



## 24. Porcupine

The porcupine is a blackish, quill-armed, slow-moving rodent with an appetite for tree bark and salt. It lives in forests and often can be seen hunched into what appears to be a black ball high in a tree. While it does not occur in all parts of Pennsylvania, the porcupine is one of Pennsylvania's best-known and most easily identified wild animals.

Its taxonomic name is *Erethizon dorsatum*. The word "porcupine" comes from two Latin words, *porcus* ("swine") and *spina* ("thorn"), which also reflects the species' colloquial name, quill pig. In the East, porcupines inhabit Canada and New England south into Pennsylvania; they range through the northern Midwest and the Pacific Northwest, south in the forested Rocky Mountains nearly to Mexico, and north to Alaska. They live at all elevations from sea level to timberline.

### Biology

Adult porcupines are about 30 inches in length, including a 6- to 10-inch tail. They weigh 9 to 15 pounds, with bigger, older adults weighing up to 20 pounds. Males are larger than females. The porcupine is North America's second largest rodent; only the beaver is bigger. Porcupines have four incisors—two above and two below that are bright orange, strong and adapted to gnawing.

Short-legged and stout, a porcupine has a pronounced arch to its back. Its skull is heavily constructed; the small, rounded head has a blunt muzzle, ears almost hidden in fur, and dull black eyes. The front and back feet bear long, curved claws, and the soles of the hind limbs are thick-skinned and callused. The tail is short and club-shaped.

Porcupines vary in color from salty-black to brownish-black, sprinkled on the sides and belly with yellow- or white-tipped hairs. The summer sun bleaches the guard hairs of some, giving them a grizzled appearance. Albinism sometimes occurs.

The most distinctive aspect of a porcupine's appearance is its coat of quills. Quills cover the animal's upper parts and sides from the crown of its head to the tip of its tail. They're 1 to 4 inches long (those on the animal's back are



longest), yellow or white tipped with black, and lined with a foam-like material composed of many tiny air cells. An individual may have up to 30,000 quills.

When a porcupine is relaxed, the quills lie smoothly along its body, but when it feels threatened, muscle contractions cause the shafts to rise. In reality, quills are specialized hairs. The rest of the pelt consists of long, stiff guard hairs and soft, woolly underfur. Two molts occur each year: in spring, short hairs replace winter underfur; and in fall, the long, insulating underfur grows back. At all times, quills are present and are replaced as they fall out.

When threatened, a porcupine will first try to escape to safety in a tree or den. Failing this, it puts its head under some object or simply tucks it in close to its chest, erects

its quills, turns its back to the enemy and, if approached, flails with its muscular tail. It may back toward an adversary, chattering its teeth.

Porcupines cannot throw their quills, but because the quills are loosely attached, they dislodge easily on contact and stick in a victim's flesh. A single quill has a needle-shaped tip covered with hundreds of minute, overlapping, diamond-shaped scales. The scales slant backward and act as barbs. When a quill lodges in tissue, actions of the victim's muscle fibers engage the tips of the scales, drawing the quill or quill fragment inward up to an inch a day. A wild animal badly impaled in the body will suffer intensely; quills may pierce its heart, arteries, or lungs and cause death, or they may sever the optic nerves and cause blindness. The best treatment for embedded quills is to pull the quills as quickly as possible, before they penetrate deeper into the flesh. Infections rarely occur from quills if they are quickly removed.

Slow and clumsy on the ground, porcupines are more at home in trees. They scale trees by digging in with their sharp claws, pressing the rough, leathery soles of their feet against the bark, and bracing with their sturdy tails. They descend tail first.

On the ground, a porcupine can muster a top speed of about 2 mph over short distances. It waddles along in plantigrade fashion on the soles of its feet with its heels touching the ground. Sensitive facial whiskers help it maneuver through thick underbrush.

A porcupine can see moving objects only at short range and is almost blind to stationary objects. Its hearing is probably inferior to that of most other mammals, but it has a keen sense of smell. A porcupine can swim, its air-filled quills helping to keep it afloat.

Porcupines are very dependent on trees for food and cover, and therefore rarely are found far from woody vegetation. Most of their feeding and movement on the ground occurs at night or at dawn or dusk. Porcupines are vegetarians. During the summer, they usually spend their days asleep in large deciduous trees. The porcupine's diet is most varied in the summer when it eats a variety of herbaceous vegetation including grasses, sedges, and the flowers, leaves, twigs, roots, buds, catkins and seeds of many other plants. In winter, much of their diet consists of needles, twigs and small limbs of evergreens, especially hemlocks. They also eat the inner bark of trees: hemlock, spruce, white and pitch pine, basswood, sugar and striped maple, beech, birch, aspen, ash, cherry, apple and other species. As a porcupine strips a tree of bark or foliage, small branches frequently fall to the ground. These trimmings play a minor role in providing food for other animals during winter. In wild areas, porcupines gnaw on shed deer antlers. Closer to civilization, their chewing damages wooden buildings, telephone poles and ornamental trees.

The porcupine's feeding and gnawing habits can leave negative impressions. Winter feeding on the inner bark of trees can result in timber losses, usually confined to specific

areas such as stands adjacent to large denning populations or where porcupines invade young even-age conifers. Winter denning concentrations often occur in rocky and steep terrain where site conditions and access for logging are poor; therefore, trees killed in such areas are relatively unimportant to timber production. Porcupines occasionally cause damage in sugar maple stands, apple orchards, and cultivated crops. If a porcupine chews off an isolated section on a tree's trunk, the bark will, in time, close over the wound. If a porcupine girdles the trunk, however, the tree will die. Trees with upper branches freshly "barked" (the newly exposed wood shows light against the bark) show that a porcupine is in the area. Beech trees are often damaged only at their bases, perhaps because individuals have a hard time climbing this smooth-barked species. Although porcupines kill a few trees by girdling, most authorities agree the damage they cause over large areas is generally insignificant. Damage also occurs when porcupines gnaw on buildings, tool handles, signs, and tubing for collecting sugar maple sap. These types of damage are localized and specific measures can be taken to eliminate or reduce the problem.





Porcupines may have a seasonal craving for sodium that peaks in May and June. In sodium-depleted environments, porcupines seek salt sources such as road salt. Materials such as plywood and rubber are often attacked because they contain sodium ions derived from the manufacturing process. Salt craving behavior in females is often the result of hormone changes during pregnancy and lactation. Where manmade sources cannot be found, porcupines rely on natural sources of sodium such as aquatic vegetation and carrion.

Porcupines grunt, groan, shriek, bark and whine; their calls may carry up to a quarter-mile. In breeding season, they are especially vocal.

Breeding takes place in September, October and into November, after a courtship that often lasts several days. Courting porcupines rub noses, chatter their teeth, walk on their hind feet or perform stylized, weaving body movements. Males are polygamous and play no part in rearing young. In females, estrus (the period when they are sexually receptive) repeats every 30 days until mating occurs or the breeding season ends.

Unlike most rodents, porcupines are not prolific reproducers. Wildlife biologists have estimated that up to half of all adult females go unmated each year. Females that do become impregnated almost always produce just one offspring. The survival rate of young porcupines is high. After a gestation period of 205 to 217 days, the female gives birth in April, May or June. Birth may occur in a ground den, although the female does not generally select a particular site.

The young porcupine is called a “pup” or “porcupette.” As might be expected after such a long gestation, it is precocial—it weighs about a pound, its eyes are open and it is about 10 inches long and fully furred. The quills are soft and hairlike, about a quarter-inch long, but they become hard and functional as they dry. Pups are able to climb trees and eat solid food within a few days. They nurse for about 50 days.

After weaning, pups receive little attention from their mothers. Females and young separate for good after about six months. Young are sexually mature at 15 to 16 months and breed in their second autumn.

Porcupines den in caves, rock crevices, hollow logs and trees, deserted fox dens, brushpiles and abandoned buildings. They have a habit of defecating at their den’s entrance, and the resulting pile of droppings is a good indicator of the animal’s presence.

In winter, porcupines take to their dens for protection from snow, wind and predators. Several individuals may use the same den site, together or at different times. An individual generally becomes resident at a den in November and uses it off and on until May. During winter, a porcupine may spend its days asleep in the den or in the top of a conifer in which it has been feeding. They do not hibernate.

Winter dens are rarely used in summer. During the warm months, a porcupine may choose a large deciduous tree—often an oak—as a daytime rest site. Porcupines are solitary in summer.

In Pennsylvania, porcupines are preyed upon by fishers, and to a lesser extent, foxes, coyotes, bobcats, dogs and owls. The fisher, reintroduced in Pennsylvania in the mid-1990s, will kill porcupines with repeated bites to the face and head. Porcupines try to defend themselves, and are relatively invulnerable to fishers, when they can put their face in a den or other protected area. They are more likely to be killed when fishers find them in open areas or other situations where they can get at the porcupine’s face. Battles between fishers and porcupines may last for up to an hour before the fisher has created sufficient wounds to incapacitate and kill its prey. Also, coyotes have been known to work in pairs to maneuver a porcupine onto its back.

Porcupines have a 10 to 12-year life expectancy in the wild. Mortality factors include predation (primarily by man or fishers), highway accidents and disease. Porcupines are parasitized by lice, ticks and mites, some are afflicted with mange, and many have tapeworms and other internal parasites.

## Population

In Pennsylvania, most porcupines live in areas of extensive forests. They inhabit the rugged mountains of northcentral Pennsylvania, the timbered land in the northwest and northeast corners, and the wooded sections of the ridge-and-valley region. Fewer porcupines live in the southwestern or southeastern parts of the state.

Porcupines seem to be holding their own. The species thrives in a variety of forest, terrain and climate types across the continent and has few enemies in the wild.

## Habitat

Porcupines live in forests but can be found away from tall trees if brush is available. They do well in mixed hardwood and conifer woodlands with suitable den sites, which include rock crevices, caves, and hollow trees. They live in wooded valleys as well as on the mountaintops.

The winter range of a porcupine is usually less than 20 acres and includes its den, coniferous feeding areas (primarily hemlocks), and the travel lanes linking them. A single animal may spend several months feeding on only one or two trees and using the land between them and its den. Summer ranges are larger, between 15 and 65 acres, with an average of 45 acres in deciduous woods. The summer ranges may be a half-mile or farther from the winter ranges, as den sites and conifers are not important components of summer territories. In summer, porcupines favor deciduous forests, especially areas with high concentrations of oaks.