Understanding Predator Management in Alaska

Alaska Department of Fish and Game

Alaska's constitution requires that Alaska's resources, including its fish and wildlife, be managed for the maximum benefit of Alaskans. It also requires that its wildlife be managed on a sustained yield basis subject to preferences amongst beneficial uses. These constitutional requirements, further amplified by the Alaska State Legislature, create the basic framework for the Alaska Department of Fish and Game (ADF&G) and the Alaska Boards of Game and Fisheries to manage Alaska's bountiful fish and wildlife.

These mandates can create potential user conflicts, such as those created where predators are temporarily manipulated to benefit prey species important to Alaskans for food. Under direction from the Alaska State Legislature, ADF&G and the Alaska Board of Game (Board) have recently embarked on several programs to increase low moose and caribou populations by temporarily manipulating wolf and bear numbers.

As the primary agency charged with managing the state's wildlife populations, ADF&G, in conjunction with the Board, is not only responsible for managing Alaska's wildlife but for providing information to the public on the background and scientific justification for, and the purposes and progress of all management programs. It is especially important to provide the public with information when programs are controversial and complex.

This booklet offers an overview of the social, legal, and biological bases for predator management in Alaska. It presents ADF&G's perspectives on predator management, discusses the reasons for specific wildlife management actions, describes the scientific information assembled by ADF&G that affects decisions on implementing predator control, and explains how ADF&G evaluates results.

Alaska is the only U.S. state with full complements of native big game (e.g., moose, caribou, deer, sheep, and mountain goats) and large predators. In this booklet, "prey" generally refers to moose and caribou and "predators" to wolves and bears.

Alaska enjoys sustainable populations of both predators and prey. ADF&G's goal is to maintain those populations in perpetuity.

Hunting is extremely important in Alaska. It is integral to lifestyles, traditional cultures, the economy, and basic food needs for many Alaska families. Approximately 7,000 moose and 25,000 caribou are reported harvested each year.

Social considerations

Moose, caribou, deer, sheep, and mountain goats provide an important food source for rural and urban Alaskans. Wild game is a high quality, local, organic, free-range food source, preferred by many over meats shipped in from far away. In addition, many small communities have few or no practical alternatives for meat. Most rural communities are not connected to road systems, are hundreds of miles from larger cities, have no commercial-scale agriculture, and lack big grocery stores. Acquiring meat and other items from outside these communities can be cost prohibitive.

Citizen views range from the belief that wildlife populations should not be manipulated for human benefits, to a demand for actively managing populations to allow people to harvest a higher percentage of wildlife populations annually. No single management approach can satisfy all users. ADF&G uses different management strategies in different parts of the state to provide for different values and demands. Some areas are managed more aggressively to maximize harvest opportunities. Other areas are closed to hunting and provide other public uses, such as viewing.

ADF&G remains committed to maintaining sustainable predator and prey populations. The department will continue to manage Alaska's wildlife populations with long-term health, sustainable harvests, and conservation as guiding principles.

Legal considerations

The Board adopts regulations to conserve and develop the state's wildlife resources, and allocates uses of those resources. Using a well established public process, the Board promulgates hunting, trapping, and other wildlife regulations, including predator management directives.

Alaska's Constitution charges state government with managing Alaska's fish and wildlife resources on the *sustained yield* principle. That is, long term harvest rates should not exceed regeneration. This principle ensures wildlife are maintained in perpetuity at sustainable levels.

In 1994, the Alaska State Legislature enacted the "Intensive Management Law," requiring the Board to designate areas where human consumptive use is the highest priority use of wildlife, and then set prey population and harvest objectives for these areas. **If management objectives are not met, the Board must consider intensive management actions,** including: 1) reducing or eliminating non-resident hunting; 2) reducing or eliminating resident hunting; 3) liberalizing hunting and trapping regulations for wolves and bears; and 4) implementing habitat improvement projects (primarily prescribed fires).

If these actions do not or are unlikely to result in higher levels of prey for food for people, and predation is the key limiting factor, the Board may consider predator control. Predator control measures are proposed by the public or ADF&G, evaluated by ADF&G, and considered by the Board. If adopted, programs are designed by ADF&G and conducted by ADF&G staff, specially permitted members of the public, or a combination of both. Not all public proposals for predator control are approved for implementation. In fact, historically, more have been rejected than approved.

ADF&G works to actively monitor wildlife populations and trends, makes recommendations to the Alaska Board of Game to manage these populations, and implements the regulatory programs established by the Board.

In much of Alaska, large predators kill far more prey than hunters do. Predators may take 70 to 80 percent of the moose and caribou that die each year.

Biological considerations

Control programs are designed to reduce numbers of predators, not eliminate them. Programs must provide for the long-term sustainability of populations of predators and prey. Control efforts are suspended after prey population and harvest goals have been met. Typically, predator populations then begin to increase in response to an increased food resource. If regulated conventional hunting and trapping harvests of predators cannot limit the growth of predator populations, control programs may be reinstated.

Control programs are designed to reduce numbers of predators - not eliminate them.

Prey and predators are managed primarily through regulated hunting and trapping. Habitat quality, weather, disease, accidents, and predation also affect the abundance of prey populations. Hunting and trapping seasons and bag limits are constantly monitored and regularly revised to make sure populations are sustainable in the long-term.

A territorial bounty on wolves began in 1915. Widespread, largely indiscriminate predator control included poisoning, and later aerial shooting and statewide bounties, and

resulted in markedly reduced wolf numbers. Poisoning killed non-target predators as well, including black bears, brown bears, coyotes, wolverines, and eagles.

Some moose and caribou populations responded by growing rapidly, reaching historic high levels, and severely damaging their habitat. Habitat degradation, severe winters, and over-harvest combined to cause large-scale population declines. Only after decades of recovery have these populations returned to levels commensurate with available habitat.

After statehood, different techniques were employed, including relocating brown bears, diversionary feeding trials for bears, sterilization of wolves, and same-day-airborne and aerial shooting programs to remove wolves. With each effort, ADF&G biologists gained valuable insights into when and where predator control could and should be used, and what results could be expected in various situations.

Limited programs involving shooting wolves from aircraft by state and/or private pilots or ground-based wolf removal methods have occurred intermittently for periods of about two to six years since the 1970s. Experimental programs to control bear predation began in 2003.

Predator control programs are established by the Alaska Board of Game, with information provided by ADF&G. Five areas of the state currently have predator control programs. Several other areas have been considered, but determined to be unsuitable for predator control.

ADF&G estimates that 7,000 to 11,000 wolves, approximately 30,000 grizzly bears, and more than 100,000 black bears live in Alaska. About one million caribou live in Alaska in 32 herds; 175,000 - 200,000 moose are widely distributed in varying densities throughout the state.

Reasons for specific wildlife management actions

Predator control is typically undertaken to maintain or increase the harvest of prey for food by people. Predator control can be used to allow prey populations to increase, to reallocate the harvest of prey from predators to people, to stabilize or prevent further growth of predator populations, or to halt or reverse prey population declines.

Low numbers of prey or low harvests are not necessarily biological, conservation, or management problems. Many parts of Alaska have prey populations at levels below what habitat can support. A low number, density, or harvest becomes a management problem when people want something different than what an area is providing. Predator control is conducted to increase harvests and meet established objectives.

ADF&G's perspectives on predator management

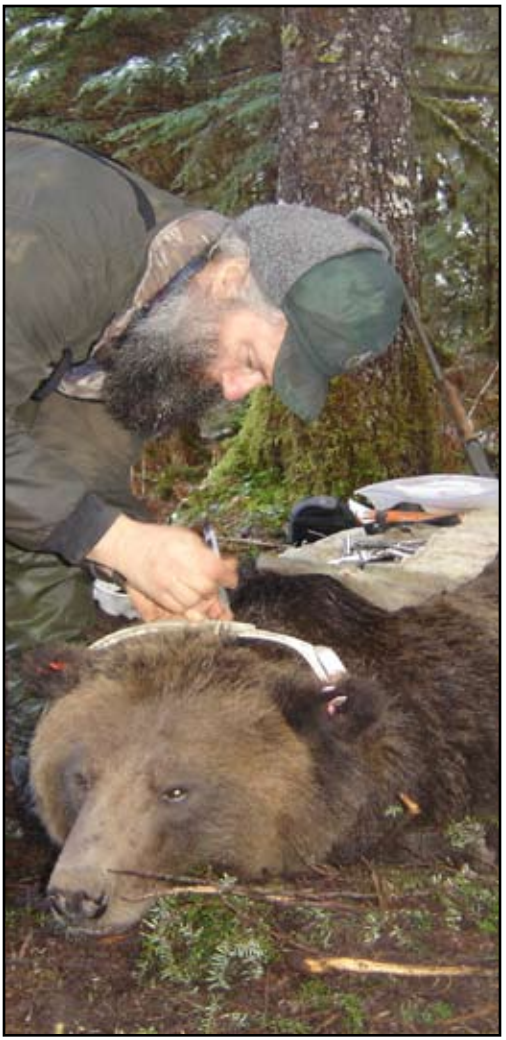
Predator control is not hunting. Conventional hunting and trapping is taking animals on a sustainable basis for food, to satisfy cultural needs, and for recreation. Laws and regulations prescribe methods, means, and bag limits for these activities. Any citizen with appropriate licenses and tags may engage in hunting and trapping.

Predator control is a specific type of management action intended to reduce predator numbers to lower but sustainable levels. It often employs

methods not available to hunters, such as aerial shooting. Fair chase standards do not apply. Members of the public involved in predator control are issued special permits authorizing them to employ these methods in specific areas. Techniques used in predator control programs depend on what can be effective. For example, in some control areas, the most effective method of reducing numbers of wolves is through the use of aircraft, using either land-and-shoot or aerial shooting techniques.

Biologists photograph and count caribou from the air to determine herd sizes, including numbers of bulls, cows, and calves.

Scientific information affecting decisions on predator control



Biologists use scientific information to understand predator-prey dynamics. They estimate the size of predator and prey populations, assess if predators are limiting prey numbers or affecting prey population trends, gauge the capacity of the habitat to support prey, forecast what effects predator control might have, and evaluate the results of predator control programs when they are implemented.

Aerial surveys, radio-tracking, harvest reports, calf mortality studies, body condition assessments, weight measurements, and browse surveys allow biologists to determine when predators are limiting prey.

Science alone cannot dictate whether predator control programs should or should not be conducted. Those choices are value-based decisions made through public processes.

How ADF&G evaluates results

A key element in managing wildlife is knowing or estimating the status and dynamics of given populations. Constraints of geography, vegetative cover, snow cover, insufficient funding, and many other factors frequently prevent biologists from directly counting individual animals across large areas. Wildlife managers use various science-based estimation techniques to come up with population estimates and relative proportions of males, females, and young animals in populations.

Carefully designed sampling in the form of composition surveys can help detect changes in population trends and reveal important herd characteristics, such as relative abundance of bulls and cows, and numbers and survival of calves. Addressing changes, with their unique sets of biological circumstances, requires the use of unique and suitable management tools and techniques.

Habitat as a limiting factor

Habitat plays an integral role in the productivity and survival of prey populations. Carrying capacity is defined as the greatest number of animals that can be supported by a certain area of habitat at a given time. This concept is easy to understand, but difficult to measure. Changes in forage quality, vegetative cover, winter conditions, and snow depth all influence an area's carrying capacity over time. Nutritional condition of populations diminish as they approach carrying capacity. This increases the vulnerability of populations to severe winters, disease, predation, and other environmental influences.

Habitats are not equal. Some are inherently more productive than others, given elevation, latitude, geological differences, damage from an overpopulation of moose or caribou, or other factors. Overall habitat quality affects prey reproduction, survival, and in the long term, the number of animals in an area.

Wildlife managers monitor population characteristics that indicate the nutritional health of moose and caribou, including:

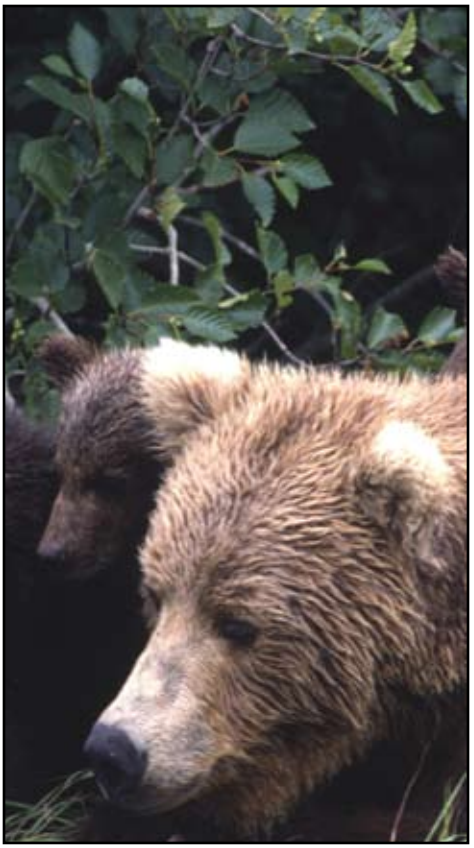
- **Twinning rates**
- **Calf weights**
- **Forage characteristics and uses**
- **Age of first reproduction**
- **Pregnancy rates**
- **Sources of mortality**
- **Survival rates**
- **Growth rates**

When prey animals are not limited by habitat or non-predation mortality, wildlife managers may suspect and investigate whether predation is a primary limiting factor.

Predation as a limiting factor

In much of Alaska, predation by wolves and bears holds moose and caribou populations lower than what their habitats can support.

Winter weather and high predation rates can keep prey populations in a low density dynamic equilibrium (LDDE), meaning both predator and prey numbers may remain low indefinitely.



In most of the U.S., where large predators are absent, wild moose are limited by habitat and commonly experience nutritional stress. In Alaska, prey populations commonly persist at low population densities, even in productive habitats. Where nutrition is good and calf production is high, survivorship may be low because of predation. If deaths are reduced, these populations will grow and more animals will be available for reproduction and harvest.

High mortality during early life reduces the number of calves that are "recruited" into the population, surviving to adulthood. Low recruitment reduces the number of moose and caribou available for harvest, restricts the population from growing larger, and may even cause it to decline.

When populations do not reach carrying capacity despite abundant habitat, good physical condition, and high calf production, biologists investigate causes of mortality. If disease is not evident, they assess the survival of different age groups of animals to determine which predators - wolves or bears - are the primary sources of predation.

Winter weather and high predation rates can keep prey populations in a low density dynamic equilibrium (LDDE), meaning both predator and prey numbers may remain low indefinitely.

Predator control as a management tool

Reducing predation can improve survival of both calves and adults. When conventional hunting and trapping cannot keep predator populations within management objectives, predator control may be the only practical option.

The goals of predator control are to increase prey densities and harvests, and establish stable but decreased predator densities. Biologists determine the level of predator removal needed to accomplish these goals, and determine predator population objectives for various areas and circumstances.

There is no indication from available scientific data that state sponsored wolf or bear control programs have created conservation concerns for wolf or bear populations in Alaska. Wolf and bear populations maintain their ability to increase after control programs end, even with the continuation of public hunting and trapping.

Can predator control work?

Used appropriately, predator control has reversed or stabilized declining moose and caribou populations, increased the numbers and/or densities of prey animals, and allowed for increased harvests of moose and caribou. Habitat quality, weather conditions, the mix and movement of predators, human access, management costs, land ownership, and duration of effort can all influence the impact of control programs and the responses of prey.

Predator control programs can be effective when:

- **Predation is limiting prey abundance and productivity,**
- **Significant predation is controlled,**
- **Predators are reduced for a sufficient time,**
- **Habitat will support more prey,**
- **Control is conducted in a sufficiently large area,**
- **Harvest of prey by hunters is limited.**

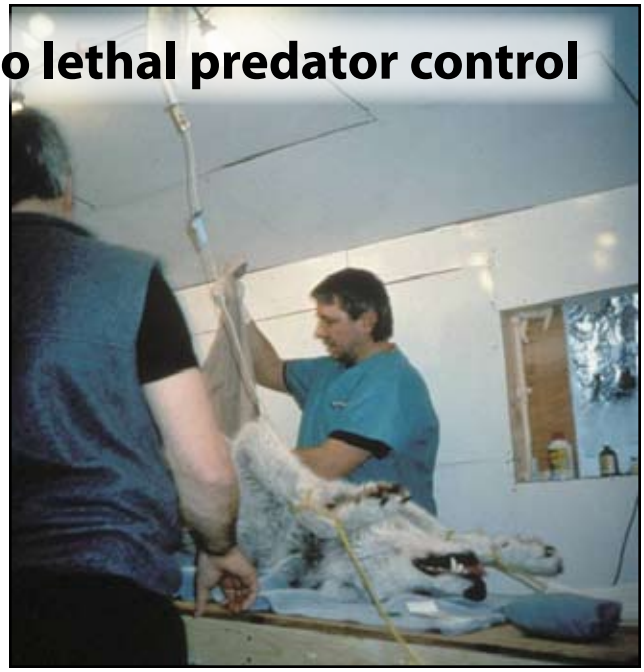
Historical data can sometimes provide insights about wolf population levels that will allow prey populations to increase, but the number of predators that must be removed to achieve program objectives is unique to each area. Several published studies report increases in prey numbers after wolf control reduced wolves to 55% or less of their pre-control numbers for at least four years. Each situation is carefully reviewed before intensive management programs are implemented.

Alternatives to lethal predator control

Non-lethal methods such as surgical sterilization can reduce predation, but are usually prohibitively expensive or logistically impractical, except in relatively small areas.

The following methods have been applied and continue to be considered in Alaska:

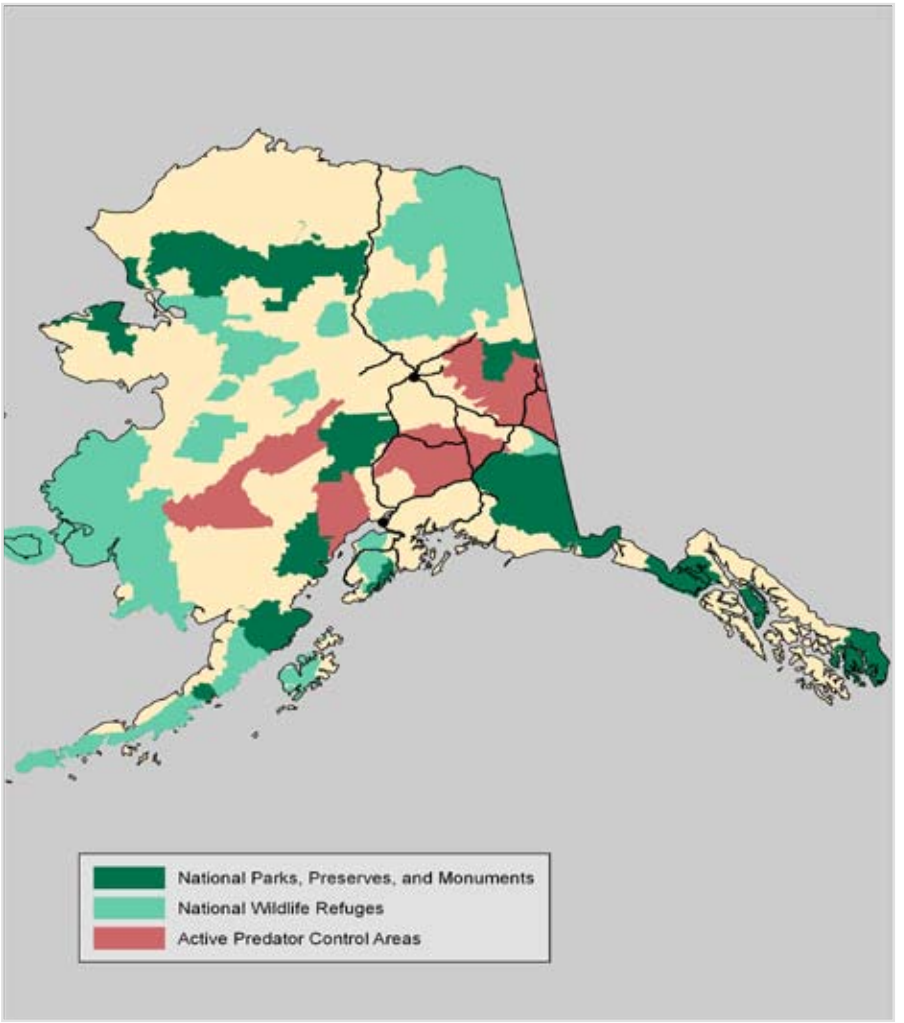
- Surgical sterilization and relocation of wolves
- Diversionary feeding
- Bear relocation



A non-lethal (sterilization) predator control program was implemented in 1997 to address predation on the Fortymile caribou herd. Fifteen pairs of wolves were sterilized. They maintained their home territories but killed far fewer caribou because they had no pups to feed.

Sedated bears await relocation. In 2003 and 2004, 115 black bears and 10 grizzly bears were relocated away from a 528 mi^2 area surrounding McGrath.

Federal parks and refuges and state predator control areas (2007)



Status of active state predator control programs

Predator control is not implemented on national monuments, wildlife refuges, and parks, shown in green on the map. Predator control programs, shown in red, are presently active on about 9% of Alaska's total land mass. These areas include the upper Susitna, Talkeetna, Nelchina and Copper Basins; the McGrath area; the upper Yukon and Tanana Basins; and part of the Cook Inlet area. Results to date show trends similar to results experienced in previous programs that successfully increased prey numbers or hunter harvests. Public participation in bear control has been low to date and no conclusions have yet been reached. The amount of information provided here varies by area depending on the status and longevity of existing programs.

Upper Susitna, Talkeetna, Nelchina, and Copper basins (GMUs 13A, 13B, 13C, and 13E)

This control project is part of a multi-year research program to measure effects of brown bear and wolf predation on moose calves.

1976 – 1978: control efforts reduced wolves 40-60%. Afterward, a large proportion of brown bears were relocated. Calf survival increased immediately, then dropped as bears returned. Diversionary feeding had similar, but less dramatic results.

1970 1980

1971: Aerial shooting of wolves prohibited without a permit.

1977 – 1987: Moose increased 9% annually, almost doubling in number in this ten-year period (within long-term trend count areas).

1977 – 1987: Spring estimates averaged 147 wolves during this period.

1988: Land-and-shoot hunting and trapping made illegal.

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Intensive, short-term predator control will not initiate a sustainable, long-term increase in harvest of prey. Calves must be protected for at least three to four years until they are old enough to produce calves of their own.

2000 – 2006: Wolf population reduced: (includes 50% from trapping and hunting and 50% from Same-Day-Airborne shooting: SDA averages 71 wolves annually).

Moose numbers up 14% (about 2% per year) within long-term trend count areas.

Calf numbers increased 110%.
Yearling bulls increased 176%.
Total bulls increased 45%.

1988 - 2000: Moose declined nearly 4% annually to nearly half of their former numbers (within long-term trend count areas).

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1990

1988 – 2000: Wolf population reaches all-time high.

2000: Spring estimate = 270 wolves; fall estimate = 520).

1999: Spring estimate = 300 wolves; fall estimate = 520.

2000

2000: Intensive wolf management plan adopted.

2004: Same-Day-Airborne (SDA) taking of wolves

2007: Spring wolf population objective is 135-165 wolves. No intensive bear management program is implemented, but brown bears are significant predators of moose calves. Bear hunting regulations are increasingly liberalized.

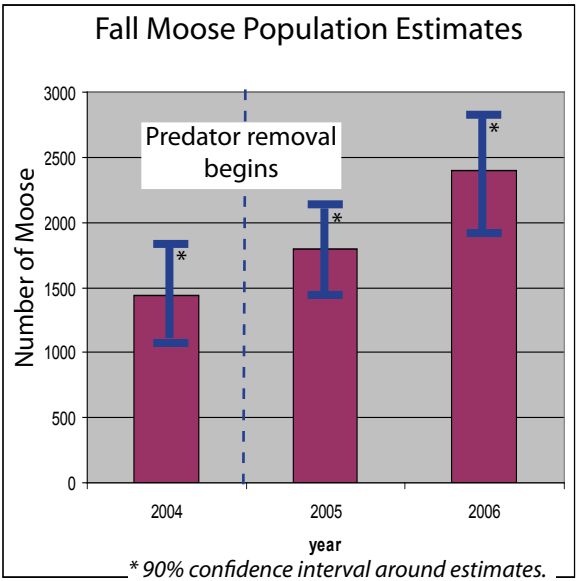
Upper Yukon/Tanana Basin (GMUs 12, 20B, 20D, 20E and 25C)

1981 – 1984: GMU 20E wolf numbers reduced by 30-60%; no discernible effect on moose calf survival (grizzly bears killed 50% of moose calves born in 1984).

2005 – 2007: Control programs remove 100 wolves and 6 brown bears.

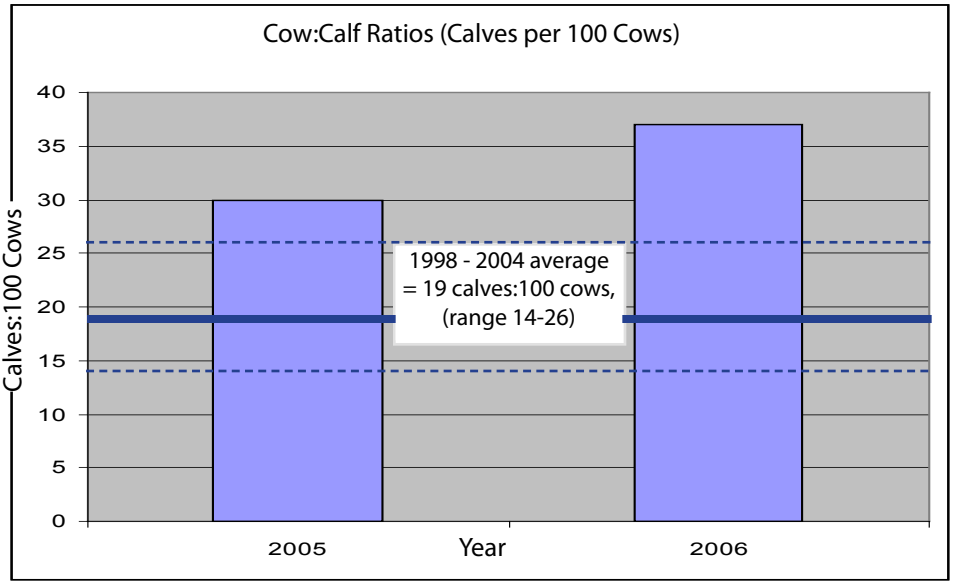
Late winters 2004 – 2005 and 2005 – 2006: Wolf population in survey area is less than 50% of pre-control estimate.

2006: Survey indicates fewer brown bears than reported in the 1980s.



Numbers of Moose increased between 2004 and 2006 in the survey area.

Initial survey data indicated increased numbers of moose and a higher cow:calf ratio in the central part of the control area. These data are preliminary and it will be necessary to continue the control program and continue data collection efforts in order to evaluate the effectiveness of the program.



McGrath (GMU 19A)

July 2004: Five-year control plan implemented.

2004 – 2005: 42 wolves taken Same-Day -Airborne (SDA) and 29 by other allowed methods.

2005 – 2006: 46 wolves taken SDA and 30 by other allowed methods.

2006 – 2007: 7 wolves taken SDA and 3 by other allowed methods (poor snow conditions limited take).

Winter and spring 2006: Surveys indicate 114 – 120 wolves.

May 2006: Alaska Board of Game reduces post-control wolf population objective from 40 – 53, to no fewer than 30 wolves.

2005 – 2006: 65% of the wolf population taken by allowed methods; distribution of the take is not uniform throughout the area.

2004 – 2005 and 2005 – 2006: Over 70% of wolves in the lower Holitna, Hoholitna, and Stony River drainages were removed; removal rates elsewhere much lower.

Spring 2007: Holitna and Hoholitna River drainage moose surveys suggest beginnings of population growth:

- 64% twinning rate,
- 31% yearlings,
- 62 calves:100 cows,
- 26 bulls:100 cows.

Moose density estimates south of the Kuskokwim River:
Fall 2004: 0.19 moose/mi^2.
Spring 2006: 0.38 moose/ mi^2.
Winter 2006 – 2007: No estimate due to poor survey conditions.

Cook Inlet (GMUs 16A and 16B)

In 2004, when aerial control began, the Unit 16 wolf population was about 200. The spring 2007 wolf population was estimated at 45 – 95, for a total reduction of 50 – 80%.

Overwinter moose calf survival was high, but spring-to-fall survival was low (about 18%), so brown bear hunting was
liberalized from one bear every four years to one per year in 2004, and to two bears per year in 2005. Black bears remain abundant; in 2007 a control program allowed participants to take unlimited numbers of black bears.

Biologists use a variety of tools, including radio collars, to help track and monitor wolf populations.

McGrath (GMU 19D)

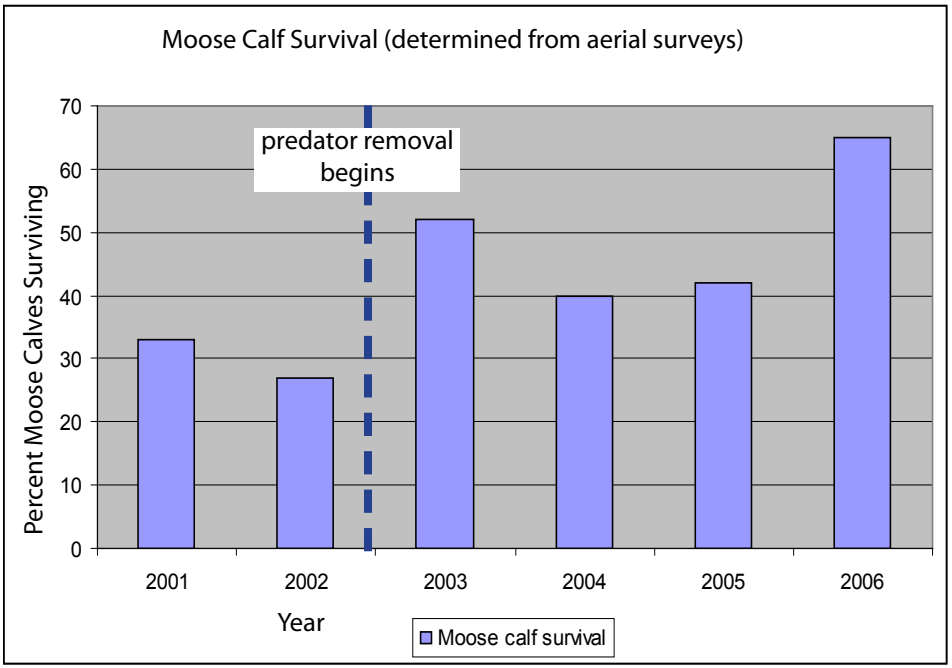
Spring 2001: Research concludes both bears and wolves are significant predators of moose in the McGrath area.

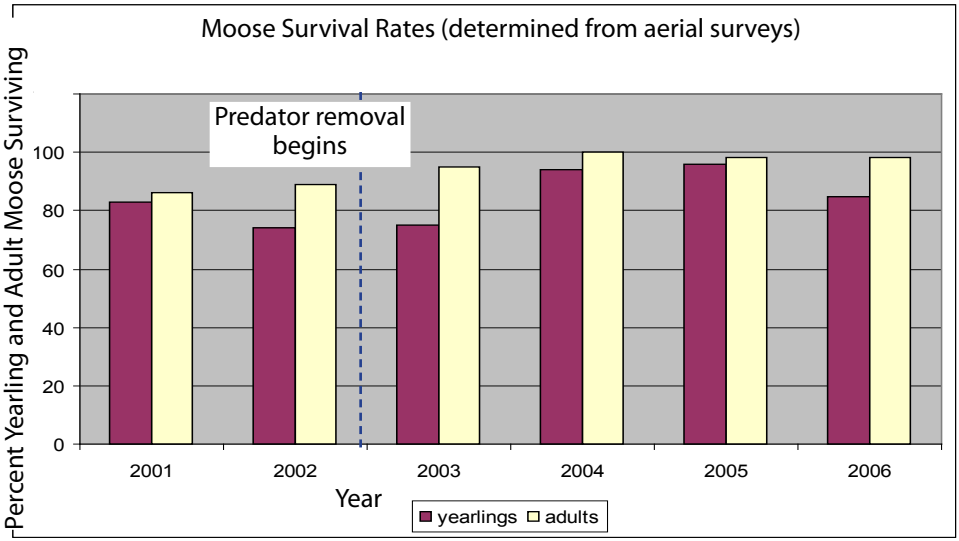
2000 — 2006

Spring 2003 and 2004: 115 black bears and 10 grizzly bears (at least a 70% reduction) relocated out of a 528 mi^2 area surrounding McGrath – the "Experimental Micromanagement Area" (EMMA).

Late winter 2004 – 2006: Aerial shooting wolf control effort initiated in EMMA; surveys indicate wolf population 75% lower than 2001.

Moose calf survival increased in GMU 19D after predator control was implemented

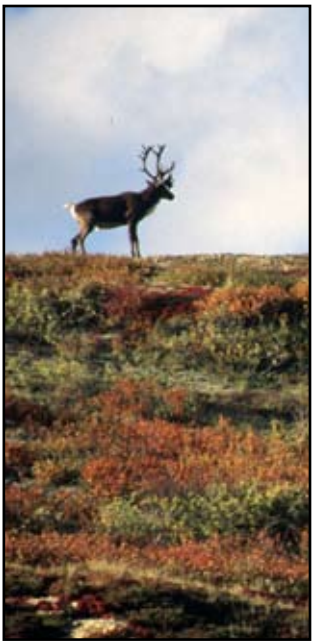




Moose survival increased following implementation of predator control

The moose population in the "Experimental Micromanagement Area" (a 528 mi^2 area surrounding McGrath) was 524 in 2001. In 2006 it was 691, about a 30% increase.

Conclusions

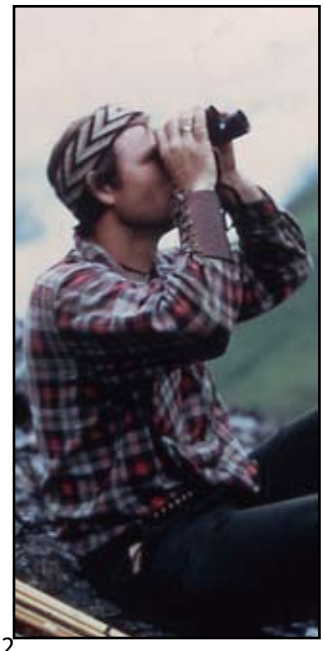


• Wild game is important food for many Alaskans.

• Moose and caribou populations across Alaska frequently persist at low numbers, often kept that way by predation. Predators kill more moose and caribou than do hunters.

• The Alaska Board of Game and ADF&G are required by Alaska's Constitution and state law to manage predators and prey for all user groups in Alaska.

• Intensive management statutes require the Alaska Board of Game to adopt regulations for certain moose and caribou populations to implement programs that provide higher harvests for hunters. Citizen views range from rejecting manipulation of wildlife populations for human benefit, to demanding management practices allowing hunters to harvest higher percentages of prey populations annually. Because of these opposing public values, predator control will always be controversial.



• Predator control programs are designed to reduce wolf or bear populations as a way to increase numbers or harvests of moose or caribou. Each situation is approached systematically and individually.

• When properly designed and carried out, predator control programs have a high likelihood of meeting population and harvest objectives for moose and caribou.

• When members of the public are involved in predator control, the state limits participation to qualified applicants through the issuance of special permits and closely monitors participants' actions.

• ADF&G continues to collect data to monitor the effectiveness of bear and wolf control programs. There is still more to learn.

• Predator control programs are active on about 9% of Alaska's land mass.

• There is no indication from available scientific data that state-sponsored wolf or bear control programs have created conservation concerns for wolf or bear populations on either a statewide or local basis.

• Data from each of the five active predator control areas are preliminary, but indicate the beginning of increased moose calf survival and population growth.

• Current bear control programs in GMUs 16, 19A, and 20E are new and thus far inconclusive; results continue to be evaluated.

• Wolf and bear populations maintain their ability to increase after control programs end, even with continued public hunting and trapping.

• No single management approach can satisfy everyone; ADF&G uses different management strategies in different parts of the state to provide for diverse values, interests, and demands.

• ADF&G is committed to maintaining viable predator and prey populations, and manages Alaska's wildlife populations with long-term health, sustainable harvests, and conservation as guiding principles.

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