

Coyotes in the Yukon



This booklet was written because of interest and concerns about coyotes first expressed by members of the Kluane First Nation. It was commissioned by the Aishihik-Kluane Caribou Recovery Steering Group.

The author is a wildlife biologist with over 10 years experience studying coyotes. He has worked in the Kluane area for the past 7 years, trapping and following coyotes, lynx, and snowshoe hares as a part of the Kluane Boreal

Forest Ecosystem Project.

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Introduction

There are few animals in North America that stir up more controversy than coyotes. Through much of their range in the U. S. and Canada, coyotes are considered by many to be major predators of livestock and valued game animals. Extensive control programs have been conducted to reduce their numbers.

Coyotes are fairly recent arrivals in the Yukon. Weighing about 10-12 kg (22-26 lbs), they are intermediate in size between foxes and wolves. How have coyotes fit into the northern ecosystem? What do they eat? How have they affected populations of their prey and of other predators?

The purpose of this booklet is to summarize what is known about coyotes, talk about what we don't

know, and address specific concerns of Yukoners about them. There have been few studies of coyotes in the north, so I have used information gathered elsewhere to help fill in the gaps in our knowledge of Yukon coyotes.

In preparing this booklet, I talked with local residents, trappers, hunters, and biologists, who generously shared their knowledge and concerns about coyotes. The questions that are addressed in this booklet came directly from these discussions. I hope this booklet is informative, and that it stimulates interest and thought about these fascinating intelligent predators.

Mark O'Donoghue

Kluane Lake



How long have coyotes been in the Yukon?

Coyotes apparently first arrived in the Yukon between 1910 and 1920. Two reports published in 1916 about Yukon wildlife make no mention at all of coyotes. By the early 1920s, however, several RCMP patrol reports mentioned the appearance and rapid spread of coyotes through the territory. In 1928, the Gold Commissioner in

Dawson City wrote to Ottawa, "I have the honor to draw your attention to the serious increase of Wolves and Coyotes in this Territory". By 1929, coyotes were numerous enough that a bounty was instituted to curb their alleged decimation of grouse and ptarmigan.



Pre-European Range



Mid-1980s Range

Where did they come from?

Coyotes' distribution in North America has been expanding for as long as there are records. Once confined to the central plains, they now inhabit virtually all of the continent except for the northern tundra. Coyotes in the Yukon likely originated from Albertan ancestors.

There are many ideas on why coyotes have been such successful colonizers. They are extremely intelligent and adaptable, and they

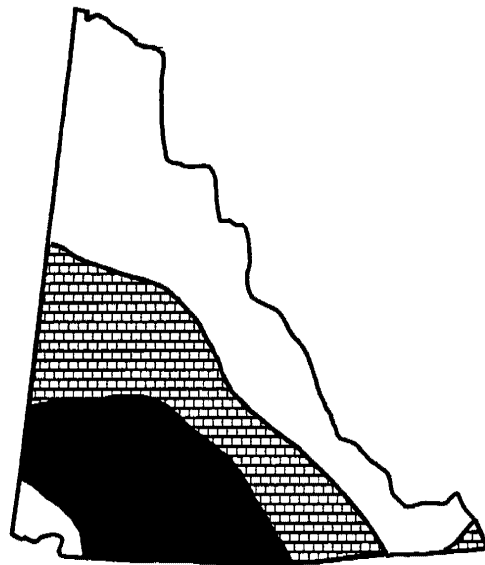
are particularly good at exploiting the new opportunities created by increasing human numbers. The trails, livestock, and refuse brought by European settlers likely aided the coyotes' spread. Likewise, the extermination of wolves in most southern areas also left an opening for expansion by coyotes. The range of the coyote is still spreading. In the late 1980s, the first coyotes were seen on the island of Newfoundland.



Where are coyotes located in the Yukon?

Coyotes are found throughout most of southern and central Yukon. The map below is based on reports by trappers of furbearer abundance on their lines. Coyotes are the most common in the southwest part of the Territory. One reason

for this concentration may be the shallower snow depths in this area, which is in the rain shadow of the coastal mountains. Deep, soft snow inhibits movement by coyotes.



Abundance of Coyotes in the Yukon

- = scarce or absent
- = regular
- = abundant

What kinds of habitats do coyotes like?

Coyotes live in a wide variety of habitats in the Yukon, from dense forests to low alpine tundra. This adaptability has been one of the keys to the success of coyotes in their spread through North America—they are equally at home in the spruce forests of the Yukon, the deserts of the southwest U.S., and the southern forests of Florida.

Coyotes take full advantage of man-made food sources, and they often frequent garbage dumps. They can even be seen in downtown Vancouver! In the Yukon, the only habitats they avoid are high, unforested mountainous terrain, and the open tundra of the north.



Do coyotes live in packs?

Coyotes live in a wide variety of social groupings across their range. There are a few things that coyotes in all areas have in common though. Mated coyotes typically defend territories, from which they keep out other pairs. Many pairs are quite stable, and they may stay together for many years, raising a litter of pups each year.

In many areas, young coyotes leave their parents' territories during their first winter. However, when

The area, or "home range", occupied by each family group ranges in size from less than 5 square kilometres (2 square miles) to over 100 square kilometres (36 square miles). Home ranges of 30-40 square kilometres are probably about typical for Yukon coyotes. This is equal in area to a circle about 7 kilometres (4 miles) across.

Besides family groups, some loners are found in most coyote

"One man at Ptarmigan Lake claimed to have shot 35 coyotes from the door of his cabin one winter." Wildlife Biologist, Tok, Alaska

food supplies are good, or when the surrounding country is densely populated by other coyotes, young coyotes sometimes remain in family groups with their parents for an additional 1-2 years. These family groups are the "packs" that are often seen. In the Yukon, groups of 3-5 coyotes are regularly sighted, and there's one record of 8 animals together. Group members that are separated from each other communicate by howling.

populations. These animals, which range over much larger areas than families, are often young animals. Also, some very large groups of coyotes -- there's one reliable sighting of 22 animals together in Wyoming -- have been seen feeding together at very concentrated food sources. These are unstable groups, made up of families, pairs, and single animals, drawn together by abundant food, often at large carcasses or dumps.



When do coyotes breed?

Breeding activity starts in late winter in the Yukon, and mating occurs in March. After a 63-day gestation period, litters of pups are born in dug-out dens during May. Coyote dens are excavated in well-drained soils, and are often found on south-facing slopes. Usually, each pair of coyotes has

several dens, and pups are moved between dens after disturbance or when the den site gets too cluttered. Litter sizes are variable through the range of coyotes, and are usually between 4 and 10 pups. Larger litters are usually born in areas and years with plentiful food.

*"Dispersing coyotes seem to move about like bumper cars, 'bouncing off' of other individuals and different places until they settle down."
Marc Bekoff, Coyote Researcher*

How long do pups stay with their parents?

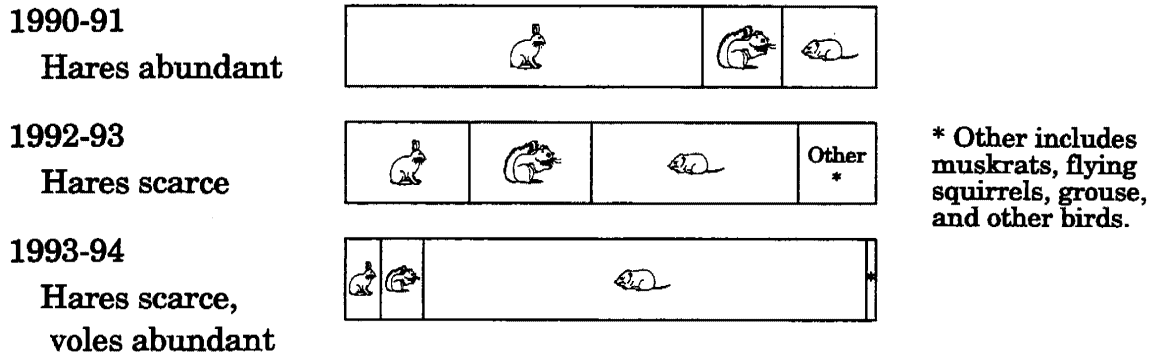
Coyote pups are born blind, and they do not emerge from their dens until they are about 3 weeks old. They nurse for their first 6-8 weeks, after which their parents start feeding them solid food. Members of family groups besides the parents rarely feed the pups, but they often stay at the den site protecting them. The pups explore progressively further from the den as they get older. They usually abandon their dens by the time

they are 10 weeks old. At 4-5 months of age, they are mostly independent of their parents.

Most coyote pups that disperse, do so from early to mid-winter. Depending on the area, anywhere from 20-80% of pups leave their parents' territories in search of a new home. Tagged pups have been trapped hundreds of kilometres from where they were born.



Diets of Coyotes near Kluane Lake during Winter



What do coyotes eat?

The versatility of coyotes in killing and eating a wide range of prey is another key to their success. The short answer to the above question would be: "Pretty much whatever is around". In the southwest U.S., coyotes eat mostly jackrabbits and small rodents, while in newly colonized regions of the northeast U.S. and Maritimes, coyotes are larger-sized, and eat mostly white-tailed deer. During the summer and fall, coyotes feed heavily on berries in some regions. They also eat birds, fish, insects, grass, and human garbage.

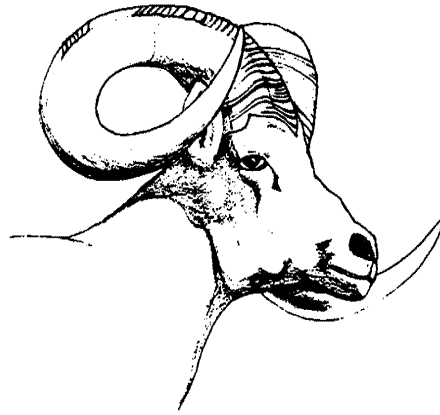
The diets of coyotes in the north are likewise variable. Coyotes on the Kenai Peninsula in Alaska mostly scavenge starved and wolf-killed moose carcasses in the winter. In the summer, they add more voles and snowshoe hares to their diet.

the tracks of coyotes have been followed for 8 winters in forested habitat to determine their food preferences. The diets of coyotes there, shown in the above figure, are strongly determined by the relative abundances of their smaller prey species, which change greatly among years.

In more open and mountainous habitats in the Yukon, coyotes also kill larger prey, such as Dall sheep. Coyotes only seem to be able to regularly prey on ewes and lambs, and most of these are killed low on mountains, where sheep cannot escape up steep slopes, often in late winter. Some Yukoners feel that certain coyotes specialize on sheep, while other "brush coyotes" restrict themselves to smaller prey. Similar strong preferences for certain prey are well-known for many wolf packs in the Yukon.

Near Kluane Lake in the Yukon,





Does predation by coyotes affect populations of Dall sheep or caribou?

There are many reliable reports of coyotes killing Dall sheep, but this doesn't answer the question of whether they kill enough to affect population sizes of sheep. One outfitter in the southwest Yukon noticed large drops in the numbers of lambs over some summers. He feels that coyote predation was the most likely cause. A study on Sheep Mountain, near Kluane Lake, showed that coyotes were the most important predator of sheep. The sheep population on the mountain has increased 30% during the past 15 years though, so this predation does not seem to be stopping growth of sheep numbers there.

In other areas of their range, coyotes are also important predators of large mammals. Studies in Texas and Oklahoma showed that coyotes were the principle predators of white-tailed deer fawns. In northeastern U.S. and the Maritimes, coyotes

regularly kill deer of all ages, especially during the winter. It is not known how much predation affects deer populations in these regions though. It is clear that coyotes can have large local effects on vulnerable prey, such as deer concentrated in "yards" in winters with deep snow. Coyotes may also affect vulnerable local groups of sheep in the Yukon.

The effect of coyote predation on caribou is even less understood. There have been several reliable reports of coyotes killing caribou calves. In one case in Alaska, predation on caribou calves was extremely high during a year of very low vole numbers. Many coyotes, which normally ate mostly voles, were also seen in the area at this time, and they were likely the main predator on the caribou calves. At this point though, the impact of coyote predation on both sheep and caribou populations is still an open question.





How do coyotes hunt?

Coyotes are usually solitary hunters, even though they sometimes travel in groups. They are most active during the evening and morning. Coyotes use all their senses when hunting--they have keen eyes, ears, and noses, and these are used to different degrees, depending on the prey, the time of day, wind, and the type of cover they are in.

When hunting hares, coyotes prefer brushier habitats, which provide them with more cover to approach their prey. Unlike lynx, that usually ambush hares, coyotes typically walk along hare trails until they encounter their prey. In successful hunts, they usually take hares by surprise, and make their kill before the hare has a chance to flee. Coyotes have fairly small feet, so they sink deeply in soft snow. This puts them at a disadvantage if they have to chase hares through snow.

Another trick used by coyotes in the north is to kill many hares in the early winter, when snow is still shallow, and to store or "cache" them for later use. They bury hares under the snow and even

into the frozen ground, often at the bases of large spruce trees or shrubs. These are so well-concealed, that to a human observer, it looks like the coyote simply turned around in its tracks. In late winter, coyotes often return and eat kills made 4 months earlier!

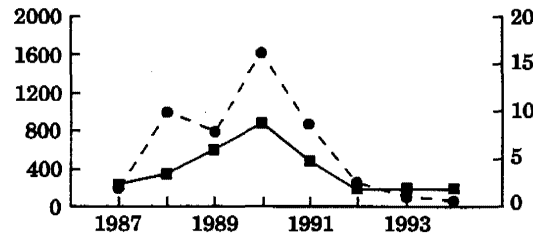
Coyotes can often be seen "mousing" along roadways or in meadows. Their main prey there are meadow and tundra voles. Coyotes listen carefully for the sound of voles under the snow or grass. When they locate their prey, they leap high in the air, and pin the vole to the ground with their front paws.

When coyotes hunt larger prey, they sometimes do so in groups. This is especially true of coyotes in eastern North America hunting deer. They are quite successful hunting Dall sheep singly though. Coyotes "test" herds of ewes and lambs by running up to them. When they do pick out a vulnerable individual, they usually kill the animal by repeated bites to its hindquarters, and finally, with a suffocating bite to the face or neck.





Number of Hares in 100 sq. km at Kluane



Number of Coyotes in 100 sq. km at Kluane



What determines the number of coyotes in an area?

As with all predators, coyote numbers are strongly influenced by the amount of prey available. Populations of snowshoe hares, their main prey in the Yukon, follow a 10-year cycle in abundance, which causes a huge change in the amount of food available to coyotes in the forest. Near Kluane Lake, hare numbers changed 30 to 40-fold between 1987 and 1994. During this time, coyote populations increased 5-fold and then decreased again, following the

cycle in hare numbers.

Studies have shown that coyote litter sizes and the percentage of females pregnant both increase when more food becomes available. At very low densities of prey, reproduction by coyotes stops altogether. These changes in the number of pups lead to fluctuating group sizes when prey abundance varies, while the number of breeding pairs often stays about the same.

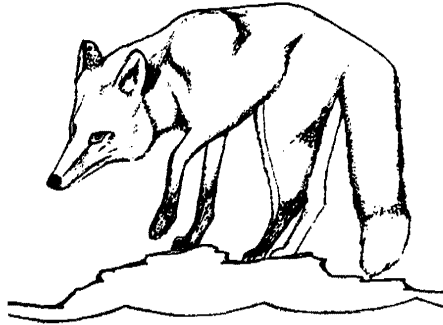
Are coyote numbers increasing in the Yukon?

There are no good records of long-term changes in coyote numbers since their arrival in the Yukon. At less than 1 coyote for every 10 square kilometres (4 square miles), even when hares are abundant, densities in the Yukon are fairly low compared to those further south. In one Texas study, there were up to 2-1/2 coyotes per 1 square kilometre. The range of coyotes in the eastern part of the territory does seem to have expanded northwards during the

last 20-30 years.

There are some local reports of increasing coyote populations as well. Residents report that coyote numbers have increased in recent years on Sheep Mountain near Kluane Lake, while wolf numbers have declined there. Since coyote numbers vary so drastically with abundance of hares, it is difficult to distinguish between long-term and year-to-year changes in density or shifts in habitats used.





How do coyotes affect numbers of other predators?

There is ample evidence that, throughout their range, red foxes avoid coyotes where they are found together. As coyotes have moved into new areas, many local residents have noticed that fox numbers have decreased. Coyotes and foxes eat many of the same foods, and there have been numerous sightings, some of them in the Yukon, of coyotes killing foxes. Foxes are often displaced to areas outside of coyote territories. In the Kluane Lake region, most foxes are found in the alpine, away from the forested habitat used by coyotes.

populations is less clear. They eat many of the same foods, but unlike foxes, lynx overlap broadly with habitats and areas used by coyotes. During the large coyote-poisoning program that took place in the U.S. earlier this century, bobcat numbers increased when coyote populations declined. Bobcat numbers then dropped again when the poisoning stopped. It is unknown whether coyotes had a similar effect on lynx in the north when they arrived. Likewise, the influence of coyotes on other predators, such as wolverines and marten, is also unknown.

The effect of coyotes on lynx

What happens to coyote numbers when wolves are removed?

This is an important question when considering the likely effects of wolf-control programs. Just as foxes avoid coyotes, there is evidence that coyotes stay away from areas with high wolf numbers. Wolves occasionally kill

coyotes, but coyotes also benefit from carrion left from wolf kills. There have been no good studies of how coyote populations react to lower wolf numbers, and the answer to this question is still not clear.

Are coyotes a danger to people?

Although coyotes are usually harmless, there have been a number of documented attacks on children. These have mostly involved coyotes habituated to people, or in urban areas. In Jasper National Park, coyotes regularly fed by tourists have bitten several children. Likewise, there have been a several cases of

coyotes acting aggressively towards humans in the Yukon (see box). Many of these have occurred during the decline in snowshoe hare numbers, when many coyotes enter town looking for a better food supply. As with bears, coyotes can be dangerous when they lose their fear of humans.

In 1992 and 1993 (years of rapidly declining hare numbers), there were 3 cases of coyotes attacking people in the Whitehorse area. In the first instance, a woman was approached and bitten on the leg by a coyote while she was walking across the soccer field at F. H. Collins school.

During late winter the next year, two children were attacked by coyotes within a week of each other in the Porter Creek area. In one case, a mother and child were shoveling snow together, when a coyote tried to grab the child. It was repelled by the child's mother with a snow shovel. In the second instance, a coyote approached a group of children while they were sliding, and bit one of them.

No one was seriously injured in any of these attacks. Conservation officers, who were called to shoot the problem animals, felt it was likely that these animals had been fed by people before these attacks.

Are coyotes a danger to livestock?

In the western U.S., coyotes kill an estimated 1-3% of all ewes, and 4-9% of all lambs, representing an annual loss of about \$20 million. While the Yukon does not have a large livestock industry, coyotes

can be a problem for farmers here as well. One Yukon sheep farmer lost an entire flock of 25 sheep to predators, mostly coyotes. Coyotes also sometimes kill chickens in the Yukon.



Are coyotes a danger to pets?

There have been numerous instances of coyotes killing dogs and cats, in the Yukon and elsewhere in their range. There are stories of female coyotes in heat luring male dogs into the jaws of other coyotes, but there is no good evidence on how often this occurs.

A second concern of many is transmission of diseases and parasites between dogs and coyotes. Coyotes are relatively resistant to rabies, and very few instances of the disease have been reported in the north. Elsewhere in their range, coyote populations are infected with several viral diseases, including distemper and canine hepatitis, that can be

passed on to dogs. Likewise, viral diseases from dogs can be passed on to coyotes when, for example, coyotes investigate hay with urine and feces of dogs left along roadsides. There is little known about the frequency of such disease transmission in the Yukon.

Coyotes in the territory are susceptible to mange, particularly when they are in poor condition during periods of declining hare numbers. Loss of hair from mange sometimes kills coyotes during the winter. The mite that causes mange is easily controlled with proper treatment though, so this is not a serious danger to dogs.

Can coyotes breed with dogs?

Coyotes and dogs can and do successfully interbreed. This is called hybridization. The fact that dog genes have not become incorporated into coyote populations in the heavily populated east though, is good evidence that hybridization is not likely to be widespread. There are several reasons for this. Unlike domestic dogs, both male and female coyotes can only breed successfully during their late winter mating season. Since male dogs, which can breed at any time, are more likely to be running free than female dogs in heat at this

time, most coyote-dog crossings have resulted from male dogs mating with female coyotes rather than vice versa.

The resulting hybrid pups are quite variable in appearance and behaviour. Even though they are fertile, their reproductive schedule no longer matches the timing of wild coyotes, and so they are unlikely to breed again with coyotes. Also, since male dogs do not help care for young, hybrid animals lose some of the behavioural traits that wild coyotes need to survive and reproduce.



What can people do to avoid problems with coyotes?

Most of the things that can be done to avoid problems with coyotes are common sense. Coyotes, as with all wild animals, should never be fed. Also, food waste and animal food should not be left lying around outdoors. These precautions are especially important during periods when snowshoe hare numbers are declining. During these times,

grazing. These have been quite effective elsewhere. Other options include changing husbandry practices, for example, by confining young lambs while they are still small.

The removal of problem animals is also sometimes effective. Coyotes are very intelligent, and they learn

Reducing coyote populations is like "digging a hole in the ocean". Young & Jackson,
The Clever Coyote

hungry coyotes often put aside their fear of humans in search of food. Small pets and poultry are better kept indoors or confined during these periods.

There are several options for owners of livestock. One Yukon sheep farmer is trying out guard dogs which will stay out in the fields with the flock when it is

well how to utilize easy new food sources. Not all coyotes kill livestock, but some become very skilled at it. While coyote control on a large scale has been very ineffective, removing specific animals can work well. People can shoot problem animals themselves if necessary, or call their local conservation officer.



Of what value are coyotes to humans?

Coyotes are now an integral part of the northern ecosystem. They have likely influenced the functioning of the natural community in ways that we little understand. For example, coyotes are important predators of snowshoe hares, and hares retard regeneration of spruce seedlings by nipping off their terminal buds. This could have important

almost \$8000 to Yukon trappers.

Coyotes have a legendary intelligence when it comes to avoiding traps. Trappers must go to great lengths, including boiling all traps and tools used for setting traps and wearing special clothing, in order to regularly catch coyotes.

Coyotes also have a great deal of

"We would hang off the backs of our snowmobiles and cut a hole exactly the size of the trap, drop the trap in, sift snow over it, and re-draw the skidoo tracks. The coyotes would still find them." Yukon Trapper

consequences for forest management. Coyotes also prey on many small rodents, considered to be pests by farmers.

Coyotes have other economic value as well. They are trapped by many Yukon trappers, and their furs are used locally and sold at fur auctions. Over the past 6 years, coyote pelts have been worth

aesthetic appeal. The sound of a group of coyotes yipping and howling out in the forest is a familiar and welcome sound to many Yukoners. Due to their fondness for roads, they are among the most frequently sighted wildlife in the Yukon. Both local residents and tourists alike gain a great deal of pleasure from watching them.



What do we still need to learn about coyotes?

There is a great deal that we do not understand about coyotes in the north. How do they affect populations of their prey? Much time and money is spent on studying and managing populations of wildlife species hunted by humans. We have very little understanding of how coyotes affect them, especially Dall sheep and caribou. How do coyotes interact with other predators?

Again, there is very little evidence to inform us of the relationship between coyotes and wolves, lynx, or other predators. This is especially important to know when programs such as wolf reduction are used. Will coyote numbers increase to fill the void left by wolves? How will this affect prey populations? All of these are open questions, at this point.

What is the best way to learn about coyotes?

Scientific studies are one way of gaining knowledge about wildlife and the interactions among different species. Conducted properly, scientific studies can inform us of the ways in which the natural community functions, which would otherwise be very difficult to discover through more casual observations.

Data gathered during such studies can be used to help us make better policies that concern wildlife. Ideally, such information is also objective and free of personal biases. However, scientific studies are also costly, limited in their goals, and difficult to conduct over a large enough area and long

enough period to answer many of the larger problems.

A second way of gaining information is using traditional knowledge and local record-keeping to help us learn about natural systems. Such information can be gained over a much larger area, and with a greater sense of history than a scientific study could ever offer. There is a great deal to be learned from people who live and work in the Yukon bush. The ways in which the natural ecosystem functions are extremely complex, and both of these methods of gathering information should be used in trying to understand them.

What observations are valuable to record about coyotes?

Interested Yukoners can make many valuable contributions to our understanding of coyotes and wildlife in general. Several suggestions are:

- 1) Keep a field journal of how much time is spent in the bush, and the numbers, locations, and habitats of any coyotes seen.
- 2) Record any direct observations made of coyote hunting.
- 3) Pay particular attention to the presence of coyotes in lambing or calving areas.
- 4) To learn about coyote food habits, kick apart their droppings that are often found on roads and trails. Look for the jaws and bones of smaller animals, and the hair of

larger prey. *** One cautionary note here is that predator droppings should never be handled by hand, since they may contain parasites harmful to humans. ***

- 5) Record numbers of prey seen while in the bush. It is especially important to note down the relative amount of sign, such as tracks and droppings, left by hares and smaller animals like voles and mice, and also the numbers of lambs and caribou calves seen.

These are fairly obvious things to note, but there is no substitute for writing down observations. If recorded properly, there is a great deal to be learned from them. Often, patterns emerge from such information only when it can all be looked at together.



Coyotes are fascinating and highly intelligent animals that are now a permanent part of our Yukon fauna. There is still a great deal that we do not know or understand

about them. It is hoped that this booklet will act not as the final word about coyotes, but rather as a starting point for Yukoners in learning more about them.

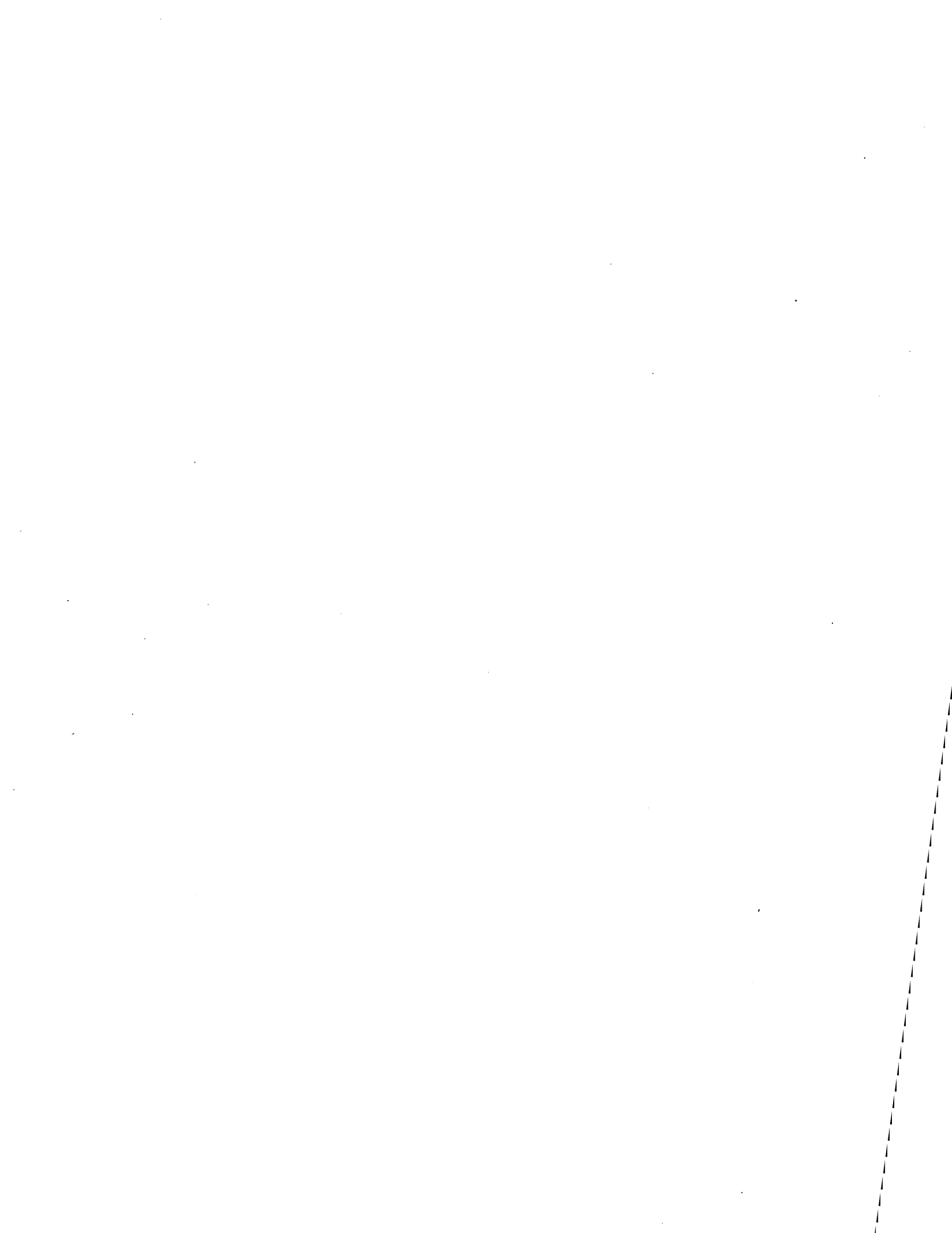
The following books are good sources of information about the ecology of coyotes, and folklore about them:

The Voice of the Coyote, by Frank J. Dobie, 1949, University of Nebraska Press

The Clever Coyote, by S. P. Young and H. H. T. Jackson, 1951, Stackpole Company

God's Dog, by Hope Ryden, 1975, Coward, McCann, and Geoghegan, Inc.

Coyotes: Biology, Behavior and Management, edited by Marc Bekoff, 1978, Academic Press



Tracks of Smaller Canids in the Yukon



Coyote

It is often very difficult to tell apart the tracks of coyotes, red foxes, and smaller dogs. In general, the tracks of coyotes are narrower than the other two species, with the nails of the outer toes pointing straight forward rather than out. Often though, the tracks are not clear enough to see this, and the best clues are found only from following the track for some distance.



Red Fox

The tracks of red foxes are rounder than those of coyotes. If a very clear track is seen, there is a clear inverted 'V' on the back pad. Trails of foxes are generally more meandering than those of coyotes. Especially with male foxes, a characteristic 'skunky' smell is apparent at sites of urinations.



Dog

Dog tracks obviously vary greatly in size, but those of many medium-sized dogs are about the same size as coyote tracks. The outward-pointing outer toes are the best characteristic that distinguishes them from coyote tracks.