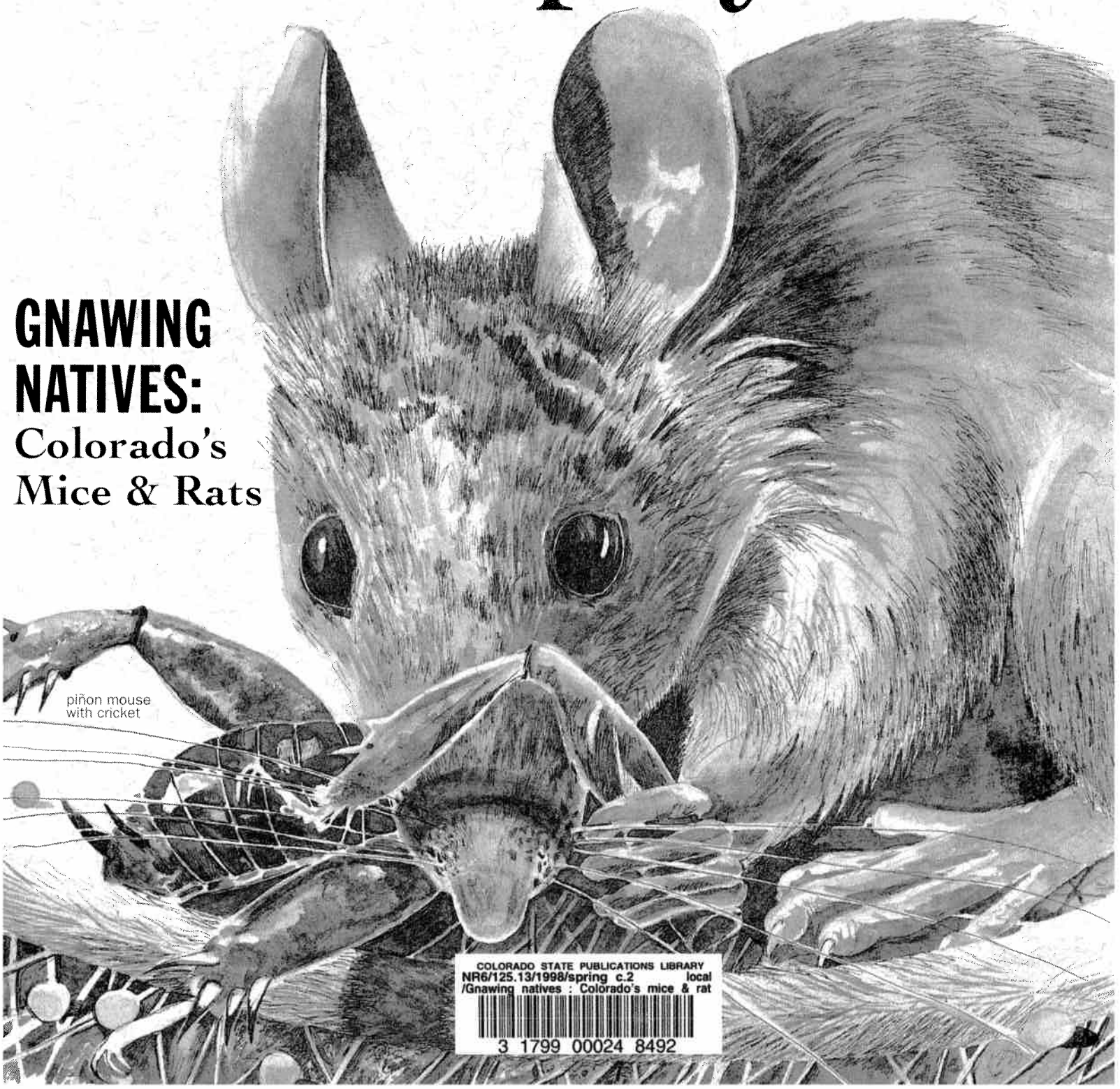
1998 SPRING COMPENDIUM OF WILDLIFE APPRECIATION

Colorado's Wildlife Company

GNAWING NATIVES: Colorado's Mice & Rats



piñon mouse with cricket

MIGHTY MITES (AND RATS) OF COLORADO'S ECOSYSTEM

by Mary Taylor Gray

> ***The mouse is a sober citizen who knows that grass grows in order that mice may store it as underground haystacks, and that snow falls in order that mice may build subways from stack to stack: supply, demand, and transport all neatly organized.***
>
> ***Aldo Leopold, Sand County Almanac***

Colorado is alive with rats and mice, its meadows, mountains, forests and prairies virtually overrun with rodents. So why aren't we all shrieking and running from our homes? Why don't we see our food supplies devoured and our sewers running wild with nasty rats? Why don't we hire a Pied Piper to lead them all away? Because the majority of wild mice and rats inhabiting Colorado's many habitats go about their daily lives with few of us ever aware of their presence. They are native wildlife, essential components of Colorado's ecosystem since long before the arrival of European settlers.

It may surprise some to learn that a mouse is not just a mouse, and a rat not just a rat. Depending upon how you count and classify them, Colorado is home to 24 species of native mice and nine species of native rats. This includes jumping, harvest, deer and pocket mice; voles; kangaroo and wood rats and the muskrat. Non-native, or Old World, species are represented in Colorado by the Norway rat and house mouse, both of which came to North America in the holds of ships and the baggage of immigrants from Europe and Asia. The observable differences between our native New World animals and their introduced cousins lie with their tails and their coloring. Old World species are uniform in color and have naked tails, while New World mice are two-toned—dark on their backs with paler undersides. Their tails are furred instead of naked and may also be countershaded—dark on top, light below.

The deer mouse and its cousins within the group known as white-footed mice are probably the best known among Colorado's native mice. With soft brown fur, white belly, long, two-toned tail and large, doe-like eyes, the deer mouse is an appealing creature. White-footed mice, including the piñon mouse illustrated on the cover, have a varied diet that includes insects.

barn owl

Another group, the voles,or meadow mice, are bob-tailed, small-eared, stocky-bodied rodents that spend their lives scurrying along runways chewed through the grass. In winter these galleries are just beneath the snow and sometimes voles can be heard scratching about inside their runways. Come spring, the meadow mouse's galleries materialize from the melting snow, little trenches snaking in all directions across the meadow. Vole tunnels are like micro game trails, used by many species to move about under relative cover.

Jumping mice are built like tiny kangaroos, with powerful hind legs and feet and long tails used for balance when hopping. Though only about three inches long, jumping mice can jump as far as seven feet when startled. Unlike many mice, Colorado's jumping mice hibernate during the winter. They prefer moist habitats and usually live among riparian vegetation. Jumping mice are mainly active at night but sometimes one can be seen during the day jumping through the grass.

Like pocket gophers, the pocket mice and kangaroo rats have external fur-lined cheek pouches used for carrying seeds. To empty them, the animal turns the pockets inside-out, then smooths the fur back into place with its paws. Pocket mice and kangaroo rats are nocturnal, live in dry habitats and can go for long periods without drinking free water, deriving the moisture they need from their food.

Unlike those beady-eyed, naked-tailed vermin that cause us all to give a collective cultural shudder—the house mouse and Norway rat—our native rats and mice are for the most part good guys. The brunt of responsibility for destruction of grain and food supplies and the carrying of disease must be borne by the foreign invaders. Native species do occasionally cause some problems. Cotton rats can damage alfalfa and other green crops. Voles sometimes destroy grain crops and kill fruit trees by chewing on the roots or girdling the trunks. Wood rats and deer mice may damage property and become nuisances by nesting in homes, buildings and mountain cabins. And the emergence of the hantavirus in the Southwest, which is borne by deer mice, demonstrates that native rodents can act as disease vectors.

But native mice and rats are major players in Colorado's ecosystem and their important role far outweighs any occasional problems they cause. We may not often see them, but these gnawing natives are out there in tremendous numbers, going about their lives. Their very abundance combined with their role as herbivores, converting plant energy to animal tissue, means that in the food web, they are like tiny Atlases holding up the world. Think of them as a vast work force of seed-eaters and grass-chewers, occupying nearly every terrestrial habitat in the state, all busily processing an incredible biomass of vegetation and making it available for predators. Just about any animal that eats other creatures for a living eats mice—foxes, coyotes, bobcats, owls, hawks, eagles, snakes, skunks, herons. A study of barn owl pellets estimated each owl consumes an average of 2000 rats and mice a year, or about five to six rodents a night. If this vast food source suddenly disappeared, Colorado's predators would soon follow. As the snack of choice for so many hunters, how do mice and rats survive?

By overwhelming the competition with numbers. A study of reproduction in voles estimated 200 to 300 adults in a one-acre plot of habitat. The female voles, about half the total, began breeding at 30 days of age, and kept on breeding, producing a litter every three to four weeks. Considering an average life span of two years, each female vole would produce about 24 litters and 150 young in her life. Each of her female offspring would also produce young. The resulting geometric progression would mean an astounding potential population explosion. Fortunately, natural controls keep mice populations in balance. Only one or two young from a litter survive to adulthood. Some rodent populations cycle, with explosive years of very high population followed by crashes or declines in numbers.

The important ecological role of mice and rats goes far beyond being a Big Mac for predators. In addition to unlocking the energy contained in plants, they distribute seeds. Caching by rodents is important to the germination of several tree and plant species. They control the spread of weeds. One study estimated white-footed mice each eat 260 seeds per day. Those that are carnivorous, like the grasshopper mouse, eat a great many insects. Burrowing and tunneling by rodents aerates the soil while the animals' feces and dead bodies fertilize the soil. Their activities help release and recycle other nutrients, such as the calcium locked in deer antlers, a favorite target of rodent gnawing.

So the next time you start to denigrate a mouse, or shriek at sight of a small scurrying form, remember that the rodent you are about to slight is a valuable and important component of Colorado's natural heritage.

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Rodents Gallery

GRASSHOPPER MOUSE

There's a black sheep in every family, and the grasshopper mouse is the one amongst mice. While other mice are shy, timid seed-eaters, the grasshopper mouse is a meat-eater, hunting insects, worms, lizards and, yes, other mice. The grasshopper mouse tracks its prey by smell, following a trail like a hound on the scent even to the point of uttering a series of squeaking "barks." Despite its carnivorous habits, the grasshopper mouse is entirely mouse-like in appearance, albeit a pretty big mouse. The body averages about five inches long with a two-inch hairy tail, big ears and grayish-brown fur with white underparts. Grasshopper mice are common nearly statewide in dry grassland, sagebrush and scrub habitats.

DEER MOUSE

The deer mouse, the most common and widely-distributed mammal in North America, stands as proof that small size is no barrier to biological success. In Colorado, this adaptable mouse is found in almost every habitat, from prairies to peaks, wherever a bit of cover and some sort of sustenance are available. Though seeds make up about three-quarters of the deer mouse diet, these mice will eat just about anything—fungi, leaves, carrion, insects. In turn, the abundant and ubiquitous deer mouse provides food for all sorts of predators, from owls to foxes to coyotes, and even to its cousin, the grasshopper mouse.

BUSHY-TAILED WOODRAT

If wildlife could go to court and change their names, the woodrat should probably be first in line. This big-eared, bushy-tailed rodent doesn't deserve all the negative connotations the word "rat" carries. The woodrat is a mountain-dweller in Colorado, found in Douglas-fir, ponderosa pine and aspen forests and even on rocky talus slopes above timberline. It is probably better known as the pack rat, renowned for its compulsion to collect artifacts, particularly shiny items, and store them in its big, messy nest. During the heyday of goldfever in Colorado, woodrats suffered as fortune-seekers, figuring the rodents might have secreted shiny gold nuggets in their nests, sought out and tore apart woodrat nests. Woodrats are the food of choice for ringtails-secretive, mountain-dwelling cousins of raccoons.

MEADOW VOLE

Voles don't fit the typical mouse profile of pointed nose, slim body and long tail. Their heads seem almost to merge with their bodies into one plump, round form. Their eyes and ears are small, sometimes almost lost in their fur, and their tails are short and stubby. Voles spend most of their time out of sight, not in underground burrows like gophers but in galleries they chew through the grass at the interface of soil and vegetation. Meadow voles prefer moist habitats—wet meadows, marshes, riparian wetlands. Because of their high numbers, voles are very important as prey animals. Meadow vole populations cycle about every two to five years. In high years, hundreds of voles may occupy one hectare of habitat, dropping to just a few animals per hectare in a low year.

ORD'S KANGAROO RAT

When the moon is full, drive out onto an arid prairie, shrubland, pasture or other dry upland habitat and you may be lucky enough to see busy kangaroo rats bouncing around on their hind legs in the moonlight like tiny kangaroos. With their soft brown coats and big brown eyes, 'roo rats are another animal undeserving of the "rat" association. They harvest seeds from grasses and plants, using their dainty paws to tuck the seeds into their cheek pouches. If startled, they will fire off haphazardly as if on pogo sticks, escaping in erratic, frantic patterns, their long, tufted tails providing counter-balance to their bounding leaps.

Why Care About A Mouse?

by Bob Hernbrode

Once, when I was describing the status of the meadow jumping mouse to a friend, he said, "If my kids grow up and never see one of these small mammals, so what? Why should we worry whether some inconspicuous bird or mammal survives? What effect will it have on humans?" There is no simple answer. It might be very difficult to show a direct connection between the extinction of the meadow jumping mouse and harm to humans. It is sort of like wondering how many bricks we can randomly pull from a wall before it falls or how many parts we can leave out of a rebuilt lawn mower and still expect it to run. Aldo Leopold said, "If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts. To keep every cog and wheel is the first precaution of intelligent tinkering."

To arouse public interest we must find meaningful ways to measure the practical, economic value of the web of life, including this little mouse. Perhaps we should ask, "What is the economic value of soil formation, food production, flood control, climate maintenance and all of the other indirect ways the land serves us?" We might find the meadow jumping mouse to be inseparably connected to land health– a key brick in the wall or the lock washer the lawn mower can't run without. Maybe, by insuring there is a place for the meadow jumping mouse, we are assured the land can continue to care for us.

DOW WORKING FOR WILDLIFE

Preble's Meadow Jumping Mouse

A tiny mouse with a body only three inches long anchored by a six-inch tail is causing a furor along Colorado's Front Range.

The Preble's meadow jumping mouse, *Zapus hudsonius preblei*, has already stalled a $35 million water pipeline project in Colorado Springs because portions of the pipeline route invade what might be prime Preble's habitat. Luckily, "agencies involved in projects where the mouse has been found have been able to develop mitigation plans and move ahead with their projects," says Preble's researcher Carron Meaney.

Why has one mouse species had so much impact? Because of its rarity. The Preble's, a subspecies of the meadow jumping mouse, had practically vanished before anyone realized it was in trouble. It had historically been known only in a few small pockets along the Front Range. The mouse favors the same habitats humans like—riparian areas along streams and rivers. Rampant suburban development of water corridors, as well as water diversion projects, has destroyed much of the dense vegetation this mouse needs. Recent surveys have found Preble's populations along a handful of creeks in Jefferson, Boulder, Larimer, El Paso and Elbert counties, at Rocky Flats, Roxborough State Park, the Air Force Academy and in the Medicine Bow National Forest east of Laramie, Wyoming.

In October of 1997, Congress passed an appropriations bill including $400,000 to develop a conservation program to protect the Preble's meadow jumping mouse. Over the last several years DOW has instituted, partly with dollars from the Great Outdoors Colorado Trust, inventory and genetic studies and is co-chairing a technical working group concerned with the mouse. Research and survey work is ongoing. The US Fish and Wildlife Service is expected to rule by March of this year on listing the Preble's as a threatened or endangered species.

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