DOMINIQUE BRAUD

by Christine Petersen

Hurrah for Muskrats!

These mammals, which aren't actually rats, are made for a life in and around water.

One evening, as naturalist Annie Dillard stood beside a creek near her home, she spotted a creature in the water. Only its head poked above the surface as the animal swam smoothly along. Dillard knew instantly what it was—a muskrat!

As soon as she moved, the animal dove and disappeared into a clump of plants along the shoreline. "I waited panting, and watched the shadowed bank," the naturalist wrote in her journal. "Now I know that I cannot outwait a muskrat who knows I am there."

Still, Dillard was motivated. She went out many more times to find and quietly watch muskrats. She often enjoyed watching her wild neighbors at work.

You might wonder why Dillard was so fascinated with muskrats. After all, they aren't rare. These small mammals can be found across most of the United States and Canada, including marshes, ponds, and streams all over Minnesota. "The great hurrah about wild animals is that they exist at all," Dillard explained. "And the greater hurrah is the actual moment of seeing them."

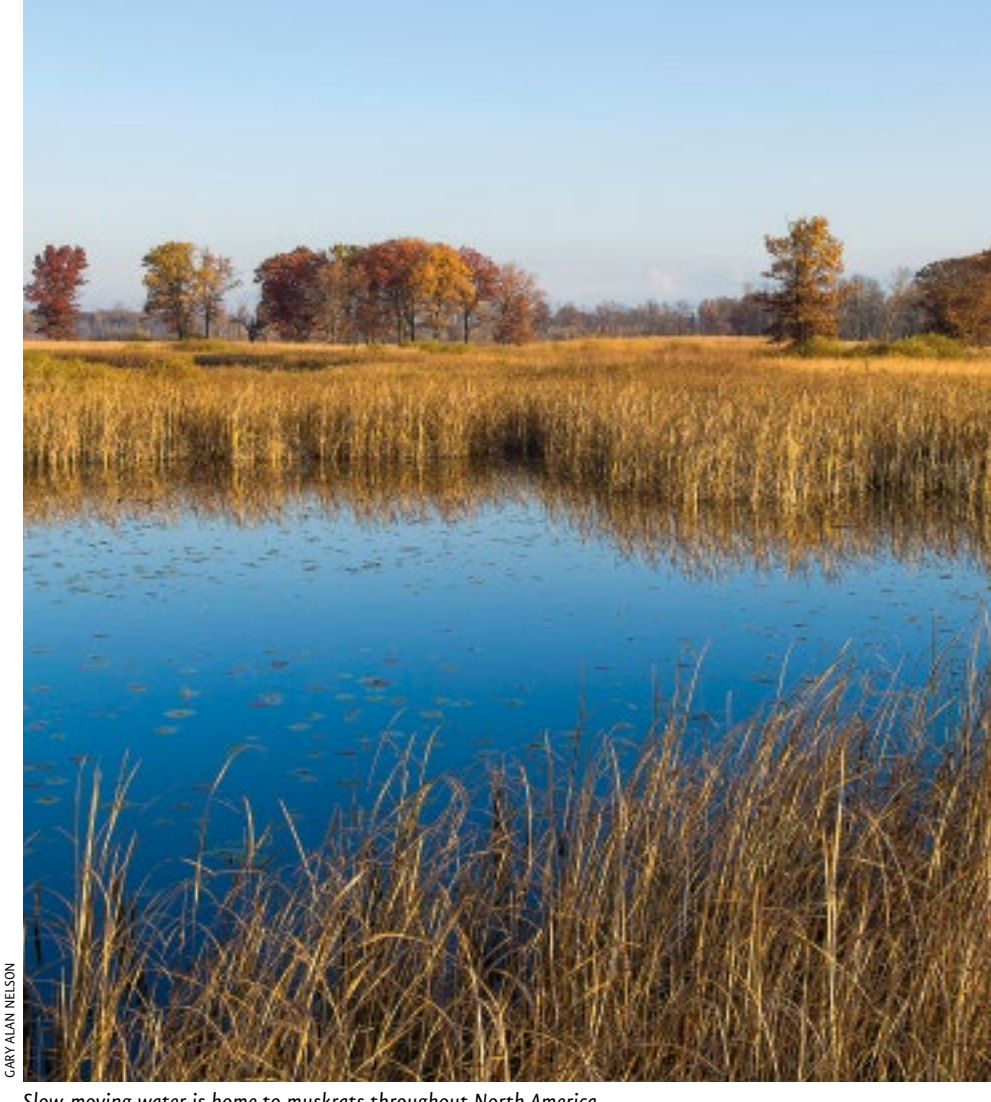
ALLEN BLAKE SHELDON

Shoreline vegetation is a mainstay of the muskrat's diet.

Not really rats

Muskrats aren't really rats. But they belong to the same group of mammals, known as rodents. More than 2,200 different rodent species can be found around the world, including squirrels, hamsters, porcupines, and mice.

All rodents have long front teeth for gnawing and chomping tough plant foods. Because these *incisor* teeth are constantly used and worn down, they continue to grow throughout a rodent's life. The muskrat uses its sharp, curved incisors like tools to cut plants for food and building material.



GARY ALAN NELSON

Slow-moving water is home to muskrats throughout North America.

A watery way of life

Streams, shallow lakes, and marshes are full of living things—from fish and mussels that can't survive in air to frogs, turtles, and birds that easily move between water and land. In the United States, several mammal species also swim or wade in fresh water. But only two mammals—the muskrat and its much larger cousin, the American beaver—are *aquatic*, spending most of their time in the water.

DOMINIQUE BRAUD

Muskrats have five toes on each of their nearly hairless front paws.

Fur and scales

Everything about a muskrat is suited for its watery way of life. Take its fur, for example. All mammals have some kind of hair, but a muskrat grows two layers. Long, heavy guard hairs provide the animal's reddish-brown coloring and protect a thick, soft inner layer of hairs. This underfur traps tiny air bubbles that help the muskrat to float. Underfur also keeps the muskrat's skin dry and warm. With this protection, it can remain active through most of the year.

The only unfurred parts of a muskrat's body are its feet and long, scaly tail. On hot days, the muskrat's heart pushes more blood into these exposed body parts. Blood warms the feet and tail, and the heat escapes into the surrounding air. The muskrat can use this same system to cool down after working hard. In winter, the muskrat's body does the opposite. Its feet and tail get less blood and are cooler than the rest of the body. This reduces the risk of frostbite.

ALLEN BLAKE SHELDON

Muskrats are often on the move in summer as they search for shoreline vegetation to eat.

Born to swim

Muskrats are fast, strong swimmers. They can twist and turn to chase prey, or rocket through the water like furry torpedoes to escape trouble. The front paws are small, but the back feet are large and angled away from the body. As the muskrat swims, it spreads its toes apart. Webbing between the toes helps it push strongly against the water.

Muskrats aren't very big—about 20 inches from nose to tail tip. The tail makes up almost half of that length. The little animal swings its narrow tail back and forth as it swims. By tilting the tail more in one direction or another, a muskrat can change direction in the water.

In quiet marshes and shallow lakes, muskrats often paddle along at the surface. But it is tiring to swim through fast-moving streams. Muskrats solve this problem by diving and swimming underwater, avoiding fast currents, then popping up elsewhere. They can swim and search for food even under thick layers of winter ice. It's not unusual for a muskrat to remain underwater for a couple of minutes. One that feels threatened can hide underwater much longer—up to 17 minutes!

Swimming is such an essential part of the muskrat's way of life that young muskrat kits learn to swim almost as soon as they can walk.

SPARKY STENSAAS

Muskrats have a wide space between their front incisors and flat chewing teeth.

Open wide

Rodents don't have the pointed canine teeth some mammals use to bite and hold prey. Instead, there is a wide space between the front incisors and the flat chewing teeth at the back of the mouth. If the muskrat opens its jaw very wide, it can fit several long pieces of plant material into these gaps. Its lips close behind the big incisors, blocking water from entering the mouth.

MICHAEL FURTMAN

Muskrats make a strongly scented substance called musk *that gives them their name.*

Natural engineers

Minnesota has plenty of natural and farm ponds, shallow marshes, and streams where muskrats can set up house. A good habitat—with lots of food and clean water—may have 15 muskrats per acre, which is about the size of a football field. Muskrats divide their habitat into territories, so that individual houses are spaced at least 60 feet apart. In this way, some of Minnesota's large marshes can support hundreds of muskrats.

You might have been wondering: If it's not a rat, how did the muskrat get its name? With its long, skinny tail, it certainly resembles one. Also, this little rodent produces a substance called *musk* from glands below its long tail. Male and female muskrats use this fluid to mark the boundaries of their territory within a habitat. The strong scent can be detected for weeks. It's like an invisible fence that reminds other muskrats to stay out.

MICHAEL FURTMAN

Muskrats build their home from the same aquatic plants they eat.

Home wet home

In shallow, calm water the muskrat builds a dome-shaped lodge house. Beavers make their lodges from small tree trunks and branches. The muskrat prefers to build from the same aquatic plants it eats. In Minnesota, that may include cattails, reeds, wild rice, water lilies, and other plants that are rooted in the water but grow up into the air.

A muskrat lodge is built from the muddy bottom up. The little rodent cuts plants and carries them to its construction site. The first stems are placed side by side to form a flat base. Layer after layer is stacked on top, each at an angle to the ones below. Soon, the area around the house has been cleared of plants. The lodge looks more like a plant island than a house. It may be eight feet wide and rise several feet above the water.

Next, the muskrat must carve tunnels and rooms. It does this by eating right through the structure. Lodge entrances are hidden underwater, leading to rooms at the top. As a final touch, the lodge-builder brings in soft plants to make cozy beds in each room.

If it lives next to a stream, the muskrat uses its long claws to dig a burrow instead of a lodge. A burrow may reach more than 30 feet into the stream bank. The entrance is less than 6 inches wide to keep out larger enemies. As in a lodge, the tunnel opens underwater and curves slightly upward to protect the den from rising flood waters.

Muskrats also dig channels in the mud. These underwater trails connect the muskrat's house with good sources of food. In winter, the muskrat gnaws holes in the ice. Atop each opening, it builds a small lodge where it can hide while eating.

MICHAEL FURTMAN

Up to 15 muskrats may live in an acre of good habitat.

Living together, living apart

Muskrats aren't very social. Most of their time is spent alone, searching for food or building and repairing their homes. But in the breeding season, male muskrats fight to establish rank within their habitat. Each male pairs up with a female, and they share a house for about four weeks while the female is pregnant.

Once the kits are born, papa muskrat moves to a separate house. The number of kits in a litter depends on the quality of habitat. In Minnesota, a female muskrat may produce three litters each summer, with six to eight kits in each.

Newborn kits weigh barely half an ounce—about as much as three nickels. The tiny, pinkish-gray babies are blind and helpless, but muskrats grow up quickly. Their eyes open within two weeks, and soft fur covers their bodies. The kits soon learn to walk and swim, and as their teeth emerge they begin to eat solid food instead of milk.

At just one month of age, young muskrats are ready to leave home. But they don't go far. The youngsters usually set up house nearby, sharing a territory with their siblings and parents. The next spring, each will find a place of its own.

BOB ARNEBECK

When it is cold, muskrats may huddle up to share warmth inside a burrow.

Sharing space, finding food

In winter, several muskrats may cozy up to share warmth inside a lodge or burrow. Their shared body heat warms the space, so that the inside of a muskrat house may be several degrees warmer than outside.

Instead of storing food for winter, muskrats swim out daily to find fresh plants in their watery neighborhood. They sometimes add animal food to the menu. A muskrat will dig up water snails, catch crayfish, or chase fish. If extreme cold weather keeps it inside for several days, a muskrat can chew on the walls of its home. After all, muskrat lodges are built from the same plants they eat every day.

Teachers resources. Find a Teachers Guide and other resources for this and other Young Naturalists stories at *mndnr.gov/young_naturalists*.

Natural connections

Muskrats are an important source of food for other wildlife. Minks are probably the most common muskrat hunters. The two mammal species are so closely linked that each can affect the other's population. When there are a lot of muskrats in an area, minks have plenty of food. Their hunting reduces the number of muskrats, which leaves the minks hungry. If some minks die, muskrats can rebuild their population—and the cycle goes on and on.

Snapping turtles hunt muskrat kits, as do pike and other large predatory fishes. On land, young and adult muskrats alike must watch out for hungry raccoons, foxes, lynx, and owls. People do not hunt muskrats in Minnesota, but some trap the animals for their thick, warm fur and sell the pelts. In some places, habitat is managed to help muskrats flourish.

Muskrat houses are important to other wildlife, too. Biologists have identified more than 60 different animals that use muskrat houses. Ducks and coots often nest on top of them. Raccoons, rabbits, and skunks may stop to rest atop a muskrat lodge or inside a burrow. Turtles, toads, and even fish have been found inside muskrat houses.

Hurrah for muskrats and their fascinating role in Minnesota's natural environment!

ALLEN BLAKE SHELDON

MICHAEL FURTMAN

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BENJAMIN OLSON

The number of muskrats rises and falls in an annual cycle, and biologists are studying why this happens. Animals that hunt muskrats include minks, snapping turtles, raccoons, and foxes.