

# FURBEARER MANAGEMENT GUIDELINES

## GRAY WOLF *Canis lupus*



Since 1926, separate trapline areas in British Columbia have been assigned and registered to individuals licenced for the purpose of harvesting 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 gray wolf is a Class 3 species, which means that its home range is large relative to the size of most traplines and, because movement between and among adjacent traplines can be expected, population management can not be applied only at the individual trapline level. However, the two Class 3 species (wolf and coyote) are not considered sensitive to harvest, and the management focus is often to encourage harvest, particularly in areas where conflicts with human interests occur.

The primary purpose of this document is to provide British Columbia's professional trappers, government managers and industry with information on wolf biology, and on principles to consider in practical and effective 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



The gray wolf is the largest wild member of the canid (dog) family, and the largest known specimens have come from northwestern North America. Its general appearance is similar to that of a German shepherd dog, but with longer fur, a bushier tail, and proportionately longer legs and larger feet. Fur colour varies considerably, from nearly pure white to the more typical brindled mix of light grey or tan with brown, black or white, to uniformly dark individuals ranging from sooty grey to coal black. Paler individuals usually have lighter coloured legs and undersides. Weights vary widely, but in British Columbia most are in the range of 35 to 50 kg for adult males and 30 to 40 kg for adult females. In comparison to the much smaller coyote, the wolf has a considerably heavier build, shorter and more rounded ears, and a wider muzzle and nosepad.

Wolves are pursuit predators with high endurance, able to run for many kilometers while chasing or following prey. There are records of them covering up to 65 km in a day in mountainous terrain, and they can attain speeds of 55 to 70 km per hour in short bursts. They are highly intelligent, and have particularly keen senses of vision, smell, and hearing, thus are well equipped to locate food sources and to avoid dangers to themselves.

## ECONOMIC CONSIDERATIONS

Public perception of the wolf has been mainly negative over much of human history, owing originally to mythological and other accounts of predatory attacks on humans. There are only a few reliable records of wild, non-rabid wolves exhibiting aggression towards a human in North America, including a recent incident on Vancouver Island in which a camper was bitten by a wolf that had been fed by and habituated to humans in that area.

On this continent, the primary conflict between humans and wolves has revolved around predation on livestock and wild ungulates. Most livestock predation is on cattle, particularly calves and horses, and sheep are also taken. Wolf predation on wild ungulates such as moose, elk, caribou, deer, and mountain sheep has been the subject of many studies and much public controversy in British Columbia over the years, and it is beyond the scope of this account to deal with those aspects fully. The wolf is an efficient and effective predator, known to significantly influence prey numbers in certain situations, thereby competing with humans and complicating management and conservation goals.

Historical attempts to control wolves on a large scale in BC included bounty programs (terminated in the mid-1950s), and extensive, government-sanctioned poisoning by aerial drops of large baits (discontinued in the early 1960s). Most official wolf control programs since then have been relatively local in nature, focusing on specific problem individuals or packs in livestock areas, for ungulate enhancement in particular regions and in programs to protect or recover species at risk. All have been controversial, particularly those done in the context of wild ungulate management and using aerial shooting, and managers are currently experimenting with alternate methods such as capture and sterilization of dominant animals to reduce wolf numbers. That approach has been used with some success in the Yukon and Alaska.

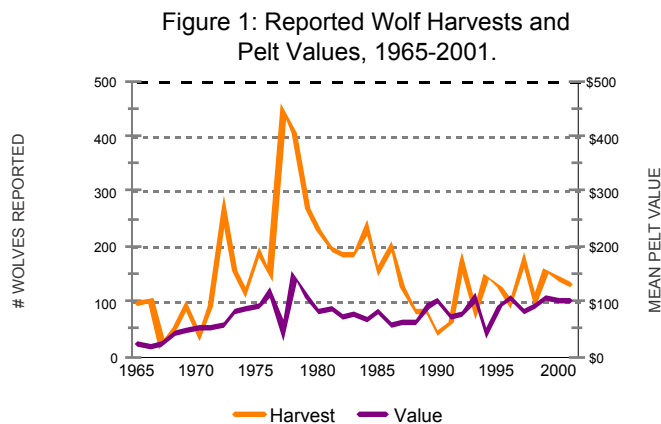
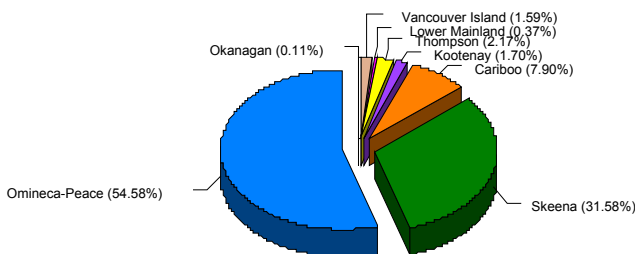


Figure 2: Wolf Harvest by Region, 1985-2000



Wolf pelts are very heavy and “woolly.” Although sometimes used in the fur trade for trim on parkas or full length coats, the primary market in recent decades has been for taxidermy. The recorded BC harvest of wolves for sale through the fur trade (including taxidermy) was highest from the mid-1930s through the mid-1940s, averaging 821 animals annually and peaking at 1349 in 1939. Since 1965, the fur harvest of wolves has not exceeded 500 animals in one year, and the annual take has been consistently below 200 since the mid-1980s (Figure 1). Current data gathering systems do not provide reliable information on the number of wolves taken by trappers but not marketed because of poor quality or the number of wolves taken by resident hunters. The annual harvest by guided non-residents has averaged about 60 since 1990, with a high of 99 in 2000. Wolves are also taken each year by animal control officers for protection of livestock.

Wolf pelts have contributed less than 1.5 percent of BC’s total fur revenue in all years since 1980. Average pelt prices have mostly been in the range of \$60 to \$100 during that period (Figure 1), with an overall average of \$82 (1980-2001). However, the general trend (on an inflation-adjusted basis) has been downward, and pelt price values alone have not been sufficient to create demand, considering the difficulties of catching and processing wolves and the high frequency of individuals with poor pelts. Recent

incentive programs, sponsored by the Guide Outfitters Association of BC and the BC Wildlife Federation, and administered by the BC Trappers Association, have begun to turn that around and interest in wolf trapping is again increasing. As shown in Figure 2, about 80 percent of the wolf harvest in BC during the past 15 years has been in the northern half of the province, in Regions 6 (Skeena) and 7 (Omineca-Peace).

## **BIOLOGY**

### **DISTRIBUTION AND HABITAT**

Highly adaptable predators, wolves historically occurred in virtually every kind of terrestrial habitat available in the northern hemisphere, from coastal rain forest to open prairie to the high arctic. At a finer scale, habitat use is affected by snow depth and prey distribution. Wolves are heavy and although they have large feet, they readily sink in deep or powdery snow. During winter in areas with significant snowfall, wolves frequent the areas where ungulates concentrate, travelling and hunting along frozen lakes and rivers, but also using forests with closed canopies and open slopes that shed snow because of exposure to sun and wind. In deep snow areas, wolves leave distinct, narrow trails created both by packs travelling in single file and by individuals and packs re-using the same routes repeatedly. They readily travel on backroads and trails left by human developments and recreational activity, but generally avoid heavily-used roads and human settlements.

The wolf currently ranges throughout most of British Columbia, with the most continuous distribution and highest densities in the central and northern portions of the province. After many years of absence or very low density, wolves began to appear again on Vancouver Island during the 1970s and are now common to abundant over most of the island. They also regularly occur on many islands along the mainland coast, but have never been present on the Queen Charlottes. Wolves reoccupied most of the southern Rockies and East Kootenays during the 1980s and 1990s, and appear to be slowly spreading through the West Kootenays, but occurrence in the highly developed Okanagan and Lower Mainland regions is sparse.

### **FOOD**

The wolf is the dominant carnivore where it occurs, eating the full range of available local prey. During the snow-free season, wolves often travel alone and hunt a variety of smaller species ranging in size from voles and ground squirrels to young ungulates. In winter, the primary prey of wolves hunting cooperatively in packs are local large ungulates, often moose or caribou in the north and elk or deer in the south, but some packs specialize on other species, such as mountain sheep and mountain goats. Coastal wolves may make heavy use of salmon in spawning areas.

Wolf predation may be the primary natural mortality factor for other furbearers in a local area, particularly beavers during the open-water season. Carnivore species, including river otter, lynx, marten, mink, wolverine, coyote, and black bear are also among the wolf's known prey. Wolves also compete with other carnivores in their use of local food resources such as voles, squirrels, and hares, but may counter-balance that somewhat in providing scavenging opportunities for large ungulate carrion.

The impact of wolves on a local prey population varies with a number of factors, including the numbers of wolves involved and the number and relative vulnerability of prey species. For example, during years of very high snowshoe hare abundance, the level of predation on ungulates may decrease. Vulnerability often varies with habitat; for example, a local mountain goat population on steep terrain will likely be less vulnerable than the moose in the adjacent valley bottom. Climate factors are also important, with wolves usually surviving well and maximizing reproductive output as a result of a very severe winter that weakens or kills ungulate prey, and therefore being in a position to exert more pressure the following year. That is particularly the case since the winter effects may also include reduced reproductive output of the prey.

Currently in BC, wolf predation is thought to be a main factor limiting the size of certain populations of ungulates, including deer on Vancouver Island, some populations of moose in the north, and caribou in several areas. Predation by wolves is also a subject of major concern in relation to recovery of the endangered Vancouver Island marmot.

## **SOCIAL BEHAVIOUR**

The core members of wolf populations occur in resident social groupings known as packs. The packs are usually family-based, consisting of a pair of adults and their offspring of various ages, but the size of some packs in northern BC (30 or more animals) suggests that there are variations on that theme. Packs maintain a rigidly enforced social structure based on dominance. When food is in short supply, either generally or in relation to prey size of a particular kill, lower ranking members do not get fed and



may eventually have to leave the pack and forage for themselves separately. The rest of a wolf population is made up of such displaced animals, mostly younger ones that may be found as singles, pairs, or in splinter packs of 3 to 5 or more animals. Those animals may remain transient, wandering over large areas, or may settle temporarily or permanently in areas that are either not occupied or are rarely visited by resident packs.

Resident wolf packs are territorial, conducting all of their activities in well-defined home range areas and aggressively defending those areas (territories) against other wolves. Territorial defence also includes scent-marking with urine, feces, and gland secretions, particularly in the boundary areas between adjacent pack territories. Territory size varies widely, but may be 10,000 km<sup>2</sup> or more. The largest territories are those in which prey is either scarce or widely dispersed.

Wolves also have an elaborate system of vocal communication. Howling announces the presence and location of a territorial pack, and is also used to assemble pack members. Transient or lone wolves rarely howl, probably because they are trying to avoid detection by resident packs.

## **ACTIVITY AND MOVEMENTS**

As suggested by the size of pack territories, wolves are generally very mobile and daily movements of 20 to 30 km are routine. On the other hand, wolves may spend several days near a large mammal kill site, moving very little during that time. The largest documented wolf movements, up to 1000 km, are made by transient animals during dispersal.

## **REPRODUCTION**

Wolves breed in late winter, usually February or March, and the pups are born in April or May after a 63-day gestation period. The sites used for whelping are typically underground dens dug by the wolves, although use of hollow logs, rock crevasses, or even abandoned beaver lodges is also known. Litter sizes are usually in the range of four to seven pups, but litters as large as 11 have been documented. Females are sexually mature at two years of age, but usually do not begin breeding until age three. In stable resident packs, the dominant female is the primary breeder, such that one litter per pack is the rule. However, cases in which more than one litter was raised are known, and transients also occasionally breed and produce pups.

## **CARE AND DEVELOPMENT OF YOUNG**

Wolf pups are blind and helpless at birth, weighing about 500 g. Their eyes open at about two weeks, they are beginning to explore areas outside the den at three weeks, and are taking solid food by about five weeks. Pups born in resident packs are cared for by both parents and other pack members, thus giving them a better chance of surviving than those born to transients. During early summer, when the pups are young, wolf packs tend to be less cohesive. The parents usually stay near the den, and often feed more extensively on small prey during that period, while other (non-breeding) members of the pack may travel and hunt more widely in their territory. Nevertheless, some of the non-breeders contribute to pup survival by bringing food to them when visiting the den.

The pups do not venture far from the den during the first two to three months of their lives, but by late summer they begin moving to a series of alternate locations that biologists refer to as “rendezvous sites” which they occupy while the adults are hunting. By late fall the pups are near full size and travel with the pack from then through the winter. Most young wolves disperse in the spring, as yearlings, but some may be forced to leave earlier if food is scarce. Most dispersing subadults are not yet effective predators of large mammals and, relying primarily on small prey and scavenging opportunities, do not have as high a survival rate as resident pack members.

### **MORTALITY, PARASITES AND DISEASE**

Wolves are relatively short lived for animals of their size, with few living beyond 10 years in the wild. Their lifestyle exposes them to many potential threats, particularly those associated with attacks on large, powerful prey, such as moose. Some wolves die in those encounters, and injuries such as broken ribs and legs and minor skull fractures are common. An advantage of being a pack member is that such injuries are less likely to be fatal than would be the case for a lone animal, because pack members are still able to obtain food. Wolves are also subject to accidents, dying in snow slides in mountainous regions and drowning after falling through the ice on the frozen lakes and rivers used for travel in winter, and some are killed by other wolves in aggressive encounters relating to territorial defence. Other large carnivores, particularly bears, sometimes find and kill pups in dens, and occasionally kill adult wolves that are attempting to defend pups or a kill.

Human-caused mortality, primarily through trapping, hunting, and predator control activities, may be significant in some areas, and some wolves die each year in collisions with vehicles or trains.

The diseases of wolves that are recognized and reported are usually those that either cause obvious symptoms to individuals, or result in noticeable numbers of ill or dying animals. Among the former in BC is sarcoptic mange, a mite infestation that causes hair loss and can result in animals in poor condition, but is rarely fatal in wolves. Mange and infectious diseases such as canine distemper and canine parvovirus are usually associated with high population levels, probably because they are most readily spread from animal to animal under those conditions. Rabies has been reported in wolves from many areas, but as yet there have been no cases identified in British Columbia.

Wolves are host to a number of parasites, both internal and external, but none are known to be of any consequence to wolf populations. One tapeworm commonly found in wolves is of interest as a potential health concern for humans (see Special Note, page 8).

### **POPULATIONS**

Wolf numbers vary widely across their range, and local fluctuations over time can be large as wolf numbers usually follow those of their primary prey. Documented densities in British Columbia have ranged from three wolves per 100 km<sup>2</sup> to more than 20 per 1000 km<sup>2</sup> in the northern Interior and 10 to 40 wolves per 1000 km<sup>2</sup> on Vancouver Island. The total BC wolf population was estimated to be about 8000 animals in the early 1990s, and was believed to be increasing.

Because females can breed as two-year-olds and can have large litters, and because pup survival can be high due to care by the pack, wolves have a much greater reproductive potential than other large predators. Population growth rates can exceed 30 percent per year, particularly for recovering populations or in newly occupied territories, where food resources may be plentiful and competition minimal. Following their reoccupation of mountainous habitats in southeastern BC, wolf numbers increased at about 20 percent per year in that area during the 1980s and 1990s.

## **HARVEST MANAGEMENT**

### **GENERAL CONSIDERATIONS AND OBJECTIVES**

The wolf is currently designated as both a game animal (since 1966) and a furbearer (since 1976), and can therefore be legally harvested by both licenced hunters and trappers, subject to restrictions by seasons, bag limits, and methods. It is also identified as a Class 3 furbearer under BC’s Fur Management Program, which means that it is not considered sensitive to harvest but is nevertheless to be managed on a regional rather than individual trapline basis.

In 2002-03, the open season for hunters over most of the province was at least seven months long, from early September through 31 March, and was 10 to 11 months (to mid-June) in most of Regions 1 (Vancouver Island), 4 (Kootenay), 6 (Skeena), and 7 (Omineca-Peace). There was no open season in eight management units of Region 2 (Lower Mainland), the Wells Gray Park portion of Region 3 (Thompson), or anywhere in Region 8 (Okanagan), and no closed season in the Rocky Mountain Trench area of Region 4. Bag limits were two per year in Region 4 and three per year in the rest of the province. The trapping season for wolves was eight months long in Region 1 (1 November to 30 June), 4.5 months long in Regions 2 and 3 (15 October to 28 February), and was 5.5 months long (15 October to 31 March) in the rest of the province except for the Trench area of Region 4 (no closed season) and all of Region 8 (no open season). There were no trapper bag limits or quotas. Compulsory reporting was required for wolves taken by both hunters and trappers in Region 1, and by trappers only in Region 4.

Those liberal regulations reflect the low level of conservation concern for the species, consistent with its Class 3 status. With their high potential for increase and high dispersal capability, wolves are able to sustain harvest rates of 30 percent or more, and the likelihood of achieving such levels is low because of the species' intelligence and adeptness at avoiding hunters and traps. Thus, the most important management consideration for wolves will usually be in trying to keep numbers low enough so that conflict situations with humans are minimized, the risk of widespread disease outbreaks is reduced, and the pressure on local prey populations (including species at risk and other furbearers) is not excessive. When pelt prices are high, or in areas where wolves may be the primary fur resource present, the maintenance of a healthy, productive wolf population may also be a consideration. Those issues are best addressed by two strategic objectives in harvest management planning:

**1) SUBSTITUTING HARVEST FOR NATURAL MORTALITY WHEREVER POSSIBLE**

Dispersing juveniles are the least likely component of the population to survive, and are therefore the primary targets in relation to this objective.

**2) CONTROLLING ANIMAL NUMBERS TO MINIMIZE NEGATIVE ECOLOGICAL AND ECONOMIC EFFECTS**

The removal of transient animals (mostly juveniles) and some resident adults (from packs) may help maintain a prey base that can provide for better survival of the remaining animals over the short term, less chance of the remaining animals being in poor condition and subject to disease, less competition with and predation on other local species that may be particularly important, and reduced human conflict situations.

Addressing those two management objectives while trapping is assisted by natural vulnerability patterns within the wolf population. Juveniles and other transients, the most expendable members of the population, are generally less secure and more likely to be travelling extensively in search of food than are pack members in established territories, and are therefore the ones that are most likely to encounter traps (Objective 1). They are also less likely to be cautious because of lack of experience both generally and in the subject area. Transient juveniles are also the primary source of potential competition for the local food supply, and are the most likely to contract and carry diseases (Objective 2).

Note that removal of the dominant adults in established packs may sometimes result in increased local numbers of wolves because, with the territorial system no longer in place to repel intruders and monopolize resources, the number of animals present and the number of successfully breeding females in the area may temporarily increase.

**PLANNING AND INFORMATION CONSIDERATIONS**

Provincial managers and trappers will rarely have detailed local population information for wolves, so annual harvest operations will usually be based on other considerations. With the above two strategic objectives as the general background, the following sections describe some of those considerations. Note that for any particular local situation, some of these factors may conflict with each other and decisions about which are the most important will require use of common sense.

**TIMING** Wolf pelts generally become prime by about mid-November and begin to lose value as a result of wear and breakage of guard hairs by about mid- to late January in most areas. Thus, maximizing the financial return for effort expended will likely involve concentrating most harvest activity in the indicated 8-10 week period.

**DEPREDACTIONS** Trappers are encouraged to direct wolf harvest activity to areas with chronic human conflict or species at risk protection situations where those can be identified and to assist livestock owners with control of problem wolves wherever possible.

**HARVEST MONITORING AND ASSESSMENT** Assessment of the wolf fur harvest by provincial managers is done primarily in reference to pelt sales, although there is potential for acquiring additional information through the provincial trapper questionnaire. At the individual trapline level, there are three kinds of information that individual harvesters are advised to keep track of, both for within-season assessment and planning of harvest activities and for long-term management interest:

**SEX AND AGE OF ANIMALS CAUGHT** This information is important for determining the degree to which the two strategic objectives are being met. Field determination of age can be difficult, particularly later in the winter as juveniles continue to mature, but is best done in relation to body size and robustness, and degree of tooth wear. Among males, juveniles appear more slender than adults, and are likely to have whiter and sharper canine teeth. Canine teeth that are discoloured (grey or yellowish) or are worn flat at the tips are indicative of adults. Among females, adults are best distinguished by the presence of conspicuous nipples, often ringed by bare patches caused by rubbing during suckling.

**LOCATION AND DATE OF HARVEST** This information can be useful over the long term in identifying important patterns of occurrence. For example, wolves may consistently appear in certain locations within a particular time period. Knowledge of that can make trapping operations more efficient, eliminating the waste of time and effort associated with tending empty traps when the wolves are not present and aiding full mobilization in anticipation of their arrival.

**PHYSICAL CONDITION OF THE ANIMALS CAUGHT** Determined primarily by the amount of body fat observed on the skinned carcass, this is a good indirect measure of how the population and local prey populations may be doing.

**RECORD KEEPING** Although it is possible to conduct the above monitoring and assessments on an informal, non-permanent basis, it is strongly recommended that the information be recorded on paper. That will provide more accurate information and a better record for demonstrating long-term patterns. Trappers are also encouraged to share information on changes in the perceived abundance of wolves and their prey by responding to the annual provincial Trapper Questionnaire. Those responses are an important component of the management of furbearers in British Columbia.

## **HARVESTING STRATEGIES AND SYSTEMS**

At the operational level on individual traplines, there are three main approaches that may be used to harvest wolves:

**QUOTA SYSTEM** This system identifies a harvest goal of a certain number of animals, and harvesting activities are stopped when that goal is reached. Such self-imposed quotas are usually based on long-term experience in which that particular number has been demonstrably sustainable. The problem with a quota system is that it is not sensitive to actual productivity in a particular year. For example, an under-harvest both shortchanges the trapper and may reduce an area's long term productivity by failing to help keep the species and its prey in optimal balance.

**TIME-BASED SYSTEM** Based either on long-term experience in a particular area or on practical considerations relating to time available, pelt primeness, and normal vulnerability patterns, this system develops a schedule in which traps are left set only for a pre-determined period, which is shorter than the actual open season. Although similar to the quota system in most respects, including the potential problems, it is less likely to result in a significant under-harvest in years of unusual abundance, since the originally determined schedule can be extended if that is judged desirable.

**AREA-BASED SYSTEM** Also referred to as a “refuge” system, the basis for this approach is that a portion of the available wolf habitat on the trapline is left unharvested, with the expectation that it will serve as a source for animals dispersing to areas where trapping does occur. As has been emphasized throughout this account, it is difficult to cause a decline in wolf populations and the formal designation of refuge areas will be unnecessary in most areas.

## **HABITAT MANAGEMENT**

The primary factor determining the distribution and local abundance of wolves in most of British Columbia is the distribution and abundance of prey species, particularly large ungulates. A secondary factor is the presence of humans, with large-scale settlements and developments generally excluding wolves. Within the broad range of rural and wilderness habitats actually available for occupation by wolves, management and “enhancement” will primarily involve measures to maintain and enhance prey populations. Those measures, which hunters and trappers are advised to support and advance, include maintenance of key winter ranges, maintenance of cover and food plants in logged areas, the judicious use of fire, and hunting and predator management that retains breeding stock but minimizes the risk of range depletion.



## **SPECIAL NOTE: HUMAN HEALTH CONCERN**

Trappers, hunters and other people who handle wolves should be aware of the diseases that may affect them, especially distemper and sarcoptic mange, both of which can infect domestic dogs. In addition, mange mites can cause a skin rash in humans who handle affected animals without gloves.

There is also some risk of hydatid disease, which is caused by the larval form of the canid tapeworm, *Echinococcus granulosus*. Mammals, including humans, can develop this disease by the accidental ingestion of tapeworm eggs, which are passed in canid droppings. The eggs, which are very resistant and can be viable for months, may be transported in dust or soil picked up on a wolf’s feet or fur. Once inhaled or ingested by a herbivore (or human), they develop into hollow cysts in the internal organs, especially the liver and lungs. In humans, this is a potentially serious disease and is thought to be most often acquired from infected dogs that were fed uncooked, infected tissues of game animals.

Trappers and hunters are encouraged to bring any animal that looks unhealthy to a local conservation officer or regional office, and should always take special precautions to prevent contamination of their hands and clothing with infectious materials. Most importantly, they are advised to handle these animals with gloves and/or wash their hands carefully before handling food, and to avoid inhaling dust that may be raised when brushing or shaking out a wolf’s fur.



## SUMMARY

The future of wolves in the province appears to be secure, assuming that managers and the public are able to maintain or enhance prey populations and their habitats. Wolves are efficient and effective predators and that fact, combined with their high reproductive potential, high dispersal capability, great intelligence, and adaptability to a broad range of habitats, often puts them in conflict with human interests. Those same characteristics also make them resistant to attempts to significantly reduce populations over the long term and very resilient to harvesting by trapping and hunting. Therefore, management considerations for the species are generally not directed to the issue of sustainability. Rather, the goal in most cases will be to keep numbers low enough so that conflict situations with humans are minimized, prey species at risk are protected, the risk of widespread disease outbreaks is reduced, and the pressure on local prey populations and competition with and predation on other furbearers is not excessive. Due to natural vulnerability patterns in wolf populations, most of the harvest will be composed of animals (mostly juveniles) that are the least secure and least likely to survive under natural conditions in any case, which is an automatic contributor to sustainable use.

To contribute to more informed, long-term management of wolf populations, trappers are urged to keep accurate personal records on harvest of the species and on relative abundance of prey species such as large ungulates and snowshoe hares, and to respond to government solicitations for information such as the annual trapper questionnaire.

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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.