WILDLIFE REHABILITATION BULLETIN

ARTICLE

Weasels, minks, and fishers—Orphan rehabilitation of the slinky carnivores, Part 1: natural history

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Abstract

Mustelids are highly specialized, efficient predators with special care needs while in a rehabilitation setting. This overview of select North American mustelids, a combination of natural history, literature review, consultations, and personal experience, addresses some of the unique characteristics and requirements of these slinky carnivores, while also providing the tools necessary for successful rehabilitation and release. *Part 1: Natural History* discusses the natural history of North American mustelids, focusing on weasels, minks, and fishers. Physical characteristics, habitat, diet, and how these factors inform care protocols is discussed. *Part 2: Care Protocols for Orphaned Infants and Juveniles* discusses vetted care protocols of orphaned weasels, minks, and fishers based on their natural history and established orphaned wildlife rehabilitation procedures. *Part 3: Pre-Release Conditioning and Release* discusses the steps involved in preparing for a successful release using appropriate pre-release conditioning, release site selection, a supported soft-release, and post-release monitoring. An understanding of natural history and behaviors leads to better understanding of mustelid welfare and requirements while in care and improved outcomes for mustelids brought into rehabilitation.

Keywords

Mustelid; weasel; mink; fisher; natural history; carnivore

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Abbreviations

ADV: Aleutian mink disease virus
HPAI: highly pathogenic avian influenza
GI: gastrointestinal
LRS: lactated Ringer's solution
PCBs: Polychlorinated biphenyls

Introduction

Combining natural history, literature review, professional consultations, and personal experience, this overview of the natural history of select North American mustelids addresses their unique characteristics and requirements, while highlighting key aspects necessary for a successful rehabilitation and release. An understanding of these slinky carnivores informs conversations with the public when a rehabilitator receives calls about a weasel, mink, or fisher (Fig. 1), and helps inform consultation and care decisions for other mustelids, such as river otters and martens.

> "Weasels have the reputation of being objectionable, bloodthirsty, wandering demons of carnage … These anthropomorphisms are of little value in understanding weasel behavior. Instead, weasel behavior should be interpreted as a highly specialized and adapted carnivorous way of life that is a result of a long and successful evolutionary process. Weasels are not angry, cunning, or wanton killers. Instead, they are efficient predators with behavioral, anatomical, physiological, and sensory adaptations that allow them to survive as small carnivores. Their quick actions and curious nature are tools with which to hunt and find small and agile prey. These same features may also help avoid being taken as prey. Their fearless and pugnacious nature is necessary to allow the weasel to attack, capture, and kill prey that may be much larger. The 'wanton slaughter' of prey is an efficient way of exploiting a locally abundant food source that is easily captured. Once prey are killed, some are eaten immediately and the rest cached for future use." (Svendsen 2003).

Natural history

The Mustelidae form one of the largest, and oldest, families in the suborder Caniformia of the order Carnivora (Law et al. 2018). Commonly known as mustelids, they are carnivorous mammals and in North America include the following (Fig. 2):

- subfamily Mustelinae
  - three species of weasels
    - least (*Mustela rixosa*, some authorities use *M. nivalis*)
    - short-tailed (*Mustela richardsonii*, formerly included within *M. erminea*)
    - long-tailed (*Neogale frenata*, some authorities use *Mustela frenata*)
  - American minks (*Neogale vison*, some authorities use *Mustela vison*)
  - black footed ferrets (*Mustela nigripes*)
- subfamily Guloninae
  - American martens (*Martes americana*)
  - Pacific martens (*Martes caurina*)
  - fishers (*Pekania pennanti*, formerly *Martes pennanti*)
  - wolverines (*Gulo gulo*);

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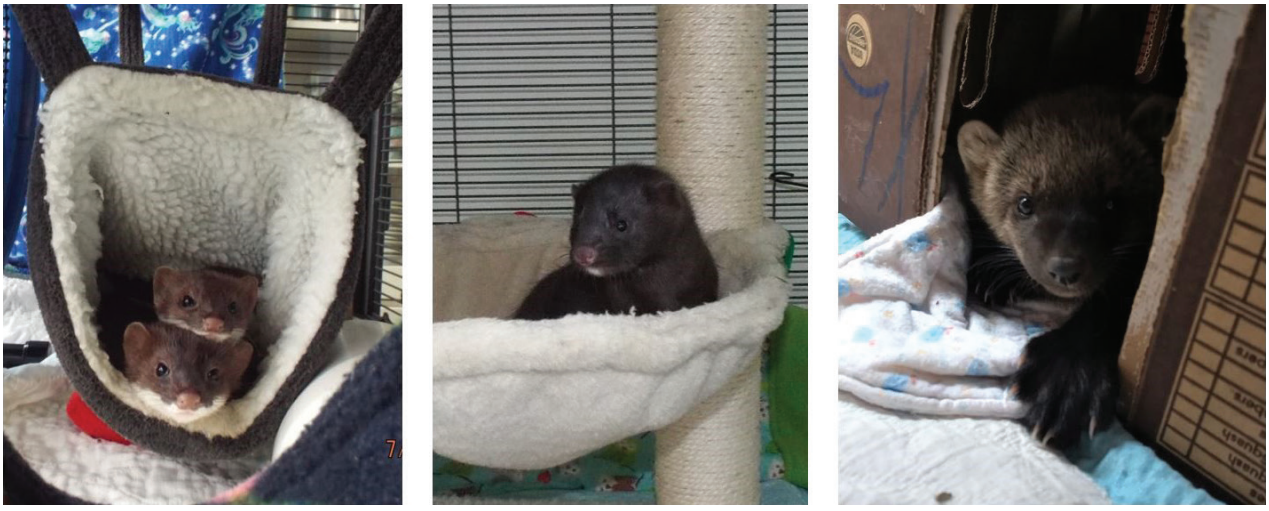

Fig. 1 Juvenile mustelid orphans (left to right): short-tailed weasels, American mink, fisher.

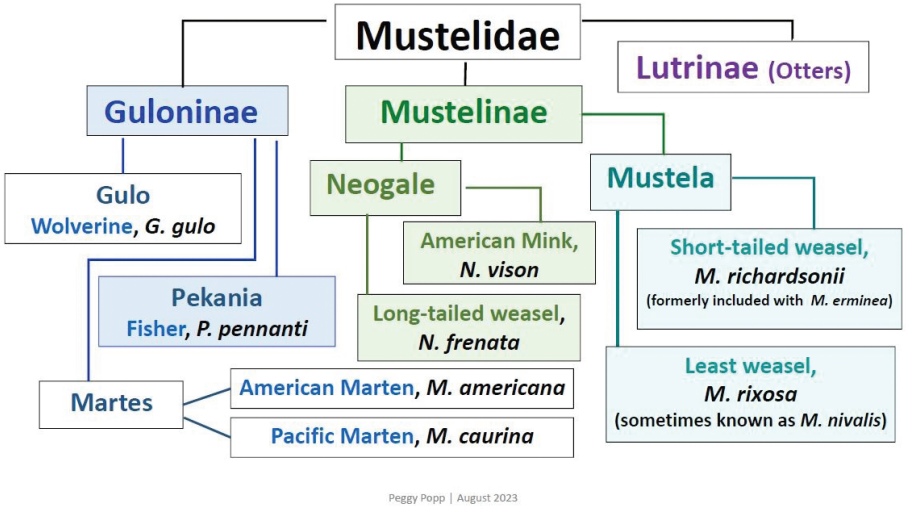

Fig. 2 A portion of the Mustelidae family tree (Li et al. 2014; Hall 2015; Patterson et al. 2021; Evans & Mortelliti 2022).

- subfamily Taxidinae
  - American badgers (*Taxidea taxus*)
- subfamily Lutrinae
  - river otters (*Lontra canadensis*)
  - sea otters (*Enhydra lutris*)

Minks and long-tailed weasels were recently re-classified as Neogale, or "new world" mustelids. A 2021 study found this clade diverged from Mustela during the late Miocene period, between 11.8 and 13.4 million years ago, and gave it the name Neogale, with all members within the clade being more closely related to one another than to any of the other species in Mustela. The Neogale stayed in the Americas while the Mustela (least weasel and short-tailed weasel) were in Europe, with some least and short-tailed weasels eventually separating from their European kin and migrating to North America through the Bering land bridge about 200,000 years ago (Patterson et al. 2021).

This paper will focus on how natural history informs the rehabilitation of orphaned fishers, minks, and the three North American species of weasels. Identification clues and limited natural history information of otters, wolverines, and martens is provided to differentiate between species and facilitate identification.

General characteristics

Mustelids are long and lean with an exceptionally high metabolism and rely heavily on hearing and smell when

hunting. All species were trapped for their fur, often leading to regional extirpation. Today, they are classified as furbearers (trapped and managed for their fur) in most US states and Canadian provinces.

Adult males are much larger than females. Female kits initially grow more quickly than males; their growth slows at the same time the juvenile males accelerate growth, with the males quickly surpassing both their sisters and their mother in size.

Mustelids are obligate carnivores, although they may eat other foods, such as berries, earthworms, insects, and fungi, when their preferred food is not available. Prey is consumed in its entirety, nose to tail and all parts in-between, often including fur, scales, and feathers.

A long, lean, slender body shape results in a higher surface-to-volume ratio than that of other mammals of the same size, and a high metabolic rate (Brown & Lasiewski 1972; Svendsen 2003). Mustelids have relatively simple stomachs and short GI tracts with no special adaptations for digesting plant matter, resulting in a GI transit time of only 3 to 4 hr (Kollias & Fernandez-Moran 2015). Their high metabolism does not let them survive for long without food and the smallest mustelids, the weasels, must eat as often as every 2 to 3 hr throughout the 24-hr cycle (Gillingham 1984). Although most mustelids generally prey on mammals, they are opportunistic and may also prey on birds, reptiles, amphibians, and fish. All mustelids cache surplus food for later consumption. They are susceptible to hypoglycemia and rapid starvation. Weasels require a constant supply of drinking water, taking frequent sips throughout the day rather than lapping a large quantity in a single visit (Svendsen 2003). The author's personal experience suggests this applies to minks and fishers as well.

A combination of short jaws, powerful muscles, and tooth arrangement gives mustelids tremendous power when they snap their jaws shut. A wolverine will consume the frozen thighbone of a moose, a fisher will consume the entire skeleton of a large rabbit or snowshoe hare, and least weasels have the strongest bite amongst all North American carnivores (Christiansen & Wroe 2007).

Their teeth are robust. The upper canines are large, blunt, and canted slightly forward. The lower middle pair of incisors have roots that are displaced lingually, allowing heavier, stronger teeth with no increase in space. Lower canines are shorter and more strongly recurved than the uppers (Copeland & Whitman 2003; Evans & Mortelliti 2014).

Habitat preferences vary within and among mustelid species, all of which (except sea otters) are largely terrestrial. River otters and minks are semi-aquatic; martens and fishers are semi-arboreal, often inhabiting and climbing trees; and the weasels are semi-fossorial, spending much of their time underground, as well as semi-arboreal.

Mustelids have extremely large territories relative to their size. For example, the territory of a 4.5 kg male fisher is 38 km^2 (9400 acres, or 14.7 square miles) (Powell et al. 2003), while a 50 g least weasel has a territory of 15 km^2 (37 acres, or 0.058 square miles) (Svendsen 2003). They are territorial but generally not aggressively so (avoidance is the common response) and will vigorously defend only the portion they rely on for food or raising their young (Powell 1993a; King & Powell 2007a). They have anal scent glands for signaling and marking territory. Scent marks (and scat) are often placed on stumps or other prominent structures. Males have larger territories than females, and the territory of a single male will often overlap the territories of multiple females (Copeland & Whitman 2003; Larivière 2003; Powell et al. 2003; Svendsen 2003). Territories of members of the same sex generally do not overlap, and all mustelids are generally solitary.

All mustelids have an exceptionally high metabolism. Depending on the age and species, the basal rate factor used to calculate the kilocalories (kcals) required per day for maintenance varies from a factor of four to a factor of eight. This compares to the standard value of 1.1 for adult placental animals and 2.2 for young placental mammals in the most rapid growth phase. Similar to other animals, the smaller species of mustelids (e.g., weasels vs. fishers), females (vs males), and younger animals (infants vs juveniles vs adults) have a higher maintenance energy requirement than their counterparts.

Hunting behavior generally consists of a zigzag foraging pattern in places where prey is likely to be found. Mustelids hunt individually; they do not lie in wait to ambush prey, nor do they chase prey for long distances. They hunt using their keen sense of hearing and smell and, once spotted, track their prey visually. Their long, lean shape allows weasels, minks, and fishers to forage in areas not generally frequented by other predators, such as within brushy areas and windfalls, among the branches of trees and bushes, and in tunnels under snow, vegetation, and underground.

Prey are most often killed when they are found resting or are flushed from a hiding place, usually by a bite on the back of the neck. If the initial bite is anywhere other than on the back of the neck of the prey animal, the mustelid may use their feet for a wraparound assist to optimally position the animal for a killing bite. For prey that is much larger, or heavily armored (e.g., a porcupine), the mustelid will attack and weaken the animal with a series of slashing bites (Powell 1993b, 1993c; King & Powell 2007b).

Once killed or immobilized, prey is usually removed from the site and either cached or consumed in a hidden area (Remington 1952; the author, personal

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observation). If multiple prey species are available, such as a nest of mice, a school of fish, or a flock of chickens, individual prey is killed or immobilized, cached a short distance away, and the mustelid immediately returns to kill another until no prey remain available. At this point, the mustelid often returns to the cache for consumption or relocation of cached prey items.

While preferring live prey, terrestrial mustelids will eat carrion and often rest close to and return to carcasses. Minks are highly opportunistic, taking advantage of any available terrestrial or aquatic prey. Least weasels and short-tailed weasels have among the most specialized diets, requiring mice and voles (and mouse/vole habitat) to survive. In addition to being efficient predators, long-tailed, short-tailed, and least weasels are also a prey species, preyed upon by anything that eats small rodents, including hawks, owls, domestic cats, and other felids, foxes and other canids, and larger mustelids.

Mustelid milk is high in protein and fat but low in carbohydrates, with smaller species (e.g., weasels) requiring the highest amount of fat and protein, and least amount of carbohydrates, compared to larger species (e.g., fishers). The milk of obligate carnivores such as mustelids is particularly high in taurine, and any formula used for infant mustelids must contain supplemental taurine (AZA Small Carnivore Taxon Advisory Group 2010).

Most mustelids delay implantation during reproduction; when a developing fetus reaches the blastocyst stage (e.g., a ball of cells), instead of implanting in the uterus it becomes dormant. The delay ranges from almost a year (fishers) to a few weeks (minks) and is followed by a short (3–7 week) active pregnancy. Least weasels do not delay implantation, usually giving birth within 35 days of breeding (Heidt 1970). The young are born in the spring and often begin eating meat soon after their teeth emerge (which may be before their eyes open) but are not weaned until later. They remain with their family units over the summer learning to hunt and disperse in late summer (minks and weasels) or fall (fishers) (Aubry et al. 2005). The young remain in their natal home ranges in the early stages of becoming independent and dispersing, before venturing further to establish their own territories. The mother offers a protected territory and may assist in providing food for her offspring as they become independent.

Larger species (e.g., fishers) take longer than smaller species (e.g., least weasels) to reach adult size, build the muscles and coordination necessary to control their long spines, and longer to mature. This may be an important consideration if a juvenile shows neurological signs—a wobbling of the back end may indicate injury or disease, but it may also be due to immaturity, with a corresponding lack of coordination and muscle tone.

Mustelids are susceptible to human toxins (such as rodenticides and lead) from both the environment and their prey, as well as respiratory viruses such as SARS-CoV-2, human colds, and avian influenza A(H5N1) virus (Taylor 2014; Molenaar et al. 2020; Agüero et al. 2022). Minks (and otters) are highly sensitive to aquatic toxins such as Polychlorinated biphenyls (PCBs) and heavy metals, and in western US, rodenticides used in illegal marijuana agriculture are a significant mortality source for fishers (Basu et al. 2007; Elmeros et al. 2011; Martin et al. 2011).

Specific characteristics of select mustelid species

Fishers. Fishers (Fig. 3) are comparable in size to large domestic cats, with males generally weighing 3.5–6.0 kg and females weighing 2.0–2.5 kg. Their coats are grizzled brown, with white to cream chest and groin markings unique to each individual.

Fisher range extends across the boreal forests of Canada and across the southern boreal and northern hardwood forests of the US Fishers are most abundant in mixed conifer and deciduous forests with a continuous canopy cover of large trees. They avoid open areas. Fishers were trapped heavily for fur in the late 1800s and the early 1900s, leading them to currently be found in the US mostly on lands managed by state environmental agencies, the US Forest Service, and the National Park Service. More recently, their range has expanded out of forests and into small woodlots in suburban and agricultural areas (Ellington et al. 2017; Frischkorn 2020).

While agile climbers, fishers spend most of their time on the forest floor foraging where fallen trees, tree roots, shrubs, and other structures make complex ground cover. They have retractable (but not sheathed)

Fig. 3 Juvenile fisher.

claws and highly mobile ankle joints, allowing close to 180° rotation in their hind paws which assists head-first descent (Powell 1993d). They eat a wide variety of small animals, deer carcasses, and other carrion, and may also eat berries and fungi. Their preferred prey are snowshoe hares; they are uniquely specialized to prey on porcupines. Porcupines provide fishers with large prey items (relative to their sizes) for which they have no competition. Low porcupine densities lead fishers to be affected by competition with bobcats, coyotes, and other similarly sized predators. Adults have few predators other than humans, but where porcupines are scarce, predation by bobcats has affected fisher populations (R Powell, personal communication).

One to four kits are born in the spring, usually in a tree cavity, with the female breeding again within 2 weeks of giving birth. Kits are weaned at about 4 months, and become independent soon after, but may remain in their natal territories until the following spring. Intraspecific aggression appears in fisher kits when they are about 3 months old, and they may be intolerant of each other by 5.5 months (Powell et al. 2003). In captivity, this aggression may be reduced or eliminated with sufficient enrichment and enclosure space.

Young are orphaned during spring timber harvests when den trees are cut and taken to sawmills, with kits sometimes falling out onto the road during the journey to the mill.

Minks. At 50–55 cm (19–22″) long, minks are about the size of a grey squirrel and weigh 0.4–0.8 kg (females) and 0.5–1.6 kg (males). While about the same length, males are much heavier than females. There is geographic variation in average body size, with the western mink generally larger than their eastern counterparts (Larivière 2003). Minks have solid colored dark brown fur with characteristic white chin markings and may also have white markings on the abdomen. The pattern of white markings is unique to the individual (Fig. 4).

They are semi-aquatic and usually found close to water. Their range extends throughout North America wherever there are bodies of water, from the boreal forests of Canada south to southeastern US.

Minks are opportunistic and adaptable predators, consuming whatever prey is available, from fish and frogs to rodents, rabbits, and assorted birds. A preferred prey is young muskrats; after consuming or scaring off the occupants, minks will occupy muskrat lodges. They rely heavily on scent and hearing while foraging and can hear ultrasonic vocalizations (1–16 kHz) of rodent prey (Larivière 2003). Their eyesight is clearer on land than underwater. They track aquatic prey by running along the water's edge, watching for movement, and diving into the water for capture.

Fig. 4 Juvenile American mink displaying characteristic white chin.

Breeding occurs in late winter or early spring, with kits born in fur-lined nests by late spring, after a slightly delayed implantation and 4-week active gestation. Kits remain with their mother through the summer and disperse in late summer and early fall. Male kits will generally disperse earlier and further than female kits.

Long-tailed weasels. Weighing 85–270 g (females average ~110 g and males ~200 g), long-tailed weasels are dark brown above with yellow, cream, or white undersides; in the southwest they may have unique, light colored masks. They typically have brown (or a combination of brown and white) feet, unique brown chest markings, and a long brown tail with a brushy black tip. Their tails are generally longer than half their body lengths. In the northern parts of their range, long-tailed weasels turn white in winter, retaining their black tail tips (Fig. 5).

Long-tailed weasels are the most widespread carnivore in the Western Hemisphere, inhabiting forested, brushy, and open habitats near water, ranging from southern Canada to South America (Svendsen 2003). They live anywhere with access to their primary prey of small rodents (mice, voles, rats, chipmunks, and small squirrels) and water for drinking. They den in abandoned burrows, often those created by chipmunks, and line their nests with fur from their prey. Long-tailed weasels mainly hunt on the ground but will also climb trees to take birds or small squirrels from their nests. Females, being smaller, often hunt voles within their tunnels.

Breeding occurs mid-to-late summer; young are born in late spring of the following year, with litters averaging 6–7 blind and nearly naked kits. The kits quickly grow a coat of silky white fur, generally within the first 24 hr.

Short-tailed weasels. Looking very much like a smaller (45–180 g), somewhat shorter-tailed version of long-tailed weasels, short-tailed weasels are dark brown above and white below, with a brown tail with a brushy

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black tip. Generally, their tails are shorter than half their body lengths, although this is not a diagnostic characteristic, and they have white feet. In the northern part of their range, their coat turns white in winter, with a characteristic black tail tip. They are often referred to as ermines, a reference to their white winter fur, and may be referred to as stoats in either color phase; stoat is the common name used in Britain (Fig. 6).

With the exception of the Great Plains, short-tailed weasels are found across the northern third of the US, through Canada and Alaska to above the Arctic Circle (Svendsen 2003). Their habitat preference is varied and includes open woodland, brushy areas, grasslands, wetlands, and farmlands—anywhere with abundant small rodent populations, particularly voles and lemmings. Dens are often found in or beneath a log, stump, roots, brush pile, or stone wall, frequently appropriated from their prey. They are strict carnivores, eating primarily mice and voles. They eat frequent small meals throughout the day, consuming a mouse or vole over the course of several hours.

Fig. 5 Long-tailed weasel kits. The larger kit is about 6 weeks old, and the smaller one about 4 weeks old.

Short-tailed weasels breed in early summer. Implantation is delayed and coincides with their mothers shedding their white winter coats. Active pregnancy is short and litters averaging six young are born in late spring. Infants are blind, deaf, and sparsely covered with fine, white fur, developing a distinctive dark mane by about 2 weeks of age. The mother is the primary caretaker, but males who court her may bring food that the youngsters also eat.

Although females do not reach adult size until at least 6 weeks after birth, they are able to mate at 6 weeks, often before their eyes are open, giving birth the following spring. Males do not breed or reach adult size until their second year.

Least weasels. The smallest living carnivores, North American least weasels generally weigh 30–90 g and are routinely misidentified as mice. There is a significant size range across the continent; they are generally smaller where their range overlaps that of either short-tailed or long-tailed weasels and larger in the absence of these competitors. Males are typically twice the size of the females.

Least weasels are dark brown above and white below, with white feet and a short, stumpy, brown tail. They do not have the brushy black tail tip of the other two weasel species, and in the northern part of their range their coat turns pure white in winter (Fig. 7).

Their range is generally north of a diagonal line drawn from Alaska to South Dakota, across to Pennsylvania, and along the Appalachians into North Carolina (Svendsen 2003). Their habitat is grassy, brushy, fields and marsh areas. They climb trees, brush, and logs to survey their environment and are active both day and night, through all seasons. They are rarely observed, spending much of their time under vegetation, snow, or underground following mice and voles in their tunnels. Least weasels prey almost exclusively on mice and voles but may also consume shrews, earthworms, or insects. Adults consume 40–100% of their body weight each day, spread out over 5–10 meals. Like their prey, least weasels rely on

Fig. 6 Infant and juvenile short-tailed weasels.

Fig. 7 Juvenile least weasel. Born in the fall and overwintered, he shows the transition from brown to white and back to brown. Left to right: December 2, January 1 and April 7.

the subnivean layer (underneath the snow) in winter for protection from weather and predators.

Litters averaging 4–5 young are usually born in the spring, but, unlike other mustelids, least weasels do not delay implantation and are known to breed year-round when prey is abundant, sometimes producing as many as three litters in a single year (Hall 1951; Heidt 1970).

NB: Comparison charts with species-specific details are available in Appendix A

Natural history informs initial care decisions. Heightened biosecurity precautions should be taken with all mustelids. They are susceptible to many human respiratory illnesses, including SARS-CoV-2; avian influenza, including HPAI; and canine distemper (Devaux et al. 2021; Zhou & Shi 2021). If mink fur farms or ranches are in the area, area wildlife may be exposed to Aleutian mink disease virus (ADV) (Mayer & Fox 2015). Be aware of disease risks in your area and follow current biosecurity recommendations, protecting both yourself and the animal. Note that disinfectants and detergents must be thoroughly rinsed to remove residues, due to the mustelid scent sensitivity.

Because of their susceptibility to communicable diseases, especially respiratory illnesses, biosecurity precautions in rehabilitation facilities must be taken to protect both the animals and the caretakers, and masks, gloves, and air filtration units are recommended during outbreaks of human respiratory infections such colds, influenza, and COVID-19. Given their opportunistic foraging habits and susceptibility to eating poisoned prey, mustelids should be assessed during intake for toxins likely to be present in the area of origination.

Mustelid orphans are an exception to the "watch and wait" rule. They nest in dens; anytime an infant is found outside of the den with no parent in sight it needs help, as quickly as possible, due to its high metabolism. Juveniles spend the summer under the watchful eye of their mothers and family units learning how to hunt and maneuver through their environments safely, returning to the den site to rest. Juveniles found alone, relatively easy to capture, and without a parent nearby, need assistance and, due to their high metabolism, need it quickly.

Because of their extremely high metabolism and rapid GI transit time, mustelids must eat frequent, small meals. They are naturally long and lean with rich, dense fur; there may not be much difference in the appearance of a healthy wild mustelid and a starving mustelid.

Upon admission, assume that any mustelid is stressed and starved (if not emaciated), consider poison or other toxins along with disease and injuries, and be aware that females may be pregnant. They should be isolated in a warm, dark, and quiet location, with a place to hide, and once warmed, should be immediately fed. Their lean body mass, rapid GI transit time, strict carnivore diet, inability to digest plants, and need for calories indicates

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that rehydration should be combined with an easy to digest protein, then transitioned to opened or chopped (for easier access) whole prey.

Using water or oral rehydrating solution as the diluent, neonates, infants and young kits not yet old enough to be weaned are started with over-diluted formula (10–20% full strength) while older kits and adults are given diluted (25–50% prepared full strength) Oxbow Critical Care Carnivore® (Oxbow Animal Health, Omaha, NE), EmerAid® IC Carnivore (EmerAid, Cornell, IL), or chicken in broth (human) baby food (e.g., Beech-Nut®, Amsterdam, NY), which provide easy to digest proteins. Rather than using the traditional approach of flushing an infant GI tract with feedings of an oral rehydrating solution, such as LRS or normal saline, provide diluted formula as soon as possible. Feed, slowly, as much as they want, and at frequent (20–30 min) intervals.

Food can initially be offered with a syringe as needed; older kits will often be capable of self-feeding in a relatively short time. Repeat the feedings every 20–60 min, with gradually less dilution and at longer intervals as the kit consumes the food and begins to perk up. Monitor for adverse effects (vomiting, deteriorating condition, not touching the food, etc.). Juveniles and older individuals should be left with water and a shallow dish of the diluted food in the cage for at-will consumption in between feedings. This process will rehydrate while also supplying critical protein and calories. Frequent small meals and at-will consumption are an important component of the care plan. Often, admissions are on full strength formula or regular carnivore (i.e., whole prey rodents) diet within 12–48 hr, depending on their condition at admission.

Mustelids trapped and brought into captivity, or housed in wire cages, may show excessive tooth wear or breakage of incisors, canines, and premolars from chewing on the trap or cage.

To improve welfare and reduce stress while in the rehabilitation setting, the habitat in captivity should mimic the natural habitat appropriate to the age of the mustelid in care. Even at intake housing should include plenty of hide areas and enrichment. Infants are often comforted by a heartbeat unit or comfort toy such as a Snuggle Puppy® (SmartPetLove, Novi, MI), while enrichment for juveniles should include soft toys the size of target prey species, both as a source of comfort and to practice prey handling techniques. Different species of mustelids, including the different weasels, should not be housed together even if there are two single orphans. All mustelids are in a predator or prey relationship with other mustelids.

Mustelids are highly specialized, very efficient predators that have special care needs in a rehabilitation setting. An understanding of their natural history, physiology, and natural behaviors informs care protocols that will lead to improved welfare and outcomes for mustelids brought into a rehabilitation setting. Rehabilitation methods will be discussed in Part 2. *Care Protocols for Orphaned Infants and Juveniles.*

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Author biography

Peggy Popp holds an Advanced License for wildlife rehabilitation in Wisconsin, with Endangered and Threatened Species Authorization. She has been an independent home-based wildlife rehabilitator since the mid-1980s, focused on orphaned small mammals. Since the summer of 2013, when an infant least weasel appeared on her doorstep, she has focused on researching and promoting best practices for the rehabilitation of mustelids, including minks, the three WI [species of weasels ...] species of weasels, and fishers.

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