

*Disclaimer: We have created a fictitious threatened species, the Potomac Highlands hedgehog and mapped it within Jefferson County as a training aid for our Habitat Conservation Planning Course ECS 3117.*

**Potomac Highlands Hedgehog**  
Erinaceus americanus virginianus

Kingdom: Animalia  
Phylum: Chordata  
Class: Mammalia  
Order: Insectivora  
Family: Erinaceidae

Listed as Threatened - March 4, 2001  
(50 CFR 122229)



**Introduction**

The Potomac Highlands Hedgehog is a rare adaptive variant of the European hedgehog. Historically, it was known to inhabit the Tri-county area and possibly in Frederick County Maryland, but now is only found in Jefferson County, West Virginia. It has been in a continuous decline over the last 50 years. Total population numbers are unknown, but estimates are around 1,000 individuals. Predation along with habitat modification has led to a declining population and the current endangered status.

**General Ecology**

Physical Characteristics - The hedgehog is a squat, rounded creature with five-toed, well padded feet. The second, third and fourth toes are the same length with strong claws, while the first and fifth toes are smaller with smaller claws. The hind feet are slightly longer but the same width as the forefeet. The hedgehog has a mobile pointy snout, round eyes, and short, rounded ears that are almost hidden in the fur. Body length ranges from 135-265 cm, with males being slightly larger than females. The total mass of the hedgehog can range from 800 to 1200 g. The dental formula is: 3/2, 1/1, 2/3, 3/3. The hedgehog's upper incisors are spaced widely apart so that the lower incisors fit between them.

In the adult, the dorsal and lateral surfaces, excluding the facial area and legs, are densely covered with very coarse hair which has not completely modified itself into spines. The young are naked at birth, but quickly grow a thick soft fur. At maturity, the fur begins to change into a rough hair, but for reasons unknown, hard spines are never created. At the base of each hair is a small ball or bulb that sits below the skin surface to root it firmly. Each hair follicle is attached to an arrector pili muscle so that it can be raised and lowered, and is highly enervated. The panniculus carnosus muscle is a sheet of muscle covering the back, surrounded by the orbicularis which, when constricted, acts like a drawstring in pulling the animal's body into the curve of the panniculus carnosus. This curling brings the hairs together across the opening of the "pouch" and stretches the arrector muscles of the hairs so that the more tightly the hedgehog curls, the fluffier it becomes. This is the same action found in the European varieties that they exhibit to curl into a spiny ball for a defensive posture. The normal hair on the hedgehog's face, legs and ventral body

surface is coarse and yellow-white to dark brown.

Biology - Hedgehogs can live for up to 10 years, but this is exceptional; over half die before their first birthday and average life expectancy is about 2-3 years. Although recent information suggests that a pair will remain monogamous for life, the male hedgehog is solitary and the female mostly so, except during breeding season. Hedgehogs can carry several diseases, but none are dangerous to humans. They also carry fleas, ticks and mites. Hedgehogs swim well but prefer to avoid open water whenever possible. Although hedgehogs can swim, they have been known to easily drown due to the inability to escape from smooth-sided stream banks or farm ponds.

Hedgehogs travel about 1-2 km each night, males more than females, but stay within about a 30-acre home range territory. The males return to the same daytime burrow for a few days then use another, perhaps returning to an old burrow at a later date. The male's winter burrow is made of leaves, tucked under a bush or log pile or anywhere that offers support and protection. Female hedgehogs build burrows in hedgerows or in the forest edge, while the males burrow in brush piles, under rocks or in other crevices. Females tend to use the same burrow for spring and summer, creating a new burrow for hibernation. Hibernation in their winter burrows lasts from November to April, and juveniles of both sexes hibernate with their mothers. In the spring they commonly spend a few days active then enter hibernation again during a cold snap.

Hedgehogs are able to squeeze under and through tight spaces. This is partly due to the loose nature of the hedgehog's skin--a feature which also allows it to curl up into a tight little ball when threatened by predators. Such predators include man and dogs, foxes, polecats, badgers and tawny owls. Because the hedgehog does not dash away from larger animals like some of its smaller relatives, *E. europaeus* is thought to be slow and ponderous, however when it wishes, the hedgehog can run quite quickly.

Habitat - The Potomac Highlands Hedgehog requires multiple habitat types where plenty of food is available. The preferred habitat is large, open hardwood forests. Intensively farmed arable land is a poor habitat, as is conifer forests, but un-mowed pastures and old-fields are utilized. Forest edges and shrubby hedgerows are used for movement while searching for food during the night. Young dispersing males often take up residence in shrubby hedgerows or along riparian corridors while looking for new territory. In winter, males use oak hardwood forest, utilizing mast and rooting for grubs and insects in the bark of old, soft logs.

Food Habits - The hedgehog has been known to eat a wide range of invertebrates but prefers earthworms, slugs and snails. Its favorite arthropods seem to be millipedes and ground beetles. The hedgehog will also eat frogs, small reptiles, young birds and mice, carrion, small bird eggs, acorns, and berries. Young hedgehogs are weaned on insects in the spring, which make up over 90 percent of their diet. The high protein content allows them to grow quickly, and they soon learn to forage for themselves, although they continue to forage with their mother. In the winter, while the female is hibernating, the male hedgehog's diet focuses on beetle larvae found underneath the bark of dead hardwood trees. Mast (primarily acorns) is also frequently eaten.

Reproduction - Mating occurs within large forested areas during early spring. Several male hedgehogs will gather in an open area of the forest and some sort of pecking order within the group will fall into place. They make a variety of snuffling and snorting vocalizations and also clack their teeth. Although some sort of behavior, akin to fighting, does occur, rarely is there any injury to the hedgehogs involved. This group behavior by the males appears to be intended to attract the females for mating. It is unknown if some sort of scent is released, but the effect does seem to draw females to the area for investigation and mating. Once, the female of the pair is located, the male will point his nose to the ground and tail into the air, make a high pitch squeal and rapidly turn half circles back and forth. This is a highly sensitive time during the season for hedgehogs that are generally solitary; mating adults are easily disturbed by bright lights and loud noises.

Mating behavior in the hedgehog involves much biting, cuffing, panting, spitting and hissing. The male will circle a female at least 10 to 12 times between advances before mating occurs. The unreceptive female will keep her fur erect and occasionally butt at the male if he comes too close. When the female is ready to mate, her hairs become damp (sweat or some other substance). She flattens her fur so that the male can get a good grip. However, the fur is slippery, and the male must hold on to her shoulder with his teeth in order to copulate.

The gestation period is usually 49 days with 3-5 pups born in late May. The normal litter size is three but occasionally 2 or 4 pups will be born. Weaning occurs in 4-6 weeks after birth. On rare occasion, if the sow's first litter is born early enough in the breeding season, she may have a second litter. However, young born late often die, being too small to survive hibernation. They need to weigh at least 450g (1lb.) or they are not fat enough to last the winter. Males do not assist in rearing them.

Hedgehogs are born completely naked. The first coat of hair is soft and white. About 36 hours later, a second coat of darker hair has grown in. After that, a third set of hair turning into a thick rough fur will generally grow in to replace the first two coats. After 11 days, the young can curl into a defensive ball, and after 14 days, it opens its eyes. By the age of one month, young hedgehogs look like miniature versions of their parents.

## **Threats**

The biggest threat to hedgehogs is probably habitat loss from habitat conversion due to changing farming practices and suburban development. Modern farming practices have eliminated much of the hedgerows that are used as cover habitat while dispersing or searching for food. The increased use of chemicals, particularly pesticides for intensive farming, has decrease the amount of invertebrates available for young and may be harming the hedgehogs directly. Burrows in hedgerows are poisoned because they are mistaken for ground hog burrows or fox dens. In addition, large blocks of forests are logged via clear-cut; the old dead fallen logs and the mast disappear. Selective logging may not be quite so injurious, but it may impede the hedgehog's winter food hunting habits.

Some hedgehogs are killed on the roads, but most are likely killed by predators. Predators include man and dogs, foxes, raccoons, polecats, badgers and tawny owls. In the past few years, West Virginia has seen a general increase in feral hunting dogs. The increase in urbanization has decreased the hunting possibilities and many dogs have been let go loose.

Although European hedgehogs have hard spines (which are modified hairs), the Potomac highlands hedgehog has a hard fur that has not totally evolved into a hard spine. Although it exhibits similar defense mechanisms as the European varieties, rolling in a ball does not provide the level of protection one would expect if hard spines were present. This continued hereditary trait combined with a lack of hard spinal protection may be a contributing factor in its continued decline as predation from feral dogs has increased.

The most recent threat to the hedgehog is the Wobbly Hedgehog Syndrome (WHS). WHS is a progressive, degenerative, neurological disease, the cause of which is still uncertain, but which acts much like Multiple Sclerosis does in humans. The hind legs are often affected first, and then the paralysis spreads to the front legs and other parts of the body. Sometimes the paralysis affects one side of the body, and the hedgehog will begin tipping over, unable to stay upright. This disease strikes both younger and older hedgehogs, but mainly affects individuals in the 18 to 24 month age class. Hedgehogs with WHS will often experience weight loss, due in part to their inability to forage (much can be done to help this) and in the advance stages of this disease, they become completely immobilized. In the cases that were studied, death occurred between 6 weeks and 19 months after the onset of symptoms. It is thought that the disease is in some way related to exposure to pesticides.