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National Wildlife Research Center's Olympia Field Station

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Mountain Beaver: The Little Rodent with a Large Appetite

BY WENDY M. ARJO

While walking through open forest areas you might have found yourself falling into large holes that dot the landscape. After extracting your foot from the hole you may have noticed other holes nearby, some with clipped sword fern or forbs neatly arrayed around the hole. These symmetrical burrows are home to the



mountain beaver. The mountain beaver, considered the most primitive living rodent species, descended from a now extinct family of rodents over 30 million years ago. Seven subspecies of mountain beaver are recognized with one subspecies in coastal California currently listed as an endangered species. This semi-fossorial rodent, endemic to the Pacific Northwest and California, is among a variety of herbivores that retard growth and cause seedling deformities and mortality.

Mountain beavers are described as voracious in their dietary habits, with the predominant criteria for plant

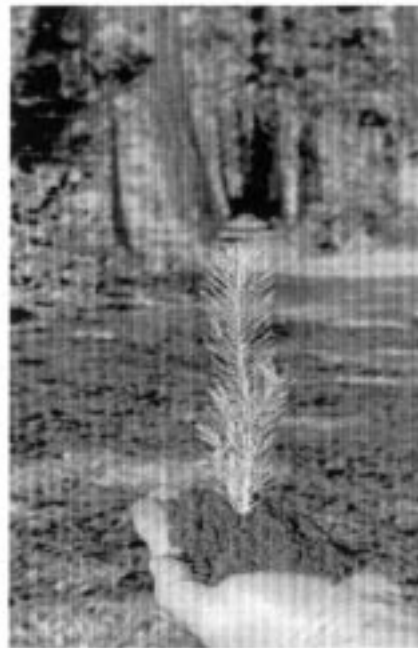


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Mountain beaver are endemic to the West Coast.

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selection being availability. Ferns and salal are preferred foods, though bark and twigs of trees are readily taken when forage is limited. Douglas-fir does not appear to be a highly preferred forage of mountain beavers, yet establishment of Douglas-fir seedlings is often difficult in areas with mountain beavers. In most areas, damage by mountain beavers is limited to seedlings less than 1.5 inches in diameter. Multiple bites on the clipped seedling create a serrated edge, but more typically the diagonal cut of the seedling will indicate mountain beaver activity. In some areas, larger trees suffer basal barking and undermining of roots. Girdling by mountain beavers can be distinguished from bear damage because the damage is lower on the tree and mountain beavers leave horizontal tooth marks and claw marks. For a species that has been around for so many years, very little is actually known about its basic ecology. The Olympia Field Station is currently conducting several studies to expand our current understanding of this rodent species.

A variety of environmental factors influence the diet selection of foraging animals. Perhaps the most significant factor in whether a plant is harvested is the availability of alternate choices. At the field station, researchers have the ability to house mountain beavers in large outdoor habitat pens in which

we can manipulate vegetation and populations. Researchers at the Olympia Field Station conducted a series of trials to determine the influence of available forage and population pressure on seedling damage, in addition to conducting standard cafeteria tests to determine mountain beaver food preference. In the cafeteria trials we determined that ferns, salal, cat's ear and salmonberry were highly preferred foods over Douglas-fir and western redcedar. Results from the habitat study showed that mountain beavers in pens without preferred forage damaged more seedlings than in pens with preferred forage. Population pressure did not have an effect on damage because mountain beavers moved to areas where there was preferred forage.

In addition to knowing basic food requirements, understanding how much area mountain beavers can cover and how far they can disperse to reinvade areas is also important information for forest managers to know. Our ability to draw conclusions on mountain beaver movements and home range use has been limited because of prior study sample sizes and available study methodology. The Olympia Field Station is conducting several studies to understand mountain beaver movements and dispersal patterns under varying vegetational characteristics.

Home range size for adult mountain beavers was previously reported as 0.08 to 0.5 acres with an average home range size of 0.3 acres. Several factors can affect home range size including population density, available forage, available cover and available water. To understand which of these factors may affect movements, we captured and radio collared 41 mountain beavers on two recent clearcuts on the Weyerhaeuser Twin Harbors Tree Farm. Captures included 12 subadults and 29 adults. Animals were radio tracked throughout a 24-hour period to determine locations and activity periods. Although most previous literature supported a nocturnal activity pattern for the mountain beaver, our data show that mountain beavers are active throughout a 24-hour period. Animals are usually active for an hour or two and then inactive for another

two. Home range sizes and core use areas (areas of intensive use) differed between our two study sites and were substantially larger than previously reported.

At the Upper Donovan study site home ranges averaged 10.28 acres (± 7.98), and core use areas 1.98 acres (± 1.56). Sylvia Creek home ranges and core use areas were smaller than the Upper Donovan, 2.89 acres (± 0.59) and 0.59 acres (± 0.72), respectively. Predation on the study sites was high (40 percent). Bobcats, coyotes and raptors are the main aboveground predators, and an unknown mustelid species, likely a mink or spotted skunk, the belowground predator. In addition to the observed home ranges that were larger than previously reported, we have found that mountain beavers can disperse over one-third of a mile to

are available hiding cover on this site. Upper Donovan, on the other hand, is dominated mostly by blackberry and salmonberry, with less down woody debris. In the absence of available preferred food, mountain beavers may travel considerable distances, as shown in this study, to forage on available plants (i.e., seedlings).

Seedling protection from mountain beaver damage has been limited to barriers, although these have met with limited success. Trapping is the most productive means to reduce mountain beaver populations, and hence, damage to new seedlings. With current information gained from mountain beaver movements and preference for food resources, alternative non-lethal methods to reduce damage may be implemented. For instance, managing for an alternate winter food source



PHOTO COURTESY OF NWRC OLYMPIA FIELD STATION

Mountain beaver seedling damage.

establish new territories.

Preliminary results suggest that the difference in home range sizes between the two areas is a result of available forage. Sylvia Creek is dominated by forbs, but also harbors salal, sword fern and bracken fern, all preferred mountain beaver forage. In addition, large uprooted stumps and a preponderance of down woody debris

may help reduce the amount of damage by mountain beavers to newly planted seedlings. ♦

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