

**DIAGNOSTIC SUMMARY OF DAMAGE CAUSED BY
VERTEBRATE ANIMALS TO PACIFIC NORTHWEST CONIFERS**

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General type of damage	Animal	Size of trees affected	Description of damage	Accessory signs	Remarks
Clipping of stems, branches, or roots	Mountain beaver	Seedlings and small saplings	Small stems (<1" diameter) and branches clipped at an oblique angle, thereby killing or deforming the seedling. Larger stems may have bark stripped at base or be chewed through; teeth marks 1/8" wide, generally horizontal.	Burrows connected by tunnels or trenches, sometimes with freshly-cut vegetation at entrances.	Common in steep, brushy forests west of the Cascades, particularly coastal areas.
	Rabbits and hares	Seedlings	Small stems (<1/4" diameter) and branches clipped at an oblique angle, frequently killing or stunting the growth of seedlings.	Droppings consist of flattened, ovoid pellets about 3/8" diameter; "particle board" composition.	Prefer brushy sites throughout the Pacific Northwest.
	Pocket gopher	Seedlings and saplings; rarely large trees	Clipping and gnawing of roots and lower stem; frequently killing conifer reproduction; teeth marks about 1/8 - 1/16" wide.	Horseshoe- or fan-shaped mounds around burrows; loose, churned soil; tunnel casts. Seedlings turning chlorotic and no longer anchored by roots.	Common in meadows and openings of east-side forests, but occurs in west-side forests as well.

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Browsing of shoots and foliage	Deer and elk	Seedlings and small saplings	Shrubby, hedged appearance of seedlings due to browsing; occasional stripping of bark and foliage by elk. Shredded bark on saplings due to antler polishing. Seedlings and saplings are rarely killed but can suffer substantial growth loss.	Oval to cylindrically shaped droppings; deer pellets about size of raisin; elk pellets about size of hazelnut. Distinctive tracks and well-defined trails.	Common in areas with patchwork of clearcuts, conifer regeneration, and mature stands throughout the Pacific Northwest.
	Cattle and sheep	Seedlings and saplings	Grazing of stems and foliage; trampling of seedlings; breakage of sapling limbs and tops due to rubbing. Damage can result in mortality, deformity, or growth loss.	Presence of animals. Characteristic droppings. Well-defined trails and distinctive tracks.	Damage is heaviest where animals congregate or graze for extended periods.
Girdling of stems and boles	Meadow voles (meadow mice)	Small seedlings	Finely gnawed bark at base of seedling and clipped lateral branches. Seedlings frequently die, exhibiting a fuzzy, barked stem near ground level.	Golf ball-sized holes connected by small runways on surface of ground.	Common in moist, old pastures or meadows with a thick thatch of grass and forbs. Found throughout Pacific Northwest.
	Tree squirrels	Pole-sized trees	Bark peeled off upper bole in large patches, often girdling the stem and causing foliage to turn color and die. Cones and cone-bearing branchlets are sometimes cut.	Short strips of bark with small tooth marks on the underside accumulate at base of trees. Cones, cone scales, and cone branchlets are scattered beneath crown.	Damage generally occurs in winter or early spring when other sources of food are scarce. Found throughout Pacific Northwest.

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Girdling of stems and boles	Porcupines	Seedlings, saplings, and pole-sized trees	Gnawed, girdled appearance of stem and large branches, causing foliage to turn color and die.	Teeth marks on gnawed areas are horizontal or diagonal and about 1/4" wide. Scat pellets are oblong, about 1" long with a "particle board" composition.	Pines are most vulnerable, particularly east of the Cascades.
	Black bear	Pole-sized trees	Bark stripped generally near base of trees, with bare areas marred by long, vertical grooves caused by incisors and canine teeth; trees turn color and die.	Patches of "yellow-" and "red-flagged" trees. Discarded strips of bark at base of tree. Characteristic bear tracks.	Damage primarily occurs in the spring in young second-growth Douglas-fir stands in west-side forests when alternative food sources are scarce.
	Dusky-footed woodrat	Saplings and pole-sized trees	Bark stripped in a patchwork pattern from upper branches and bole; stripped areas are relatively smooth except for occasional tiny horizontal or diagonal tooth marks; no bark strips at base of trees; trees turn color and die.	Large stick nests constructed of shredded bark strips, twigs, and branches occur on ground or in nearby trees.	Common in dense, second-growth and old-growth stands west of the Cascades in Oregon and northern California.
	Stream beaver	Saplings to pole-sized trees	Trees chewed through in an hourglass fashion at base. Flooding caused by dams can kill riparian trees.	Distinctive chisel-like tooth marks and piles of chips at base of cone-shaped stump. Characteristic beaver huts and dams in waterways.	Damage occurs near streams, rivers, and ponds throughout the Pacific Northwest.