



# FYI

INFORMATION

*A Research  
Summary  
From the  
Washington  
Forest  
Protection  
Association*

## **New Research Addresses Damage Done to Forestland by the Elusive Mountain Beaver, Uncovers New Behavior Patterns**



**A**lthough elusive and seldom seen, mountain beavers—ground-dwelling rodents not closely related to better-known stream beavers—kill or damage trees on thousands of acres of Pacific Northwest forestland each year, with obvious implications for commercial forestland and forest managers. However, new research being conducted at the USDA/APHIS (Animal & Plant Health Inspection

Service)/Wildlife Services/National Wildlife Research Center (NWRC) in Olympia has improved our knowledge of mountain beaver behavior and has the potential to limit their damage.

Dr. Wendy Arjo, a research wildlife biologist, and others at the field station are conducting research on mountain beavers using some of the recent advances in radio-telemetry technology. Studies involve both wild mountain beavers—captured, collared, and released—and captive animals in large open pens designed to simulate wild conditions at their Olympia facility. Their research has created a new understanding of mountain beaver mobility and food preferences that may provide new insights into methods of controlling their damage to young trees, thus enhancing reforestation efforts.

### **Mountain Beavers Represent Costly Threat to Reforestation**

Mountain beavers are mostly found in the coastal mountains and lower elevations in the western Cascades stretching from southern British Columbia to northern California.

Although not closely related to true beavers, they were given their name because of their sharp cutting teeth and powerful jaws, which can shear through

tree branches or sapling trunks up to about 1.5 inches in diameter. Mountain beavers live a solitary existence outside of the breeding season, spending most daylight hours underground in a complex of tunnels and coming out at night to gather food. Each animal can roam over as much as six acres, but tends to defend only about one acre, depending on food availability and population density.



*A primitive, ground-dwelling rodent, the mountain beaver represents a threat to reforestation in the western Cascades. If left unchecked, a mountain beaver population can kill up to 30 percent of the seedlings in a freshly replanted unit over the first two growing seasons. The animals clip seedlings right at their base and carry them to their extensive burrow systems, where they are used for both food and bedding.*



*A wildlife biologist fits a mountain beaver with a state-of-the-art radio telemetry collar to help track its movement patterns and behavior.*



Although they prefer shrubs and other native plants—chiefly salal and sword fern—to conifers, there is a period of time each year between January and March where in many areas availability of preferred forage is naturally limited, and they turn to recently planted conifer seedlings to bridge the gap until other food sources begin to grow. These young conifer seedlings or small saplings provide an easily obtainable food source for mountain beavers during this lean period, and some research suggests they use the material for bedding as well. Cutting through the stem at ground level and taking the whole tree back to their burrow, a single animal living in a recently planted unit can kill up to 30 percent of the newly-planted young seedlings on an acre in a single season.

### Behavior Research at the Olympia Field Station Changes Old Thinking

“Very little was known about these animals until recently,” Arjo said, “and what was known was based on 30-year-old research. For example, mountain beavers were commonly thought to be nocturnal, since they were almost never seen during the day. With radio tracking, however, we found that they are active throughout the day either within their burrow systems or aboveground, on a three- or four-hour cycle of activity and rest.”

The studies at the Olympia field station have yielded other interesting results as well. Standard “cafeteria” studies have determined that mountain beavers are less likely to damage trees when other preferred food sources are available. For example, they preferred salal, ferns, cat’s ear, and salmonberry to conifer seedlings when both were provided in ample quantities. New data have also changed old thinking about dispersal patterns of animals and the size of their home ranges, both of which are much greater than previously thought. “One mountain beaver can range over a number of acres if food is not plentiful in its home territory,” said Arjo. “They have also been shown to travel up to half a kilometer to establish new territories. For forest managers, this creates significant challenges to controlling populations.”

### Foresters Study Managing Beaver Damage on Commercial Forestland

John Todd, an operational forester in Weyerhaeuser’s Aberdeen Timberland District, has made company forestland available for research in the wild and has been working closely with Arjo on many

Biology	Historic Knowledge	Current Knowledge
Home Range	Less than 0.5 acres	3-7 acres, with 0.5-1.5 core area
Activity	Nocturnal	Active most periods for short durations, more active in evening
Reproduction	Not until second year	Can reproduce before one year
Movement	Stay near nest site	Can move up to 0.5 kilometers
Densities	No data in recently harvested units	NWRC research will help understand population dynamics after harvest

*Recent studies at the Northwest Research Center have greatly increased our understanding of mountain beaver movement patterns, reproduction patterns, and range. Our previous knowledge base was decades old, and current information can be invaluable to forest managers.*

of these studies. A 30-year veteran in forestry, he has witnessed the struggles managers have had with mountain beaver damage. “Weyerhaeuser has spent a great deal of time researching ways to reduce the damage done by these animals,” said Todd. “The problem is that they are attracted to recently harvested areas because more forage grows when harvest opens them up. When the time comes for replanting, the population of mountain beavers has invariably increased to a higher level than in pre-harvest stands.”

Both Todd and Arjo have conducted a great deal of research into barriers, repellents, and other means of protecting seedlings from depredation, but a cost-effective method has not been developed to date. Trapping, which has been the primary method of controlling population, has also proved quite difficult. “In areas where mountain beaver activity is known to be a problem,” said Todd, “we usually will trap during the winter to try to minimize their numbers before breeding season and replanting occur, then again the following year if reinvasion has occurred. If we can get trees to survive two full growing seasons, most of their stems become too thick for the animals to cut through with their teeth. After those critical two years have passed, the lower level of damage makes further trapping unnecessary, and repopulation usually occurs within a short period of time.”

Terrain and dense vegetation make mountain beavers difficult both to find and trap, however, and Initiative 713, which made body-gripping traps illegal, forces landowners to use padded leg-hold traps—a much more expensive, labor-intensive, and less humane method of animal control. “One of the problems with limited tools is that trapping can occur anywhere from October through February, leading up to the replanting season,” said Dr. Arjo. “If a particular

unit was trapped during the early part of the winter, as much as four months may have elapsed before planting, which allows plenty of time for animals to invade. We need integrated management strategies, and not just a single tool to address these kinds of issues.”

Arjo feels, however, that the current direction of their research shows some hope of alleviating the problem in other ways. “As our knowledge of mountain beavers continues to grow, so does our hope of finding natural ways to coexist with them. Our discovery that they prefer many other types of vegetation over Douglas-fir and western redcedar means that we may be able to manage our forests in ways that will provide alternative, preferred foods for them. We’re also very optimistic that an improved understanding of their movements and dispersal patterns, made possible with new technology, will help identify new approaches to damage control, to the benefit of forest managers.” ■

For further information on mountain beavers, please visit the Washington Department of Fish and Wildlife at <http://wdfw.wa.gov/wlm/living> for their “living with wildlife” series.



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