Predator Management in Alaska

 

 

Alaska Department of Fish and Game
Division of Wildlife Conservation
November 2007

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1.0 PURPOSE OF DOCUMENT

As the primary agency charged with managing resident wildlife populations in Alaska, the Alaska Department of Fish and Game (ADF&G) has a responsibility to provide the public with the best information regarding its management programs, including predator control. Continuing scientific, legal, and general public attention to predator management accentuates the need for ADF&G to inform Alaskans about their wildlife resources and how they are managed. These concerns are the impetus for this report.

This paper offers an overview of the social, legal, and biological bases for predator control in Alaska. It presents ADF&G's perspectives on predator management, lays out the reasons for specific wildlife management actions, describes the scientific information assembled by ADF&G that affects decisions on implementing predation control, and explains how ADF&G evaluates results. Abbreviated versions and other forms of this paper will be made available to help inform the public on this important issue. This document will be updated as new information and findings become available.

2.0 THE ISSUE

2.1 Definition of Predator Control

Big game species in Alaska, including predator populations, are affected by and managed primarily through regulated hunting and trapping. In contrast, predator control is a program used when other management techniques are not effective to reduce the limiting effects of predation on prey populations (e.g., moose, caribou, deer, Dall sheep, mountain goats). Predator control is intended to ultimately allow a higher sustainable harvest of prey in a particular area. The initial objective in a control program is a reduction (not elimination) in numbers of predators in the shortest possible time, in a specified area, followed by maintenance of predators at this temporarily lower level to enable the prey population to increase. After harvest and prey population goals set by the Alaska Board of Game (board) and ADF&G have been met, and predator populations have begun to increase in response to increased food resources, regulated hunting and trapping harvests of predators need to be sufficient to limit the growth of those predator populations. If these activities are insufficient, predator control programs may be reinstated.

Techniques used in predator control programs are determined based on what can be effective. For example, in many remote areas where ground access is difficult, the only effective method of reducing numbers of wolves is through the use of aircraft, in either land-and-shoot or aerial shooting. Land-and-shoot involves landing, exiting an aircraft, and shooting, whereas aerial shooting involves shooting from a flying aircraft.

Predator control is not the same as hunting and is not conducted under the same regulations as hunting or trapping. Hunting and trapping involves taking animals on a sustainable basis for food, to satisfy cultural needs, for monetary gain (trapping) and for recreation. They are governed by laws and regulations prescribing methods, means, and bag limits, and hunting involves the fair chase ethics of the individuals participating.

Hunting and trapping are broadly available to citizens who qualify for and purchase the appropriate licenses and tags. Take of predators by conventional hunting and trapping may be increased through liberalized seasons and bag limits to reduce the effects of predation on prey populations.

If conventional harvest is insufficient to produce the desired effect, predator control programs may be undertaken. Predator control is intended to reduce predator numbers while still retaining viable populations, and often employs methods not available to conventional hunters. These methods include: 1) aerial shooting (taking or attempting to take an animal by discharging a firearm from an airborne aircraft), 2) land-and-shoot (using an aircraft to locate an animal, landing the aircraft, exiting the aircraft, and immediately shooting or attempting to shoot the animal), and same-day-airborne shooting (taking an animal without waiting until after 3:00 a.m. following the day in which the person was airborne). Special permits are required to authorize members of the public using aircraft for predator control. Although the hides of wolves and bears taken under control programs must be salvaged, fair chase ethics are not applied to predator control programs.

Predator control is typically undertaken to benefit people (to maintain or increase the harvest of caribou and moose by people for food), not necessarily because it is needed to benefit moose, caribou, or deer populations. Predator control can be used to 1) allow prey populations to increase, 2) reallocate the harvest of prey by predators to people, 3) stabilize or prevent growth of predator populations, or 4) halt or reverse prey population declines due to hunting or other events.

Predator control programs are proposed by the public or ADF&G. Proposals are evaluated by ADF&G and may be adopted by the Alaska Board of Game. Programs are then designed by ADF&G and are conducted by ADF&G staff, permitted members of the public, or a combination of both. Budget constraints frequently preclude control activities conducted solely by ADF&G, so control programs currently depend on private citizen volunteers, who are issued permits to take wolves or bears using their own time and resources.

2.2 Alaska's Range of Values

Citizen opinion varies widely about how wildlife should be managed. One of the most fundamental and controversy-generating differences of opinion is whether wildlife populations should be manipulated by people for human benefits.

Hunting is extremely important in Alaska. It is integral to lifestyles, traditional cultures, the economy, and basic food needs for many Alaskan families. Approximately 25,000 caribou (estimated) and 7,000 moose (reported) are harvested each year. Unlike in other states, many small communities in Alaska have few or no practical alternatives for meat. Frequently, these communities are not connected to road systems, are hundreds of miles from larger cities, have no commercial scale agriculture, and lack big grocery stores. Costs to acquire meat and other items from outside are high and, in many cases, prohibitive. Wild game is a high quality, local, organic, free-range food source, and many Alaskans – even those who live on the road systems – prefer this meat over farmed or feedlot products. As a result, moose, caribou, deer, Dall sheep, and mountain goats provide an important food source for both rural and urban residents.

In this document, the term “prey” generally refers to moose and caribou. In much of Alaska, large predators kill far more prey than do hunters. Studies indicate that predators often take 70% to 80% of the moose and caribou that die each year.

In some situations, traditional hunting and trapping efforts have been able to adequately manage predator numbers. However, these efforts generally have the greatest effect in and around urban areas, where land is accessible and the number of hunters and trappers is high. Many rural areas of the state have lower numbers of hunters and trappers, more difficult and expensive access, and, in general, persistently low moose and caribou populations. These are also the areas whose residents rely most heavily on sustainable prey populations for food, where cash economies are not well-developed and income is limited, and food prices are the highest. In addition to remote terrain, poor weather conditions can make predator harvests in some years difficult if not impossible.

Citizen views range from believing that wildlife populations should not be manipulated for human benefits, and that people should harvest only the number of animals that the population can naturally replenish each year (the extreme range of that end of the spectrum includes people who believe wildlife should not be harvested at all), to a demand for manipulating most, if not all wildlife populations to allow people to harvest a high percentage of wildlife populations annually.
No single management approach can satisfy everyone in an environment with such radically opposed philosophies. ADF&G uses different management strategies in different parts of the state to provide for different values, interests, and demands. Some areas are managed aggressively – including the use of wolf and/or bear control – to maximize prey harvesting opportunities. Conventional management tools are used throughout most of the state to support hunting and wildlife viewing opportunities. Some areas are closed to hunting where wildlife viewing is the primary objective. ADF&G remains committed to maintaining viable predator and prey populations, and will continue to manage Alaska’s wildlife populations with long-term health, sustainable harvests, and conservation as guiding elements.

2.3 Why and When Predator Control is Used

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. Low numbers, densities, or harvests become management problems when people want or need something different than what an area is providing. Predator control is considered when these conditions all occur: a) people request it, b) predation is limiting the number or harvest of prey by hunters, c) the habitat can support more prey animals, and d) other means of achieving prey population or harvest objectives are ineffective.

3.0 HISTORY

3.1 Pre-Statehood

Control of predation intended to increase human consumptive use of populations of moose, caribou, deer, and other game in Alaska began before contact with Europeans. Alaska Natives actively manipulated predator populations using a variety of techniques, including "wolf pupping" and "springbaits." The territorial government implemented a bounty in 1915, followed by federal programs to kill coyotes and wolves in the late 1920s. Federal agents and others used a number of methods to significantly reduce numbers of predators, including poisoning, statewide bounties, and aerial hunting (before the advent of the 1971 federal Airborne Hunting Act). Widespread predator control that began in the 1940s ended at statehood. (See Section 7.1 for more information about early control programs in Unit 13.)

3.2 Post-Statehood

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 2 – 6 years since the 1970s. Experimental programs to control bear predation have been conducted intermittently since the 1980s. (See Section 7.3 for more information about recent programs.)

Widely divergent opinions about the appropriateness of predator control led to ballot initiatives that prohibited shooting of wolves the same day airborne (1996) and a referendum that repealed legislative changes regarding aerial shooting of wolves by the public (2000). Both were substantially altered by legislative action within two years. Another initiative about same day airborne shooting by private pilots is scheduled for the 2008 primary election ballot in Alaska.

4.0 LEGAL CONSIDERATIONS

4.1 Constitutional Mandate

State government is charged with managing Alaska's fish and wildlife resources by Alaska's Constitution. Article VIII, Section 1 describes maximum use and development of natural resources, Article VIII, Section 2 directs that maximum benefit shall accrue to Alaskans through development of natural resources, and Article VIII, Section 3 reserves fish and game to the common use of all Alaskans. Specifically regarding fish and game management, Article VIII, Section 4 states: "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses." This constitutional mandate is the state's primary directive for managing all fish and game species in Alaska, and is augmented by numerous state laws, contained largely in Title 16 of the Alaska Statutes (AS), and regulations, found mostly in Title V of the

Alaska Administrative Code (AAC). For precise wording of these legal documents, visit the state's website at: http://www.law.state.ak.us/doclibrary/doclib.html

"Sustained yield" is a basic principle of conservation specific to human use of resources. At its simplest, it means annual harvest should not exceed the annual regeneration of a resource, unless management goals encompass reducing a population to a lower, but still sustainable, level. This principle ensures harvests will not extirpate populations or drive species to extinction. This principle alone, however, provides little guidance where high levels of human use are mandated or desired.

4.2 Intensive Management

In 1994, the Alaska State Legislature (legislature) enacted AS 16.05.255, the "Intensive Management Law." The law requires the board to designate intensive management populations, for which human consumptive use is the highest priority use, and to set population and harvest objectives for those areas. If moose, caribou, or deer populations or harvests fail to meet management objectives, the board must consider and evaluate intensive management actions as a means of attaining the objectives.

The sequence of intensive management actions typically progresses from the more benign to the most aggressive. For instance, initial actions may include reducing or eliminating non-resident hunting, reducing or eliminating resident hunting, liberalizing hunting and trapping regulations for wolves and bears, and habitat improvement projects (primarily prescribed fire).

If these actions do not result or are unlikely to result in increased harvests of moose, caribou, or deer for food, the board will consider predator control, but only if habitat can support more of these animals and predation is a significant limiting factor. Predator control plans must consider the long-term viability of predator populations.

5.0 MAKING DECISIONS

5.1 Alaska Board of Game

The board is Alaska's regulatory authority that adopts regulations to conserve and develop the state's wildlife resources and allocates uses of those resources. ADF&G works to actively monitor trends in wildlife populations, makes recommendations to the board to manage these populations, and implements regulatory programs established by the board.

The board consists of seven citizens appointed by the governor and confirmed by the legislature. The board promulgates hunting, trapping, and other regulations for wildlife, including predator management policy, through a well-established public process.

More than 80 local fish and game advisory committees, various organizations, and individual members of the public participate in the state's regulatory process every year.

Any individual or organization may propose new regulations or changes to existing regulations, and may offer oral and/or written testimony on regulatory proposals. For every proposal, ADF&G provides available scientific information pertinent to the issue and analyzes effects of proposals, if adopted. ADF&G also makes recommendations to the board to adopt or not adopt proposals. However, ADF&G normally does not make recommendations on proposals that affect allocation of a wildlife resource between competing user groups. Allocation issues are specifically the purview of the board, subject to pertinent legal review.

By law, the board considers all of the information presented to them in their decision-making process. The amount of data upon which the board bases its decisions is variable. Alaska is a huge state; it is financially impossible to amass detailed information on all wildlife populations in all areas. In some areas, the board and ADF&G must rely upon general information to make management decisions. In other areas, information is much more specific.

5.2 Alaska State Legislature

The legislature may revise or create new statutes regarding wildlife management. Changes in state law necessarily affect how the board and ADF&G conduct their activities. The legislature delegates management authority to the board and ADF&G, who conduct their activities within the boundaries of state law and sometimes with specific legislative instructions.

5.3 Alaska Department of Fish and Game

ADF&G is the state agency responsible for managing Alaska's fish and wildlife resources through constitutional mandate, state laws and regulations, and it is the government body wherein wildlife management expertise exists. The department contains the staff, resources, and local knowledge to implement and conduct management and research programs as well as make wildlife management recommendations on regulatory proposals to the board. Once the board has made regulatory decisions, it is up to ADF&G to implement the regulations.

ADF&G carries out a wide variety of programs to meet diverse public interests in the conservation and use of wildlife. These programs range from protected areas where only viewing is allowed (e.g., McNeil River, west of Cook Inlet) to intensive management of habitat, predation, and harvest to produce high yields of game species such as moose or caribou for consumptive use (e.g., the Fortymile River drainage north of Tok). Diverse public interests often preclude managing for multiple objectives in any given area, so management programs often differ among areas of the state.

ADF&G strives to determine when predators are preventing prey populations from either increasing or meeting minimum harvest targets. Additionally, ADF&G forecasts what effects predator control might have in given situations, and helps the public and the board objectively evaluate results after predator control is initiated. ADF&G's primary goal is to manage and maintain healthy populations of all wildlife in perpetuity.

5.4 Federal Management Authorities

While the board and ADF&G have management authority over most of Alaska's wildlife resources, the federal government owns about 60% of the land in Alaska, including seventeen National Park Service (NPS) areas that cover 54 million acres, and a national wildlife refuge system that covers 69.5 million acres, administered by the U.S. Fish and Wildlife Service (USFWS). Both of these agencies have policies in place that either prohibit wolf and bear control or require elaborate procedural steps in order to implement predator control. As a matter of policy, the State of Alaska has not extended the wolf or bear control programs to these federal lands. Collectively, USFWS and NPS lands compose approximately one-third of Alaska's land area.

6.0 THE ROLE OF SCIENCE

Biological information is used to estimate the size of predator and prey populations, detect if predators are limiting prey numbers or affecting prey population trends, forecast what effects predator control might have in given situations, and evaluate the results of predator control programs when they are implemented.

Science cannot answer the question of whether management programs should or should not be conducted – that is a value-based decision rendered from a mix of decision-making processes that involve the board, the legislature, and the public.

6.1 Predators and Prey

Wolves and bears are powerful and effective predators. ADF&G estimates that roughly 7,000 to 11,000 wolves, approximately 30,000 grizzly bears, and more than 100,000 black bears live in Alaska. Since statehood, populations of wolves and bears have been neither threatened nor endangered in Alaska. These predators' diets include large and small prey such as deer, caribou, moose, mountain goats, Dall sheep, fish, hares, and rodents. Bears also eat vegetation such as roots, berries, sedges, and grasses. Research in Alaska and Canada has shown that predation by wolves and bears can be an important factor in population declines or maintaining low densities of moose and caribou. ADF&G research has shown a single wolf consumes 12-13 moose in a typical year, and/or 30-40 caribou, mostly calves. But when faced with large predator populations of only one species, either wolves or bears, moose can reach relatively high densities.

Although caribou populations are subject to significant fluctuation, ADF&G estimates that more than one million currently live in Alaska in 32 herds. They eat lichens and other plant material and migrate widely between winter and summer ranges. About 175,000 – 200,000 moose live in Alaska and are widely distributed throughout the state in densities that vary markedly. Moose eat willows, shrubs, sedges, grasses, mushrooms, and aquatic plants during the summer and mostly woody twigs during the winter.

6.2 Monitoring and Managing Predators and Prey

Managing wildlife populations requires biologists to monitor prey populations to ensure that the capacity of the habitat to support them is not exceeded. Surveys of predators help biologists understand predator-prey dynamics and enable them to ensure long-term viability of populations of both.

ADF&G uses a variety of tools to monitor predator and prey populations including aerial surveys, radio-tracking, harvest reports, mortality studies, calving surveys, body condition surveys, and habitat surveys. Hunting and trapping seasons and bag limits are constantly monitored and regularly revised to make sure populations are sustainable in the long term.

6.3 Wildlife Surveys

A key element in managing wildlife is knowing or estimating the status and dynamics of given populations. Geography, vegetative cover, snow cover, funding, and many other factors frequently prevent biologists from directly counting individual animals across large areas. In addition to direct observations and reports from the public, wildlife managers use various field survey techniques including statistically rigorous population estimates to relative abundance indices and general counts to estimate animal numbers and relative proportions of sex and age classes of animals in a population. 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, numbers of calves per 100 cows, and trends in survival of calves. Different situations require different tools.

<u>Caribou</u>

Caribou range widely through a typical year. Biologists generally rely on a subset of radio-collared animals to estimate annual productivity, survival, and movements. In summer after calving, caribou tend to form large aggregations in areas that are identified by aerial tracking of radio-collared animals. Groups are surveyed from low-flying aircraft, photographed, and counted. Counting the number of individuals in the aerial photographs provides a minimum herd size. Accounting for caribou not in the aggregations by radio-tracking and surveying adjacent areas allows estimations of overall population size.

Composition surveys are also important to caribou management. Biologists in helicopters examine a subset of animals and collect information on numbers of calves produced, survival of young and adult animals, and proportions of males to females, and young to older animals.

Moose

The most common method of estimating moose numbers is a stratified random sample, where large areas, commonly Game Management Units (GMU), are divided into survey units and a randomly selected sample of these units is surveyed using small, slow-flying aircraft in winter. The resulting information is projected over entire GMUs or defined portions of GMUs to produce population estimates. Biologists also employ repeated count areas, i.e., counting animals on the same large plots of land year after year. Composition surveys provide information on numbers of calves produced, survival of young and adult animals, and proportions of males to females and young to older animals. Biologists also conduct habitat surveys.

Wolves

Wildlife managers estimate wolf abundance by employing aerial surveys in winter, when snow cover and daylight are most favorable for observing wolf tracks. Wolf numbers may be estimated using reconnaissance techniques, or they may be surveyed using more intensive, expensive techniques that result in statistical estimates. Important data are also provided by trappers and hunters through sealing reports that include information about pack sizes, locations, and movements. Multiple reports of individual wolf packs received throughout the winter from trappers, hunters, and other members of the public help biologists estimate pack sizes, colors, and ranges over large management areas.

Bears

Bears remain in dens over the winter and must be counted in the summer, when thick foliage and a lack of snow create challenges to observation. In non- or sparsely-forested habitats, bears may be observed from the air, and wildlife managers are able to estimate bear populations using mark-and-resight or aerial transect techniques. In habitats too dense for aerial surveys, biologists can use bait sites surrounded with barbed wire to collect individual bears' hair for DNA analysis. Along the Upper Susitna River as well as near McGrath, biologists have experimentally removed and relocated bears, which allowed for a minimum count of bears in those areas.

6.4 Limiting Factors

Habitat

Carrying capacity is defined as the greatest number of animals that can be supported by a certain area of habitat at a given time and at a defined nutritional condition. Although this concept is easy to understand, it is very difficult to measure. Changes in forage quality, vegetative cover, winter conditions, and snow depth all influence an area's carrying capacity over time.

Habitat regulates wildlife populations because as populations grow, competition for forage increases. The declining availability of forage causes nutrition to wane, calf production to taper off, and mortality to increase. The nutritional condition of populations diminishes the closer they approach carrying capacity. This increases the vulnerability of these populations to severe winters, disease, predation, and other environmental influences. Habitat conditions play an integral role in the productivity and survival of prey populations.

Attempting to manage for the absolute highest density that can be supported may have unintended consequences, such as damage to browse species, poor body condition, risk of widespread mortality during a severe winter, or increased vehicle collision or crop damage. Managers may recommend threshold values of nutritional indices (see Section 6.5) for defining the carrying capacity, or the public may define other thresholds above which negative effects of high prey density become undesirable.

Predators

In much of Alaska, predation by wolves and bears holds moose and caribou populations well below what their habitat can support. High predation rates can keep prey populations at low densities for years, and in some cases, indefinitely. Many moose and caribou populations persist in what biologists refer to as a *low density dynamic equilibrium*, meaning both predator and prey numbers may fluctuate at low levels for indefinite periods of time.

Simply put, births and deaths regulate the number of animals on the landscape. In most of the U.S., where large predators are absent, wild caribou (which exist in very low numbers outside of Alaska) and moose are limited by habitat and commonly experience nutritional stress. In Alaska, moose populations are commonly at low population densities despite widely available forage maintained by wildland fires and floodplain disturbance. In these systems, nutrition is good and the number of calves born relative to the number of cow moose can be quite high, although survivorship is quite low because of predation. If deaths are reduced, these populations will grow and a higher number of animals will be available for harvest.

Very high rates of mortality during the first year – and especially the first few weeks – of life greatly reduce the number of calves that are “recruited” into the population; i.e., those that survive to become adults. This loss of recruitment can substantially reduce the number of moose and caribou available for harvest and restricts the population from growing larger, or may even cause it to decline. Poor recruitment of calves to adulthood can also limit sustainable harvest from moderate density populations.

Wildlife scientists can determine when predators are keeping caribou and moose at low densities relative to available forage by using information collected from various combinations of field surveys including data from aerial surveys of predators and prey, harvest reports, calf mortality studies, body condition and weight measures, and browse surveys. Reproductive rates in particular are useful indicators of prey populations’ potential for growth.

When wildlife habitat is healthy and abundant, moose and caribou are in good physical condition, and calf production is high. Biologists must understand causes of mortality if populations are unable to increase. If disease is not evident, the survival of different age classes of moose and caribou can be assessed, which can be used to indicate if wolves or bears are the primary source of predation. Bears focus predation on very young calves compared to wolves.

In some cases when moose or caribou populations have exceeded what their habitat can support, habitat can be damaged. If severe damage occurs, such as with the Nelchina basin caribou range during the late 1960s, it may take several decades for the habitat to recover. Habitat quantity and quality ultimately determine how many animals a range can support.

6.5 Monitoring Habitat and Nutrition

<u>Habitat</u>

In many other states, where large predators are absent, wild moose (and what few caribou exist outside Alaska) are limited primarily by habitat, winter conditions, vehicle collisions, hunting, and other factors. Generally, animals that are limited by habitat experience poor body condition, low reproductive rates, and higher incidence of disease and parasites. Where prey animals do not show signs of habitat limitations or limitations by other non-predation mortality factors, wildlife managers may suspect and investigate whether prey populations are primarily limited by predation.

Not all habitats are equal. Some areas are inherently more productive than others, given elevation, latitude, and geological differences. While one habitat may not be as high quality as another, it is important to distinguish this situation from habitat damaged by 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.

<u>Nutrition</u>

Wildlife managers monitor several indicators of nutritional health of moose and caribou, including:

- *Twinning Rate.* The percentage of cow moose giving birth to twins declines as the population approaches carrying capacity. Caribou do not twin.
- *Calf weight.* Poorly nourished calves, or calves conceived late in the rut, are smaller the following winter and have lower overwinter survival rates than heavier calves.
- *Forage Characteristics and Use.* More vegetation will show signs of browsing as the population approaches carrying capacity. Moderately high browsing rates on some plant species accelerates regrowth, but severe overbrowsing can actually kill plants or allow plant species less favorable as browse to dominate.
- *Age of first reproduction.* As nutritional condition declines, cow moose have their first calves later in life. For example, in areas where plenty of good food is

available, cow moose and caribou may have their first calves at two or three years of age, but where food is scarce, a majority of cow moose do not reproduce until four years of age. Annual changes in productivity resulting from fluctuating nutritional status are common in caribou, resulting in fluctuations in the proportion of three-year-old cows that have calves.

- *Pregnancy rate.* The percent of females that are pregnant each year is related to nutritional condition of the population during the previous autumn. Predation on last year's calves can reduce over-winter lactation demands resulting in increased pregnancy rates the following fall. Under excellent nutritional conditions, caribou cows can have calves every year and the majority of reproducing cow moose can have twins. Poorly nourished caribou cows often skip a year between pregnancies, and fewer than 10% of poorly nourished moose cows have twin calves.
- *Sources of Mortality.* The percent of moose that die for reasons unrelated to predation or harvest (e.g., disease, malnourishment, or accidents) can increase as a population increases toward the upper limit of habitat carrying capacity.

To date, ADF&G has not identified any Alaska moose populations that have been limited at low densities by poor nutritional status.

6.6 Habitat Enhancement

Rejuvenation of moose winter forage has been accomplished at the landscape scale by working with landowners and managers to allow wildland fire to cycle nutrients and regenerate shrubs and young deciduous trees. However, benefits gained through wildland fire are unpredictable because of the uncertainty of when and where fires will take place. Large prescribed fires have been accomplished, but they are becoming increasingly unpopular with the public, especially near urban interface areas, where there is strong aversion to smoke. Mechanical treatments (e.g., bulldozers) can crush or shear decadent forage species, which stimulates growth of new forage. Mechanical techniques are expensive and inherently limited to small, localized areas, and logging operations are presently small and limited to areas adjacent to the road system in Interior and southcentral Alaska.

6.7 Predator Control as a Management Tool

When conventional hunting and trapping prove insufficient to keep predator populations within management objectives, predator control may be the only practical means of changing this situation. When nutritional condition of moose or caribou is adequate, reducing predation by wolves and/or bears can improve survival of both calves and adult prey to increase population numbers or harvest by hunters.

If prey numbers fall to very low levels, reductions in predation and harvest must be more dramatic. When implemented in a timely manner, predator control can result in shorter-term programs where prey numbers are stabilized and improved more quickly and efficiently. In such cases, the age and sex structure of prey populations can be maintained at optimum ratios of young to adults. When populations boom and crash, age structures can become skewed, and create difficult management situations long into the future. Harvest regulations also change regularly as the sustainable harvest numbers fluctuate year to year. Predator control programs are designed to maintain stability of elevated harvests while maintaining viable numbers of prey and predators alike.

In control programs, predators are reduced in number but never permanently eliminated from any area; viable populations of predators are a requirement of law. The long-term goal of a successful program is increased prey density, increased harvest, and stable populations of predators. Biologists determine the level of predator removal needed to allow growth of prey populations. Biologists determine predator population objectives for areas that can achieve desired levels of harvest. Intensive management efforts, including predator control, focus on achieving those objectives.

Past wolf control efforts have involved ADF&G staff or members of the public. Current programs allow public permittees to remove a specific number of wolves using land-and-shoot or aerial shooting techniques in designated areas as part of predator control programs. Shooting from aircraft is a federal offense for hunters, and state law prohibits hunters from landing and shooting animals the same day they have been airborne. However, these methods are allowed for permittees involved with predator control programs. Similarly, bear control programs may, in some cases, allow permittees to sell bear hides or set bait stations for grizzly bears in control areas. These activities are prohibited under hunting regulations.

When members of the public participate in control programs, their activities are monitored under a permit system. Wolves killed must be reported promptly, and ADF&G requires permittees to report numbers, colors, and locations of all wolf packs and individual wolves seen or taken.

There is no indication from available scientific data that state-sponsored wolf or bear control programs have permanently adversely affected the persistence or ability of wolf or bear populations to recover following control on either a statewide or local basis. Not all public proposals for predator control are approved for implementation. To date, more proposals have been rejected by the board than approved.

6.8 Can Predator Control Work?

When applied under appropriate conditions, predator control can provide the opportunity for people to increase their harvest of moose and caribou. Predator control has been used in a few areas of Alaska and elsewhere to effectively reverse or stabilize declining moose or caribou populations, increase the numbers and/or densities of prey animals, and increase harvest of moose and caribou. Habitat quality, weather conditions, the mix and movement of predators, human access, management costs, and land ownership can all contribute to or detract from the success of control programs. The response of prey to control efforts depends on many factors, and in some cases, several years of predator reductions. Several studies specifically note reduced hunting and favorable weather during and immediately after predator control as contributors to successful programs.

Moose and caribou population and harvest objectives are usually not met if programs are interrupted or applied sporadically or incompletely.

Predator control programs can be effective when:

- *Predation is a limiting factor of prey abundance and survival.*
- *Significant predation is controlled.* Where more than one predator is responsible for significant levels of mortality on a moose or caribou population (i.e., wolves and bears), reductions in only a single predator such as wolves will be less effective than reductions in both predators.
- *Predators are reduced for sufficient time.* A program must exert sufficient influence long enough to allow increases in calf survival over several years. The sooner prey declines are addressed, the sooner intensive management can be successful. Waiting until a “biological emergency” exists requires the most drastic and intensive predator control.
- *Habitat is sufficient to support more prey.* Forage must be able to support higher numbers of prey, and snow must be shallow enough to allow access to the forage. Food, space, cover, and arrangement of habitat resources must be adequate to support the population and harvest objectives. The history of natural disturbances (e.g., fire and flooding) and management of each area is important in understanding and determining how many animals a particular area can support.
- *Control is conducted in sufficient area.* Experience gained from successful predator control programs suggests control areas should be at least 10,000 square kilometers (3,861 mi^2) in size to both account for prey movements and dispersal and to reduce the effect of immigration of predators from adjacent areas. Wolves especially have very high dispersal rates and can quickly re-populate areas having low numbers of wolves as prey populations increase.
- *Harvest of prey by hunters is limited.* Harvest of the prey population, including subsistence harvest, must not be excessive and may be reduced or, in extreme situations, even eliminated during a control program. Typically, before predator control is implemented, harvest is severely restricted and often limited to subsistence only.

6.9 Numbers of Predators Removed

The numbers of predators that must be removed to achieve program objectives is unique to each area. Not all areas have the same suite of predators and prey. For example, GMU 13 contains moose, caribou, wolves, brown bears, and black bears, with limited availability of salmon, whereas GMU 16 includes moose but relatively few caribou, wolves, more brown bears, more black bears, and abundant salmon (which are important food for predators). Further, availability and quality of forage differs by area and species (i.e., more calves may be born in one population than another), creating a better situation for population recovery. General reduction targets are not simply applied across the state but are specifically designed for each situation.

Several published studies report increases in prey numbers in Alaska and the Yukon after wolf control occurred that reduced wolf numbers to at least 55% or less of their pre-control numbers for at least four years. Wolf fecundity increases in response to control efforts as well. For example, in GMU 13 from 1989 to 1999, normal, regulated hunting and trapping removed only 20-50% of the wolves annually. While that may appear high, given the dispersal, reproduction, and harvest patterns of wolves in this area, the GMU 13 wolf population actually increased to an all-time high during this period.

In some cases, there are enough historical data on predator and prey populations to demonstrate the reduced level at which wolf populations will allow moose and caribou populations to increase. In other areas, this level of information is lacking, requiring less specific, more generalized approaches in the implementation of predator control. Given changing wildlife productivity, as well as changing access and the ability of regulated hunters and trappers to remove predators in specific areas, each situation must be carefully reviewed before intensive management programs are implemented.

6.10 Duration of Control

The duration of intensive predator control programs needed to achieve success depends on specific situations. Intensive, short-term wolf control cannot be reasonably expected to initiate a successful, sustainable, long-term increase in harvest of moose or caribou. Calf survival must be protected for at least three to four years until the calves are old enough to produce calves of their own. The National Research Council’s (NRC) 1997 review of predator control programs in Alaska and Yukon found that successful programs lasted at least four years.

Wolf control is stopped when prey populations and/or harvest objectives are reached. After control has been terminated, long-term, sustained harvest of wolves and bears usually remains necessary to sustain the higher prey populations. If moose or caribou populations are increased, those populations constitute not only increased harvesting opportunity for hunters, but also an increased source of food for predators, whose populations will predictably tend to increase in size in response to greater food availability.

Therefore, harvest of wolves and bears – through traditional hunting and trapping or other means – must limit the natural growth of predator populations, which would otherwise normally return the predator-prey situation to the same low density dynamic equilibrium condition that existed before the control program was initiated. Efforts by the public or possibly periodic, short-term secondary predator control will sometimes be a necessary part of overall, intensive management programs designed to increase harvests of moose and caribou.

6.11 Alternatives to Lethal Predator Control

Non-lethal methods have been effective in reducing predation on moose and caribou. However, some of these methods tend to be very expensive or logistically impractical, except in relatively small areas. Although these methods have the potential to be relatively efficient, effective, and easy to monitor in some situations, they often are difficult to implement on a geographic scale large enough to be effective in most intensive management situations. However, these non-lethal methods will continue to be considered in Alaska's predator control programs on a case-by-case basis to determine if they are applicable in specific situations.

The following methods have been applied in Alaska:

- ***Surgical sterilization/relocation.*** In GMU 20E (Fortymile drainage), surgical sterilization of primary male and female wolves in 15 packs prevented pairs from producing pups; yet the pairs continued to defend their territories against incursions by other wolves. In addition, all other subordinate wolves in these targeted packs were removed either through live-capture and release at remote sites or by public trapping and hunting. This reduced the number of wolves in the vicinity of caribou calving grounds, which reduced the amount of predation on caribou calves. This program was relatively expensive, and it was difficult to find release sites acceptable to the public for the wolves that were live-captured and removed from the control area. Public concerns arose about translocated wolves causing predation problems in the areas where they were released.
- ***Diversionary feeding.*** In GMUs 20D (Delta) and 20E, studies have demonstrated that providing wolves and bears with alternate sources of food during the moose calving season produced an increase in moose calf survival to early winter. Reduction in predation stops as soon as the diversionary feeding is discontinued. This technique is cost prohibitive for large scale efforts.
- ***Predator relocation.*** In GMUs 13B, 13E, and 19D, capturing and relocating grizzly and/or black bears has resulted in substantial reductions in moose calf mortality. Two studies were conducted primarily to document the response of moose populations – specifically calf moose survivorship – to reductions in bear predation. These projects were not conducted as routine management techniques, or with an expectation that they would become routine efforts. These projects were expensive, logistically difficult, and unpopular with residents who lived in or had an interest in the localities where the bears were released. Also, bears have a strong tendency to return to their original locations, even over great distances, and may require additional translocations. Relocation of wolves has proven ineffective because wolves quickly return to their original home ranges. In addition, there are no areas of wolf habitat that need additional wolves.

7.0 PREDATOR MANAGEMENT RESULTS

7.1 Pre-statehood Efforts

In several areas, including GMU 13, extensive aerial shooting and poisoning through the late 1940s and early 1950s reduced wolf numbers dramatically. Poisoning likely reduced numbers of many non-target species as well, including black bears, brown bears, coyotes, wolverines, and eagles. Predator numbers were driven to the lowest recorded levels during this early period.

Large scale killing of predators allowed prey numbers to increase, often to levels their habitat could not support. Many moose and caribou populations responded by growing rapidly and reaching historic high levels in the 1960s. The Nelchina caribou herd reached an all-time high and severely damaged its available habitat. Habitat degradation, severe winters, and over-harvest then combined to cause a large scale crash in the herd. Both moose and caribou in that area fell to very low numbers and it has taken decades for those populations to return to levels approaching those appropriate for the available habitat.

7.2 Post-statehood Efforts

After statehood, different intensive management techniques were tested or used routinely, including relocating brown bears from the Upper Susitna River in GMU 13, diversionary feeding trials for bears in GMUs 13, 20D, and 20E, sterilization of wolves in GMU 20E, and several same-day-airborne and aerial shooting programs to remove wolves. With each effort, ADF&G biologists learned valuable insights about when and where predator control could be used, and what results could be expected in various situations.

The most intensively managed area for moose was the Tanana Flats and Alaska Range foothills south of Fairbanks (GMU 20A), which had predator control programs during 1976-82 (for moose) and 1993-94 (for caribou) and has sustained a relatively high harvest of wolves by hunters and trappers. This area now supports the highest moose density and harvest density in the state for any equal-sized unsettled area, yet predators kill an estimated four times as many moose as do hunters.

7.3 Status of Current Programs

Predator control programs are presently employed on about 9% of Alaska's total land area. There is no indication from available scientific data that state-sponsored wolf or bear control programs have permanently adversely affected the long-term viability of wolf or bear populations on either a statewide or local basis. Wolf and bear populations have maintained their ability to increase after control programs end, even with continued public hunting and trapping.

Presently active wolf control programs are in relatively early stages, and results thus far show trends similar to results experienced in previous programs that successfully increased prey numbers or hunter harvests. Thus far, public participation in bear control areas has been low, and none have shown conclusive results. Bear control programs conducted by the public are relatively new, and it remains to be demonstrated whether the methods allowed thus far for taking bears in these programs will be successful. Additional methods for taking bears may be necessary to make these programs successful.

Status reports for current control programs include the following, with intensive management population and harvest objectives in 5 AAC 92.108 except as noted:

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

Control Area Size: 15,413 mi^2

Control Program Goal: Initiate an increase to the intensive management population objective for these four subunits of 16,400 – 20,000 moose and intensive management harvest objective of 975 – 1,990 moose.

Control Method(s): Public hunting and trapping of wolves and hunting of bears, aerial shooting, and land-and-shoot take of wolves by permittees.

Status: Active

Within the Upper Susitna River (a portion of GMUs 13B and 13E) from 1976-1978, wolves were reduced by 40-60% as part of a multi-year research program to measure effects of brown bear and wolf predation on calf moose. After wolf removal ended, a large proportion of the brown bears were relocated out of the area. Calf survival increased immediately after bear removal, but dropped to pre-relocation levels once bears returned to the area. While attempts were made to liberalize brown bear hunting regulations at the time, harvest regulations and bag limits were conservative compared to current regulations.

Following these experiments, wolf management across GMU 13 kept pressure on wolves. Between 1977 and 1987, the spring wolf estimate averaged 147. While aerial shooting of wolves was prohibited without a permit after 1971, many wolves were harvested by the land-and-shoot method during this period under general hunting and trapping regulations. During the same period, moose numbers within long-term trend count areas covering some 3,500 mi^2 increased 9% annually, almost doubling in size in the ten-year period.

When land-and-shoot was eliminated as a legal method of take under hunting/trapping regulations in 1988, conventional shooting, trapping, and snaring became the only methods by which to manage wolves in GMU 13. While land-and-shoot activities were permitted for two years, 1990-1991, the efforts were too short-lived to have much of an impact on wolf numbers. The wolf population began to grow, and by 1999 and 2000, the population had reached an all-time high (both years the fall estimate was 520 wolves, spring estimates were 300 and 270, respectively). Moose numbers during the same period declined as well; numbers within long-term trend count areas declined by nearly 4% annually to nearly half of their former numbers.

In 2000, an intensive wolf management plan was adopted for GMU 13; the use of snowmachines was liberalized for the taking of wolves at that time, and the same-day-airborne taking of wolves began in January 2004. Between 2000 and 2006, the wolf population was reduced across the intensive management portion of GMU 13 (13A, 13B, 13C, and 13E). Trapping and hunting accounted for nearly 50% of the unit-wide annual wolf take, whereas same-day-airborne take was responsible for the other half. The number of wolves taken same-day-airborne in GMU 13 has averaged 71 annually. From 2000 to 2006, total moose numbers in long-term trend count areas are up 14%, or about 2% per year; calf numbers increased 110%; yearling bulls increased 176%; total bulls increased 45%; and cows decreased 3%. The current spring wolf population objective for GMU 13 is 135-165, based largely on previous predator/prey dynamics within this area. The wolf population was within that range during spring 2006. ADF&G issued an emergency order April 11, 2007 to close the control program to prevent reduction of the wolf population below the mandated objectives.

While no intensive bear management program has been implemented for GMU 13, brown bears have been identified as significant predators of moose calves in that unit. As a result, hunting regulations have been increasingly liberalized over time. Results of these changes are currently being analyzed.

<u>Cook Inlet (GMUs 16A and 16B) (wolf and bear control)</u>

Control Area Size: 11,105 mi^2

Control Program Goal: Initiate an increase to the intensive management population objective for these two subunits of 10,000 – 11,500 moose and intensive management harvest objective of 500 – 960 moose.

Control Method(s): Public hunting and trapping of wolves and hunting of bears, aerial shooting, and land-and-shoot take of wolves by permittees.

Status: Active

In 2004, when aerial wolf control began in GMU 16B, biologists estimated the unit population at about 200 wolves. The spring 2007 population was estimated at between 45 and 95 animals, for a total reduction of between 53 and 78%. Overwinter survival of moose calves was very high. However, spring to fall survival of newborn calves remained low at about 18%. To reduce predation on newborn calves, the brown bear season was liberalized from a take of one bear every four years to one bear per year beginning in fall 2001, and two brown bears per year beginning in fall 2005. Despite a year-round hunting season and a three bear limit, black bears remain abundant in GMU 16B. In July 2007, ADF&G initiated a black bear control program in 16B, allowing permitted participants to take an unlimited number of black bears of any age.

<u>Middle Kuskokwim/Aniak (GMU 19A) (wolf control)</u>

Control Area Size: 9,969 mi^2. Since control does not occur on federal wildlife refuge lands or on private lands posted against trespass, 9,368 mi^2 of the control area are open to wolf control.

Control Program Goal: Initiate an increase to the intensive management population objective of 7,600–9,300 moose and intensive management harvest objective of 400–550 moose for this unit [5 AAC 92.125(e)(1)(A)(viii)].

Control Method(s): Public hunting and trapping of wolves and hunting of bears, aerial shooting, and land-and-shoot take of wolves by permittees, sale of black bear hides and skulls by permittees.

Status: Active

The five-year wolf control implementation plan, adopted by the board in March 2004 for the Central Kuskokwim, originally consisted of Units 19A and 19B and was initiated in July 2004. The plan was subsequently modified in January 2006 to include only Unit 19A.

During the 2004–2005 regulatory year, 42 wolves were taken same-day-airborne and 71 wolves were reported by all methods. During 2005–2006, 46 wolves were taken same-day-airborne and 76 wolves were reported by all methods. ADF&G issued an emergency order on April 3, 2006 to close the control program as well as hunting and trapping seasons to prevent a reduction of the wolf population below the mandated objectives. During 2006–2007, 7 wolves were taken same-day-airborne and 10 wolves were reported taken by all methods. The low wolf take in 2006–2007 resulted from poor snow conditions unsuitable for effectively tracking wolves.

Surveys conducted during January and March 2006 indicated 114–120 wolves inhabited Unit 19A. Largely based on these data, the board reduced the post-control wolf population objective from 40–53 to no fewer than 30 wolves during their May 2006 meeting.

During 2005–2006, 65% of the wolf population in 19A was taken by all methods. However, the distribution of this take was not uniform throughout the area. During 2004–2005 and 2005–2006, over 70% of the wolves in the lower Holitna, Hoholitna, and Stony River drainages were removed. Removal rates in other portions of Unit 19A were much lower, and probably had minimal effect in reducing predation on moose. Although snow conditions in the Aniak River drainage were not conducive to the use of airplanes to take wolves during 2004–2006, snow events in most winters are sufficient for aerial tracking purposes. Elsewhere in Unit 19A, topography, trees, typical wind and snow conditions, and other factors make it difficult to take wolves using fixed wing aircraft.

In fall 2004, a moose density estimate of 0.19 observable moose/mi^2 was measured in Unit 19A south of the Kuskokwim. The most recent density estimate, obtained in March 2006 in the western portion of Unit 19A south of the Kuskokwim River, was 0.38 observable moose/ mi^2. No density estimates were obtained during winter 2006–2007 because of poor survey conditions.

During May 2007 a moose calf twinning survey in the Holitna and Hoholitna River drainages within 19A showed a 64% twinning rate. Furthermore, the data recorded on sex and age of observed moose suggested 31% yearlings, 62 calves:100 cows, and 26 bulls:100 cows. Although these observations suggest the beginning of moose population growth and excellent nutritional status, the sample size was too small to make conclusive statements. Biologists were unable to obtain sample sizes sufficient for analysis elsewhere in Unit 19A.

<u>Middle Kuskokwim/McGrath (GMU 19D East) (wolf and bear control)</u>

Control Area Size: 8,513 mi^2 (of this area, 6,245 mi^2 are active).

Control Program Goal: Initiate an increase to the intensive management population objective of 6,000 – 8,000 moose and intensive management harvest objective of 400 – 600 moose.

Control Method(s): Public hunting and trapping of wolves and hunting of bears, aerial shooting, land-and-shoot take of wolves by permittees, and ADF&G relocation of brown bears, hunting black bears over bait, same day airborne by permittees, sale of black bear and grizzly bear hides or skulls by permittees.

Status: Active

Research on the effects of predation on moose in the McGrath area began during spring 2001. Results from that research indicated that habitat is not limiting moose population growth and both bears and wolves were significant predators of moose in the McGrath area. Therefore, during the springs of 2003 and 2004, ADF&G staff removed 115 black bears and 10 grizzly bears from a 528 mi^2 area surrounding McGrath – the "Experimental Micromanagement Area" (EMMA). This removal represented at least a 70% reduction in the bear population for that area. In addition, starting in late winter 2004, a wolf control effort employing aerial shooting was initiated in the same area and remained in effect during the winters of 2004-2005 and 2005-2006. Wolf surveys conducted during spring suggest the wolf population within the area was about 75% lower as a result of the program.

ADF&G continued the basic research program that was initiated in the spring of 2001 during the predator removals, and it is that research project that provided insights into the effectiveness of removing predators in the McGrath area to increase moose numbers. During 2001 and 2002, prior to removal of predators, annual moose calf survival was 33% and 27%, respectively. Following removal of predators, survival of calves was 52%, 40%, 42%, and 65%, respectively, for 2003, 2004, 2005, and 2006. Annual survival rates of yearling moose also increased following removal of predators with 83%, 74%, 75%, 94%, 96%, and 85% surviving in 2001 thru 2006, respectively. Annual survival of adult moose followed the same basic pattern of increase following removal of predators with 86%, 89%, 95%, 100%, 98%, and 98% surviving in 2001 thru 2006, respectively. In addition, moose surveys conducted in the McGrath predator removal area indicated the moose population in the area had grown from 524 moose in 2001 to 691 moose in 2006, representing an approximately 30% increase in the moose population. By request of the McGrath Advisory Committee, moose harvest in the EMMA has been voluntarily suspended during the control program.

<u>Upper Yukon/Tanana basin (GMUs 12, 20B, 20D, 20E, and 25C) (wolf and bear control)</u>

Control Area Size: 18,745 mi^2. To avoid federal wildlife refuge lands, 15,949 mi^2 are open to wolf control and 4,050 mi^2 are open to grizzly bear control.

Control Program Goals: Initiate increases to: 1) the Unit 12/20E portion of the intensive management population objective of 8,744 – 11,116 moose and intensive management harvest objective of 547 – 1,084 moose [5 AAC 92.125(b)(1)(A)(xv)]; and 2) the Fortymile caribou herd intensive management population objective of 50,000 – 100,000 caribou and the intensive management harvest objective of 1,000 – 15,000 caribou.

Control Method(s): Public hunting and trapping of wolves and hunting of bears, aerial shooting, and land-and-shoot take of wolves by permittees, hunting black bears or grizzly bears over bait in the Brown Bear Control Area, same day airborne by permittees, sale of black bear and grizzly bear hides or skulls from Brown Bear Control Area by permittees.

Status: Active

Results of research and management surveys conducted within the Upper Yukon/Tanana Predator Control Area during the past 24 years indicated wolves were the primary predators on the Fortymile caribou herd, and brown bears and wolves were the primary predators on moose in northern GMU 12 and GMU 20E. A brown bear and wolf control program was initiated in 2005, within a portion of northern GMU 12 and GMU 20E, to reduce predation on moose. In 2006, the wolf control area was expanded to include the Fortymile caribou herd's range in portions of GMUs 12, 20B, 20D, 20E and 25C, to reduce predation on the caribou herd. One hundred wolves and six brown bears have been killed under these programs since it was initiated.

Initial indications suggest moose survival and moose numbers have increased in a 2,452 mi^2 portion of southern GMU 20E, within the west Moose Survey Area (survey area). Annual reductions in the wolf population within the survey area occurred during the winters of 2004-2005 and 2005-2006 as a result of wolf kills by wolf control permittees and harvests by hunters and trappers. The late-winter estimated wolf population within the survey area during the winters of 2004–2005 and 2005–2006 was less than 50% of the pre-control estimate. Results from a 2006 brown bear population survey conducted within the survey area indicated there were fewer grizzly bears within the survey area than reported during research conducted in the 1980s. Extensive fires occurred in southern GMU 20E in 2004 and 2005, which included much of the survey area. These fires may have influenced grizzly bear distributions and may have contributed to lower than normal numbers of bears in the survey area in 2006.

The calf:cow ratios observed in the survey area during 2005 and 2006 fall moose surveys were 30 and 37 calves:100 cows compared to an average of 19 calves:100 cows (range 14-26 calves:100 cows) observed in the survey area during 1998–2004. The fall moose population estimates in the survey area were 1,435 (90% confidence interval ±22%), 1,801 (90% confidence interval ±17%) and 2,398 (90% confidence interval ±19%) during falls of 2004, 2005, and 2006, respectively. This suggested an increase in the moose population between the fall of 2004 (pre-control) and 2006.

While lower numbers of wolves within the survey area likely resulted in increase moose survival, fewer grizzly bears may have accounted for some of the observed increase in the moose calf:cow ratio and the population within the survey area in the falls of 2005 and 2006. The moose population appeared to remain stable in the remainder of GMU 20E and northern GMU 12, where annual wolf reductions did not exceed 30% of the late-winter pre-control population. Additional information is needed to accurately evaluate the effects of the predator control program on the moose population. Because the wolf control program for the Fortymile caribou herd has only been in place for one year, there are inadequate data to evaluate this portion of the program at this time.

From 1981-1984, wolf numbers were reduced in Unit 20E by 30-60%, with no discernible effect on moose calf survival. Grizzly bears killed 50% of the moose calves born in 1984.

8.0 CONCLUSIONS

- Moose, caribou, and deer provide important food for many Alaskans.

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

- The Alaska Board of Game and Alaska Department of Fish & Game are required by Alaska’s Constitution and state law to manage predators and prey for all users in Alaska.

- Intensive management statutes require the Alaska Board of Game to adopt regulations that implement programs intended to provide more prey harvesting opportunities for hunters.

- Predator control programs are designed to reduce wolf or bear populations 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 increasing moose and caribou harvests. As populations increase, ADF&G will periodically assess nutritional status to determine capability of the habitat to support increasing populations.

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

- ADF&G has collected and continues to collect data to monitor the effectiveness of bear and wolf control programs. There is still much to learn.

- Predator control programs are active on about 9% of Alaska's lands.

- There is no indication from available scientific data that state-sponsored wolf or bear control programs have permanently adversely affected the persistence of wolf or bear populations on either a statewide or local basis.

- Data from each of the five active wolf control areas are preliminary, but indicate beginnings of increased moose calf survival and population growth.

- Current bear control programs in GMUs 16, 19A, and 20E are new and thus far inconclusive; new information is being collected and evaluated.

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

- Citizen values range from rejecting manipulation of wildlife populations for human benefits, to demanding management practices allowing hunters to harvest higher percentages of wildlife populations annually. Because of these opposing public values, predator control will always be controversial.

- No single management approach can satisfy everyone; ADF&G uses different management strategies in different parts of the state to provide for different 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.

9.0 RESOURCES

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