

## Wetlands Mammals

# Red Fox

### basics

The red fox has orangish-red fur on its back, sides and head, and white fur under its neck and on its chest. It has a long bushy tail tipped in white, prominent pointed black ears and black legs and feet. It weighs 7-15 lbs., is 22"-27" long (w/o tail) and has a shoulder ht. of 15"-16".

They are solitary animals with home ranges that vary in size depending on the quality of the habitat. In good areas ranges may be 2-5 sq. miles; in poorer habitats ranges are larger, 8-20 sq. miles. During parts of the year adjacent ranges may overlap somewhat, but parts may be regularly defended. Ranges are occupied by an adult male and one or two adult females with their young. Animals remain in the same home range for life.

- They live an average of 3 yrs. in the wild and 10 to 12 years in captivity.
- Their top speed is about 30 mph, and they can leap as high as 6 ft.
- Most red foxes that are taken by natural predators are young pups. Adult red foxes may also be attacked by coyotes, wolves, or other predators, but this is rarely in order to eat them. The most significant predators on red foxes are humans.

### habitat

The red fox makes its home along the edges of forests, in tilled fields and near marshes. They prefer habitats with a diversity of vegetation types.

Except for breeding females, the fox doesn't usually use a den. Sometimes it will sleep in the open, wrapping its bushy tail around its nose to stay warm. When it does use a den, it will usually find an abandoned rabbit or marmot den instead of making its own.

### adaptations

Activity: Mainly nocturnal or active at twilight, but will sometimes go out in the day.

Senses: A fox has excellent hearing and sense of smell, and depends on these two senses in locating prey. It can hear a mouse squeak 100 ft. away and will dig in dirt or snow to catch prey. They quickly see moving objects, but might not notice objects that are still.

Communication: Foxes communicate with each other with growls, yelps, and short yapping barks. It also makes scent stations by urinating at various spots to tell foxes in the area that another fox is present.

## food

The red fox is an omnivore and its diet includes fruits, berries and grasses. It also eats birds and small mammals like squirrels, rabbits and mice and invertebrates like crickets, caterpillars, grasshoppers, beetles and crayfish. They also eat carrion. Red foxes store extra food under leaves, snow or dirt and are very good at relocating these caches.

Foxes are quick, skillful hunters and can easily catch a dodging rabbit. The fox can also creep silently toward a bird, rush up and pounce on it. They have a characteristic manner of hunting mice. The fox stands motionless, listening and watching intently for a mouse it has detected. It then leaps high and brings the forelimbs straight down forcibly to pin the mouse to the ground. They eat between 1 and 2 lbs. of food each day.

## breeding

The red fox is sexually mature at 10 months, mates annually, January through March with a gestation period of 52 days. The average litter size is 5, weaned in 56–70 days.

The female will prepare multiple dens right after mating, using the extra dens if the original den is disturbed. A fox den may be underground, in a cave, among rocks, or in a hollow log or tree. Foxes will dig their own dens or modify burrows abandoned by other animals. An underground den may be as long as 75 feet and have several entrances. A main tunnel leads to several chambers that the animals use for nests and for storing food. Two pairs of red foxes may share one burrow and the same den is often used over a number of generations.

Young remain in the den for 4 to 5 weeks, where they are cared for and nursed by their mother. Males and females, and sometimes their older offspring, cooperate to care for the pups. The male brings the female food during the first few weeks.

The kits start playing outside the den when they are about a month old. The mother begins feeding her kits regurgitated food, but eventually she will bring them live prey to "play" with and eat. Playing with live prey helps the young kits develop the skills they will need for hunting. The young remain with their parents at least until the fall of the year they were born in and will sometimes remain longer, especially females. They settle in areas as nearby as 6 miles and as far away as almost 250.

## key facts

- Weight: 7–15 lbs. Length w/o tail: 22–27 in. Shoulder height: 15–16 in.
- Sharp Senses: Using their keen hearing and an excellent sense of smell they can hear a mouse squeak over 100 feet away and will frequently dig in the dirt or snow to catch prey.
- Diet: As an omnivore the fox eats invertebrates, fruits and vegetation, small birds and mammals. It eats between 1 and 2 lbs. each day.

- **Hunting:** It has a distinctive hunting technique: freeze, listen, leap, and pin down.
- **Breeding:** The female prepares multiple dens after breeding but except for raising young, foxes rarely use a den.
- **Communications:** The fox makes urine scent stations to communicate with other foxes.
- **Ecological Role:** Red foxes help to control populations of their prey animals, such as rodents and rabbits. They also disperse seeds by eating fruit. In some areas where foxes had been killed off, rodents increased so much that farmers brought in other foxes.

# Coyote

## basics

The coyote has a grizzled grey or reddish-grey coat with buff underparts, long, rusty or yellowish legs, a bushy tail, arresting yellow eyes and prominent ears. It weighs 20-40 lbs. is 30-39" long w/o tail and has a shoulder height of 23-26". They keep their young in or near the den while they are young so that the pups aren't killed by predators and competitors such as wolves and mountain lions.

- Their range is 12 miles in diameter around the den with travel along fixed routes or trails; usually defended only during denning season.
- They live 10 years in the wild, 18 years in captivity.
- Top speed: Coyotes are capable of running at speeds up to 45 mph and they can jump distances of up to 13 ft. They are good swimmers and poor climbers.

## habitat

Coyotes are adaptable utilizing a wide range of habitats including forests, clearcuts, farms and woodlots and prefer habitats without wolves. Because of their tolerance for human activities they are sometimes seen near farm buildings and at the edge of towns.

The typical den is a wide mouthed tunnel with several entrances, terminating in an enlarged nesting area. Coyotes will dig their own burrows or enlarge those of other mammals. Dens are used year after year.

The coyote was native only to the prairies and arid west but as settlers moved across the country, altering the landscape and eliminating wolves, a new niche was opened up to them. They now thrive in the Western Hemisphere from the Pacific to Atlantic Ocean.

## adaptations

**Activity:** Coyotes are nocturnal but can occasionally be seen during daylight. They are secretive, and near human habitations are active early in the morning and late evening.

**Senses:** They have acute hearing and sense of smell but their sight is less developed and used primarily to note movement.

**Communication:** Coyotes use auditory, visual, olfactory and tactile signals to communicate. They are the most vocal of all North American wild mammals, using 3 distinct calls, the squeak, distress call and howl call, all consisting of a quick series of yelps, followed by a falsetto howl. Howling may act to announce where territories are to other packs. Coyotes also howl when two or more members of a pack re-unite and to announce to each other their location.

They use stumps, posts, bushes or rocks as "scent posts" on which they urinate and defecate to mark territory.

## food

Coyotes have versatile eating habits. They are essentially carnivorous; 90% of their diet is mammalian. They eat small mammals and occasionally eat birds, snakes, large insects and other large invertebrates. They prefer fresh meat, but eat large amounts of carrion.

Coyotes are less likely to form packs than are wolves. Hunting, which takes place around the den, is done individually, in pairs or in family units depending on prey availability.

Coyotes hunt animals in interesting ways. When on a "mousing" expedition, they slowly stalk through the grass and sniff out the mouse. Suddenly, with all four legs held stiffly together, the coyotes stiffen and pounce on the prey. Hunting deer, on the other hand, calls for teamwork. Coyotes may take turns pursuing the deer until it tires, or they may drive it towards a hidden member of the pack. They can run up to 40 mph.

Coyotes sometimes form "hunting partnerships" with badgers. The two move together, using their keen sense of smell to locate burrowing rodents and badgers then dig them up with their powerful claws. Both predators then share the proceeds. The average distance covered in a night's hunting is 2½ miles.

Eating almost anything it can chew the coyote is an opportunistic and cunning hunter. Part of what makes coyotes so successful at living in so many different places is the fact that they will eat almost anything, including human trash and household pets in suburban areas. Fruits and vegetables are a significant part of the diet of coyotes in the fall and winter months.

## breeding

Courtship lasts for approximately 2 to 3 months. Female coyotes are monoestrous and are in heat for 2 to 5 days between late January and late March. Mating occurs within these 3 months. Once the female chooses a partner, the mates may remain paired for a number of years or for life.

Gestation lasts 60-63 days, with litter size 1-19 pups with 6 the average. The pups weigh about 9 oz. and are born blind, limp-eared and pug-nosed. After 10 days their eyes open, they weigh over a pound and their ears begin to erect in true coyote fashion.

21- 28 days after birth, the young emerge from the den, and by 35 days are fully weaned. The parents feed them regurgitated food. The male pups leave the dens at 6- 9 months but the females usually stay with the parents and form the basis of the pack.

Adult size is reached at 9 to 12 months and sexual maturity is reached by 12 months.

## key facts

- Weight: 20-40 lbs. Length w/o tail: 30-39 in. Shoulder height: 23-26 in.

- Diet: Coyotes eat mostly small mammals, but it depends on the season. They rely on some carrion in winter.
- Hunting: They use a very distinctive freeze-and-pounce mousing technique.
- Communication: They use auditory, visual, olfactory and tactile signals to communicate and are the most vocal of all North American wild mammals. They also, use "scent posts" to mark territory.
- Senses: They have acute senses of hearing and smell.
- Avian Conflicts: Coyotes will take birds on occasion, but generally favor mammalian prey, so their impact is less than from other carnivores.
- Ecological Role: Coyotes help keep small mammal populations in check, such as mice and rabbits. If populations of these small mammals were allowed to become too large it would result in habitat degradation.
- Middle Dog: Halfway in size between wolves and foxes, coyotes don't usually get along with either because they overlap in food preferences. Coyotes are more numerous in the absence of wolves.

# Raccoon

## basics

Their color and weight vary with habitat and region. Their wt. is 12–31 lbs. and males are usually heavier than females by 10 to 30%. Raccoons are stocky in build and their color ranges from grey to reddish brown to buff above, and black or grayish below. The most prominent characteristics are the black mask outlined in white and the bushy tail with 4-10 black or brown rings. Their tails comprise about 42%-52% of their total length. The ears are small and the forepaws resemble slender human hands and make the raccoon unusually dexterous. Both their forepaws and hindpaws have five toes.

- Their home range is around 160 acres for males and 100 for females. Home ranges are generally not exclusive, although some level of territoriality has been recorded in western prairies where raccoon densities are low, as is resource availability. Range diameters are typically from 0.6 to 2 miles, but can be up to 6 miles in western areas.
- Their common gait is a shuffle like walk but can reach speeds of 15 mph. Raccoons don't travel any farther than necessary, traveling only far enough to meet the demands of their appetites. They usually travel between 0.5 and 1.5 mi. per night, with males traveling slightly farther during fall, winter, and spring, and females traveling longer during summer, when foraging with and for their young.
- Raccoons may live up to 16 years in the wild, but most don't make it past their second year. If they survive their youth, raccoons may live an average of 5 years in the wild. The primary causes of death are humans, (hunting, trapping, cars), and malnutrition.
- Raccoons escape many predators by remaining inactive during the day in a den. While active they remain alert and can be aggressive. They are preyed on by large predators such as coyotes, wolves, large hawks and owls. Their young may be taken by snakes as well.
- Population densities vary widely with habitat type. In wet, lowland areas, such as marshes, intertidal areas, and flood plains, densities averaged 5 per acre. Densities are generally less than half that in agricultural areas and hardwood forests, higher than that in suburban areas. Rabies may substantially impact population densities, with populations doubling in density during times of low rabies incidence.

## habitat

Raccoons are extremely adaptable and are found in many habitats but are most common along stream edges, open forests and coastal marshes. They inhabit hollow trees and logs and often use the ground burrows of other animals for raising their young or for sleeping during the coldest part of the winter months.

They require ready access to water and prefer to live in moist woodland areas. However, they can also be found in marshes, farmlands, suburban, and urban areas. Raccoons prefer to build dens in trees, but also use burrows, caves, mines, deserted buildings, barns, garages, rain sewers or houses.

### **adaptations**

**Activity:** Raccoons are nocturnal and seldom active in the day. During very cold, snowy times, raccoons have been seen sleeping for long periods at a time, but do not hibernate. Their metabolic rate and temperature remains constant during these times and they live off of their fat reserves, potentially losing as much as 50% of their body weight.

Primarily a solitary animal, the only real social groups raccoons form are that of mother and young. Occasionally a male may stay with a female for a month prior to breeding and until after the birth of their young.

Raccoons climb with great ease and are not bothered by a drop of 35-40 feet. As well as being excellent climbers, raccoons are strong swimmers, although they may be reluctant to do so. Without waterproof fur, swimming forces them to take on extra weight.

**Senses:** Raccoons have a highly developed tactile sense. Their human-like forepaws are sensitive and enable the raccoon to handle and pry open prey and climb with ease. They usually pick up food with their front paws before putting it in their mouth. With their acute sense of hearing raccoons are also especially alert and have excellent night vision.

### **food**

The raccoon is omnivorous and opportunistic. It feeds on wild grapes, cherries, apples, berries, acorns, nuts, grubs, crickets and other insects, crayfish, frogs, fish, small mammals, birds' eggs and nestlings. Raccoons consume more invertebrates than vertebrates. In some habitats plants provide a larger percentage of a raccoon's diet than animals do. Winter is the raccoon's greatest enemy when food is scarce.

Raccoons have adapted to include trash and other food available in suburban and urban areas in their diet. Some raccoons eat carrion from roadkilled animals. Raccoons travel in straight lines between their dens and rich food patches.

Often seen washing their food, the raccoon is actually feeling for matter that should be rejected as the wetting of the paws enhances its sense of feel.

### **breeding**

The gestation period is 63 to 65 days. Sexual maturity often occurs in females before they are one year old and in males at two years. Mating season is from February through June, with most mating in March. Northern populations tend to breed earlier than southern populations.

Raccoons generally have one litter per year. Born in April or May, litter sizes range from 3-7, but are typically 4. Young are born blind and helpless in a tree den, their eyes open at 18-24 days of age, and they are weaned after 70 days, by late summer. At first the mother carries them by the nape of the neck like a cat but by 20 weeks old the young regularly forage with their mother at night and continue to stay in the den with her. The young remain with her through their first winter, becoming independent the following spring. Mothers and young often den nearby even after they have reached maturity.

During the mating season, raccoon males frequently expand their home ranges, presumably to include the home ranges of more females as potential mates. Females are sometimes found temporarily denning with males during the mating season. After mating there is no association of males and females.

## key facts

- Weight: 12–31 lbs. Ave. Length: 16 in. plus tail of nearly same length.
- Habitat: It is a common wetlands resident, using hollow trees and logs for homes and ground burrows for raising young or for sleeping.
- Diet: Omnivorous and opportunistic, they feed on fruit, seeds, nuts, grubs, crickets and other insects, crayfish, frogs, fish, small mammals, birds' eggs and nestlings. They consume more invertebrates than vertebrates.
- Feeding: The raccoon picks up food with its front paws before putting it in its mouth. They often seem to be washing their food as they feel for matter that should be rejected; wetting of the paws enhances the tactile sense.
- Activity\Senses: They have a good hearing and night vision and are most active at night. They are good climbers and swimmers.
- Predators: Their predators include coyotes, wolves, large hawks and owls. Young are also taken by snakes.
- Avian Conflicts: Raccoons and birds have interacted for millennia without serious impact on either. What generally determines predator impact on desired species such as birds is access and alternatives. Weather, climate, restricted habitat and/or the absence of other predator food items can shift the advantage to one or the other.

# Striped Skunk

## basics

The striped skunk weighs 4-9 lbs with a total length of 21-31". Their fur is black with a white stripe that begins as a triangular shape on the top of the head, forks into two stripes that travel down the sides of the back, and usually merges again near the base of the tail. Another white stripe runs from the base of the snout between the eyes and ends on the forehead. Stripe width and length vary with each individual. The tail can be striped but more often it is composed of both black and white hairs intermixed.

- The striped skunk is about the size of a domestic cat, with a small head, small ears, short legs, a long, fluffy tail and feet with five partially webbed toes. Claws are longer on the front feet to aid in digging.
- In the wild skunks may live to be 2 to 3 years old. Up to 90% of skunks die in their first winter from predation, disease or starvation. In captivity they have been known to survive for up to 15 years. Due to their offensive odor skunks are rarely preyed on by other mammals but occasionally by coyotes and badgers. They are eaten primarily by large birds that lack a strong sense of smell, such as great-horned owls and red-tailed hawks.

## habitat

The skunk prefers the desert, woodlands, grassy plains and suburbs and open areas with a mixture of habitats such as woods, grasslands, and agricultural clearings and are not usually found further than two miles from a water source. They are also often found in suburban areas because of the abundance of buildings that provide them with cover.

## adaptations

Their bold black & white fur pattern provides a memorable warning function to dissuade would-be repeat offenders.

**Activity:** The skunk has perhaps the most widely known defense system of any mammal, the scent-spraying mechanism. They don't usually discharge the fetid, oily, yellowish musk of their scent glands unless mortally threatened. When faced with danger they first stomp their front feet as a warning, then arch the back and erect the tail and hair. When mortally threatened they bend into a U-shape with both head and rump facing the enemy. They then emit two streams of fluid from scent glands located just inside the anus, which meet after traveling about a foot, finally spreading into a fine spray that is accurate up to 15 feet. The spray often causes nausea and a fleeting loss of vision as it burns the eyes and nasal cavities of the unfortunate target.

Striped skunks are nocturnal, sleeping during the day in underground burrows and emerging around dusk to search for food. They prefer to use burrows made by other animals of equal size or natural burrows under tree stumps or buildings. They use their

long front claws to build their own den if necessary. Although they do not hibernate, during the lean winter months they may become temporarily dormant.

Both males and females undergo periods of inactivity from November until March. Females often remain in their winter dens for the entire winter, but males usually emerge during mild temperature periods to feed. Winter dens usually consist of six females and their young. One male sometimes occupies a den with females, but usually lives alone in its own den.

**Senses/Communication:** Skunks have a good sense of hearing, but their vision is poor. They use scent marking to communicate presence and reproductive state to other skunks. They also communicate visually, by raising their fur and changing posture. They are mostly silent, but do make a variety of sounds such as churring, hisses, and screams.

### food

The skunk is a true omnivore, and eats insects, small mammals, fish, crustaceans, the eggs of ground nesting birds, amphibians, fruits, grasses, leaves, buds, grains, nuts, and carrion. Insects make up approximately 70% of their diet but skunks are opportunistic and diet changes depending on the time of year and available resources. They will scratch on hives to encourage the bees to emerge, and then kill them as they do.

### breeding

In mid May 2–11 young are born, with an average of 7.

Females are monestrous, but they occasionally can have a second estrous if the first pregnancy is unsuccessful. Mating takes place from mid-February until mid-March. The gestation period is 63–66 days, with a brief delayed implantation probably involved. At birth, baby striped skunks are blind, deaf, and extremely immature. They nurse for about a month and a half in the mother's den. Fully weaned, the young then follow the mother about, finally breaking from the family about a year after reaching adult size. M.

Males provide no parental care and are typically polygamous and solitary. Males and females do not associate beyond the few days required for fertilization.

### key facts

- Weight: 4–9 lbs. Total length: 21–31 in.
- Lifespan: In the wild skunks may live to be 2 to 3 years old. Up to 90% of skunks die in their first winter from predation, disease or starvation.
- Defense: One of the most widely known defense systems of any mammal, the scent-spraying mechanism.
- Senses: Strongest sense is hearing.

- **Diet:** A true omnivore, it eats a vast assortment of insects, small mammals, fish, crustaceans, the eggs of ground nesting birds, amphibians, fruits, grasses, leaves, buds, grains, nuts, and carrion. Insects make up approximately 70% of their diet and they will scratch on hives to encourage the bees to emerge, and then kill them as they do.
- **Predators:** Mostly large birds that lack a strong sense of smell, such as great-horned owls and red-tailed hawks. Their offensive odor causes most mammals to avoid skunks. Their bold black & white fur pattern helps attackers remember negative experiences.
- **Winter:** They do not hibernate, but go into periods of torpor.
- **Avian Conflicts:** Skunks and birds have interacted for millennia without serious impact on either.
- **Ecological Role:** They help control insect populations.

# Long-tailed Weasel

## basics

The long-tailed and short-tailed weasels occur in northern Utah, the former being the larger of the two. The short-tailed weasel, also called ermine, generally inhabits forests and their borders. Long-tailed weasels are more common in open habitat like marshes.

The long-tailed weasel weighs 6-16 oz., is 8-15" w/o the tail and the males are considerably larger than females. They have a long slender body, short legs and long bushy tails that are about 50% of their total body length. Their head is small and narrow and they have long whiskers. The fur is composed of short, soft underfur covered by shiny guard hair. They are cinnamon brown in color with white under parts that have a yellow tinge. The coat of animals in northern populations is white in the winter and brown in the summer, while those in southern populations are brown year round.

- The home ranges of long-tailed weasels can vary from 25-400 acres depending on food supplies. Long-tailed weasels are not social animals; the sexes live apart from each other except during the mating season. One male's home range may overlap several female home ranges, but home ranges of adults of the same sex never overlap. Weasels exhibit very aggressive behavior to intruders of their home ranges.
- Feisty and aggressive, they will threaten animals much larger than themselves. They may be preyed upon by larger animals, like large owls, coyotes, or large snakes and are especially vulnerable to predators at a young age. Many die before reaching one year old, however once they reach adulthood, they may live for several years.

## habitat

This weasel is most common in open habitats, ranging from marshes and crop fields to small wooded areas and suburban areas. They are not found in deserts or dense forests.

Their dens and nests are in hollow logs, rock piles, under tree stumps and barns. Sometimes instead of building a new nest, they take over the burrow of one of their prey & line their nest chambers with grass or fur and feathers of the previous occupant.

## adaptations

**Appearance:** Twice a year these slender bodied weasels shed their fur, once in the spring and again in the fall. This process is controlled by photoperiod.

**Activity:** Long-tailed weasels are quick, agile, and alert animals. They are good climbers and swimmers. While they can be active during the day, they are more active at night. Weasels bound or lope with the back arched and tail held straight out or slightly higher

than the plane of the back. They swim well and climb trees easily. Their small girth (1 to 1 1/2 inches) enables it to easily invade rock crevices and mouse and squirrel burrows.

**Senses/Defenses:** Long-tailed weasels have well-developed senses of sight, hearing, and smell, which allows them to be efficient and sensitive predators. Weasels, like skunks, discharge a foul-smelling liquid called musk when they are threatened or attacked.

**Communication:** Long-tailed weasels communicate among themselves with visual, sound, and scent cues. Females emit an attractive scent when they are ready to mate. Body language and sounds are used to communicate when weasels confront each other.

A loud, harsh chirp or a screech can be heard when a weasel is disturbed or ready to attack. A low trill often signals a friendly meeting between male and female. A trill also helps a female to call her young. Babies make high-pitched squeaks and at about four weeks it gets lower-pitched & raspier, eventually reaching a chirp similar to the adults.

## **food**

Mammals are the food of choice: mice, rats, voles, squirrels, chipmunks, shrews, moles and rabbits. Less common foods include birds, bird eggs, snakes, lizards, frogs, earthworms, insects, fruits and berries.

Long-tailed weasels hunt their prey by picking up a scent or sound, then follow the animal and make a quick attack. They kill their prey by biting the base of the skull. They are very strong, able at times to take prey more than three times their own weight.

They follow regular hunting routes, starting and ending at the den, covering only parts of their home ranges during a single night. In a night they may go less than one tenth of a mile up to 3½ miles with males going further than females. Females have better success in hunting small rodents because their bodies can fit inside the small rodent burrows. Males often pursue larger animals, such as squirrels and rabbits.

## **breeding**

Long-tailed weasels have only one litter per year. Females mate in their first summer, but males wait until the following spring. They mate in July or August. The fertilized eggs develop for eight days, and then enter an extended dormant period. About 7½ months later, the eggs attach to the wall of the uterus and resume development. The young are born 23 to 27 days later, usually during April or May. Litter sizes vary from 1 to 9 and average 4 to 5 young.

At birth young weasels weigh about 0.1 oz. (3 grams, or the weight of a dime). They are pink with wrinkled skin and white fur. At fourteen days, the white hair begins to thicken, and size differentiation makes it easy to tell males from females. At 36 days young weasels are weaned and can eat food brought back to the nest by the mother.

They learn how to kill prey from the mother and by 56 days old they are able to kill prey on their own. Young long-tailed weasels begin hunting with their mother at 6 to 7 weeks and are ready to leave her at about 11 to 12 weeks.

## key facts

- **Weight:** 6–16 oz. **Length w/o tail:** 8–15 inches. Males are considerably larger than females.
- **Appearance:** The weasel has a long slender body, short legs and a long bushy tail. It's cinnamon brown with yellow-tinged white under parts.
- **Diet:** Small mammals are the food of choice—mice, rats, voles, squirrels, chipmunks, shrews, moles and rabbits. Less common foods: birds, bird eggs, snakes, lizards, frogs, earthworms, insects, fruits and berries. Male-female size difference helps them reduce reliance on the same prey items.
- **Color Changer:** They shed their fur to change from brown to white, summer to winter, then back again, triggered by day length. They evolved as a benefit to warmth (hollow white hair), but also aids in camouflage.
- **Behavior:** Ounce for ounce, weasels are among the world's most impressive predators. They resemble hyperactive tubes of muscle ever alert to pounce upon an unsuspecting small mammal. They are amazingly strong for their size, able to take prey more than three times their own weight. They kill with a quick bite to the base of the skull.
- **Shelter:** Hollow logs, tree stumps, rock piles or under barns. Sometimes instead of building a new nest, they take over the burrow of a prey mammal, lining their nest chambers with the victim's fur.
- **Predators:** Large owls, coyotes or large snakes are their predators. They are especially vulnerable when they are young.
- **Ecological Role:** Weasels will occasionally take birds but their impact is less than from other carnivores. Long-tailed weasels help to control the of rodent and rabbit populations.

# Vagrant Shrew

## basics

The world's smallest mammal is a shrew, of which there are over 300 species worldwide. Most are very small, with the smallest adult weighing only 2-3 grams (one-tenth of an ounce). Some shrews are poisonous, allowing them to hunt and kill larger prey, including small vertebrates. Most shrews seem to prefer moist microhabitats, although a few species are found in deserts.

A few kinds of shrews are aquatic, including the water shrew that is also found here. It is well adapted to swimming and catching aquatic invertebrates and small fish. They have long, bristly hairs between their toes and along the sides of their feet, which aid them in swimming by increasing the surface area of the feet. These hairs also can hold air bubbles, allowing the shrew to actually run across the surface of the water!

While the information below is specific to the vagrant shrew, much is applicable to other species.

- The vagrant shrew weighs  $\frac{1}{16}$ – $\frac{1}{4}$  oz. with a total length of 3.75–4.75 in. (Tail: 1.25–2 in.) It gets its name from its extraordinary activity in pursuit of food rather than to its wanderings, which are no greater than those of other shrews.
- In summer it is brownish to grayish above, grayish tinged with brown or red below. In winter, entirely grayish or blackish. Its long tail is uniform in color or grading to paler below.
- Breeding home ranges average 0.82 acre and non-breeding home ranges average 0.26 acre. Adults are solitary except for breeding season, when there is extensive home range overlap. Adults begin defending their home ranges from other adults in late summer and continue to do so until the next mating season. Predators include snakes and barn owls.

## habitat

They are found in open areas, woodlands and forests, prefer dense litter or ground cover, use vole runways, and prefer patchy, open areas with wet microhabitats such as damp meadows and stream banks. Rarely are they found more than 600 ft. from water.

## adaptations

Physical: The pointed shape of their snout helps them burrow into the ground as they look for prey items such as grubs. Their small size results in a large amount of surface exposed, relative to its volume, which results in significant heat loss and a voracious appetite to replenish the lost energy. Its heart can beat up to 1,000 times per minute. Their eyes are tiny and their main senses are probably touch, hearing, and smell.

Activity: Although active day or night, most activity is nocturnal. It spends much of its time in voles' runways avoiding predation and seeking food. It forages under litter on moist surfaces, underground, and in moist accumulations of dead plant material.

## food

Shrews have a high metabolic rate and consequently a voracious appetite. On average, shrews must eat every three hours, and so are active throughout the day and night, feeding primarily on invertebrates like insects and their larvae, caterpillars, centipedes, worms, snails, slugs, and spiders. They also eat fungi, small mammals, roots, young shoots, and probably seeds.

## breeding

The shrew makes a nest of dry grass, moss, or other materials under logs, roots, or dense vegetation. After a 20-day gestation period, most young are born from March to May but there may be a second peak of births in August and September. Litter size ranges 2-9 with 6 the average, and there are 1 or 2, rarely, 3 litters per year. The young are weaned 16-20 days after birth. Females may breed in their first year, and the maximum lifespan is about 16 months. Most shrews do not live to breed a second year.

## key facts

- Weight:  $\frac{1}{16}$ – $\frac{1}{4}$  oz. Total Length: 3.75–4.75 in. (Tail: 1.25–2 in.)
- World Record: Shrews are the world's smallest mammals. The vagrant shrew weighs about the same as a quarter.
- Lifespan/Senses: They live about 16 months and most do not live to breed a 2nd year. Their senses are touch, hearing and smell...eyes are tiny.
- Habitat/Predators: Wetlands are perfect for shrews—lots of insects to eat and places to hide. They stay close to water, foraging under litter on moist surfaces, underground, and in moist accumulations of dead plant material; use vole runways. Predators include snakes and barn owls.
- Diet: They eat mostly invertebrates—insects and their larvae, caterpillars, centipedes, worms, snails, slugs, and spiders. Its small body causes it to lose heat fast, and it has a metabolism to keep up: It must eat something every 3 hours—the same or more than its own weight each day!—and its heart beats up to 1,000 times per minute.

# Meadow Vole

## basics

Voles are thickset, short-tailed, short-eared versions of mice, to which they are closely related. In Northern Utah there are four major groupings: red-backed, heather, meadow and sagebrush voles. The information below is based mostly on the meadow vole, but is variously applicable to the other species as well.

The meadow vole weighs 1.2–2.3 oz. and is 5½–7¾ inches long including its tail (1¼ – 2½ in.). Its back color ranges from yellowish to reddish brown, sprinkled with black, to blackish brown. The abdomen is grey or white and may be tinged with light brown. Its winter fur is duller and grayer and there is no difference in size or color by to sex.

Females are territorial, and males have overlapping home ranges about three times larger than those of females. Female territories are actively defended and when more than one female occurs within a territory it is probably a mother-daughter relationship. The mother seems to prevent these offspring from breeding, although how is unknown.

- Meadow voles are short-lived, rarely living for longer than one year in the wild. They are aggressive and will attack when cornered or captured.
- Their predators are owls and other birds of prey, snakes, foxes & weasels.
- Meadow voles are aggressive and will attack if cornered or captured. They take refuge from predators in their system of burrows and grass tunnels.

## habitat

They live in meadows, lowland fields, grassy marshes, near rivers & lakes and they are sometimes found in flooded marshes, high grasslands near water, or grassy open woodland. Meadow voles seem capable of excluding red-backed voles and mice from their preferred grasslands.

A common sign of the meadow vole is the piles of grass cuttings that it leaves in its runways, located within dense vegetation.

## adaptations

Activity: The meadow vole is active at all times of the day, but tends to be more nocturnal during the summer and diurnal during the winter. During cold winter months communal nesting can occur among non-overlapping maternal families consisting of non-reproducing individuals of mixed sex and age groups.

The meadow vole makes extensive runways through vegetation where they deposit feces and food refuse. They are proficient diggers and swimmers.

Senses/ Communication: Meadow voles have keen hearing and a good sense of smell. Vocalizations are primarily used in defensive situations.

## Food

From May until August voles feed mainly on fresh grasses, sedges, and succulent vegetation. In the fall they switch to grains and seeds, and during the winter they have been known to feed on the bark and roots of shrubs and small trees. These voles will also eat tubers and bulbs when available. When they overlap the range of cranberries, meadow voles feed on them extensively. They also eat other types of fruit.

Meadow voles do eat flesh and are cannibalistic, especially on newborn young. They don't show much storage behavior, but sometimes make small caches of tubers in fall. They are voracious eaters, consuming close to 60% of their body weight daily. When eating, these animals sit up and will stand to gnaw bark or a grain stalk.

## breeding

Mating is promiscuous. Gestation is 21 days. The size of the litter varying from 1–11, with an average of 4–6, is correlated with the size of the female, with younger females giving birth to smaller litters. In their first month 90% perish. Those born in the spring reach adult size in 3 months; those born later do so after winter.

They breed all year round with March through November being the main breeding season. Breeding is virtually continuous and the female will mate immediately after giving birth. First mating in females occurs when they are about half grown at an age of 25 days. Males mate when they reach the age of about 45 days.

Baby voles are born helpless, but grow quickly. Females care for and nurse their young in the nest until they are weaned at two weeks old. Soon after weaning the young disperse from their mother's home range.

## key facts

- Weight: 1.2–2.3 oz. Length: 5½–7¾ inches, including tail (1¼ – 2½ in.) The meadow vole is larger than most other vole species.
- Habitat: They're more common in meadows than in marshes, since their preferred food is fresh grasses and sedges, or their seeds. They eat close to 60% of their body weight daily.
- Habits/Senses: Makes extensive runways through vegetation and are proficient diggers and swimmers. They have a keen sense of smell and hearing.
- Prolific/ Short Lifespan: A vole female can give birth to as many as 40 young in a year. They rarely live longer than one year in the wild.

- **Predators:** Owls, other birds of prey, snakes, foxes and weasels are its predators. These voles are aggressive and will attack when cornered or captured, and hide from predators in their system of burrows and tunnels.
- **Ecological Role:** While to us they look similar to mice, there are more kinds of voles, they are more abundant and their role in the ecosystem is far greater. Many predator species rely on voles to make up a significant portion of their diet, especially owls, small hawks and falcons. In addition, meadow voles consume large quantities of grass and recycle the nutrients held in the grass through their droppings. They also help to aerate and turn the soil through their digging activities.

# Muskrat

## basics

A muskrat's average weight is 2.5 lbs. and their average length is 12.5 inches, plus a 9.5 in. tail. They have large, robust bodies with a flat and scaly tail. Their heads are very large, their ears are almost invisible underneath the fur, and their whiskers are medium size. Muskrats have short legs and big feet. Adult muskrats have glossy upperparts that are dark brown, darker in winter and paler in the summer.

Muskrats are arranged in large family groups and live in definite territories. If the conditions are overcrowded, the females will kick their offspring out of the group. Muskrats continue to live in large groups even when fighting and cannibalism occur in high rates.

- Their name derives from the distinctive odor from their musk glands, used to communicate with others of their species.
- Although muskrats have been known to live to 10 years old in captivity, they probably live about 3 years in the wild.
- Their predators are mink, raccoons, otters, coyotes, barn owls, barred owls, northern harriers, bald eagles and several hawk species.
- Muskrats are excellent swimmers and can evade many predators by escaping into water or into their burrows and nests.

## habitat

Muskrats are found in wet environments, favoring locations with 4-6 ft. of water. While muskrats are found in ponds, lakes, and swamps, their favorite locations are marshes, where the water level stays constant. Marshes also provide the best vegetation.

Muskrats find shelter in bank burrows, tunnels excavated in a bank, and their distinctive nests. The nests of the muskrats are formed by piles of vegetation placed on top of a good base, for example a tree stump, generally in 15 to 40 inches of water.

## adaptations

Physical: The back feet are slightly webbed for swimming, the tail is flattened to serve as a rudder and the underfur is waterproof and traps air bubbles for buoyancy and insulation. They have a special adaptation called regional heterothermia, which regulates the flow of blood to the feet and tail, allowing these structures to be cooler than the body core.

**Activity:** Muskrats are active at all times of the day but most active from mid-afternoon until just after dusk. They construct lodges of vegetation or excavate bank dens to protect them from the elements and predators. They are good swimmers and can stay underwater for 12–17 minutes but move relatively slowly on land.

**Senses:** Muskrats have poorly developed senses of sight, hearing, and smell and are affected by quick changes in temperature. Dry, hot weather is especially bad for them.

**Communication:** Muskrats communicate by a secretion of musk from their glands. This scent also serves to warn intruders. They can also vocalize with squeaks and squeals.

## food

In summer they eat the roots of aquatic plants, including cattails, and in winter they swim under the surface ice to get to plant foods. In winter they also make “pushups” of aquatic vegetation that they shove up through cracks in the ice to feed upon.

Muskrats consume about one-third of their weight every day. Their digestive system is designed for green vegetation. Muskrats are mainly vegetarians but will eat clams, crayfish, turtles and fish as well.

## breeding

Northern populations usually breed March to August, sometimes resulting in two or even three litters. The gestation period is 29-30 days and the litter size averages 6 or 7. Young are born in a grass-lined nest. When born, the muskrat has short dark fur, closed eyes, and weighs around  $\frac{3}{4}$  oz. They are able to swim at 10 days and by 21 days can eat green vegetation. In 30 days muskrats gain their independence and will reach adult size in 200 days. Most muskrats wait to breed in their second year.

Young are cared for and nursed by their mothers in the nest until they are about 2 weeks old, when they begin to swim and eat vegetation. They are fully weaned by 3 to 4 weeks old and leave their mother's home range after their first winter, usually when they are less than a year old.

## key facts

- Ave. weight: 2.5 lbs. Average length: 12.5 inches, plus a 9.5 in. tail.
- Features: Large, well-insulated underfur is waterproof and traps air bubbles for buoyancy; webbed feet for swimming with flat, hairless tail used as a rudder.
- Habitat: Well-suited for the food and cover of wetland marshes. For shelter they use bank burrows, tunnels excavated in a bank, and their distinctive nests which are formed by piled vegetation.

- Habits: They are excellent swimmers and evade predators by escaping into water or into their burrows and nests. They can remain under water for up to 17 minutes.
- Food: Mainly leaves and roots of aquatic plants, including cattails, but also clams, crayfish, turtles and fish. In winter, they swim under the surface ice to get to plant foods and make “pushups” of aquatic vegetation to feed upon.
- Predators: Mink, raccoons, otters, coyotes, barn owls, barred owls, northern harriers, bald eagles and several hawk species.
- Ecological Role: Muskrats are abundant in areas of good habitat, making them important prey animals for predator populations. By grazing on vegetation, muskrats influence the make-up of local plant communities.