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Abstract: This document provides direction that will guide New Mexico Department of Game and Fish (NMDGF) in effectively managing cougars from 1997 through 2004. The long range plan identifies 16 issues that affect public satisfaction with cougar management in New Mexico, and 29 strategies to satisfy people's recreational, economic, and ecological interests in cougars. NMDGF will use these strategies to develop and implement management actions, which will be described in the Operational Plan for the Management of Cougar in New Mexico, 1997-2004 and published in late 1997. This document includes information on cougar status, distribution, population dynamics, and habitat assessment, and addresses predation and sport hunting related issues and economic impacts of cougars.

draft

**Long Range Plan for the Management of Cougar
in New Mexico**

1997-2004

**New Mexico Department of Game and Fish
Santa Fe, New Mexico
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About the Plan

This document provides direction that will guide New Mexico Department of Game and Fish (NMDGF) in effectively managing cougars from 1997 through 2004. The plan identifies strategies to satisfy people's recreational, economic, and ecological interests in cougars, and to resolve cougar-related issues in New Mexico. NMDGF will use these strategies to develop and implement management actions. The *Operational Plan for the Management of Cougar in New Mexico, 1997-2004*, to be produced in the fall of 1997, will describe cougar management actions to meet public needs and interests.

Much of the background for this plan came from the results of a 10-year cougar study conducted by the Hornocker Wildlife Institute from 1985 to 1995. The study was initiated by the State Game Commission and NMDGF to provide information necessary to evaluate cougar management practices that were being questioned by the public, and to address cougar-related issues and conflicts. This plan incorporates the results of this study in an effort to satisfy all of the following public needs and interests that were identified by public involvement.

In January 1997, NMDGF held 18 public meetings around New Mexico to provide background information on cougar biology and management. Survey forms were provided at these meetings to identify public concerns regarding cougar management. After public needs and desires were determined, draft strategies were developed and sent out for public comment in March 1997. Public input (including 477 written responses) helped to identify the following major public desires:

- Development of a conservation strategy that will ensure the persistence of cougar populations in New Mexico for both sport-hunters and non-consumptive interests.
- Continued collection, analysis, evaluation, and dissemination of the best available information on cougar populations and the impacts of cougar management practices.
- Cougar control to prevent economic losses and cougar-human conflicts.
- Monitoring and evaluation of the impacts of cougars and cougar management on various prey species.

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Long-range Plan for the Management of Cougar in New Mexico

NATURAL HISTORY

The cougar (*Puma concolor*) has been both one of the most admired and most persecuted animals in the history of western North America. The cougar, also known as mountain lion, puma, or panther, is the largest member of the *Felidae* (cat) family inhabiting the temperate zones of North America.

Male cougars may grow up to 8 feet long and weigh up to 160 pounds. Females are slightly smaller, reaching 7 feet and weighing 90-110 pounds. Cougars become adults and begin breeding at about 2 years of age. In New Mexico, cougars usually give birth from July to September, and average 3 cubs per litter (Logan et al. 1996). Cubs are born with spots, but fade to a uniform yellow to brown color as they become adults. Cubs leave their mothers after 1 to 1.5 years, and have been found to establish adult home ranges 18 to 63 miles away for females and males, respectively (Logan et al. 1996). Outside of the breeding season, adult males and females do not share common areas, and adult cougars occasionally kill other cougars that they encounter.

Cougars may be found in nearly every habitat type in the West, but generally select rocky areas, rugged terrain, and areas of dense vegetation. Cougar habitat in New Mexico ranges from deserts to subalpine meadows. The most consistent feature of cougar habitat may be the presence of mule deer (*Odocoileus hemionus*). Although mule deer are the primary food source for cougars in western North America (Russell 1978, Shaw 1979, Anderson 1983), cougar predation does not generally limit mule deer populations below the carrying capacity of the habitat. In the temperate mountains of central Idaho, Hornocker (1976) concluded that predation by cougars did not determine the numbers of deer, but that deer were limited by the winter food supply. In a California study area where cougars were not hunted, Hopkins (1989) concluded that cougars were not exhibiting a strong limiting force on the deer herd. Cougars are ultimately limited by habitat quantity and quality, and when prey are in low supply, cougar population densities are expected to be low.

Cougars are opportunistic predators, and may learn to prey on whatever species are readily available within an area (Russell 1978, Ross et al. 1996). Cougars may prey

on a variety of wildlife species, including elk (*Cervus elaphus*), bighorn sheep (*Ovis canadensis*), antelope (*Antilocapra americana*), oryx (*Oryx gazella*), coyote (*Canis latrans*) and small mammals, and some birds.

HISTORICAL PERSPECTIVE

Distribution

Cougars historically had the broadest geographic distribution of any wild mammal in the Western Hemisphere, ranging from northern British Columbia to the tip of South America, and from coast to coast across both continents (Goldman 1946). From the 1700's through the early 1900's, heavy hunting and predator control efforts resulted in the reduction or elimination of many cougar populations. Since the late 1800's, cougars have been rare or absent from the eastern half of North America (Fig. 1).



Fig. 1. Current range of the cougar in North America.

In the late 1800's and early 1900's, populations of cougars and other predators in New Mexico were reduced in an effort to protect livestock and game, and to reduce the fear of attacks on humans. As a result, wolves (*Canis lupus*), grizzly bears (*Ursus arctus*) and jaguars (*Panthera onca*) were eliminated from the state. By 1927, Ligon (cited in Young 1946) reported that agency and public hunters had practically eliminated cougars from the Upper Gila River drainage. Hibben (1937:6) indicated that one impetus of his study of cougars in New Mexico in 1934 and 1935 was the growing concern over the scarcity of cougars. "It was felt that the [cougar] was in danger of

extinction in several areas of his former range. The number of [cougars] which the modern hunter encountered was alarmingly small compared to that reported two or three decades ago." Young (1946:28) suggested that the cougar in New Mexico "due to intensified hunting, is not as common as it was at the beginning of the present century. The animals may now be said to be confined mainly to the rougher mountainous sections west of the Rio Grande." Cougars in New Mexico began to recolonize historical habitat following their classification as a game animal in 1971.

Management History

Cougars in New Mexico first received legal recognition in 1867 when the Territorial Legislature passed a predatory bounty law which paid \$5.00 for a dead cougar (NMDGF Operational Plan, 1987-1995). The bounty was suspended in 1923 (Nowak 1976). In 1971, the cougar was placed on the list of New Mexico's protected wildlife species, and NMDGF assumed management authority, which included the establishment of hunting seasons, bag limits, and resolution of depredation on livestock (Evans 1983).

Cougar hunting regulations have varied since the species was protected (NMDGF big game hunting proclamations, 1971-1995). In 1971, three-quarters of New Mexico was closed to cougar hunting. The southwestern quarter was open for 4 months with a bag limit of 1 cougar per hunter, and cubs less than 1 year old and females followed by cubs were protected from that year forward. More areas in New Mexico were opened to cougar hunting in subsequent years, and the season length was extended to 11 months. Between 1979 and 1983, most of New Mexico was opened to an 11-month-long cougar hunting season with a bag limit of 2 cougars per hunter. After 1979, hides of all cougars killed by hunters had to be tagged by NMDGF.

In 1983 the protected status of the cougar was challenged. Members of the agricultural industry concerned with depredation on livestock attempted to return the cougar to its former status as a "varmint" by introducing a bill to New Mexico's House of Representatives. The bill was tabled in committee, but the legislature requested more information from the State Game Commission and NMDGF. NMDGF responded by producing the first in-depth report on cougars in the state (Evans 1983). Evans (1983) reviewed harvest trends and previous population estimates, and concluded that cougar numbers probably had declined during the previous 11 years (1972-1983). His recommendations, bolstered by public sentiment, resulted in more conservative cougar hunting regulations.

In 1984 the cougar hunting season was 3 months long throughout most of New Mexico. However, 5 hunt units (2 in the southwest, 3 in the southeast) had seasons extended by 2 additional months and harvest quotas of 10 to 17 cougars. The objective in those units was to obtain a higher kill in specific areas where cougar depredation on livestock was perceived to be a problem. Since 1985, cougar hunting regulations have been uniform across the state. Most of New Mexico is open to cougar hunting for 4 months (1 Dec. to 31 Mar.) with a bag limit of 1 cougar per hunter.

The new laws that protected the cougar in 1971 also gave NMDGF the authority to manage cougar depredation on livestock. Cougar depredation incidents usually involved domestic sheep, but cougars also killed goats, cattle, horses, and pets (Littauer and White 1984, Haussamen 1994). NMDGF maintained 2 full-time predator control officers between 1971 and 1987, and federal predator control personnel were used when necessary. Once depredation incidents were verified, NMDGF personnel were issued depredation permits authorizing the removal of the offending cougar. The cougar was either killed by predator control officers, or the ranchers were given permission to kill the cougar (Evans 1983).

Today, federal predator control agents work with NMDGF personnel to locate and remove depredating cougars. Sometimes exceptions to this process occur when ranchers kill cougars that are directly threatening or in the process of killing livestock, or when depredating cougars are killed by licensed hunters during the sport-hunting season.

Within New Mexico, the southeastern region has the most cougar depredation on livestock, with 67% (268 out of 400) of the depredation permits issued from 1978-1993 (Haussamen 1994). Because of unusually high cougar depredation on 5 domestic sheep ranches in the Guadalupe Mountains in the southeastern region, NMDGF has conducted a special preventive control program in Game Management Unit 30 since 1985. This program allows the removal of up to 14 cougars per year in an effort to prevent cougar predation on livestock. Moreover, other cougars that are involved in depredation incidents or pursued for sport-hunting can be killed. During the first 3 years of the program in Unit 30, an average of 28 cougars per year were removed for depredation and preventive control. Since 1988, cougar harvest for depredation and preventive control has been reduced to an average of about 10 animals per year.

Areas of southeastern New Mexico with lesser cougar depredation problems include the Sacramento and Capitan Mountains north to the Corona area. A small

number depredation incidents also occur in the southwestern region. NMDGF records show that in all of New Mexico, excluding Unit 30, an average of 17 cougar depredation incidents occurred each year from 1984 to 1995, resulting in an average of 7 cougars killed per year. The reported male to female ratio of cougars killed for depredation control is approximately 1 to 1.

Cougar Attacks on Humans

In New Mexico, there has been only one reported unprovoked cougar attack on a person. A cougar killed an 8-year-old boy in Arroyo Seco in north-central New Mexico on 20 January 1974. The cougar was a 3-year old female in below normal physical condition (Beier 1991). Despite infrequent public safety problems caused by cougars in New Mexico, the concern for cougar-human conflicts remains a significant issue.

Research

Four research projects have studied cougars in New Mexico. Hibben (1937) investigated the basic life history of cougars in northern and western New Mexico and central and southeastern Arizona in 1934-1935. NMDGF conducted cougar research in southwestern New Mexico during 1971-1978, with objectives to estimate cougar numbers from track counts, identify home range characteristics and movements by radio-telemetry, and determine diet (Donaldson 1974, 1975, Bavin 1976, 1978). Between 1982 and 1985, Smith et al. (1986, 1988) investigated cougar population dynamics in the Carlsbad Caverns and Guadalupe Mountains National Parks region, and established a program for long-term monitoring of cougar populations within these parks. The study was begun in response to sheep ranchers' complaints of depredations by cougars believed to be inhabiting both national park lands and adjacent ranches (Smith et al. 1986).

The most recent study of cougars in New Mexico (1985-1995) was initiated in response to the controversy in 1983 and 1984 regarding the status and management of cougars in New Mexico. The Hornocker Wildlife Institute designed and carried out the most intensive research ever conducted on cougars, examining many of the management needs discussed below. The study (Logan et al. 1996) provides NMDGF with the most reliable information available for cougar management.

Managing Depredation.-- Depredation on livestock is of prime consideration because of the political ramifications to cougar management and the economic losses to livestock producers. None of the 241 marked cougars in New Mexico's 10-year study were ever documented to be involved in depredation incidents. Although no livestock

were present within the San Andres Mountains, 83% of the males and 59% of the females born within the study area dispersed outside of the study area (Logan et al. 1996). An examination of over 800 fecal samples from the San Andres Mountains, including those from at least 22 cougars that immigrated onto the study area, revealed no traces of predation on cattle. Also, no depredation complaints resulted from an experimental relocation of 14 cougars from the study area to northeastern New Mexico (Logan et al. 1996). However, in some localized areas cougars do prey upon livestock, primarily calves and domestic sheep (Shaw 1979, Smith et al. 1986, Cunningham et al. 1995), and therefore cause economic impacts to livestock operators. Cougars involved in depredation incidents may be removed in order to prevent future depredation, but in prime cougar habitats new immigrants will likely replace any individuals that are removed (Smallwood and Fitzhugh 1991). Some types of livestock operations may be inherently vulnerable to depredation problems. These include livestock operations with densely-vegetated terrain nearby and extended periods when young animals are born (Shaw 1979, Shaw et al. 1988).

Relocation of cougars is one possible means of removing cougars involved in depredation incidents. Logan et al. (1996) evaluated cougar translocation and found that after release, the majority of adult cougars moved long distances (50 miles or more) in the direction of their original home ranges. In addition, survival of relocated cougars was lower than other cougars located on the study area (Logan et al. 1996). Translocation of adult cougars results in low survival, long distance movements, and the possibility of cougars encountering developed areas, which makes translocation an ineffective and impractical method of managing problem cougars.

Sport-hunting in New Mexico and Cougar Population Dynamics.-- The results of the San Andres Mountains study (Logan et al. 1996) suggest that cougars may currently be overharvested in some areas of the state. Using the estimate of 1,268 cougars in New Mexico (see *Population Status and Demand for Cougars*) and assuming a sex structure similar to that observed by Logan et al. (1996), adult cougars statewide are comprised of approximately 302 males and 435 females. An average of 105 cougars were harvested per year in New Mexico from 1985-1995; males averaged 60% and females 40% of the harvest. Consequently, annual harvest rates may averaged as high as 21% of all adult males and 10% of adult females. In contrast, adult male cougars increased by 7-8% per year in the protected San Andres Mountains, and annual female

rates of increase were as low as 4%. Furthermore, cougars killed for depredation control and illegal kills were not included in these calculations.

Harvesting of female cougars may cause greater impacts to cougar populations than harvesting males. The killing of females removes reproductive members from the cougar population, and may result in the abandonment and starvation of cubs. A small proportion of adult females within a population may be responsible for the majority of the cubs produced (Logan et al. 1996), and loss of a few individuals could severely impact a population's reproductive potential. Consequently, killing fewer females and more males can provide a higher level of sustained harvest. This has been achieved in some western states and provinces through harvest quotas. Quotas limit the harvest to a specified number of males and/or females within a given area. In a quota system, hunters purchase a permit or license that generally allows them to hunt in any area of the state. A hunter selects a certain unit or zone, and must then check in with the local wildlife management agency to determine if that area is still open to hunting. A hunter who successfully harvests an animal must bring a hide and proof of sex to a representative of the state wildlife management agency (as is currently done in New Mexico). When the quota is met for a given zone or unit, hunters are notified that the area is closed (or will close within a given number of days), and hunters may then go to any other open unit or zone. Quotas prevent overharvesting within certain areas and direct hunting pressure toward areas where the objective is to control the cougar population.

The use of dogs for sport-hunting of cougars can help protect females and cubs. A cougar treed by dogs can be easily sexed, allowing the hunter to decide whether or not to harvest that animal. In places where female sub-quotas exist (such as Montana, Wyoming, and Alberta, Canada) hunters and guides are motivated to select for males in order to increase the length of time when units or zones are open to cougar hunting. In 6 years after a quota system was implemented in Alberta, the percentage of females in the cougar harvest decreased from 43% to 29%, while the season length, total harvest, and hunter success all increased (Ross et al. 1996). The female portion of the quota provides opportunities for those who choose to hunt without dogs, and may have more difficulty in sexing a cougar before it is harvested.

Cougar Impacts on Prey Populations.— New Mexico's ten year research project examined the relationships of cougars to mule deer. Logan et al. (1996) found that although cougars were the major cause of death in mule deer, habitat quality was the

ultimate limiting factor for deer populations. This agrees with findings from other studies in southwestern states, where deer populations are believed to be limited by precipitation and its effects on habitat quality (Smith and LeCount 1979, Brown 1984, Smith 1984). When habitat quality was good and the deer population was below the carrying capacity in the San Andres Mountains, cougar predation did not keep the deer population from increasing. However, during drought, the reduced carrying capacity of the habitat and increased cougar predation helped contribute to deer population decline. Cougar predation may compound the negative effects of drought or other mortality factors and slow the increase of deer populations as habitat conditions improve. However, no studies have shown that reducing cougar populations causes significant increases in mule deer populations, and cougar control should not be expected to reverse deer population declines caused by habitat deterioration, such as during drought (Hornocker 1976, Connolly 1978, Gruell 1986, Logan et al. 1996).

The San Andres Mountains study also examined the effects of cougar predation on desert bighorn sheep (*Ovis canadensis mexicana*). Cougars occasionally killed desert bighorn sheep during the study, but the density of adult cougars was not related to sheep survival rates (Logan et al. 1996), and the sheep population remained at approximately 40 individuals throughout the study. The sheep population was limited by the combination of small population size and the high prevalence of diseases (scabies), which made sheep more vulnerable to a variety of mortality causes, including cougar predation. However, cougar predation and other factors have reduced the San Andres Mountains sheep to less than 10 animals today. Small populations of prey may be impacted by individual cougars, which can learn to prey upon different species in a relatively short time (Ross et al. 1996).

Wildlife managers and publics are concerned that the cumulative effects of predation by cougars, other predators, and sport-hunters may reduce game populations and may increase depredation on livestock. In New Mexico, coyotes, bobcats (*Lynx rufus*), and black bears (*Ursus americanus*) are most likely to compete with cougars for game. Cougars displace bobcats and sometimes coyotes when they associate at kills, and have been documented to occasionally eat both species (Koehler and Hornocker 1991, Beier and Barrett 1993). Black bears may displace cougars from kills, which could contribute to a higher kill rate by cougars (Murphy et al. 1996).

The U.S. Fish and Wildlife Service's plan to reintroduce Mexican wolves into eastern Arizona may result in the dispersal of wolves to some cougar habitats in western

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New Mexico. Wolves that disperse to the Gila National Forest will compete with cougars. In northern Montana, wolves have been observed displacing cougars from kills, pursuing them, and even occasionally killing them (Ruth and Hornocker 1996). If wolves usurp cougar kills on a regular basis, then wolves may contribute to a greater cougar kill rate on ungulates. However, frequent wolf-caused mortality could reduce cougar densities. Cougars may also shift their range and behavior to avoid areas frequently used by reintroduced wolves.

HABITAT ASSESSMENT

Cougars reside in all habitats within New Mexico, with the exception of large, open plains. The New Mexico Gap Analysis project (Thompson et al. 1996) quantified cougar habitat in New Mexico by selecting mountain ranges and vegetation types used by cougars. The analysis identified approximately 17,132 mi² of cougar habitat across the state. However, this is probably a minimum estimate of the amount of potential cougar habitat in New Mexico. *maybe ~ 21,415 mi² cougar habitat*

SUPPLY AND DEMAND FOR COUGARS

Reliable estimates of the number of cougars in New Mexico do not exist. Ligon estimated there were about 400 cougars in 1917 (Bailey 1931). In 1967, Berghofer (1967) estimated that there were at least 350 cougars. These numbers likely are conservative and reflect the great difficulty in attaining accurate estimates of cougars. From 1972 to 1974, NMDGF attempted to quantify cougar numbers by counting tracks, and estimated at least 493 cougars (of all ages) in the southwest region alone (Donaldson 1975). However, the accuracy of Donaldson's (1975) method has never been tested.

The best estimate for the cougar population in New Mexico can be made by using the densities found by Logan et al. (1996), and multiplying by the amount of cougar habitat within the state. Cougar densities in New Mexico currently are estimated to be about 4.3 adults/100 mi.² (Logan et al. 1996), which is similar to densities found for both hunted and unhunted populations in other areas of the western United States and Canada (Logan et al. 1986, Hopkins 1989, Ross and Jalkotzy 1992). Using this estimate of cougar densities and multiplying by the amount of habitat identified within New Mexico (Thompson et al. 1996), there may be about 1,268 cougars in New Mexico, including about 737 adults.

In the 11 years since the 4-month-long hunting season began, the number of cougar licenses sold increased by 158%, from 443 to 1,145 (Fig. 2), and the number of cougars harvested per year increased by 90%, from 79 to 150. However, hunter success declined from a high of 22% in the 1986/87 season, to 13% in 1994/95 (Fig. 3; Weybright 1993, NMDGF Cougar Harvest Records 1993-1995). The demand for cougar hunting in New Mexico may further increase as a result of recent ballot initiatives in other western states (Oregon, Washington, California) that have restricted cougar hunting opportunities. These initiatives could increase the already growing number of cougar hunters and cougar harvests in New Mexico.

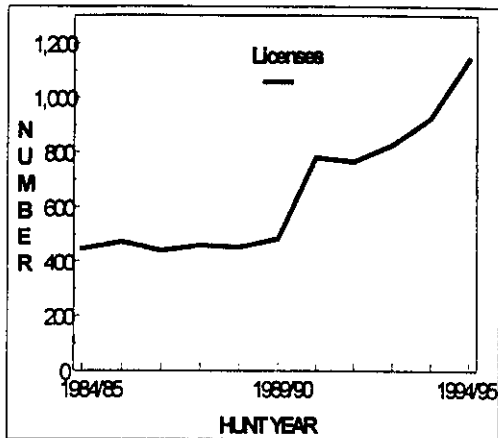


Fig. 2. Number of New Mexico cougar hunt licenses issued per year from the 1984/85 hunt season through the 1994/95 hunt season.

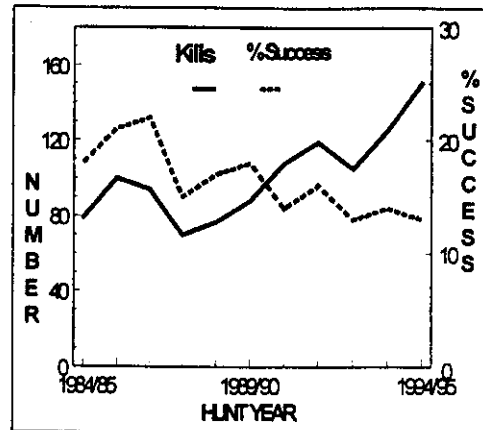


Fig. 3. Number of cougars killed by hunters and percent hunter success each year in New Mexico from 1984/85 through 1994/95.

Traditionally, cougar harvest has been highest in the north-central and southwestern regions of New Mexico. Evans (1983) examined harvest data from 1979 to 1983 and found that the north-central region (bounded by State Highway 44 on the south and west and Interstate Highway 25 on the south and east) contributed the highest number of hunter-killed cougars. The Sangre de Cristo Mountains, found within this region, provided the greatest cougar harvest statewide. The Mogollon Mountains, Mimbres Mountains, and Black Range had the greatest cougar harvest within the southwest. Areas with slightly less cougar harvest included the Guadalupe Mountains

and the Capitan-White Mountain complex in the southeast. Since 1985 the greatest harvest has been in the northwest and southwest mountains.

Since 1985, the average annual harvest in New Mexico has been 105 cougars. The composition of the kill has averaged 60% males and 40% females, suggesting that hunters select the larger cougars as trophy animals. Although data on cougar sport-harvest is relatively complete, population estimates across the state can only be made through extrapolations from cougar study areas and identification of cougar habitats. It is therefore not possible to confidently evaluate effects of current management practices on cougar populations throughout New Mexico.

ECONOMIC IMPACTS

NMDGF received \$15,980 in revenue from cougar hunting licenses during the 1995/96 license year. Revenue is expected to increase in the future as a result of an increased demand due to recent restrictions on cougar hunting in other states, and an increase in the cost of New Mexico cougar hunting licenses. Cougar licenses for New Mexico residents increased from \$10 to \$30 for the 1996/97 season. The current cost for a non-resident hunting license is \$200. Non-residents accounted for about half of the total revenue from cougar hunting licenses in 1995/96, and an undetermined amount of income to local economies in the form of accommodations, hunting supplies, and outfitting services. Guides and outfitters play a significant role in cougar hunting. For the years 1993-1995, an average of 33% of all cougar hunters and 56% of hunters that harvested a cougar employed guides or outfitters (NMDGF Cougar Harvest Records 1993-1995). Although the fees charged by guides and outfitters vary, the revenue from these services almost certainly exceeds the total revenue generated from cougar licenses by NMDGF.

Cougars can have negative economic impacts on some livestock operations. Cougars occasionally prey on sheep or other domestic livestock for food. Although the number of these depredation incidences in New Mexico is relatively small, there may be significant economic impacts to individual ranchers that suffer from chronic cougar depredation losses.

SPECIAL CONSIDERATIONS

The often controversial and emotional nature of issues regarding cougars results in the need for information about cougar biology and ecology. An informed public can contribute valuable input on management activities, including urban planning, livestock management, and other areas where humans and cougars may conflict. However, New Mexico may never be able to meet the public demand for precise information on cougar populations throughout the state, due to the time and resources required to collect cougar population data. Monitoring the impacts of a statewide management program can help reduce public uncertainties in our knowledge of cougar populations, and increase public satisfaction and confidence in New Mexico's management of cougars.

SUMMARY AND CONCLUSIONS

Cougar management is an issue which generates strong and diverse public opinions. Meeting the diversity of public desires for cougars within a given area is a challenging task. Cougar management is further complicated by the difficulty and expense of obtaining reliable knowledge of cougar populations. Cougar management in New Mexico can only be successful by attempting to provide for different needs and desires in different locations throughout the state. Management actions will have to be undertaken without complete certainty of their impacts, but using the best available knowledge and information. Monitoring the results of management activities and public satisfaction with these actions will enhance NMDGF's ability to meet the changing public needs for cougar management.

MANAGEMENT GOAL AND OBJECTIVE

- GOAL:** That the management of cougars by NMDGF satisfies people's recreational, ecological, and economic interests, and successfully resolves cougar-related issues.
- Objective:** That by 2004, the NMDGF has achieved 75% public satisfaction in managing cougars to meet people's recreational, ecological, and economic interests, and in resolving cougar-related issues.

IDENTIFIED COUGAR ISSUES AND STRATEGIES

ISSUE 1: Incompatible recreational, ecological, and economic interests may be impossible to satisfy within any particular geographical area.

Strategy 1: Implement a zone management approach and designate appropriate areas of New Mexico for cougar management activities that will accommodate specific recreational, ecological, and economic interests.

ISSUE 2: There is some public concern that harvest and control strategies may be locally excessive and conflict with ecological and existence values.

Strategy 2: Harvest cougars at levels and sex ratios consistent with the desired objectives for designated management zones.

Strategy 3: Allow the use of dogs in cougar hunting as a tool to facilitate hunters' ability to determine gender and take cougars in the desired sex ratios.

ISSUE 3: Use of dogs in cougar hunting is considered offensive to some people and may diminish their confidence in the cougar management program.

Strategy 4: Provide public information on the rationale for cougar hunting strategies, with particular emphasis on how use of dogs can aid in the protecting of female cougars and thereby conserving cougar populations.

Strategy 5: Inform houndsmen how they might avoid offending public sensibilities regarding the use of dogs to take cougars.

ISSUE 4: Sportsmen are concerned that management activities designed to accommodate popular ecological interests may reduce cougar hunting opportunity.

Strategy 6: Provide for maximum sustainable cougar harvest in zones designated for recreational interests.

Strategy 7: Emphasize the use of sport-hunting to reduce cougar populations in zones where economic interests are primary and cougar control is the desired objective.

Strategy 8: Limit cougar harvest rather than hunting opportunity in zones where limited harvest is prescribed.

ISSUE 5: Zone management may result in designating 1 to 3 geographic areas in where cougar hunting is prohibited. Such closures may cause concern for lost recreational opportunity and increased depredation.

Strategy 9: Select areas to be closed to cougar hunting in which such opportunity is already limited, where ecological interests are primary, and where potential conflicts with livestock are minimal.

Strategy 10: Respond to depredation problems in zones closed to cougar hunting.

Strategy 11: Provide public information as to the management rationale for closing some zones to cougar hunting.

ISSUE 6: Some hunters are concerned that restricting the taking of females and cubs diminishes their recreational opportunity.

Strategy 12: Provide public information as to the rationale for cougar hunting strategies and the intended long-term recreational benefits.

ISSUE 7: Increasing human populations and accompanying changes in land use may reduce the capacity of New Mexico's habitats to support cougar populations in the numbers necessary to satisfy various public interests.

Strategy 13: Designate zones as cougar population reservoirs that are closed to cougar hunting only where current land uses are expected to be stable and remain favorable to cougar populations.

Strategy 14: Provide information about cougars and cougar habitat needs to land management agencies and others who may be affected by or interested in land management decisions.

ISSUE 8: Some people's concerns for the extent of our knowledge of cougar populations and our ability to know the effects of our management decisions may diminish their confidence in the cougar management program.

Strategy 15: Use the best available scientific information to develop flexible management strategies.

Strategy 16: Monitor the results of management actions and public concerns regarding these actions to inform future decision-making processes.

ISSUE 9: The effectiveness of cougar management strategies in meeting the desired outcomes of diverse publics can not always be anticipated.

Strategy 17: Allow management activities to change over time as new information and public needs arise.

Strategy 18: Set aside large zones with little or no cougar hunting to guard against management errors and uncertainties, and to provide a population reservoir to supply other management zones.

Strategy 19: Survey public opinion to determine public satisfaction with cougar management activities.

ISSUE 10: Some sportsmen believe that the cougar management program should address their fears that cougar predation may significantly reduce deer and bighorn sheep populations and related hunting opportunities.

Strategy 20: Investigate possible correlations between cougar, deer, and bighorn sheep populations in areas of particular concern and publish findings.

ISSUE 11: Cougar management strategies may conflict with management plans for other wildlife, particularly prey species.

Strategy 21: Anticipate and work to resolve potential conflicts with other programs before they occur.

ISSUE 12: Some recreational and ecological interests do not approve of killing cougars to prevent livestock depredation.

Strategy 22: Emphasize the use of sport-hunting to reduce cougar populations in areas of chronic depredation problems.

Strategy 23: Provide public information explaining the need for lethal control of depredating cougars.

Strategy 24: Work with agricultural interests to discover and encourage any non-lethal control alternatives that may exist.

ISSUE 13: Some agricultural interests are concerned that popular public opinion against animal damage control activities will diminish the use of currently available techniques which they believe are effective in relieving cougar depredation losses.

Strategy 25: Employ increased sport-hunting to reduce cougar populations in areas experiencing chronic livestock depredation by cougars.

Strategy 26: Where sport-hunting proves inadequate, supplement with direct control techniques.

ISSUE 14: The Unit 30 preventive control project is controversial and may adversely impact public satisfaction with the cougar management program.

Strategy 27: Reduce the need for preventive control by increasing sport-hunting opportunity and interest in Unit 30.

ISSUE 15: Dissatisfaction with NMDGF's cougar management program arises from differing public perceptions regarding the seriousness of cougar depredation.

Strategy 28: Provide public information pertaining to the frequency and severity of cougar depredation incidents.

ISSUE 16: Public fears of cougar attacks upon humans conflict with the maintenance of cougar population levels sufficient to meet recreational and ecological interests.

Strategy 29: Provide public information regarding the frequency of cougar attacks and appropriate behavior to avoid attacks while in cougar habitats.

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