Montane vole

In the PP and BG zones, there are three species: the Great Basin pocket mouse, western harvest mouse, and montane vole that could serve as indicators of habitat maintenance in ‘open range’ old fields, sagebrush with native bunchgrasses, and ponderosa pine forest. The pocket mouse is a species of arid and semi-arid habitats whereas sagebrush and bunchgrasses are dominant. It also occurs in ponderosa pine forests. The women harvest mouse is associated with dry grasslands of the Okanagan and Similkameen valleys. Dominant vegetation of these grasslands includes bluebunch wheatgrass, big sagebrush, and antelope-wheatgrass. Habitat types utilized by harvest mice include shrub-steppe rangeland, old fields, dry gullies and overgrown grainy areas bordering cultivated fields. Both of these species could act as indicators of sufficient ‘open range’ habitats of grassland and shrubland are being maintained in these two zones.

The montane vole prefers and short grassland at lower elevations and in valleys bottoms. This vole is similar to the meadow vole in many of its habits with some limited evidence reported for both multi-annual and annual cycles of abundance. Montane voles prefer pine-spruce forests that provide both cover and food sources such as grasses, sedges, forbs, and shrubs. Thus, they are an excellent indicator of the maintenance of grassland habitat.

Response of Small Mammals

Agricultural systems have led to the development of small-mammal indicators with their myriad uses. These three small mammal indicators, with their myriad uses, could act as indicators to determine if sufficient ‘open range’ habitats for the harvest mouse, western harvest mice, and montane vole are present. The success of the forest industry in these two zones.

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The southern interior of B.C. is characterized by three major forest zones: Interior Dry Forest (IDF), Ponderosa pine (PP) and the Bunchgrass (BG) zone. Dry Douglas-fir forests are found in the drier, southern part of B.C., with Ponderosa pine in the drier, southern part of B.C. and Bunchgrass zone in the drier, southern part of B.C.

A crucial question is: are we able to maintain stand structure and “forest range” attributes for cattle grazing in managed forests? We predicted that, at 10-12 years after partial harvesting of dry Douglas-fir forests, a different distribution of age structures and “forest range” attributes will exist, with higher levels of the number of red-backed voles per hectare in the harvested stands, compared to the uncut forest stands. However, mean height of red-backed voles per hectare was similar between the harvested and uncut stands, and the mean number of red-backed voles per hectare was higher in the harvested stands than in the uncut forest stands. The mean coefficient of variation for diameter of Douglas-fir was similar among stands, but the mean number of red-backed voles per hectare was lower in the harvested stands than in the uncut forest stands.

### Table: Mean Coefficient of Variation (%)

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There were no differences in measured parameters of understory vegetation among treatments, but there were 5 plant species for cattle forage.

Inferences to timber, biodiversity, and range

Our study used “keystone structures” and “ecological indicators” as inferences to managing dry Douglas-fir forests. We found that dry Douglas-fir forests are critical to the maintenance of grassland habitat. Multi-annual openings in Douglas-fir forests are maintained or increase. This stands in contrast to the uncut forest stands where openings are reduced. Inferences to timber, biodiversity, and range are critical to the future of the timber industry and conservation of biodiversity need to be maintained in the harvested stands.

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Montane vole. Understory development in multiple objectives. This mandate will become crucial as we approach the end of the harvest era for lodgepole pine, owing to the mountain pine beetle outbreak, and enter Douglas-fir forests on a much larger scale.

In the PF and BG zones, there are three species: the Great Basin pocket mouse, western harvest mouse, and montane vole that could serve as indicators of habitat maintenance in “open range” old fields, shrublands with native bunchgrasses, and ponderosa pine forest. The pocket mouse is a species of arid and subdesert habitats where sagebrush and bunchgrasses are dominant. It also occurs in ponderosa pine forests. The western harvest mouse is associated with sagebrush habitat and bordering fields of agricultural crops (forages, tree plantings). It also occurs in ponderosa pine forests. The montane vole prefers arid short grassland at lower elevations and is similar to the meadow vole. Thus, they are an excellent indicator of the maintenance of these two zones.

The montane vole prefers short grassland at lower elevations and in valleys bottoms. This vole is similar to the meadow vole in many of its habits with some limited evidence reported for both multi-annual and annual cycles of abundance. Montane voles prefer perennial grassland habitats that provide both cover and food sources such as grasses, sedges, forbs, and shrubs. Thus, they are an excellent indicator of the maintenance of grassland habitat.

Sagebrush habitat with native bunchgrasses and forage species includes bluebunch wheatgrass, big sagebrush, and antelope-wheatgrass, and bordering fields of agricultural crops (forages, tree plantings). The pocket mouse is associated with dry grasslands of the Okanagan and Similkameen valleys. Dominant vegetation of these grasslands includes Bluebunch wheatgrass, big sagebrush, and antelope-wheatgrass. Habitat types utilized by harvest mice include shrub steppe, rangeland, old fields, dry gullies and overgrown gassy areas bordering cultivated fields. Both of these species are closely associated with the same areas of sufficient “open range” habitats of grizzly and shrubland are being maintained in these zones.

The pocket mouse and harvest mouse at lower elevations and in valleys bottoms. This vole is similar to the meadow vole in many of its habits with some limited evidence reported for both multi-annual and annual cycles of abundance. Montane voles prefer perennial grassland habitats that provide both cover and food sources such as grasses, sedges, forbs, and shrubs. Thus, they are an excellent indicator of the maintenance of grassland habitat.

Western harvest mouse occurred primarily in the old field habitats reaching annual peaks in abundance, ranging from 3.5 to 10.5 animals per ha, in the fall and late winter months. Mean overall abundance of western harvest mouse per ha was highest in the old field (7.2) compared with the sage (0.8) and pine forest (0.01) habitats.

The pocket mouse is an indicator of the maintenance of shrubland habitat.

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Montane vole. *Clethrionomys rutilus*. The montane vole prefers arid short grassland at lower elevations and overgrown grassy areas bordering cultivated fields. Both of these species could serve as indicators of habitat conditions in these two zones. The montane vole is short and grazes at lower elevations and in valley bottoms. This vole is similar to the meadow vole in that it shows indications of both multi-annual and annual cycles of abundance. Montane voles prefer discontinuous habitats that provide both cover and food sources such as grasses, sedges, forbs, and shrubs. Thus, they are an excellent indicator of the maintenance of grassland habitat.

Western harvest mouse occurs primarily in the old field habitat reaching annual peaks in abundance, ranging from 9.5 to 10.5 animals per ha, in the fall and early winter months. Mean overall abundance of western harvest mice per ha was highest in the old field (3.7) compared with the sage (0.8) and pine forest (0.03) habitats.

In the PP and BG zones, there are three species that could serve as indicators of habitat maintenance in open range habitats. The women’s harvest mouse and montane vole is associated with dry grasslands of the Okanagan and Similkameen valleys. Dominant vegetation of these grasslands includes bluebunch wheatgrass, big sagebrush, and antelope bitterbrush. Habitat types utilized by harvest mice include dry meadows, rangeland, old fields, dry gullies and valleys. Thus, they are an excellent indicator of the maintenance of grassland habitat.

Old field habitat with native bunchgrasses and forage species

Sagebrush habitat with native bunchgrasses and balsamroot

Forest habitat with native bunchgrasses and balsamroot

Ponderosa pine forest with native bunchgrasses and balsamroot

References


Sullivan, T.P., D.S. Sullivan, and P.M.F. Lindgren. 2009. Dry Douglasfi eld forests: Stand structure, openings, and maintenance of biodiversity using small mammal indicators. (In review at a scientific journal.)

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Open Range Habitats and Conservation

The preference for sagebrush habitats by the pocket mouse, and consequently a trap disparity ability, suggests that these species, including old fields, need to be conserved as non-lin ear components within a mosaic of natural and managed habitats. Western harvest mice and montane voles, on the other hand, may do well in linear and non-linear habitats with a high human and structural diversity of grasses and forbs. Various configurations of linear habitats in the form of hedges, forest edge, roadside ditches, and linear stream corridors and ditches may provide sufficient habitat for the harvest mouse and montane vole, however the vegetative component is maintained. To this end, linear habitats created within and bordering fields of agricultural crops, storages, true fruits and vineyards could help curtail the encroaching habitat base for these species.

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