AREA SPECIFIC WOLF MANAGEMENT PLAN

Game Management Units 11, 13, & 14

Proposed Plan

Alaska Department of Fish and Game

March 1992

STATE OF ALASKA
Walter J. Hickel, Governor

DEPARTMENT OF FISH AND GAME
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DIVISION OF WILDLIFE CONSERVATION
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9 March, 1992

Dear Wildlife Enthusiast:

Enclosed is the Alaska Department of Fish & Game recommendation to the Alaska Board of Game for the area-specific plan and zoning for Game Management Units 11, 13 and 14.

The recommended plan is the product of three months of work, including seven public meetings through the planning area.

Following a public meeting in mid-December in Anchorage, we assembled three alternatives that reflected the range of zone recommendations received from nearly two dozen people or organizations.

The alternatives represented a starting point. None was "preferred", and we made it clear that our final recommendation could include zoning not envisioned in any of the three alternatives.

Those alternatives were reviewed at public meetings in Cantwell, Talkeetna, Wasilla, Glennallen and Anchorage. Comments received at those meetings, as well as those received in our office throughout the planning process, were used to distill the three alternatives into the one you have before you.

Generally, there was strong sentiment in rural areas for aggressive wolf management while wolf protection was a higher priority in the Anchorage area.

The Board of Game has adopted a strategic wolf management plan that calls for a variety of uses, ranging from total protection to intensive management. For that reason, suggestions that the entire planning area be zoned as a 1 or a 7 were dismissed. Such blanket zoning clearly does not meet the board's intent.

Likewise, we got numerous suggestions that certain areas be zoned in ways that either are incompatible with the board's strategic plan or contrary to federal law. In those cases, we adhered to the strategic plan and the applicable federal laws as we interpret them.

Enclosed are our recommendations for zoning specific areas, the reasons why we would zone them that way and some discussion of why we rejected other suggestions.

Underlying the entire planning process is the determination voiced by the board in the strategic plan that wolves remain viable throughout their historic ranges in Alaska. We certainly are satisfied this area-specific plan complies with that goal.

The planning process has been a learning experience for everyone involved, including our staff. As the public has raised its concerns, our thinking with regard to some of the zone definitions has evolved and it may be necessary to ask the board to fine-tune some of those definitions to fit actual situations. The suggested wording changes are incorporated in the back of this plan and were used when making the zoning recommendations contained herein.

The process has been complex and difficult. But wolf management is a complex, difficult issue and not one that lends itself to a simple solution.

This recommendation will go the Board of Game in March. As with all items before the board, there will be ample opportunity for public comment. You are welcome to submit those comments to the board in writing or to appear before the board to testify.

Your help in this process is appreciated.

David M. Johnson

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Regional Supervisor
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INTRODUCTION

The Alaska Board of Game (BOG), at its fall, 1991 meeting, adopted a strategic plan for the management of wolves in Alaska. The purposes of the strategic plan were "to help the Alaska Department of Fish and Game (ADF&G), while working with other agencies, provide for the conservation of Alaska's wolves and their prey populations" and "to establish a process to prepare and adopt measures to implement this plan consistent with Alaska's constitution and with due consideration to public review and comment."

The goals of this plan are: 1) "to ensure the long-term conservation of wolves throughout their historic range in Alaska in relation to their prey and habitat"; 2) "to provide for the broadest possible range of human uses and values of wolves and their prey populations that meet wildlife conservation principles and that reflect the public's interests" and 3) "to increase public awareness and understanding of the uses, conservation and management of wolves, their prey and habitat in Alaska."

The strategic plan is based on a zone concept to accommodate different public demands for protection and use of wolves, their prey and habitat. It outlines seven zones and specifies what activities may occur within each zone. Management activities in the zones range from total protection of wolves and their prey from hunting and trapping to high harvests of both wolves and prey.

The strategic plan specifies the preparation of **area-specific management plans**. These plans must contain specific objectives and determine the management activities that will be used to achieve those objectives. Zone boundaries and classifications are presented in the area-specific plans.

This area-specific plan includes Game Management Units (GMUs) 11, 13, and 14, all located in Southcentral Alaska. Wildlife species considered in this plan are wolves, brown/grizzly bears, and black bears (predators) and moose, caribou, Dall sheep, and mountain goats (prey).

ADF&G is also preparing an area-specific plan for GMUs 12, 20, and 25C, in the Interior. Plans for other GMUs throughout the state will be developed during upcoming years.

This proposed plan contains information on the planning area, its wildlife resources, and our recommended management zones. Initially we conducted a public workshop on December 13, 1991 to solicit zone recommendations from which we developed three alternatives. We then held public meetings to take comments and suggestions during the week of February 10-14, 1992. We also met with organizations, fish and game advisory committees, and major landowners and managers in a public workshop on March 2, 1992 at the Fairview Community Recreation Center in Anchorage to present our zone recommendations to the public, prior to the BOG meeting.

DESCRIPTION OF PLAN AREA

GMU 11 (12,872 mi^2) is comprised of the southern Wrangell Mountains, a portion of the eastern Chugach Mountains and eastern drainages of the Copper River. The Unit is dominated by the Wrangell Mountains, comprising about 80% of the total area, with peaks reaching over 16,000 ft. About 30% of the Unit is covered by glaciers and nearly 60% of the Unit is above 4,000 ft elevation with little vegetation. The valleys, foothills, and well-drained lowlands support stands of white spruce, birch, cottonwood, and aspen. Wet lowlands are forested with black spruce and have numerous ponds and muskegs.

River bars and streambeds contain extensive stands of willow and other shrubs. Dwarf birch and willow dominate the area immediately above timberline. Above the shrub zone is alpine tundra dominated by dwarf heath.

Approximately 90% of GMU 11 is within the Wrangell-St. Elias National Park and Preserve. Of land below 4,000 ft elevation (primary wildlife habitat), about 76% is within the Park and Preserve. Subsistence hunting and trapping in the Park are limited to local residents, while general hunting and trapping are allowed in the Preserve. Native conveyed lands comprise about 7% of GMU 11 while another 7% has been selected but not conveyed. About 1% of the Unit is state land and 0.5% is in non-native, private ownership. The area has few roads; only the Nabesna and McCarthy roads and some primitive mining roads penetrate the Unit. Few people actually reside in GMU 11, probably less than 200 total. McCarthy, with a population of about 25, is the largest settlement.

GMU 13 (23,376 mi^2) is generally bounded by the Alaska Range, the Talkeetna Mountains, and Chugach Mountains, and the Copper River. The Unit is essentially a large basin drained by the Matanuska, Susitna, Copper, Nenana, and Delta Rivers. About 31% of the area is above 4,000 ft. elevation and is considered to be poor year-round wildlife habitat. Habitats change from bare rock, glaciers, and snowfields in the mountains to dense spruce forests interspersed with lakes, ponds and muskegs in the lowlands. Intermediate habitats, important to wildlife, include alpine tundra and shrublands. Wildfires are a powerful mechanism in the creation and maintenance of seral vegetation important to wildlife. No major fires have occurred in GMU 13 within the last 35 years due primarily to government-sponsored fire suppression. The Unit is bisected by the trans-Alaska oil pipeline.

Major land owners/managers in GMU 13 include the State of Alaska, Bureau of Land Management, National Park Service, Matanuska-Susitna Borough and Native corporations. Denali State Park and Denali National Park comprise about 7% of the total acreage of the Unit. The human population of GMU 13 is about 2,750. Most residents (60%) live in the Glennallen-Copper Center-Kenney Lake area. While much of the area is remote and roadless, it is crossed by four major highways; the Denali, Glenn, Parks, and Richardson and is readily accessible from the major population centers in southcentral and interior Alaska. Many remote areas are accessible by all-terrain vehicles, snowmachines, or light aircraft.

GMU 14 (6,625 mi^2) includes the upper Cook Inlet area extending from the head of Turnagain Arm to Talkeetna. It is bounded by the Susitna, Talkeetna, and Chickaloon Rivers, Knik Arm, Turnagain Arm, Twentymile River, and Prince William Sound drainages. GMU 14 is subdivided into three subunits: 14A (2,561 mi^2) - the Matanuska Valley from the Knik River to Willow; 14B (2,152 mi^2) - the western Talkeetna Mountains from Willow to Talkeetna; and 14C (1,912 mi^2) - the greater Anchorage area from Knik River to Portage Creek drainage. The Unit contains portions of two mountain ranges, the Chugach and Talkeetna Mountains. Major rivers including Twentymile, Eagle, Eklutna, Knik, Matanuska, Little Susitna, Kashwitna, Talkeetna, Chickaloon, and many smaller streams, drain these mountain ranges. Valleys, foothills and well-drained lowlands support forests of white spruce, birch, aspen, and cottonwood. Wet lowlands are forested with black spruce and have numerous lakes, ponds, and muskegs. Shrublands and alpine tundra are found above timberline. Glaciers, snowfields, and bare rock dominate higher elevations in both the Chugach and Talkeetna Mountains. Logging, clearing for agriculture and other human activities have created favorable moose habitat in many areas.

Much of the land in GMU 14 was transferred to private ownership through homesteading. Other major land owners/managers are the State of Alaska including Chugach State Park, Matanuska-Susitna Borough, Municipality of Anchorage, U.S. Army and Air Force, U.S. Forest Service, and Native corporations. Unit 14 is the most highly developed and populous area of the State with about 265,000 residents, nearly half of the State's total population. Most of these, 226,000, live in the greater Anchorage area. The Matanuska-Susitna Valley is the state's agricultural center. Much of the Unit is accessible through a network of roads, however a great deal of the backcountry still might be considered wilderness.

WILDLIFE RESOURCES AND HUMAN USES

Wolves: Wolf numbers in GMU 11 were very low in the mid-1950's following an extensive, indiscriminate federal wolf control program. The population grew after conclusion of the control program in 1953, and the wolf population averaged about 100 animals, post-harvest, in recent years. This equates to a relatively high density of one wolf per 128 mi^2 or one wolf per 52 mi^2 of area below 4,000 ft. elevation. Fall population estimates have averaged about 135 wolves in recent years. Reported annual harvests have averaged 25 (range 14 to 37) wolves over the past five years with about 70% taken by trappers. Snowmachines (57%) and aircraft (25%) were the primary means of transportation for wolf hunters and trappers.

Wolves are thought to be abundant and further growth in the population probably will be limited by habitat and prey numbers. Dispersal of wolves into suitable habitat in GMU 13 where prey are more abundant is thought to occur. It is likely that wolf abundance will remain fairly high in GMU 11 in the near future as most of the area is in National Park Service ownership and wildlife will be minimally managed. It is possible that moose and caribou populations may eventually decline to low enough levels that current wolf numbers cannot be supported, however, this falls within the Park Service mandate of managing for "natural populations." The current population objective for GMU 11 is to maintain a post-hunting season population of at least 50 wolves. Currently, the GMU 11 wolf population is well above the minimum population objective.

Wolf abundance in GMU 13 was also very low in the mid-1950's because of wolf control activities. The population recovered rapidly after wolf control stopped and the season was closed. Wolf populations in Unit 13 peaked in the mid-1960s, mid-1970s, and again in the early-1990s. The population has fluctuated substantially in recent years with spring estimates ranging from 109 in 1982, to 285 in 1990. The 1991 spring estimate was 242; the fall estimate was 414. The spring estimate equates to an overall density of one wolf per 97 mi^2 or one wolf per 67 mi^2 of area below 4,000 ft. elevation. Annual wolf harvest over the past 5 years has averaged 91 (range 32 to 145) animals. Trappers reported taking an average of 36 wolves each year during the same period. Aircraft (46%) and snowmachines (31%) were the primary means of transportation for successful wolf hunters and trappers over the past five years.

Hunting and trapping has been the primary factor controlling wolf abundance in GMU 13 in recent years. Future wolf abundance will largely depend on the level of harvest by humans if prey species remain abundant. The population objective for GMU 13 is to maintain a minimum post-hunting season population of 150 wolves. Currently, the Unit 13 wolf population greatly exceeds the minimum population objective.

Wolves have not been particularly abundant in GMU 14 since the predator control programs of the late-1940s and early-1950s reduced wolf populations. Disturbance

caused by human development and increasing numbers of people living in the Anchorage area and along the highway system in the Matanuska and Susitna Valleys are probably responsible for wolf numbers remaining low in much of the area. The current estimate is 50-60 wolves in GMU 14, based on incidental observations and responses to a trapper questionnaire. This equates to an overall density of one wolf per 120 mi^2 or one wolf per 84 mi^2 for the area below 4,000 ft. elevation. Subunit 14C probably has about 20 wolves and 14A and 14B combined about 30-40. Because wolf harvest in Unit 14 is low, systematic surveys are not conducted and precise estimates are not available.

Harvests over the past five years have been low, averaging two wolves per year (range of zero to three). Trappers accounted for 56% of the harvest. Wolf hunters and trappers reported using a wide variety of transportation including aircraft, snowshoes, boats, 3-wheelers, snowmachines, ORVs, and highway vehicles.

It is unlikely wolves will ever be abundant in the Unit due to extensive human development. Existing population objectives for wolves include maintaining a post-hunting season population of 35 wolves in 14A and 14B, and 20 wolves in 14C. Currently, wolf population objectives for Unit 14 are probably being achieved.

Post-hunting wolf population estimates, management objectives, density estimates and annual harvest are shown for GMUs 11, 13, and 14 in Table 1.

TABLE 1. Post-hunting wolf population estimates, management objectives, densities and harvest in GMUs 11, 13, and 14.

Unit	Post-Hunting Population Estimate	Current Management Objective	Density*	Harvest**
11	100	50	1/52 mi^2	25
13	242	150	1/67 mi^2	91
14	50-60	55	1/84 mi^2	2

* Area below 4,000 ft elevation
** Most recent five-year average

Wolves in Alaska are subject to diseases and parasite and infestations. Most cause only minor problems, however, the ADF&G considers any disease or parasite condition serious if it measurably affects wildlife populations or human uses of those populations.

The biting louse, *Trichodectes canis*, may affect wolves in the planning area. This parasite now infests virtually all of the wolves on the western Kenai Peninsula. Small numbers of wolves emigrate from the Peninsula to other parts of the state, including the planning area. The Department will attempt to control the spread of this louse species. Management options, with the emphasis on preventing further infestations, range from live capture and treatment to killing infested wolves.

Brown Bear: GMU 11 appears to have an abundant brown bear population that is distributed throughout the Unit. Bears eat berries and salmon extensively during late-

summer and fall. Brown bears also prey upon caribou and moose, particularly calves. Overall, GMU 11 has high-quality brown bear habitat with a variety of vegetation types, large tracts of undeveloped land, low human population, and many salmon streams throughout the Unit. Most of Unit 11 brown bear habitat is within Wrangell-St. Elias National Park and Preserve where habitat loss should be minimal.

Brown bear harvests in the past five years have been low, averaging eight bears per year (range 5 to 12) comprised of 63% males. This level of harvest is not thought to have an impact on the size of the brown bear population. Harvests averaged 16 bears per year during the 1960s and 1970s prior to establishment of Wrangell-St. Elias Park and Preserve. National Park Service regulations allow only qualified subsistence hunters in the Park and aircraft may not be used. Sport hunting and aircraft access, however, are allowed in the Preserve and on other lands in Unit 11.

The brown bear population in GMU 11 is expected to remain high because management intensity and harvests are expected to remain low and habitat is protected. The current management objective is to maintain a population that will sustain an annual harvest of 25 bears comprised of at least 50% males. Although the percent males in the harvest well exceeds the minimum harvest objective, we are unable to determine if a sustained harvest of 25 bears could be maintained.

Brown bears in GMU 13 were probably reduced to low numbers by the mid-1950s, a result of a Federal wolf control program that included the use of nonselective poison baits. When the use of poison baits was discontinued, the population recovered and brown bears were considered numerous by the mid-to-late-1970s. During this period, the brown bear population in Unit 13 was approximately 1,500 bears. Population growth ceased about 1980, as bear hunting increased. Since 1980, evidence suggests bear numbers have declined in the more accessible, heavily-hunted portions of the Unit. It now appears there are about 1,200 bears in GMU 13. Bears have access to salmon in portions of the Unit, however, most rely on berries and other vegetation, as well as killing moose and caribou, and scavenging carcasses for food.

Average annual harvests for the periods 1961-69, 1970-79, and 1980-90 were 39, 58, and 99 brown bears, respectively. Exceptionally high harvests averaging 133 (range 128 to 137) occurred between 1983 and 1986, when seasons were lengthened and the bag limit was increased to one bear every year. More restrictive hunting regulations between 1987 and 1990, lowered the average annual harvest to 83 (range 73 to 98) bears. At the current population level, the annual sustainable harvest of brown bears in GMU 13 is 70 bears. If the harvest remains above this level, the population will most likely continue to decline.

There are a substantial number of remote mines, cabins, and homesites in GMU 13. Residents of these sites occasionally experience conflicts with bears and some animals are killed in defense of life and property. Problems often occur because of improper garbage disposal and food storage. These encounters have developed into a substantial mortality factor for bear populations associated with these sites. Continuing settlement of rural areas in GMU 13 is expected to affect the brown bear population negatively.

The current management objective for the Unit is to maintain a population of 1,200 bears that will sustain a harvest composed of at least 50% males. The annual sustainable harvest level has been exceeded in recent years, however, the population is probably near the management objective.

Brown bear distribution and abundance in GMU 14 has been adversely affected by urbanization, agricultural development, and remote settlement. Much of the brown bear habitat in Unit 14, including many salmon streams, has been degraded by human development and activity. While brown bears are abundant in remote portions of the Unit, they are only occasionally seen in the more populated regions. Estimates are between 150 and 200 bears in GMU 14A and 14B. A conservative estimate for Subunit 14C is 30-40 bears, based on observations during sheep and goat surveys.

The average annual harvest in GMU 14 over the past five years was 12 bears (range 9 to 15). Much of Subunit 14C is closed to brown bear hunting.

Brown bears will likely persist in GMU 14 as long as there are large undeveloped areas such as Chugach State Park and portions of the Talkeetna and Chugach Mountain ranges. However, brown bears will become less abundant as the human population increases. Humans are often intolerant of brown bears in urban areas and see them as a threat. The existing management objective for GMU 14 is to maintain a population of 160 brown bears with a sex and age structure that will sustain a harvest comprised of at least 60% males. This objective is being met.

Brown bear population estimates and annual harvest are shown for GMUs 11, 13, and 14 in Table 2.

TABLE 2. Summary of brown bear populations and harvest summaries in GMUs 11, 13, and 14.

Unit	Population Estimate	Annual Harvest*	Percent Males*
11	N/A	8	63%
13	1,200	94	56%
14	150-200	12	58%

* Most recent five-year average

Black Bear: Black bears are numerous in those portions of GMU 11 where suitable forested habitat occur. The lower Chitina River valley, where salmon are available, appears to be particularly favorable habitat with high bear densities. The majority of the bear habitat is in protective land status and should benefit bear populations in the future.

Hunters killed 14 black bears (64% males) during the 1990-91 season, four more than the 5-year average of 10 bears a year (range 7 to 14). Males averaged 71% of the harvest during the past five years. Much of the Unit is open to general hunting, only subsistence hunting is allowed in Wrangell-St. Elias National Park. Access by aircraft is not permitted in the Park but is within the Preserve. The current management objective for GMU 11 is to maintain black bear populations at the 1987-88 level with a sex and age structure that will sustain a harvest composed of at least 60% males. The proportion of males in the harvest has met or exceeded the management objective in recent years.

Black bears occur in moderate numbers in those areas of GMU 13 that have suitable forested habitat. The majority of prime black bear habitat occurs in Subunits 13D and 13E.

Hunters reported killing 88 black bears (80% male) in the 1990-91 season. Average annual harvests, however, have increased from 62 between 1970-79, to 80 between 1981-90. The average annual harvest for the past five years was 78 animals (range 64 to 88). The percentage of males in the harvest has averaged over 65% in the past five years. Subunits 13D and 13E account for 88% of the Unit harvests. No changes in abundance are anticipated in GMU 13. The existing management objective for GMU 13 is to maintain black bear populations at the 1987-88 level with a sex and age structure that will sustain a harvest composed of at least 60% males. The percentage of males in the harvest meets or exceeds the management objective.

Black bears are a common species throughout GMU 14. They tolerate humans and development more readily than brown bears. There are an estimated 1,200 black bears in the Unit with the largest number occurring in Subunit 14A. Black bears are usually found in forested habitat although they sometimes utilize subalpine areas, particularly during late-summer and fall.

The average annual harvest for the past five-years is 107 bears (range 72 to 133), about 60% of the harvest occurs in 14A and 20% each in 14B and 14C. There is concern that harvests, particularly in 14A, are approaching sustainable yield and it may be necessary to impose more restrictive seasons and bag limits and/or hunting means. If this is not done, numbers could decline. Management objectives for GMU 14 are to maintain a black bear population that will sustain a three-year average annual harvest of 100 black bears composed of at least 60% males. The percentage of males in the harvest currently meets or exceeds the management objective.

Caribou: The Mentasta Caribou Herd calves, summers, and often winters in GMU 11, largely in Wrangell-St. Elias National Park and Preserve. The core range of the Mentasta Herd is the western flank of Mount Sanford between the Sanford River and Drop Creek, where most calving occurs. During the past several years, the herd has wintered north of the Mentasta Mountains in GMU 12. Historically, this is a small herd that reached peak size, about 3,150, in the mid-1980s. Since then calf survival has been poor and the herd has declined in size. The herd was estimated to be 1,938 caribou in 1991. Calf recruitment was at an all time low with calves comprising only 1.5% of the herd in October 1991. Relatively high densities of predators (wolves and brown bears) may be one cause of chronically poor calf survival. The nearly complete failure of the 1991 calf crop may have been related to the dry summer of 1990, resulting in poor physical condition of females.

The Mentasta Herd is harvested in a federally administered subsistence hunt in GMU 11. The state hunt in GMU 11 was cancelled in 1990, in response to declining herd size and low recruitment. A few Mentasta caribou are killed incidentally in state and federal hunts targeted at abundant Nelchina caribou in GMU 12 during winter. In 1991, the harvest quota for Mentasta caribou was 50 bulls. The average annual harvest between 1983 and 1989 was 85 caribou (range 45 to 119).

We do not fully understand the causes of the Mentasta Herd decline but suspect it is partially associated with high predator densities. Until the declining trend reverses, harvests should be limited to a very small number of bulls. The current population objective for this herd is to maintain a minimum overwinter population of 2,500 adults with a minimum post-hunting season sex ratio of 35 bulls:100 cows. Herd size is below

the population objective. It may be that our current population objective is unrealistic considering the National Park Service mandate of managing for "natural populations."

The Nelchina Caribou Herd calves and summers in GMU 13 although a few animals range into GMU 14B. Nelchina animals winter in Units 11, 12, 13, and 14. Most of the herd wintered in GMU 12 during the past two years. The core of the Nelchina range is the foothills of the northeastern Talkeetna Mountains between Tsisi Creek and the Little Oshetna River, where most calving occurs. The Nelchina is a medium-sized herd that has ranged between 10,000 and 71,000 caribou over the past 30 years. The herd reached peak size in the early to mid-1960s and then declined to 10,000 animals in the early-1970s. Since then the herd has steadily grown to its current size of 45,000 caribou, because of high recruitment. During fall counts calves have averaged 22% of the herd, over the past 10 years.

The Nelchina Herd has been particularly important to hunters and wildlife viewers because of its accessibility and proximity to Anchorage and Fairbanks. Between 1954 and 1991 about 116,000 animals were killed by hunters. Over the past five years the average annual harvest has been 1,873 animals (range 958 to 3020). Nelchina caribou are currently harvested in state and federal hunts in both Units 12 and 13. Small numbers are also taken when Nelchina animals migrate into Canada. The recommended harvest quota for regulatory year 1992-93 is 5,000 caribou. There is concern nutritional constraints will affect population dynamics of the herd if it becomes too large. Although a few Nelchina caribou range into GMU 14A and occasionally into 14C, caribou hunting is not allowed in these Subunits. The current population objective for the herd is 30,000 adult caribou or approximately 40,000 total animals with a post-hunting season sex ratio of 35 bulls:100 cows. The herd size and bull:cow ratio presently exceed population objectives.

Caribou population estimates and annual harvests are shown for the Nelchina and Mentasta Caribou Herds in Table 3.

TABLE 3. Summary of caribou populations and harvest in the Mentasta and Nelchina herds.

Herd	Population Estimate	Annual Harvest*
Mentasta	1,938	83/yr
Nelchina	45,000	1,873/yr

* Most recent five-year average

Moose: Moose habitat in GMU 11 is quite limited. Only 41% (5,220 mi^2) of the Unit is below 4,000 ft. elevation. While accurate estimates are not available, an estimated 2,000 moose inhabit GMU 11. This equates to an overall density of 0.15 moose per mi^2 or 0.4 moose per mi^2 of area below 4,000 ft. Compared to other areas in southcentral Alaska this is a low density moose population. Moose numbers peaked in GMU 11 in the early-1960s following Federal wolf control programs. Moose numbers declined through 1979, then increased until the late-1980s. Since then, moose numbers have been stable or have declined slightly. Calf survival over the past 10 years has been low with an average

of 10% calves in the fall population. This may reflect high predator abundance in the Unit although severe winters in the late-1980s may have had an effect.

Moose in GMU 11 are harvested in both a federal subsistence season and a state general season. Annual harvests averaged 41 (range 32 to 58) bulls between 1986 and 1990. We do not know if the moose population will increase if winter weather is favorable or if predation will limit population growth. The harvest should be limited to a few bulls considering the poor recruitment and low population density. The current population objective for moose in Unit 11 is to achieve and maintain the population at the 1987-88 level (about 2,200), with a post-hunting season sex ratio of 15 adult bulls:100 cows. Moose populations in the Unit appear to be below the population objective.

There are about 22,000 moose in Unit 13; an overall density of 0.9 moose per mi^2 or a density of 1.4 moose per mi^2 of area below 4,000 ft. elevation. This is a high-density moose population. Moose numbers in GMU 13 increased during the 1950s and peaked in the mid-1960s following wolf control. This was followed by a decline that continued through 1975. Moose numbers then increased until 1987 or 1988 when severe winters and high wolf densities contributed to another decline. Moose populations now appear comparable to levels observed in the early-1980s. Calf survival for the 10-year period, 1979-88, was reasonably high with calves averaging 18% of the fall population. Concurrent with increasing wolf numbers and severe winter weather, calf survival declined to 13% of the fall population from 1989 through 1991. Substantial additional mortality of calves occurred during winter throughout this period. During the past five years, the post-season sex ratio of adult bulls (> two years old):100 cows has averaged over 17% (range 15 to 20).

Annual moose harvests averaged 1,011 (range 521 to 1,259) for the five year period 1986-90, approximately 12% of the statewide total. During the past two years (1990-91) moose harvests have ranged between 500 and 600 animals, the result of more restrictive seasons that were mandated by low recruitment and declining moose numbers. It is unclear what to expect in the near future for the GMU 13 moose population. If wolf numbers are reduced and winter severity decreases, the population could recover to 1988 levels within several years. Current moose population objectives in GMU 13 are to maintain the population at the 1987-88 level (about 25,000), with a post-hunting season sex ratio of 15 adult bulls:100 cows. Moose population size in Unit 13 is currently below the management objective.

Moose are an important species in GMU 14, approximately 9,800 moose occur in the Unit. Overall density for the Unit is 1.5 moose per mi^2. Densities are high, particularly in Subunit 14A (see Table 4). Moose numbers in the Unit were high in the late-1960s and then abruptly declined in the early-1970s, the result of two severe winters and large harvests. Populations gradually recovered, although deep snow in 1984-85 may have slightly reduced numbers. The winter of 1989-90 was especially severe, particularly in the northern portion of the Unit, moose numbers were reduced by about one-third in Subunit 14B. Moose populations in Subunits 14A and 14C were not as severely affected, being reduced by 10-20%. Calf recruitment has been exceptionally good in Subunit 14A where calves have averaged about 26% of the fall population. Since 1985, calves have averaged 16% and 23% of the fall population in 14B and 14C, respectively.

Since 1986 annual harvests in GMU 14 have averaged 862 (range 432 to 1,059) moose, 22% of the harvest were comprised of females. This is approximately 12% of the statewide harvest. Only Units 13 and 20 have consistently produced comparable moose harvests.

Mortality factors that appear to limit GMU 14 moose populations include severe winter weather, highway and railroad mortality, and hunter harvests. Loss of habitat is also an important population factor as the Unit continues to be developed.

It is anticipated moose numbers will increase substantially in Subunit 14B given mild winter weather conditions. Large increases are not expected in Units 14A and 14C because moose populations are currently at high densities. Population objectives for GMU 14 are to maintain moose populations at 1987-88 level numbers (about 11,000), with post-hunt sex ratios of 20, 30, and 25 bull:100 cows for Subunits 14A, 14B, and 14C, respectively. Currently, the population objectives are being met in Subunits 14A and 14C. The Subunit 14B moose population is recovering from the severe winter of 1989-90.

Moose population and density estimates, and annual harvests are shown for GMUs 11, 13, and Subunits 14A, 14B, and 14C in Table 4.

TABLE 4. Moose population estimates, densities, and harvests in GMU 11, 13, and 14.

Unit	Population Estimate	Density*	Annual Harvest**
11	2,000	0.4/mi^2	47
13	22,000	1.4/mi^2	1,011
14A	5,800	3.1/mi^2	523
14B	2,000	1.4/mi^2	184
14C	2,000	1.5/mi^2	156

* Area below 4,000 ft elevation
** Most recent five-year average

Mountain Goat: Mountain goats are found in the southern portion of GMU 11, in the Wrangell Mountains and the eastern Chugach Mountains. This is the northernmost mountain goat range and densities are generally low. Goat distribution is limited to specific areas of suitable habitat. Mountain goat habitat normally contains escape cover that is rocky, steep terrain often above 3,000 ft. elevation. Winter ranges often contain steep, timbered hillsides.

There are about 400 goats in the Wrangell Mountains and about 300 in the GMU 11 portion of the Chugach Mountains. Kid recruitment for the period 1979-88 averaged a moderate 20%. Mountain goats are lightly harvested in Unit 11. Since 1986, annual harvests have averaged 19 goats (range 15 to 30). It is difficult to predict future population trends. Unit 11 is the northern extent of mountain goat range and the habitat is not considered high quality. Populations are influenced by deep snow and icing during winter, droughts in summer, and predation. The current management objective for mountain goats in GMU 11 is to maintain a pre-hunting season population of at least 500 goats. This objective is being met.

In GMU 13, mountain goats occur in Subunit 13D in the Chugach Mountains. There are an estimated 150 animals in the Subunit. Occasionally an animal is observed in the

occurs in the Chulitna Mountains near Cantwell. These goat populations, like those in Unit 11, are on the periphery of mountain goat range and occupy poor habitat. Only Subunit 13D animals are hunted; since 1987 the average annual harvest has been three goats (range 1 to 5). The future of mountain goats in GMU 13 depends largely on winter weather conditions. During the early-1970s, when deep snowfall occurred, goat numbers were greatly reduced. The current management objective for Unit 13 mountain goats is to maintain a pre-hunting season population of at least 100 goats. Currently, the objective is being met.

In Unit 14, mountain goats occur in the Chugach Mountains and limited numbers are found in the Talkeetna Mountains. Approximate goat numbers by subunit include: 14C - 550, 14A (south of the Matanuska River) - 60, and the Talkeetna Mountains portion of 14A and 14B - 40. The Talkeetna Mountains are also the northern limit of mountain goat range and are marginal habitat. A portion of GMU 14, north of the Matanuska River, has been closed to hunting for the past three years. Goat harvests in the remainder of the Unit have averaged 29 animals (range 23 to 33) in recent years, occurring mostly in the Lake George area. Given favorable weather conditions and low harvest rates, goats may increase somewhat in the Chugach Mountains portion of the Unit. Goat habitat is marginal in the Talkeetna Mountains and it is unlikely the area will support a large goat population. The existing management objective for Subunits 14A and 14B is to maintain a pre-hunting season population of at least 60 goats. Management objectives for Subunit 14C are to maintain a population of 500 goats that would sustain an annual harvest of 25 goats composed of at least 60% males. These management objectives are being met.

Mountain goat population estimates and average annual harvest are shown for GMUs 11, 13, and 14 in Table 5.

TABLE 5. Summary of mountain goat populations and harvests in GMUs 11, 13, and 14.

Unit	Population Estimate	Annual Harvest*
11	700	19/yr
13	150	3/yr
14	650	29/yr

* Most recent five-year average

Dall Sheep: The southern Wrangell Mountains and eastern Chugach Mountains provide substantial amounts of excellent sheep habitat in GMU 11. Most sheep (4,000) occur in the Wrangells with lesser numbers (400) in the Chugach Range. Nearly all sheep habitat within the Unit is in Wrangell-St. Elias National Park and Preserve. Only subsistence hunting by local residents is allowed within the Park and aircraft cannot be used by subsistence hunters in the Park. General and subsistence hunting are allowed within the Preserve and aircraft can be used for transportation. Harvests have averaged 124 (range 103 to 147) animals in the past five years, and nearly all of these were mature rams.

The sheep population is large and fluctuates because of weather conditions. Habitat in the Park and Preserve will remain protected. Current management objectives for Dall sheep are presented by mountain ranges rather than by unit. The existing management objective for the southern Wrangell Mountains is to maintain a sheep population that will sustain an annual harvest of 60 rams. This management objective is being met. The existing management objective for the Chugach Mountains is to maintain a population of sheep that will sustain an annual harvest of 120 rams. The 1986-90 average annual harvest was 124 rams, meeting the management objective.

In GMU 13 approximately 1,900 Dall sheep inhabit the Chugach Mountains, 1,050 sheep occur in the Talkeetna Mountains, 500 sheep live in the Chulitna Mountains, and 200 sheep occupy the Watana Hills. Annual harvests have averaged 158 rams (range 135 to 187) for the past five years. Hunting regulations limit the harvest to adult rams, therefore, populations will fluctuate because of environmental conditions. The current management objective for Dall sheep in the Talkeetna Mountains is to maintain a population of sheep that will sustain an annual harvest of 120 rams. Management objectives have not been established for the Chulitna Mountains or Watana Hills.

Dall sheep in GMU 14 are found in both the Chugach and Talkeetna Mountains. About 3,100 sheep occur in the Chugach portion of the Unit; 700 in Subunit 14A and 2,400 in Subunit 14C. Approximately 1,050 sheep are found in the Talkeetna portion of the Unit; 700 occur in Subunit 14A and 350 inhabit Subunit 14B. Average annual harvests for the past five years were 123 (range 102 to 152) sheep, with 65% coming from Subunit 14C. Numbers are currently at a historically high level in Subunit 14C. Adverse weather probably will cause a decline in sheep numbers. Management objectives for sheep in the Chugach Mountains and Talkeetna Mountains are being met.

Dall Sheep population estimates and average annual harvest are shown for GMUs 11, 13, and 14 in Table 6.

TABLE 6. Summary of Dall sheep populations and harvests in GMUs 11, 13, and 14.

Unit	Population Estimate	Annual Harvest*
11	4,400	124/yr
13	3,650	158/yr
14	4,150	123/yr

* Most recent five-year average

PUBLIC INVOLVEMENT

The Strategic Wolf Management Plan requires ADF&G to prepare area-specific management plans for wolves, other predators, and prey throughout Alaska. Public participation was vital in the development of the Strategic Plan and ADF&G is committed to work with the public, local fish and game advisory committees, and land owners/managers in drafting area-specific plans. The Department sent invitation letters to these and other public interest groups requesting their comments and participation in a preliminary planning workshop. In addition, public notices were sent to the news media inviting participation in the planning process.

ADF&G held a public workshop in Anchorage on December 13, 1991, to solicit public comments for an area-specific plan for GMUs 11, 13, and 14. This workshop provided information about the planning process to organizations and the public so they could recommend management zones in the planning area. Each recommendation was reviewed by ADF&G staff and incorporated into one of three zonal management alternatives.

Forty-three people attended the workshop and an additional 14 information packets were provided to others who did not attend. Comments were received from twenty-one individuals or groups by January 9, 1992.

The three management alternatives presented in the draft plan were derived solely from public comments. A preferred alternative was not developed. All suggestions were represented in an alternative unless a zone designation was contrary to law or regulation. We also received some ambiguous proposals that we attempted to incorporate into these alternatives. The original Denali National Park could only be designated a Zone 1 because federal law prohibits all hunting and trapping. Management in the extension to Denali National Park and Preserve and Wrangell-St. Elias National Park and Preserve could not be more restrictive than Zone 3 or more intensive than Zone 5.

Public meetings were held in Cantwell, Talkeetna, Wasilla, Fairbanks, Glennallen, and Anchorage to solicit comments on the three alternatives presented in the draft plan. We made it clear that our deliberations would not be confined to the three alternatives and asked specifically for new ideas or approaches not contained in the three alternatives. We also met with interested individuals, groups, and agencies to obtain their recommendations. We considered all comments before developing one "preferred alternative" that is included in this proposed plan. We will present this proposed plan to the BOG at its meeting in late March 1992. This meeting will be another opportunity for the public to comment on the appropriateness of the plan.

PROPOSED MANAGEMENT ZONES FOR GMUs 11, 13, AND 14

Our recommendations for management zones for the planning area are presented in Figure 1 and Table 7. The key to evaluating the proposed zones is understanding the zone concept in the Strategic Wolf Management Plan. The Strategic Plan established seven zones to manage wolves and prey in the State. The Plan describes the management intensity and expected results in each zone. Terms used to describe zones are defined in Appendix I. It became necessary, after initial attempts to apply the zone concept, to expand the zone definitions to more precisely reflect the intent and management emphasis of each zone. We found the original definitions did not always clearly distinguish between levels of management intensity and human utilization of wolves and prey in the different zones. Clear delineations between some zones were lacking. We attempted to adhere strictly to the intent indicated by the BOG at their Fall 1991 meeting. Following are expanded definitions as they are applied in this proposed area-specific plan. Also included are examples of areas in the planning area that are managed similarly to the zone descriptions.

Zone 1-Full Protection

Human use goals in this zone are:

1. to provide areas where wolves and prey are fully protected from hunting and trapping;

2. to provide opportunities to view, photograph, hear, enjoy and learn more about wolves and prey in an unaltered environment; and

3. to provide opportunities for scientific study of wolves where human influence is minimal.

Conditions of use and management are:

1. emphasis is on nonconsumptive uses of both wolves and prey;

2. hunting and trapping of wolves and prey are not allowed; and

3. human activities and developments are regulated to keep disturbance of wolves and prey to a minimum.

The original Denali National Park is an example of an area that has been managed as a Zone 1.

Zone 2-Wolf Protection

Human use goals in this zone are:

1. to provide areas where wolves are fully protected from hunting and trapping;

2. to provide opportunities to view, photograph, hear, enjoy and learn more about wolves where they are not hunted or trapped; and

3. to provide opportunities for scientific study of wolves where they are not hunted or trapped.

Conditions of use and management are:

1. emphasis is on nonconsumptive uses of wolves;

2. hunting and trapping of wolves are not allowed;

3. hunting and trapping of other species may be allowed; and

4. use and management intensity of other species may vary from low or minimal to high or intensive.

Chugach State Park is an example in the planning area that has been managed as a Zone 2.

Zone 3-Minimum to moderate use of wolves and prey/Minimum management of wolves and prey

Human use goals in this zone are:

1. to provide areas where wolves and prey are not significantly influenced by people and are affected primarily by natural environmental factors;

2. to provide opportunities to view, photograph, hear, enjoy and learn more about wolves and prey in nearly unaltered environments;

3. to provide opportunities for scientific study of wolves where human-caused mortality and manipulations are not significant factors; and

4. to allow low to moderate harvests of wolf and prey populations to meet special needs.

Conditions of use and management are:

1. emphasis is on nonconsumptive and special consumptive uses of both wolves and prey;

2. hunting and trapping of wolves and prey are allowed, but harvests will normally be low to moderate in most areas; and

3. wolf population regulation and reduction are not allowed.

Zone 4. Moderate use of wolves and prey/Minimum management of wolves and minimum to moderate management of prey

Human use goals in this zone are:

1. to provide areas where wolves and prey are primarily affected by natural environmental factors, but some influence by people is permitted;

2. to provide opportunities to view, photograph, hear, enjoy and learn more about wolves and prey in an environment that may be slightly altered; and

3. to provide for moderate harvests of wolves and prey by people.

Conditions of use and management are:

1. emphasis is on nonconsumptive and moderate consumptive uses of wolves and prey;

2. hunting and trapping of wolves and prey are allowed, but harvest rates will be kept low to moderate by hunting/trapping regulations or remote access; and

3. wolf population regulation and reduction are not allowed.

Wrangell-St. Elias National Preserve is an example that has been managed as a Zone 4.

Zone 5-Moderate use of wolves and moderate to high use of prey/moderate management of wolves and moderate to intensive management of prey

Human use goals of this zone are:

1. to provide areas where wolves are influenced by both natural environmental factors and by people;

2. to provide opportunities to view photograph, hear, enjoy and learn more about wolves and prey under managed conditions; and

3. to provide for moderate harvests of wolves and moderate to high harvests of prey by people.

Conditions and use of management are:

1. emphasis is on consumptive uses of wolves and prey;

2. hunting and trapping of wolves and prey are allowed;

3. moderate harvest rates of wolves will normally be maintained while harvests of prey will normally range from moderate to high;

4. wolf control, i.e. population regulation and reduction, will not normally occur but may be considered at the request or concurrence of the land owner/manager; and

5. if wolf control does occur either land and shoot or aerial shooting may be utilized.

Subunits 14A and 14B are examples within the planning area that have been managed as Zone 5.

Zone 6-High use of wolves and prey/Moderate management of wolves and moderate to intensive management of prey

Human use goals of this zone are:

1. to provide areas where wolves and prey are managed for high human use;

2. to provide opportunities to view, photograph, hear, enjoy and learn more about wolves and prey under managed conditions; and

3. to provide for high harvests of wolves and prey by people.

Conditions of use and management are:

1. emphasis is on elevated consumptive uses of wolves and prey;

2. hunting and trapping of wolves are allowed and may be encouraged;

3. wolves and prey will normally be managed to provide for moderate to high harvests;

4. land-and-shoot taking of wolves as a regulation or reduction measure may be allowed under permit;
5. wolf populations may be regulated at levels below those that would occur naturally; and

6. wolf population reductions are not anticipated, but may be allowed.

Unit 13 most closely reflects Zone 6 management in the planning area.

Zone 7-High use/Intensive management of wolves and prey

Human use goals of this zone are:

1. to provide areas where wolves and prey are intensively managed for human use;

2. to provide for high harvests of wolves and prey by people; and

3. to provide a mechanism for increasing depressed prey populations or harvests when wolf predation is a major limiting factor.

Conditions of use and management:

1. emphasis is on prey population recovery and elevated and sustained consumptive uses of wolves and prey;

2. hunting and trapping of wolves are allowed and may be encouraged;

3. wolves and prey will normally be managed to provide for high harvests;

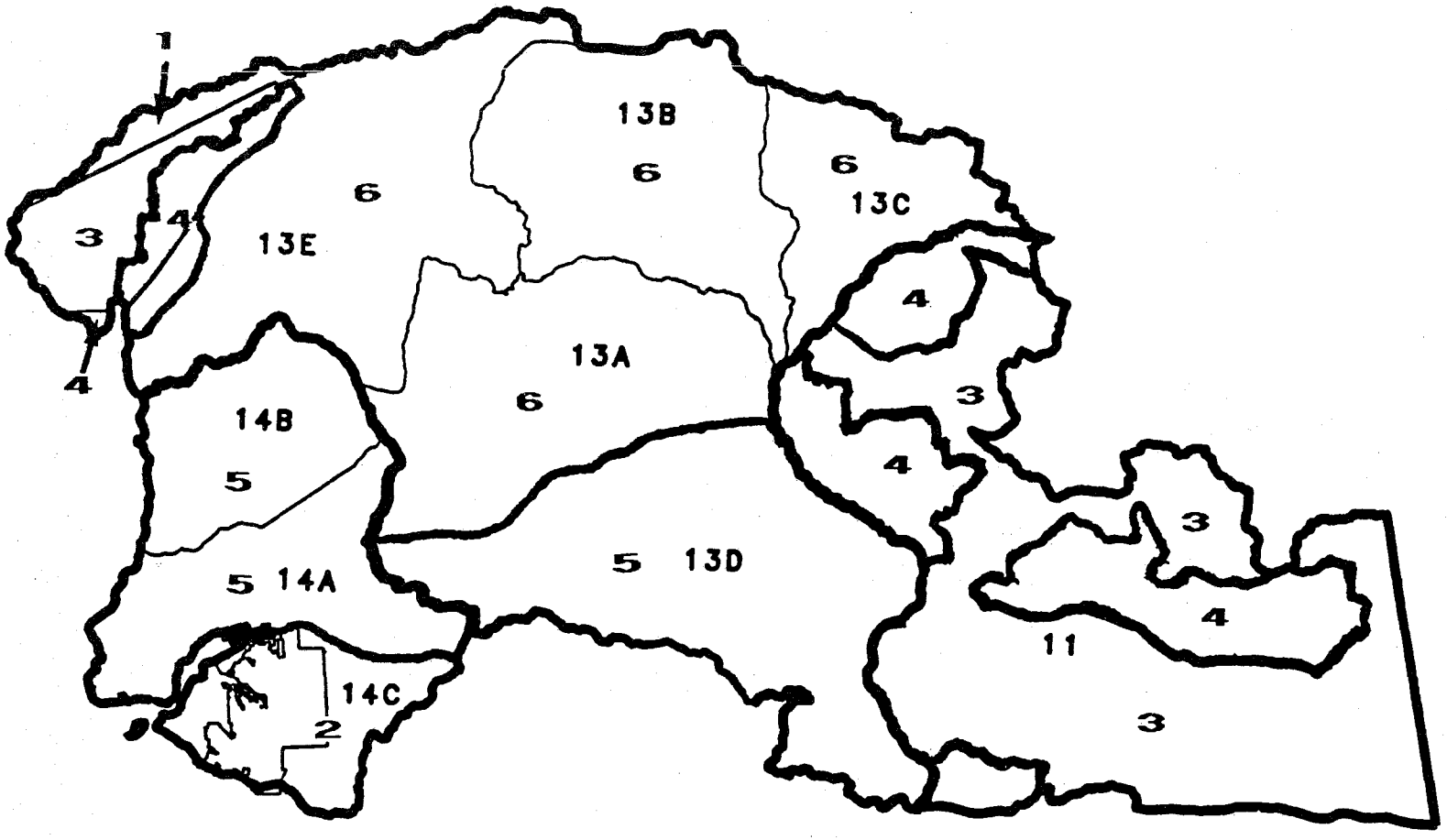
4. land-and-shoot taking and aerial shooting of wolves as a regulation or reduction measure may be allowed under permit;

5. wolf populations may be regulated at levels below those that would occur naturally; and

6. wolf population reduction may be necessary periodically but normally would not be a long-term practice.

No portions of Units 11, 13, or 14 have been managed as a Zone 7 in recent years.

Figure1. PROPOSED AREA SPECIFIC WOLF MANAGEMENT ZONES
GAME MANAGEMENT UNITS 11, 13, AND 14



In Unit 11 all inholdings within Wrangell-St. Elias National Park and Preserve are Zone 4.

A key difference between zones is that wolf regulation and reduction (wolf control) is allowed only within Zones 5, 6, and 7. In Zone 5 wolf control may be allowed but is not anticipated. Some difficulty was encountered in differentiating between Zones 6 and 7. Some degree of wolf population control through population regulation or reduction is allowed in both zones but on Zone 6 lands, wolf population reductions are not anticipated. On Zone 7 lands wolf population reduction may be necessary. We believe the BOG intended wolf population reduction would occur only in two cases: 1) where wolf predation caused or threatened to cause prey population declines, or 2) where predation held prey populations at low levels and prevented desired increases.

Wolf control in Zones 5, 6, and 7 must be preceded by an implementation plan, subject to public review and BOG approval. Wolf control would be conducted either by Department personnel or by members of the public under strict terms of a Department permit.

Table 7. Proposed management zones for Units 11, 13, and 14 and current management.

Area	Proposed Zones	Current Management
GMU 11		
Wrangell-St. Elias N. P.	3	3
Wrangell-St. Elias Preserve	4	4
Other GMU 11 Lands	4	5
GMU 13		
Old Denali National Park	1	1
New Denali National Park	3	3
Denali State Park	4	5
13E West*	4	6
13E East**	6	6
Subunits 13A, 13B, 13C	6	6
Subunit 13D	5	5
GMU 14		
Subunit 14A	5	5
Subunit 14B	5	5
Subunit 14C	2	2/5

* Those portions of 13E west of the Parks Highway and outside Denali National Park.
** Those portions of 13E east of both Denali State Park and the Parks Highway.

GMU 11

Current Department management goals for moose, caribou, Dall sheep, and mountain goats in GMU 11 primarily emphasize hunting under aesthetically pleasing conditions although maximum opportunity to hunt moose and sheep and trophy hunting of sheep are emphasized in portions of the Unit. Predator populations are high and are not

heavily harvested within the Unit. Some prey populations may be limited by predation and periodic weather events and produce few surplus animals for human harvest. Most land in GMU 11 (about 90%) is within Wrangell-St. Elias National Park and Preserve. Therefore management options and actions are dictated largely by federal law, regulation, and policy except on the limited state and private lands.

The Department suggests lands in the Parks be Zone 3 and Preserve lands be Zone 4. This was clearly the intent of the BOG in defining these zones so that they comply with National Park Service regulation and policy. ADF&G recommends that other lands, both public and private within GMU 11, be Zone 4. This was a difficult decision. An important use of some of the private land is for subsistence hunting. The major private landowner expressed a strong preference for a zone that would allow wolf control. The likelihood of conducting a wolf control program is extremely remote. Most private and public lands are small acreages that adjoin Park Service lands. Wolves on private lands could be considered "park wolves" because they spend much of the time in the Park and Preserve.

We received suggestions that all of Unit 11 be Zone 1. This was inappropriate because federal law requires local subsistence users be allowed to utilize wildlife on Park and Preserve lands except under special circumstances. Subsistence use has occurred in recent years and probably will continue.

We received suggestions that Park and Preserve be Zone 5. This could allow wolf control and more intensive management, however, the land manager did not concur and believed a Zone 5 was inappropriate. It is our understanding that under federal law, wolf control can be conducted on parks and preserves only under very limited circumstances that are unlikely to occur in GMU 11.

Major management actions in GMU 11 that would be conducted under this proposed plan include moose and caribou sex and age composition surveys and censuses, mountain goat surveys, and administration of mountain goat permit hunts.

GMU 13

Department management objectives in GMU 13, excluding Denali State Park and Denali National Park, call for high human use of predators and prey. This reflects the long history of use, well developed access from major population centers, and highly productive habitat. Because of high human demand, moose and caribou populations have been managed to increase numbers and to provide large annual harvests and roadside viewing. Predators have been harvested at high rates to maintain populations at moderate to low levels and increase prey yields for humans.

We propose that Subunits 13A, 13B, 13C, and 13E (east of both the Parks Highway and Denali State Park) be Zone 6. This management intensity would be similar to what has occurred over the past decade when public land-and-shoot wolf hunting generally has kept wolf populations at moderate to low levels. It might be necessary to harvest cow moose to avoid overpopulation as the moose population approaches carrying capacity. Moose habitat enhancement would be considered. If this proposed plan is adopted by the BOG we would prepare an implementation plan for this portion of the Unit because wolf population regulation would be anticipated. The wolf population objective for GMU 13, maintaining a minimum post-hunt population of 150 wolves, would limit the extent of wolf control allowable.

We suggest a Zone 5 would be appropriate for Subunit 13D. This area has not been as intensively managed as other areas in the Unit. Land-and-shoot harvest has not been very effective in the Subunit because of topography and habitat. Zone 5 allows intensive management of moose and retains the option of wolf control for unforeseen circumstances. No implementation plan will be prepared as wolf control is not envisioned.

Zone 1 is appropriate in a portion of the original Denali National Park in 13E because of federal prohibitions on hunting and trapping. A Zone 3 is fitting for the addition to Denali National Park in 13E as subsistence hunting and trapping by local residents is allowed by federal law. Denali State Park, the majority of which is in 13E, is recommended to be a Zone 4. This would allow moderate use of both wolves and prey and reflects current management and human use in the area. To provide management continuity and human use and also to provide an easily identifiable boundary between management zones, we recommend the portion of 13E west of the Parks Highway and outside of Denali National Park be a Zone 4. An implementation plan would not be prepared for any of these areas as wolf control would not be allowed.

Public recommendations for GMU 13 ranged from the Unit being Zone 1 to Zone 7. Such broad-based approaches clearly did not accommodate the intent of the BOG and were rejected. We did consider these zones in portions of the Unit. With the exception of the original Denali National Park we rejected Zone 1 because it was incompatible with existing uses and management or because federal law prevents such a designation. Zone 3 and 4 were also suggested but would not have allowed intensive management of wolves, moose, caribou, and bears that now occurs in portions of the Unit. Zone 7 was the most common suggestion for the majority of GMU 13. This was rejected because prey populations are not depressed, wolf predation is not thought to be the principal factor limiting moose and caribou populations, and wolf population reduction is not anticipated in the area. We believe that Zone 6 was the proper designation for much of the Unit and allows sufficient flexibility to manage wildlife.

A recommendation to establish Zone 1 for one-half mile corridors along all highways and federally designated wild and scenic rivers was received. It was not adopted because of lack of support at all public meetings with the exception of the Anchorage meeting.

Under all alternatives, major management actions would include sex and age composition sampling of moose and caribou populations, censuses of moose, caribou, wolf, and goat populations, and the administration of permit hunts for caribou and mountain goats.

GMU 14A

Current management emphasis in Subunit 14A is to provide optimum harvest of moose and the greatest hunting opportunity. Harvests of mountain goats and Dall sheep are low and will not be changed substantially by the wolf management plan. Predation by wolves nor bears, has not been a significant limiting factor of moose, sheep, or mountain goat populations in recent years. Collisions with highway vehicles and trains along with hunter harvest and loss of habitat are the primary influences affecting the population. It is unlikely that wolf control will be appropriate because of low wolf abundance and the limited impact predation has on the large prey densities. We recommend that Subunit 14A be a Zone 5. This allows for continued intensive management of the large moose population.

Wolf control is unlikely in 14A. In the past 40 years wolf control has not been necessary in this area and we don't anticipate a situation where wolf control will needed in the future. An implementation plan to conduct wolf control is unnecessary.

Public suggestions for zoning of Subunit 14A ranged from 1-7. Zones 6 and 7 were rejected because of the extremely low likelihood of wolf control. Zones with less intensive management (Zones 1-4) seemed inappropriate given the emphasis on intensive use and management of the moose resource in the Subunit.

Primary management activities likely to be conducted under all alternatives include periodic moose censuses, mountain goat surveys, monitoring of wolf and other furbearer abundance, efforts to reduce highway and railroad mortality of moose, moose range enhancement, and the administration of permit hunts for antlerless moose and mountain goats.

GMU 14B

The management emphasis in GMU 14B is to provide the greatest moose hunting opportunity. Harvests of caribou, Dall sheep, and mountain goats are low and will not be affected substantially by the wolf management plan. Predator populations are generally low, with the exception of black bears. Wolf numbers are low and wolf predation is probably not a significant limiting factor of ungulate populations in the Subunit. Important sources of mortality include severe winters, highway and railroad kills, and hunter harvest. We recommend Subunit 14B be a Zone 5. This would allow for intensive management of the moose population and indicates the likelihood of wolf control is quite low. At no time in the past 40 years would wolf control have been appropriate in this area and we don't anticipate a situation where wolf control would be merited in the future. Preparation of an implementation plan to conduct wolf control is not planned. Public suggestions for zoning of Subunit 14B ranged from 1-7. Zones 6 and 7 were rejected because of the low likelihood of wolf control. Zones with less intensive management (Zones 1-4) seemed inappropriate given the emphasis on intensive use and management of the moose resource in the Subunit.

Primary management activities to be conducted include periodic moose censuses, monitoring of wolf and other furbearer abundance, efforts to reduce highway and railroad mortality of moose, and moose range enhancement. We anticipate implementing permit hunts for antlerless moose when the population recovers from recent harsh winters.

GMU 14C

Much of the management emphasis in Subunit 14C is on viewing and other nonconsumptive uses of wildlife as these populations are in proximity to half the state's population and many tourists. There is, however, intensive management of a number of wildlife species in the Subunit. Harvests by humans are directed toward moose and Dall sheep in areas where conflicts with nonconsumptive uses are minimal. Mountain goats, black and brown bears are also taken. Wolves occur in low densities and are not trapped or hunted in much of the Subunit. The Subunit is highly developed in most areas outside of Chugach State Park, limited habitat occurs within the park and it is unlikely wolves will ever become abundant. Wolf predation does not appear to affect populations of moose, sheep, or mountain goats significantly in Subunit 14C. An important mortality factor for moose and sheep in Subunit 14C is severe winter weather, and for moose, collisions with highway vehicles.

We recommend Subunit 14C be Zone 2. This would protect the local wolf population and also would allow intensive management of moose and Dall sheep. This zone designation recognizes that nonconsumptive uses of wildlife are the emphasis for much of the area. Minimal loss of hunting and trapping opportunity would occur under this proposed plan.

The highest zone recommendation received for Subunit 14C was a 5. We rejected that because the priority use of wildlife in the area, particularly wolves, is nonconsumptive. It is unlikely that wolf control will be needed in Subunit 14C. Zones 1, 3, and 4 would prohibit intensive management of moose and Dall sheep in portions of the Unit. It is important to continue managing moose because of declining habitat availability and public safety concerns, particularly moose/auto collisions.

Major management activities that will occur under the proposed zoning include surveys and censuses of moose, Dall sheep, and mountain goats and administration of permit hunts for these species. Efforts will continue to reduce the level of mortality caused by highway vehicles.

IMPLEMENTATION PLAN

The BOG must adopt an area-specific wolf management plan before wolf control can occur. If wolf control is necessary in an area to achieve management objectives, an implementation plan must be prepared after the area-specific plan is completed. The implementation plan will include specific details of predator and prey populations in the affected area, and proposed management actions. The implementation plan is subject to public review and must be approved by the Board. The specifics of an implementation plan are contained in the strategic plan. We anticipate writing an implementation plan for portions of Unit 13 under this proposal.

Appendix I

Definitions of Terms Used In the Planning Process

The strategic wolf management plan employs numerous terms, primarily relating to human use and management, that are not clearly defined. In developing area specific plans we have had to develop standardized definitions of these terms so that all parties have a common understanding of their meaning. Following is a list of some of the terms used in the strategic plan along with definitions of how we have used the terms in this draft.

The **genetic diversity** of wolf populations in Alaska will be protected.

> Genetic diversity refers to the genetic differences of individuals within and between populations. It results from the exchange of genes among populations. Genetic diversity of wolf populations can be protected by preventing the isolation of populations and maintaining potential sources of immigrants.

Short-term and **long-term** effects of wolf and prey habitat loss and fragmentation will be addressed.

> The duration of short-term effects is 1 to 5 years, thus the duration of long-term effects is greater than 5 years.

... to provide for the **broadest possible range of human uses and values** of wolves and their prey.

> Human utilization includes consumptive and nonconsumptive uses and both of these endeavors are managed on a sustained yield basis. Common nonconsumptive uses include, but are not limited to, viewing, photographing, listening, and studying animals in natural settings. Consumptive uses usually involve predator and prey harvesting that may vary in intensity from low to maximum sustained yields.

Prey populations

> Prey species include: moose, caribou, Dall sheep, mountain goat, Sitka black-tailed deer, and musk ox. For management purposes, populations of musk ox and caribou are identified as discrete herds; populations of Dall sheep and mountain goats are identified based on major mountain ranges; populations of deer are generally identified by islands and moose populations are identified on the basis of geographic area, usually GMUs or major drainages.

Predator populations

> Predator species include: wolves, brown bears, and black bears. For management purposes populations of wolves and bears are generally identified on the basis of GMUs or major drainages.

...to provide areas where wolves and prey are not **significantly influenced** by people.

> Significant influence means that there are long-term measurable changes in population size, composition, density and/or distribution.

...to provide opportunities to harvest a **small portion** of the wolf and prey populations to meet **special needs**.

> Small portion, [sic], very low, and low harvest rates are used synonymously to describe limited harvests of wolves and prey that have no measurable effects on population size, structure, and/or distribution. At low harvest rates, populations of wolves and prey can be expected to fluctuate much as they would without human harvest. Special needs refer to the opportunity for subsistence harvest that is guaranteed by law.

...to provide for **moderate harvests** of wolves and prey by people.

> Moderate harvest rates describe levels of use of wolves or prey that may have measurable effects on population size, structure, and/or distribution. Under moderate harvest rates, populations of wolves and prey may fluctuate near the pre-determined levels, differing from those that might occur naturally, because of human harvests and natural environmental factors.

...to provide for **high harvests** of wolves and prey by people.

> High harvests of wolves and prey are near maximum sustainable levels and will have measurable effects on population size, structure, and/or distribution. Populations of wolves and prey can be expected to fluctuate near pre-determined objective levels as a direct result of harvest management.

Minimum, moderate, and **intensive management** of predator and prey populations

> Wildlife management is the art and science of manipulating habitat, wildlife, and/or people to produce sustained yields and achieve specific human use goals, both consumptive and nonconsumptive and to ensure the welfare and perpetuation of animal populations. Wildlife management can vary in intensity depending upon the management techniques that are employed.
>
> **Minimum management** involves limited manipulation of habitat, predators, prey, and human uses. Under this management regime, predator and prey populations can be expected to fluctuate much as they would without human harvest and habitats will be unaffected by management. Examples of management activities that might be conducted include periodic surveys or censuses, general hunting seasons, and opportunistic law enforcement.
>
> **Moderate management** involves intermediate manipulation of habitat, predators, prey, and human uses. In some cases predator populations may be reduced or regulated and the size or composition of prey populations may be affected. Moderate management may include limited habitat improvement. Populations may produce higher sustained yields than would result from minimal management. Examples of management activities that might be conducted include permit hunts, either sex hunts, controlled use areas, specimen collections, routine surveys and censuses, and routine law enforcement.
>
> **Intensive Management** involves substantial manipulation of habitat, predators and prey, and human uses to achieve identified objectives. Predator populations will likely be regulated and may be reduced to achieve prey population management objectives. Intensive management may include a broad spectrum of habitat improvements including mechanical manipulation of vegetation and the

use of fire. Populations of wolves and prey are an expected result of management prescriptions and result in maximum sustained yields. Other examples of management activities may include intensive surveys and censuses, permit hunts, either sex harvests, special seasons, specimen collections, and intensive law enforcement.

...to provide areas where wolves and prey are managed for high **human use**.

This implies significant exploitation (near maximum sustained yields) of predator and prey populations by humans for consumptive, nonconsumptive, or both types of uses.

ADF&G will provide for consumptive use of healthy wolf populations on a **sustained yield** basis.

Sustained yield, used in the context of consumptive uses, means the numbers or biomass that can be taken from a population year after year while assuring persistence of the population. Sustained yield, used in the context of nonconsumptive uses, implies maintaining opportunities to view, photograph, hear, enjoy, and learn about wildlife in a natural setting that are available year after year while assuring persistence of the resource.

Professional wildlife biologists . . . will be asked to review the area-specific plans and comment on whether the affected wolf population will remain **viable over time**.

Viable over time means that self-perpetuating populations of wolves will continue to exist in the plan area.

Predator pit

Predator pit describes the situation where predation is able to keep a prey population at a level well below what the habitat could support. Evidence indicates this situation can occur where moose are the primary prey species; wolves, or wolves in conjunction with one or two bear species, are the primary predator; and both predators and prey are lightly harvested.

The public is encouraged to provide comments on this proposed plan. The Board of Game will acccept public comments on wolf management beginning Friday, 20 March, 1992 at the Anchorage International Airport Inn, 3333 West International Airport Road. The tentative schedule for public testimony is as follows:

PUBLIC TESTIMONY

Friday, 20 March, 6:30pm - 8pm

Saturday, 21 March, 8:30 - 9:30pm

Sunday, 22 March, 10am - 3pm

The Board is tentatively scheduled to begin deliberation on wolf management proposals on Monday, 23 March, at 8:30am and continue until Wednesday, 25 March , at 12pm.

The role of the Division of Wildlife Conservation is to conserve and enhance Alaska's wildlife and to provide for a wide range of uses for the greatest benefit of current and future generations of the people.