

# FURBEARER MANAGEMENT GUIDELINES

**ERMINE** *Mustela erminea*

**LONG-TAILED WEASEL** *Mustela frenata*

**LEAST WEASEL** *Mustela nivalis*



Since 1926, separate trapline areas in British Columbia have been assigned and registered to individuals licensed to harvest the province's plentiful fur resources. To obtain a licence, trappers must successfully complete a three-day course that focuses on humane trapping methods, fur handling, and trapline management. The trapline management component includes knowledge of, and fosters respect for, provincial trapping regulations, adherence to professional and ethical standards established by the Ministry of Water, Land and Air Protection and the BC Trappers Association, and practices that help to manage and maintain furbearer populations. There are approximately 2900 registered traplines in British Columbia, and 19 mammal species are officially classified as furbearers.

For management purposes, the weasel is a Class 1 species, which means that it has a home range that is small enough for a sustainable population to be contained within one trapline area and can therefore be managed on an individual trapline basis. Other Class 1 species are beaver, marten, mink, muskrat, raccoon, squirrel, red fox and skunk.

This document is intended primarily to provide British Columbia's professional trappers with information on weasel biology, and on principles to consider in the sustainable management of the species. The material presented is generalized from the results of many studies conducted over a wide geographic area and local variations and exceptions may occur.

## DESCRIPTION

Weasels are the smallest North American carnivores. There are three species, and all occur in British Columbia. All have the typical long, thin mustelid (weasel family) shape, with short legs, long neck, and short, dense fur, and most change colour from brown back and white or yellowish belly in summer to predominately white in winter. In areas where winter snow does not normally accumulate, such as the lower Fraser Valley, the change to white may not occur or may be incomplete. Some identification features for the three species are given below. The measurements and weights given are for adults (at least one year old). Juveniles in their first winter may be near full-size in terms of length but are usually lighter in weight, particularly in the case of males.



1.) Summer ermine.



2.) Winter ermine.



a) least weasel, b) ermine, c) long-tailed weasel (after Banfield 1974).

**Ermine** - By far the most common, this species (also known as the short-tailed weasel) is best identified by its black-tipped tail that is less than half the combined length of the head and body. Adult males in inland habitats are typically 320 mm or more in total length, with a tail length of 90 to 110 mm, and weigh 130 to 200 g. Adult females are much smaller, always less than 300 mm in total length (tail about 70 to 90 mm), and weighing about 70 to 90 g. Ermines on the islands and along the Lower Mainland coast are somewhat smaller than those inland.

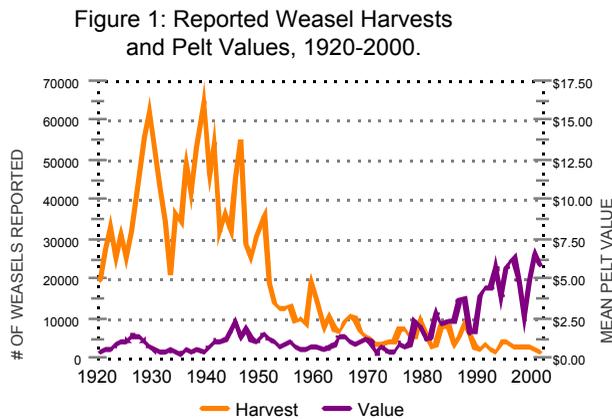
**Long-tailed Weasel** - The tail on this species is also black-tipped, but is typically more than half the length of the head and body. This is the largest of the weasels, with adult males usually 420 to 450 mm in total length, of which the tail comprises 150 to 170 mm, and weighing 240 to 300 g. As with ermines, females are smaller, about 320 to 350 mm in total length (tail 120 to 145 mm) and weighing 130 to 150 g.

**Least Weasel** - This is the smallest of the weasels, little more than mouse-sized. It is distinct from the other two species in having a very short tail (less than one-quarter the combined head and body length) without a black tip. Males are less than 200 mm in total length, with a tail length of about 25 to 35 mm, and usually weigh less than 125 g. There have been few specimens from British Columbia, but females are believed to be about 15 percent smaller in body measurements and rarely weigh more than 60 g.

## ECONOMIC CONSIDERATIONS

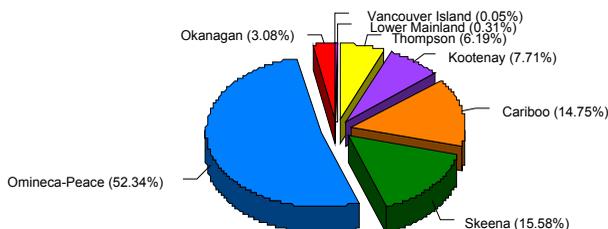
Provincial harvest and fur industry records to date have not distinguished between the three species, listing and compiling them together under the general category “weasels” and the data available for this document reflect that fact. However, based on both relative abundance and distribution, the great majority of the provincial harvest (probably well over 90 percent) is composed of ermines, and most of the rest is long-tailed weasels. Least weasels are so small that they rarely trip the triggers on the quick-kill traps currently in use for small mustelids and, on those rare occasions when they do get caught, they are often considered to be of too little value to process.

Historically, the white winter pelts of weasels were commonly used for decorative and ceremonial purposes in many aboriginal societies and the Sumptuary laws of the European Middle Ages reserved ermine for use only by “royalty and clergy.” In the 1920s and 1930s, when many people worked long hours at hard labour for a dollar a day, individual weasel pelts brought 50 cents to \$1.50. Under those conditions, it was worth targeting weasels and annual provincial harvests of 30,000 to 50,000 animals were common (Figure 1). Weasel pelts contributed as much as 5.7 percent of total annual provincial fur revenue during that period.



Since the early 1960’s, pelt prices have been higher in absolute value, but considerably lower in terms of buying power, and most trappers have been taking weasels primarily as an incidental catch or sideline while focusing on other species such as martens and minks. However, weasel trapping has remained a fairly lucrative opportunity for young trappers working private property traplines. The total reported weasel harvest in BC has been less than 10,000 annually since the mid-1960’s, and averaged 2800 between 1990 and 2001. As indicated by historic harvest levels (Figure 1), the potential is much higher and it is apparent that weasels have been greatly under-harvested in BC over the past few decades.

Figure 1: Weasel Harvest by Region, 1985-2000.



Weasel pelt sales have contributed an average of less than two percent of annual provincial fur revenue since 1960, and an average of only 1 percent since 1990. Weasels are harvested in all eight of the administrative regions of the province (Figure 2), but the highest numbers are from the northern half of the province (Omineca-Peace, Cariboo, and Skeena regions).

Human conflict situations with weasels are not common in BC, but predation on poultry and other small livestock occasionally occurs. Trappers can help reduce some of those problems either by general control of populations during trapping operations, or by assisting in the response to specific complaints.

# **BIOLOGY**

## **DISTRIBUTION AND HABITAT**

Ermines and least weasels occur widely across northern North America and Eurasia, and both have been introduced to New Zealand. The long-tailed weasel is a strictly “new world” species, with a broad range from southern Canada to west-central South America. In British Columbia, ermines are the most widespread species, occurring throughout the mainland and on Vancouver Island, the Queen Charlottes, and other coastal islands. Least weasels are found mainly, if not entirely, in the northern half of the province, and long-tailed weasels are primarily in the southern half, but both species are found exclusively on the mainland.

Weasels are generally adaptable, utilizing a variety of habitats at all elevations including coniferous and deciduous forests, riparian shrublands, natural meadows, and man-made openings such as forest cutblocks and agricultural clearings. The least weasel appears to be the most specialized, favouring sparsely treed habitats such as the Cariboo parklands, open pastures, and even alpine tundra.

Within their home ranges, weasels hunt by relentlessly poking and prodding into every nook and cranny that might harbour prey and, with their long thin shape, they are adapted to following small rodents into the tightest of spaces, including their home burrows. Ermines and long-tailed weasels also climb well, and commonly hunt and pursue prey in trees. All three species regularly hunt along water courses, exploiting the richness of riparian and wetland habitats, but unlike their cousin the mink, none regularly enter or hunt in water.

All three weasel species commonly den in the burrows of rodent prey, often using the fur of the original occupants for bedding. However, they are by no means restricted in that regard and may also den in a variety of natural cavities, such as in hollow trees, stumps, and logs, and rock or debris piles, and man-made structures, such as haystacks, farm machinery, and outbuildings.

## **FOOD**

Weasels are strictly carnivorous, eating no plant food of any kind. The primary prey for all three species are small rodents, especially voles and mice, but they are highly opportunistic and regularly consume a variety of other animals and carrion. The main differences in diet between the species reflect their differences in size: least weasels subsist primarily on small rodents and small birds; ermines take those plus other animals up to the size of small hares and grouse; long-tailed weasels take the largest range of prey, ranging from small mammals to adult ground squirrels, hares, grouse, and occasionally eating both of the other weasel species. Within each species, the larger males are able to exploit a greater diversity of foods than are females.

Weasels have high metabolic rates and require the food equivalent of up to 40 percent of their body weight daily (up to 70 percent for lactating females). They are also very efficient hunters, often killing beyond their immediate needs and caching surplus items. While clearly beneficial in winter, this instinct to cache food often results in spoilage and waste in summer. More importantly, by returning again and again to specific locations where prey may be concentrated, weasels can have a large impact on prey populations in a relatively short time.

## **SOCIAL BEHAVIOUR**

Adult weasels of all three species are solitary except for short periods during the mating season, and when females are accompanied by dependent young. As with other small mustelids, the stable and productive component of a weasel population consists of established residents, which are mostly adults with distinct and relatively secure home ranges. The population also includes weasels, sometimes in large numbers, that do not have established home ranges. These “transients” are most often juveniles that have dispersed from their birthplaces, but also include some adults that have been displaced from previously secure home ranges. Such displacement occasionally occurs because a weasel is unable to defend its range against a stronger intruder, but is most often a case of forced departure because the local food supply has failed or some other important features of the home range have been lost.

Residents remain solitary and separate as a result of a “territorial” social system in which there is little overlap between the home ranges of neighbouring animals of the same sex, and in which transient animals are prevented from settling. Territorial boundaries are marked with feces, urine and musks from scent glands, and are sometimes defended with aggressive behaviour. Home range sizes vary by species, sex, season, and probably between years, but are generally up to about 15 ha for least weasels, 40 ha for ermines, and 160 ha for long-tailed weasels, with those for males generally being at least twice as large as female home ranges.

### **ACTIVITY AND MOVEMENTS**

Weasels are active throughout the year, but in inland areas where snow accumulates they often travel and hunt in tunnels and open spaces under the snow, and may leave little sign of their presence through much of the winter. In most areas and seasons, the bulk of weasel activity is undertaken between dusk and dawn, and particularly after dark. That generally corresponds with the timing of activity for the rodents that constitute their primary prey. However, individuals that have not met their caloric requirements may also travel and forage during daylight hours.

The extent of daily movements by resident weasels depends upon the abundance and distribution of prey within their home ranges, but is often less than 500 m from the home den for all three species. Within that space, the actual distance covered may be much larger; one ermine trail in the snow covered 8 km. The largest movements on an annual basis are made by males during the mating season, when they will travel well outside of their territories for that purpose, and by transient animals of both sexes. Most transients are dispersing juveniles, for which movements up to 35 km (ermine) have been recorded.



Long-tailed weasel, summer.

### **REPRODUCTION**

Weasels generally have high reproductive rates, designed to provide for quick population increase in response to high or increasing prey abundance. Least weasels are almost mouse-like in that regard, able to produce up to three litters of five to six young each year, and with juvenile females maturing and able to produce their first litters before they are six months old. Ermines and long-tailed weasels both breed in the spring or summer, but the embryos are then carried in a state of arrested development for up to 10 months (delayed implantation) and the young are not born until the following spring. Thus, females of those two species produce just one litter per year. Litter sizes of up to 13 for ermines and 9 for long-tailed weasels have been recorded, but the average for both species is about 6. The reproductive potential for both species is increased by the early maturation of juvenile females. Female ermines reach maturity in a matter of weeks and may mate before leaving the natal den. Female long-tailed weasels mature at age three to four months. In both cases, first litters are produced at about the female’s first birthday.

Reproductive success is directly tied to nutrition. When food is scarce, either due to cyclic changes in prey populations or to local over-exploitation of prey by the weasels themselves, few young are produced, fewer still survive, and juveniles cannot support pregnancies.

## **CARE AND DEVELOPMENT OF THE YOUNG**

At birth, weasels are blind, sparsely furred, and helpless. The three species are closest in size at that time, with newborns weighing about 1, 2, and 3 g for least weasels, ermines, and long-tailed weasels, respectively. As with most mustelids, young weasels grow and develop quickly, with the mother providing all parental care. They are weaned at about five to six weeks, are near full size by 12 to 16 weeks, and are independent and dispersing by late fall of their first year. Females of all three species usually reach full size and attain sexual maturity before they are 6 months old, but males develop more slowly and may continue to grow throughout the first year, not becoming sexually mature until about 10 months for ermines and 15 months for long-tailed weasels.

## **MORTALITY, PARASITES AND DISEASE**

The high reproductive rate of weasels is necessary because they also have high death rates. Four-year-old least weasels and ermines have been documented, but few attain that age in the wild and the average life expectancy after independence for both species is less than two years. There is no comparable information for long-tailed weasels, but they may be somewhat longer lived.

Prey abundance is likely the most important factor for local populations, potentially affecting both the productivity and survival of individuals. With their high metabolic rates and typically small fat reserves, weasels are particularly subject to nutritional difficulties. Declining physical condition increases susceptibility to parasites and disease. It also increases vulnerability to predation because of both weakened condition and the extra exposure resulting from the need to increase time and area coverage while hunting. Finally, the combination of increased energy expenditure in looking for food, with the decreased intake when little is found, often results in death by starvation. These problems may affect most members of a population in some years, particularly as winter progresses, but are most common for those that do not have secure home ranges, particularly dispersing juveniles.

No chronic, population-limiting disease conditions have been identified in weasels, but all three species are subject to infection by a parasitic worm that locates in the sinuses and sometimes causes severe damage to the skull. High rates of sinus worm infection in some areas have led biologists to suspect population effects, but that has not yet been fully demonstrated. Weasels are also infested by a number of other parasites, both internal and external, which probably increase energy requirements and indirectly affect the condition of some individuals, particularly when prey is scarce.

Weasels are preyed upon by hawks, owls, and most other carnivores, including predation by larger weasel species on smaller ones. The extent of predation is not known but, as suggested above, it is probably directed primarily to individuals that are weakened or otherwise insecure for food-related reasons. Direct human-caused mortality of weasels is primarily by trapping, although road kills and occasional removals in human-wildlife conflict situations also occur.

## **POPULATIONS**

With their high reproductive potential, weasels can attain high population densities when food is abundant. There have been no population studies in British Columbia, but least weasels are theoretically capable of a 25 to 30-fold increase in one year, and local densities of up to one animal per hectare have been documented in other areas. Ermines and long-tailed weasels are not as prolific, although densities of 7 to 10 weasels per km<sup>2</sup> are known for those two species.

## **HARVEST MANAGEMENT**

### ***SPECIAL NOTES***

**LEAST WEASELS** Because least weasels are not targeted and are rarely caught during trapping operations, they will not be discussed further. The distribution and biology of the species is poorly known in British Columbia, and trappers can assist in improving knowledge by reporting sightings and captures to the Ministry of Water, Land and Air Protection, the BC Trappers Association, or the lead author for these guidelines. Reports should indicate the date and location for sightings, and those data plus the sex for captured animals.

**ERMINE ON VANCOUVER ISLAND AND THE QUEEN CHARLOTTE ISLANDS** Ermines are the only weasels on these islands and, because they appear to occur only in low numbers in those areas, are considered “at risk” (on the provincial Red List) and are closed to harvesting. Compulsory Inspection applies, and trappers accidentally catching ermines on the islands are obligated to deliver the intact carcasses (unskinned) to an officer of the Ministry of Water, Land and Air Protection within 15 days of the end of the trapping season, and to provide the following information: 1) trapper name, address, and assigned trapper number; 2) location and date of kill; 3) type of trap and set used; 4) number of days the trap was set before the animal was killed.

**LONG-TAILED WEASELS IN THE LOWER MAINLAND** Long-tailed weasels are presently rare (possibly absent) in Management Units 2-3, 2-4, 2-6, 2-18 and 2-19, and are closed to harvesting and subject to Compulsory Inspection. Trappers accidentally catching long-tailed weasels in those units are obligated to deliver the intact carcasses (unskinned) to an officer of the Ministry of Water, Land and Air Protection within 15 days of the end of the trapping season, and to provide the same information listed for island ermines, above.

Note: Trappers are advised to check regulations annually for possible changes in the status of the above closures and attendant Compulsory Inspection requirements.

### **GENERAL CONSIDERATIONS AND OBJECTIVES**

The management information provided below is most applicable to the ermine, the species comprising the bulk of the harvest in mainland British Columbia. However, the population biology of the long-tailed weasel is similar enough to the ermine’s that, at the current level of knowledge, there is no clear reason to treat it differently. Accordingly, the general term “weasels” is used below, and refers to both species.

Weasels are able to sustain harvests of up to 80 percent of the fall population, and their ability to persist in a large variety of habitats ensures widespread dispersal in most areas. Thus, they are not particularly susceptible to over-harvesting, especially in northern areas, where the animals may spend much of the winter under the snow. In most cases, using trap spacing suitable for larger mustelids, particularly marten, will help ensure that weasels occupying the smaller territories between them will persist. For smaller traplines, including those restricted to private property, the overall harvest management plan should address two strategic objectives:

**1) SUBSTITUTING HARVEST FOR NATURAL MORTALITY WHEREVER POSSIBLE** Since transient animals, mostly dispersing juveniles, are the least likely to survive the winter, they are the component of the population that should be primarily targeted in relation to this objective.

**2) CONTROLLING ANIMAL NUMBERS TO REDUCE PRESSURE ON PREY POPULATIONS** The likelihood of impacting prey populations to levels below which they can sustain local weasel productivity increases with the number of animals (both weasels and other predators) that are preying on them. Low numbers of weasels can recover to pre-trapping numbers annually if they have a sufficient food supply.

Addressing the two management objectives listed above while trapping is assisted by natural vulnerability patterns within the weasel population. Specifically, the most expendable (transient) members of the population are generally less secure and more likely to be traveling extensively in search of food than are established residents, and are therefore the ones that are most likely to find and enter baited traps (Objective 1). Further, they are the most likely to compete with established residents for the local food supply (Objective 2).

### **PLANNING AND INFORMATION CONSIDERATIONS**

**TIMING** Regardless of which of the trapping strategies described below is followed, a decision common to all relates to the timing of operations. Although the legal trapping season for weasels begins on 1 November and ends in mid- to late February in most of BC, it will rarely be advisable to trap them over that entire period. Pelt primeness is not a significant issue, as weasel pelts are generally prime and white throughout that time. The primary consideration at the beginning of the season is that the main

targets, dispersing juveniles, may be dying or moving from the area and will be missed if one waits too long to start trapping them. The decision to end the year's trapping of weasels should consider that resident adults become more vulnerable and more of those will be caught as the winter progresses.

**HARVEST MONITORING** Regardless of the harvesting plan or system, it is advisable to examine the trapped animals on a regular basis. The annual abundance, productivity, and condition of weasels are good indicators of the status of local small mammal populations and, as such, may also be useful in helping to assess the trapping potential for other rodent-eating species such as the marten. Age determination of trapped weasels is inexact, but a rough idea of population production (proportion of young) can be obtained in reference to the following features:

#### **MALES**

**SIZE** Adults are larger and more robust than juveniles, with thicker necks and relatively broad heads. In the northern half of the province, male ermines weighing under 140 g are mostly juveniles and those weighing more are mostly adults. Southern ermines are somewhat smaller, with a comparable cut-off weight at about 120 g, and the cut-off for long-tailed weasels is about 200 g. However, the weights of juveniles in good condition will overlap those of adults in poor condition, so other features must also be considered.

**DEGREE OF TOOTH WEAR** The upper canine teeth of juveniles are usually bright and sharply pointed, while those of adults may be somewhat discoloured and distinctly duller (the point worn flat). Age is indicated but not confirmed by this feature.

**SIZE OF BACULUM (PENIS BONE)** The bacula of juveniles are considerably smaller than those of adults, particularly in the early part of the season, but the difference is not always clear and it takes some experience to make the assessment.

#### **FEMALES**

**SIZE** Winter-caught adults and juveniles do not differ significantly in size, and cannot be distinguished by weights or measurements.

**DEGREE OF TOOTH WEAR** Same considerations and reliability as for males, above.

**PRESENCE OF MAMMAE (NIPPLES)** The nipples on winter-caught females are not conspicuous, and some effort is required to locate them. The procedure is to lay the thawed animal on its back and blow into the fur along the lower belly, lightly rubbing a finger in that area at the same time. In general, nothing will be seen or felt on juvenile specimens, while one or more nipples of at least 1 mm length will usually be present on adults.

Condition is more easily monitored than age, and may be more important. It is generally indicated by the amount of body fat, which can be rated in reference to a four-point scale (0 = no fat, 1 = little fat, 2 = moderate fat, 3 = much fat). The primary fat deposits are in the groin area and under the front legs ("armpits"), and scale points 0 to 2 will generally relate only to those. Animals rated as having much fat (#3 on the scale) usually have large deposits in those locations, as well as elsewhere on the body (neck, back, and along the sides).

**RECORD KEEPING** Written records of weather conditions, the performance of particular trap sets, and the date, sex, age, location, and condition of catches are useful over the long term to help a trapper know the area better and to make trapping activities more efficient and effective. Written records are also potentially important when a trapper needs to demonstrate the biological importance of particular areas on the trapline in relation to logging plans or for related habitat protection purposes. Finally, trappers can help improve knowledge about the weasels of BC by specifying which of the three species their written records pertain to.

## **TRAPPING STRATEGIES AND SYSTEMS**

For average-sized and larger traplines, the risk of over-harvesting weasels is slight. For example, a 200 km<sup>2</sup> trapline could theoretically support 1400 to 2000 ermines at the highest densities recorded (7 to 10 per km<sup>2</sup>), and would likely support at least 200 (one per km<sup>2</sup>) at low density. Thus, at a 50 percent harvest level (well below the maximum sustainable level), this relatively small trapline could provide a yield of 100 animals in a low density year. Few BC trappers take that many weasels in one trapping season, even on much larger traplines and likely at higher weasel densities. In short, consistent under-harvest is a more likely scenario for most traplines in the province, a situation that is not ideal from the standpoint of maintaining populations of the small mammals that serve as prey for both weasels and other furbearers.

At the operational level, concern for sustainability of weasel harvesting is a consideration only for traplines on private property and very small registered traplines, where variations of three main harvesting systems may be employed, as follows:

**QUOTA SYSTEM** Based either on long-term experience in which a particular number of weasels has been harvested without apparent effect on the population year-after-year, or on theoretical considerations relating to amount of habitat, assumed density (actual density will rarely be known), and a harvest rate of up to 80 percent, this system identifies a harvest goal (total numbers) and trapping is stopped when that goal is reached. The problem with this system is that it is not sensitive to actual productivity in a particular year, especially if the sex and age of animals caught are not monitored. In years of poor production, even a conservative quota may be too high, and in years of average to good production it will almost certainly be too low. An under-harvest both shortchanges the trapper and may reduce an area's long-term productivity by failing to keep the species and its prey in optimal balance.

**TIME-BASED SYSTEM** Based almost entirely on long-term experience in a particular area, this system develops a schedule in which traps are left set only for a pre-determined period or specified number of trap checks. Although similar to the quota system in most respects, including the potential problems, it is less likely to generate a significant under-harvest in years of high production, as demonstrated by the results of Harvest Monitoring. That is, it provides an opportunity to shorten or extend the originally designated schedule based on the nature of the catch.

**AREA-BASED SYSTEM** Also referred to as a "refuge" system, the basis for this approach is that a portion of the available weasel habitat is left untrapped, with the expectation that it will serve as a continuing source for weasels that will be captured in other parts of the trapline. An alternate year approach in which half of the available weasel habitat is trapped in every other year may be the most preferred, since prey populations in "permanent" refuge areas may become depleted over the long term, especially when the number of transient weasels is high. In addition to reduced reproductive success when prey numbers are low, there is high natural mortality in weasel populations, and a trapper cannot stockpile weasels over several years in hopes that they will build up to provide a large catch sometime in the future.

## **HABITAT MANAGEMENT**

Because weasels are adaptable and may thrive in a variety of habitats, they are not as subject as some other species to negative effects from landscape changes due to forestry and agriculture. The most important consideration is probably maintenance of overhead cover in the form of coarse woody debris and/or multiple vegetation layers. In arguing for such practices, trappers are advised to remind managers that maintaining weasels is in their best interests. A healthy, mobile weasel population is a potentially effective defence against damage to trees and food crops by small rodents.

## SUMMARY

There are three weasels species in British Columbia. The smallest, the least weasel, which is not targeted by trappers and is rarely taken incidentally, is of little direct concern in relation to the objectives of this document. Both of the other species, ermine and long-tailed weasel, are regularly trapped, but the former is the most widespread and comprises the bulk of the harvest in this province. Ermines on Vancouver Island and the Queen Charlotte Islands and long-tailed weasels in the Lower Mainland are considered to be at risk, and there is no open season in those areas. Weasels have a high reproductive potential, with females capable of producing young in their first year, and with litter sizes averaging up to six kits, and populations can sustain harvest rates of up to 80 percent. However, primarily because of relatively low pelt prices, the species has been greatly under-harvested in British Columbia in recent years. Weasels are efficient hunters and are able to deplete prey populations. For that reason, and because they appear to suffer high rates of natural mortality, they cannot be stockpiled and the best management will involve systematic and regular trapping. Strategies for sustainable harvesting involve substituting harvest for natural mortality wherever possible, and controlling animal numbers to reduce pressure on prey populations.

**BY: David F. Hatler, Garth Mowat and Alison M.M.Beal  
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wildeor@junction.net

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**NOTE: This document has been formatted for insertion into the British Columbia Trappers Association Trapper Education Training Manual and for inclusion in print documents intended for government managers and industry representatives who are involved in furbearer management in British Columbia.**