

LIFE UNDER THE SNOWPACK

There's an active "subnivean" world down there



KATHARINE FLETCHER

While people snowmobile, hike, snowshoe, ski or ride horses across the winter landscape, few give much thought to what's going on beneath them. It's a fascinating environment called the subnivean, a word derived from Latin, where "sub" means "under" and "nives" means "snow."

Many animals use the snowpack as shelter from harsh conditions above ground. In the Ottawa Valley, mammals like voles, mice, red squirrels and shrews build tunnels, enabling them to travel about safely in search of food. These are tunnels of life, lit by filtered light, a specialized ecosystem where animals forage for roots, grass, bark, as well as insects, plus their eggs and pupae – not so safe for them!

Rocks, fallen branches, twigs and layers of deciduous leaves help to create pockets of air, light and space beneath the snow. They help tunnelers to create secure networks – and reduce the amount of energy they have to expend, because fallen branches help support the tunnels from the weight of snow.

And it's warmer down there. Snow traps the heat of the earth so the bottom of the snow blanket hovers around 0° C. As well, it's a moist environment, so venting is important. Too much moisture, and animals could become wet and start losing body heat. It's a delicate balance.

Perhaps you've seen their traces – holes in the snow with pawprints leading to and from them. Look around bird feeders where seeds have fallen down. Red squirrels often create tunnel openings here, which give them a door to a reliable food source.

Tunnel "doorways" are also escape hatches from above-ground predators such as domestic cats, foxes and coyotes. And they provide ventilation for the carbon dioxide that accumulates beneath the snow from animals breathing and from its natural release from the ground.

Although subnivean tunnels seem to offer safety, predators also use them. One in particular is superbly adapted to tunnels. With a long, tube-shaped body, short legs, and a voracious appetite, weasels are the terrors of the subnivean world.

Ben Gadd's Handbook of the Canadian Rockies has lessons for our part of the world.



Photo by Eric Fletcher

Subnivean hollows: squirrels have been eating the spruce cones, and have made holes around the base for protection from predators.

He writes that weasels "spread terror through a series of winter runs that small rodents make at the base of the snowpack." And the hunt goes on from outside the tunnels as well. Owls, coyotes and foxes have such sharp hearing that they can detect their invisible prey. Perhaps you've seen photos of snowy, great gray, or great horned owls plunging into snow and emerging with a vole or mouse in their talons.

And then there are the grouse. When a ruffed grouse bursts out from the snow as you ski or snowshoe silently through the bush is an unforgettable, startling moment which demonstrates that birds, too, use snow as

shelter. I love to trace grouse tracks back to discover the cavity and wing-marks that mark their emergence from a subnivian lair. It's usually safe, but freezing rain can convert their shelter into a tomb.

This subnivean world is a busy place which we rarely see. I say "rarely" because yes, only if we're observant, do we see the openings and, during a melt the tunnels themselves, snaking over the surface – traces of the creatures who made them, visible for all to see. ■

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