



# Flotation Devices

Anyone who spends time in the winter woods knows that many winter-active animals reduce their sphere of activity after a big snow. Most hole up until travel becomes easier. This is not to be wondered at. Survival in winter is a matter of meticulous budgeting of energy resources. This is a season when food is scarce. Many mammals rely upon stored fat or cached food to make it through the season. Moving through deep snow will use more energy than they can hope to acquire by foraging. So they wait for the snow crystals to transform and bond, for the snowpack to become more dense and firm.

There is a classification system for animals that live in the snowy north. The technical terms, for those of you who like such things, use the Greek root *chion* (snow) to make *chionophobes*, *chioneuphores*, and *chionophiles*.

Chionophobes (snow fearers) are poorly adapted for winter. Many hibernate or mi-


grate. The opossum is a good example of a winter-active chionophobe. The opossums that survive northern winters usually lose parts of their naked tails and ears to frostbite. They persist because of their high reproductive rate and ability to take advantage of food sources and shelter created by humans.

Chioneuphores (snow tolerators) are animals that have no special adaptations for snow, yet do fairly well under ordinary winter conditions. Most of the animals that remain active in Vermont winters fall into the chioneuphore category—squirrels, foxes, bobcats, and fishers, to name a few.

In the chionophile (snow lover) category we have snowshoe hare, ermine, and moose. Lynx and pine marten are also chionophiles, but you'd be very lucky to see one in our area. Chionophiles live only in areas with snowy winters. By the time you get to the tundra, only chionophiles remain.

Which brings me to porcupines. I find





their tracks in even the deepest, freshest snow. I once thought I would help my old pal, Fretful, by packing a path to his den with snowshoes after a big storm. As I floundered, I watched him paddle past me and disappear into the night forest. How embarrassing. I couldn't help but notice that he seemed to swim across the snow.

One measurement winter ecologists use to assess an animal's ability to cope with snow is foot load—the amount of weight carried by each foot expressed in grams per square centimeter. I decided to see how porcupines compare to other winter-active animals. I divided the average weight by the foot area for several species of chionophores to get these scores: red fox, 78; gray fox, 106; coyote, 132; bobcat, 167. Porcupines had a load of 81, the low end of the foot load spectrum among this group of snow tolerators.

I then tried a couple of snow lovers. The bobcat's cousin, the lynx, weighing the same 35 pounds as the hypothetical bobcat, would have a foot load of 64; the bobcat carries two-and-a half times more weight on each centimeter of paw. The snowshoe hare was the champion, with a foot load of 14 even without their toes spread.

As I pondered where to file Fretful in the classification of snow dwellers, I remembered his tail. His tail! Porcupines have

extraordinary tails. They are very muscular and act as a fifth appendage during such activities as climbing, resting in precarious places, sitting up to eat, and standing on their hind legs. While porcupines ordinarily hold their tails above the ground when they walk, in deep or icy snow the tail maintains contact with the snow surface. It acts as a brake on steep descents, and I assume it helps to spread the porcupine's weight. What if we add its area to the calculation? I measured Fretful's tail. The results: Snowshoe hare, 14; Fretful, 13.4!

I don't really believe that porcupines are better adapted to travel in deep snow than snowshoe hares, and I doubt that my measurements will persuade a winter ecologist that porcupines are chionophiles. It's true, their range extends nearly to the arctic circle. It also reaches down the western side of North America and into northern Mexico. While they don't need snow to survive, they certainly tolerate it just fine.

Like opossums, we humans are poorly adapted for life in the snow. Thank goodness for coats, mittens, and snowshoes. It's always good to give deep fresh snow a few days to set up before you head out, though. Porcupines we're not.