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PREDATION ON FURBEARERS AND MANAGEMENT ALTERNATIVES

Ronald D. Andrews
Wildlife Resource Specialist, Furbearers

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Most of the presentations from other members of the panel have discussed direct predation of one animal upon another with evidence and data to support it. Their presentations indicate that in some instances, considerable data has been collected that substantiates the fact that predation has been and can be a limiting factor in sustaining certain local animal populations. Suggestions have also been made concerning management alternatives that might help to reduce this predatory impact when desirable.

Predation on furbearers and its impact is considerably more ambiguous and abstract. Facts and data concerning significant predation on furbearers, except for mink on muskrats and perhaps coyotes on bobcats, are not readily available.

Also, it would appear from the limited data available that, in most cases, management alternatives to reduce predation on furbearers are neither warranted, justified or for that matter, feasible. Most of the subject matter in this paper will deal with predators, other than man, on furbearer populations. The bulk of the information presented here is based on an extensive but not complete review of the literature and personal communications with some of the professionals currently studying predators.

MUSKRATS

The muskrat is probably the one major furbearer where predation has been studied to any significant degree. Dr. Paul L. Errington dedicated most of his life to the study of muskrat population dynamics. An important
part of these studies included the role of mink predation upon muskrat popula-
Errington and Errington 1937; Errington, Hamerstrom and Hamerstrom 1940, and  
Errington, Scott, 1945).

Errington (1962) assessed mink predation on muskrats in this manner:  
"Mink predation has, in north-central studies, accounted for more muskrats  
than predation by all other native predators together, yet it appeared but  
to have taken the place of losses from other agencies that in the absence  
of mink probably would have done an equal amount of eliminating."

In Errington's most intensive studies of mink in Iowa, he concludes  
that "when losses from mink predation were considered in the total picture  
of muskrat population dynamics, the severest observed had doubtful net  
effect on the muskrat populations as long as the habitats remained in good  
condition for muskrats. During the breeding season on muskrats, which typical-  
ly is the period of severest non-human predation, nearly all that mink ever  
were able to do as muskrat predators was to prey upon the more expendable parts  
of the population."

In his analysis, more than 70 percent of the closely studied feeding by  
mink upon muskrat flesh appeared to represent scavenging mostly upon victims  
of the hemorrhagic disease.

Mink predation seemed to very closely parallel muskrat population cycles.  
When muskrat populations reach levels beyond the carrying capacity of their  
habitat, mink predation increases accordingly. Mink predation, in this case,  
may be playing one of the important roles that predation plays in nature,  
that of prolonging the healthy status of a prey population by feeding upon  
the surplus, and the unhealthy portion of the muskrat population. As with  
most predator-prey relationships, the predation involved is relative to total
prey availability and to environmental conditions associated with prey populations.

Other predators of muskrat that are of less importance include larger hawks, owls, coyote, foxes, dogs, raccoons, weasels, snapping turtles, and perhaps a few predaceous fish such as northerns or muskies. As mentioned earlier, their predatory impact in total is less than that of mink.

The reproductive capacity of the muskrat and the natural boom or bust cyclic tendencies of muskrat population dynamics leads Errington, as well as many others, to believe that mink predation on muskrats does not require management alternatives to reduce such predation.

**MINK**

As far as predation on mink are concerned--their principal predators include man, dogs, owls, foxes, coyotes and bobcats. Food habit studies of owls, foxes, coyotes and bobcats indicate that mink remains are found in only trace amounts or nothing at all in their diets. In personal communications with several professionals, most believe that there is a natural animosity between dogs, coyotes, other carnivores and mustelids. This animosity could mean that predation on mink could be higher than we believe but data collected at this point does not substantiate that.

While some mink studies have occurred, the ecology and life history of the mink is a fertile field of research. It is my understanding that Al Sar-geant, Wildlife Research Biologist at the Northern Prairie Research Center will soon be embarking upon an extensive mink ecology study that should provide some valuable information on the role of this animal in the wildlife community. Management alternatives to reduce the apparent negligible predation on mink are unnecessary at this time.
BEAVER

Effects of predation on beaver is apparently minimal in most locales. Boyce (1974) in his Alaskan studies, believes that wolf predation on beaver was only incidental, however, some kits and a few dispersing pre-reproductive animals were taken. Mech, 1970, acknowledged that beaver in northeast Minnesota were occasionally preyed upon by wolves but wolves preferred other types of food because of the ease and availability of other food items.

However, in a personal communication with Bill Berg of the Minnesota DNR, indications are that with the current declines of the deer population in the Superior National Forest and generally throughout northeast Minnesota, wolves are resorting more to beaver and moose as alternative food sources. More data needs to be collected to determine if this predatory impact on the beaver is significant.

Pimlott et al. (1969) observed in the Pakesley area of Ontario when beaver population densities were very high, predation may become a significant mortality factor. In his studies he observed that 59% of the wolf scats examined contained remains of beaver. Like a lot of predatory relationships, the type and amount of predation that occurs is largely dependent upon the availability of all prey species.

Coyotes (Murie, 1940; Berg and Chesness, 1978), bobcats, and very occasionally otter and mink, will also prey upon beaver but the impact is negligible. Management alternatives to reduce predation on beaver appear unnecessary.

OTTER

Little information was found in the literature about significant predation on otters by predators. It is suspected that predation on otter would
be similar to that of beaver. Otter are likely taken when they give the ensuing predator the ample opportunity to catch them.

**RACCOON**

Predation on raccoon is probably generally insignificant over much of the raccoon range in North America. However, in a few locales predators of potential significance other than man, include alligators, bobcats, coyotes and great horned owls.

Giles and Childs (1949) reported that raccoons occurred in only 4 of 318 alligator stomachs collected in summer in Louisiana. Whitney and Underwood (1952) as cited by Johnson (1970) stated that raccoons are not generally plentiful where bobcats are prevalent. They considered bobcats one of the foremost enemies of raccoons and stated that the "coonhunters" chief thought in raccoon preservation might well be of this one very real enemy.

Raccoons occurred in 2.5 percent of the stomachs in bobcats in Alabama (Davis, 1955). Raccoon remains were found in 2.1 percent of 181 bobcat scats and digestive tracts from the Appalachians of North Carolina and Virginia (Progulske, 1955) and in 0.4 percent of 317' bobcat scats from South Carolina (Kight, 1962). Korschgen (1959) reported 0.8 occurrence of raccoons in 1,006 red fox stomachs from Missouri. Berg and Chesness (1978) reported that raccoon occurrence in coyote stomachs varied from 0.0 percent to 12.9 percent from samples collected between 1968 and 1976. Andrews and Boggess (1978) reported that occurrence of raccoon in 222 coyote stomachs was 0.9 percent while 246 scats had a 2.8 percent occurrence. Many local sportsmen believe that coyote are major predators of raccoon, however, data collected at this time does not indicate such.

Whitney and Underwood (1952) reported finding raccoon remains in the
nests, pellets and stomachs of owls. However, quantitative data from numerous food habit studies indicate that raccoon are not a common item in the diet of owls (Latham 1950).

Despite the fact that raccoon in certain age brackets may be vulnerable to some predation, overall the impacts are still minimal and it is doubtful that management needs to be implemented to reduce this predation.

**RED, GRAY AND ARCTIC FOXES**

Man and domestic dogs tend to be the most important predators on red fox. Many researchers in recent times have began studies on the relationship of foxes, particularly red foxes, to coyotes (Allen and Sargeant, personal communication; Johnson and Sargeant 1977; Pils and Martin, 1978; Storm et al. 1976). Most believe that there is only very limited predation of foxes by coyotes, however, they believe an indirect spatial avoidance between foxes and coyotes exists. Hunters and trappers in many states indicated that they have witnessed foxes being pursued by coyotes and that they have found foxes in traps killed by coyotes.

All indications point to the fact that when coyotes move into a particular area they then tend to tie down a great deal of space and through social harassment of foxes and competition for food and space, the fox retreat or avoid the established coyote territory. Prior to the ban on poisons to reduce coyote, many people believed there was an increasing trend in red fox numbers. As the use of poisons was restricted a noted increase in coyote populations have occurred and an apparent decrease in red foxes have occurred in some locales.

In recent years in Iowa we are noting that in some areas of southern Iowa where coyote are being harvested adequately and somewhat suppressed, there
seems to be an increase in red fox numbers. This inverse relationship of foxes to coyotes has occurred in other periods in the past as well as other states.

Allen and Sargeant (personal communication) believe that they have circumstantial evidence to support the fact that two of their tagged young foxes were suspected of being preyed upon by badger. We also had evidence of badger predation in a very few Iowa tagged red foxes but in neither study was predation of fox by coyotes ever verified.

Current studies in the arctic give preliminary evidence that as red foxes adapt and invade these new northern frontiers, they have also begun competing with arctic foxes for space and food. This may in the long term cause population reductions in arctic fox in certain locales.

Little information is available that would indicate that gray fox are vulnerable to significant predation. One would, however, assume that it probably occurs by a few coyotes and other species but is likely very minimal because of the natural secretive nature of the gray fox and the fact that predation by larger carnivores on other fox species appears to be insignificant. As with most other furbearers, management alternatives to reduce predation on fox appears to be unnecessary.

COYOTE

It seems reasonable to believe that coyotes do occasionally fall prey to wolves where the two exist in similar territories. Berg (personal communication) indicates that he has no direct evidence of this but that he does get scattered reports from trappers who believe this is happening. He agrees with fellow researchers that incidences of this are so few that they do not warrant concern for the coyote population. Some circumstantial evidence
points to the fact that coyotes may occasionally feed upon other coyote pups (Camenzind, 1978) in certain locales and that badger on rare occasion feed on coyote pups at den sites but again incidents of this appear to be few and far between.

Study of wolves on Isle Royal indicated that foxes and coyotes both fell prey to wolves when other food supplies were short.

With fox, coyotes, and wolves, it appears actual predation of the larger animal upon the smaller is nearly non-existent except in a few incidents where one group preys on the young of another. In most cases rather than actual predation, there appears to be a spatial avoidance of one species from the other particularly during the breeding season. Management alternatives to reduce this limited predation are unwarranted at this time.

**BOBCAT**

Men, dogs, and perhaps coyotes, are the most important predators of bobcats but it is suspected that foxes and great horned owls occasionally take a few young. However, as with red fox, there appears to be both an inverse spatial relationship and perhaps a predator relationship of coyotes on bobcats.

An abstract from a paper by Nunley (1978) presented at the 8th Vertebrate Pest Conference best summarizes his views on the subject:

"Bobcat (*Lynx rufus*) populations throughout the west have reportedly decreased from the high levels of the early sixties. This decrease is also reflected in the annual New Mexico bobcat take of the U. S. Fish and Wildlife Service when based on a bobcat trapped per man-year of effort relationship from 1916 through 1976. Bobcat populations in New Mexico were comparably low from 1916 through 1948. In 1949 through 1950, populations began to increase to triple their highest pre-1948 levels by the late fifties. New Mexico
bobcat populations began to decrease in the early sixties to present levels typical before 1948. The same New Mexico bobcat population trends reflected by this data are also reflected throughout the west in the combined bobcat take totals for the U. S. Fish and Wildlife Service in the western states. The bobcat population decrease from the early 1960's was not caused by habitat loss, fur trapping, or predator control. The unprecedented bobcat increase in the early fifties was in direct response to the general reduction of coyote numbers throughout the west by the use of sodium monoflouracetate (1080) as a coyote control tool. After several years, coyotes began to increase their numbers and bobcat numbers responded inversely by a decrease of their numbers down to present lower levels. Bobcat, skunk, fox, and badger numbers have all responded inversely to that of coyote numbers due to the coyote's role as an efficient competitor and predator upon these other carnivores."

Nunley (1979) concludes his paper with the following. "Coyote numbers are major limiting factor upon bobcat populations with predation playing a significant role. In order to return bobcats to their once man induced high, general coyote numbers will have to be reduced. The use of 1080 was the only predacide giving adequate general coyote population reductions for prophylactic control purposes. No mechanical control means can equal 1080's success."

Neil Johnson from Kansas Fish and Game (personal communication) agrees with the conjecture that many of us have, and that is that high coyote populations likely have depressive effect on bobcat, fox, and skunk. The data to substantiate this is not there but the circumstantial evidence supports that conjecture.

It also seems reasonable to assume that coyotes prey upon bobcats when we consider the reports from some states of the high loss of pets, particularly domestic cats, to marauding coyotes. More research is definitely needed to
truly assess this impact particularly in light of the fact that bobcat specialist, Doug Crowe from the University of Wyoming, believes that coyotes have little, if any, predator impact on bobcats but rather it is one of competition for food and space.

My belief is that the use of such predacides as 1080 are no longer socially or politically acceptable and thus mechanical means and perhaps the use of M-44 devices are the most acceptable management tools we have to keep the coyote populations at levels that will reduce domestic animal losses and perhaps positively effect bobcat populations.

Although I suspect that management alternatives to reduce potential bobcat predation are probably unnecessary and perhaps impractical, additional research is needed before this conclusion can be made.

OTHER FURBEARERS

Skunks are not commonly preyed upon because most animals probably fear or respect the skunks ability to retaliate by using its powerful scent. However, when great-horned owls, coyotes, badgers, foxes and bobcats are pressed by starvation or the right opportunity exists, they may prey on young skunks. Many sportsmen tell me the major reason we have low skunk populations in southern Iowa is because skunks prey on them. Larry Fredrickson of South Dakota and others tell me they hear the same story concerning skunks falling victims to coyote and fox.

Researchers in the northeastern states indicate that fishers also prey upon martens and bobcat kittens but generally speaking, the impact is probably minimal. There is some conjecture by some prairie dog and black-footed ferret specialists and some animal damage control personnel (Rue Hanson, personal communication) that increased predation by coyotes and badger on prairie
dog acreages after the use of poisons was banned may have contributed to further declines in black-footed ferret reductions. The natural animosity, as mentioned earlier, between carnivores and mustelids, could have been an additional factor contributing to further reduction of the very rare black-footed ferret populations, however, their population status prior to the ban of 1080 was somewhat precarious and thus their numbers were such that they likely would have become endangered regardless.

In summary, we can say that there is a lot of conjecture and indirect evidence that supports the fact that larger predatory furbearers prey upon the smaller ones and more specifically on the young of other species. It is doubtful that the impact is significant in most cases. Predators are adaptable, opportunistic feeders that eat whatever is seasonably abundant. In most seasons and in most locales they generally have a large supply of small mammals to draw upon and when in season, insects and fruits and berries are abundant food sources. They are, however, opportunists and when conditions are right and the hunger pangs call, the animals will feed upon one another, usually the larger ones on the smaller ones.

Management alternatives to reduce such predation on furbearers is probably economically unjustified and unwarranted. Perhaps in situations where data supports the fact that this type of predation is having an impact on threatened or rare and endangered species, management alternatives might be of merit. At this time I know of no direct data or evidence to support such a case.


Errington, P. L., and T. G. Scott. 1945. Reduction in productivity of muskrat pelts...


