Chapter 5: Wildlife Population Management and Conflict Response Actions

This chapter presents policies and actions related to wildlife population management and wildlife conflict responses. It begins with separate sections on moose, bears, geese, and feral animal population issues, and then describes conflict response policies.

Wildlife Population Management Recommendations

While the planning team was able to agree generally about wildlife population goals for major species, there was less consensus about the means to achieve those goals if current population levels are higher. In this section of the plan, we examine these population management issues for moose, bears, Canada geese, and exotic species (pigeons, starlings, and feral rabbits). The intent is to define areas of agreement and disagreement, and make recommendations for resolving the latter.

Readers should note that ***this plan is <u>not</u> the final word on population management decisions in Anchorage.*** Public hunts, trapping, and other lethal control actions directed at game species are generally the responsibility of the governor-appointed Board of Game, which also works in tandem with the Anchorage Fish and Game Advisory Committees. These actions may also require approval from landowners in the areas where they are proposed. If firearms are involved, legal exceptions to ordinances prohibiting firearm discharge within certain land management areas may also be required. Similarly, other governmental authorities and laws are involved in Canada geese or feral animal control in Anchorage, and not all have been extensively involved in this planning effort. Accordingly, this plan makes recommendations on how governmental agencies should proceed with population management decision-making, but final actions are likely to be determined in other forums.

Moose Population Management

There was no consensus among the planning team about the need for hunts or lethal control programs in the Anchorage area to reduce moose populations. While a majority of the planning team agreed that current moose populations may be too high (based on biological criteria), there was sharp division over the need for hunts or lethal control actions to reduce them. There was also unresolved discussion over whether such reductions would have noticeable effects on the reduction of moose conflicts such as moose-vehicle collisions, aggressive moose encounters, or moose-related property damage.

This lack of consensus is mirrored in the community and other wildlife decision-making authorities. While the Board of Game recently approved a new moose hunt in Chugach State Park, the voting margin was narrow (4-3). In addition, the approval of Chugach State Park officials and its Citizen's Advisory Board is necessary for the hunt to take place, and there appears to be division in that group as well. Finally, the moose management issue has been a focus of considerable discussion at public meetings and in public comments associated with this planning effort. During the most recent public comment period on the Draft Plan, well over half of the comments focused primarily on moose management issues, with 64% opposed to a hunt while 36% supported a hunt.

A scientific survey of Anchorage residents conducted in 1996 showed contrasting results (Whittaker and Manfredo, 1997). Survey findings indicated that a majority (61%) would accept public hunts to reduce

moose populations, but that views were also strongly polarized. When asked about a specific moose hunt in Chugach State Park, results showed 51% support, 34% opposition, with 15% reporting that they "don't know." Additional analysis of the park hunt results revealed that hunt opponents and supporters had divergent beliefs about the consequences of a hunt, some of which appear to trace back to fundamental differences in values toward the use or protection of wildlife (Whittaker et al., In press).

The survey also provided information about residents' evaluations of moose population levels and the problems those may cause. While a majority supported moose hunts, most residents did not consider the current moose population too high. Results suggest that 69% thought there were "too few" or "about the right amount" of moose in Anchorage, while only 31% thought there were "too many." In addition, nearly two-thirds reported that moose encounters on trails or in neighborhoods were "at acceptable levels," and 61% reported the same about moose-related property damage incidents (moose eating gardens and trees). However, 60% did report that there were "too many" moose deaths from moose-vehicle collisions.

Taken together, survey results highlight the complex attitudes Anchorage residents hold toward moose and moose management actions. While there is clear concern about some moose problems (vehicle collisions), there is less concern about others (encounters and property damage). And while most people would accept or support a hunt, most also do not think that population reductions are necessary.

Given this background, the planning team was unable to decide for or against a hunt, and agreed to defer recommendations on moose population actions. Instead, **this plan recommends a "step-down" planning effort to resolve this and related moose population issues.** While we recognize potential public frustration with a plan that simply advocates more planning, additional information and consensus-building appears necessary to resolve key issues in the debate.

The Alaska Department of Fish and Game has agreed to lead this step-down planning effort, which is expected to be organized along similar lines to the Anchorage Waterfowl Working Group (developed to address geese management issues). The timeframe for this planning effort is fall and winter 1999-2000.

Although agencies and existing authorities (ADF&G, Chugach State Park, and the Board of Game) will ultimately be responsible for moose population decisions, the working group is expected to include representation from a diversity of other public agencies and citizen advisory boards, including the Anchorage Fish and Game Advisory Committee, the Chugach State Park Citizen's Advisory Board, the military reservations, BLM, and the Anchorage Municipality's Division of Parks and Beautification. The working group is also expected to provide extensive opportunities for interest groups and interested individuals (e.g., hunting groups, park user groups, Hillside residents) to become active participants in the planning effort or to provide comments.

As this new group begins its work, the planning team has identified a number of additional information needs and issues which should be used to structure decision-making processes and content. These are summarized below.

- ***If moose reductions are necessary, either hunts or lethal control programs should be considered.*** The planning team could not agree on the need for actions to reduce populations. However, if such a need is established, there was general agreement that either hunts or lethal control programs could be used to accomplish this, depending upon population reduction goals and locations. While the 1996-97 survey of residents showed greater acceptability for hunts than control actions (even if the latter

lead to charitable donations of meat), respondents were provided few details about how such a program would work. In particular, the question did not specify how guides or sharpshooters (as opposed to agency personnel) could be used to reduce moose populations in developed areas, where safety issues make public hunts less acceptable.

The planning team has recognized demand for additional moose hunting opportunities in the Anchorage area, as well as the generally lower costs of administering public hunts in comparison to lethal control programs. However, if moose reductions are necessary in residential or more developed parts of the city, the planning team suggests that safety concerns might favor lethal control in those areas.

- ***Consider expanding existing hunts first.*** There are already moose hunts in the Anchorage area; 125 permits are issued each year to hunters on the military reservations, and these typically result in the harvest of about 50 to 65 moose. If the decision is made to reduce moose populations, it may be possible to expand the season or number of hunters involved in those existing hunts before developing new ones. This would obviously require participatory decision-making with authorities at Elmendorf and Fort Richardson. Potential problems with this approach include: 1) expanding existing moose hunts could change the quality or harvest success rate of the military hunts; 2) moose population reductions on the military reservations could have few practical impacts on moose populations in the city; and 3) moose population reductions could diminish wildlife viewing opportunities on the reservations.

- ***Specify goals of any hunt or lethal control actions before they are implemented.*** Data from the survey of residents show divergent beliefs among hunt supporters and opponents (Whittaker et al., In press). For example, support is based on beliefs that a hunt will reduce moose-vehicle collisions, reduce the potential for human-moose encounters, and keep moose from becoming overpopulated. In contrast, opponents of the hunt were far less likely to believe the hunt would address these problems. If a hunt is conducted, a connection between the hunt and the reduction of these problems should be determined (see below) and the hunt designed accordingly.

- ***Need for additional information on consequences of population reductions***. Hunt supporters believe reduced moose population levels would help reduce both moose-vehicle collisions and moose encounter levels. These links, however, have not been quantified; increased monitoring of these incidents thus might help determine if these relationships exist. One of the actions described in the next chapter (creation of an urban wildlife position/program), would provide for this monitoring effort.

- ***Need for additional information on biological carrying capacity for moose in Anchorage.*** Biological carrying capacity (BCC) refers to the limits of an area to support a sustainable population of a certain species, such as moose. Despite the common use of this term and concept, defining BCC is complex and depends upon value judgments about what one means by "sustainable" (Dasmann, 1964; Shelby and Heberlein, 1986; Decker and Purdy, 1988). To take a simple example, BCC is different depending upon whether the goal is to maximize the number of animals, the overall health of those animals, or the overall health of the vegetation that is needed to feed those animals over time. In each case, scientists must monitor different indicator variables to decide whether the system is "healthy."

Current estimates of BCC for moose in Anchorage are based on professional judgments that focus on browse condition (which is currently poor) and population changes after severe winters (precipitous decreases of 25 to 30% in after the winter of 1994-95 suggest that population levels were too high). More rigorous quantification of these variables is possible, however, and may be necessary to establish the need for hunts to reduce overpopulation. Newly developed techniques for assessing moose health during winter may also help assess BCC for moose (e.g. fat-content analyses of moose droppings, estimates of rump fat). One of the priority actions in this plan is to fund studies to develop and periodically monitor these types of indicators.

- ***Biological carrying capacity for moose is different from social acceptance capacity.*** It is important to distinguish biological carrying capacity (BCC) from social acceptance capacity (SAC) (Decker and Purdy, 1988). The former is about the health of the moose population and the resource base upon which it depends, while the later is about the number of moose that people will tolerate (and which can vary for different groups of people). BCC is determined by biological information; SAC is determined by social information. In some urban areas, for example, SAC is far lower than BCC for white-tailed deer. These areas could biologically sustain more deer but many residents are interested in keeping their numbers lower to minimize conflict problems including vehicle accidents, landscaping damage, or the transmission of Lyme's disease (Loker et al., 1999). In Anchorage, however, data suggest that SAC is higher than BCC for moose. Survey data suggest that most residents (69%) do not feel that there are too many moose in Anchorage, while ADF&G biologists suggest that current populations are probably at or above BCC.

  The implication is that moose population goals should consider both BCC and SAC, and probably manage for the lower of the two. The planning team generally agrees that moose populations in Anchorage should be kept below BCC, but there is division over whether we have enough quantifiable information to determine that number. The best current estimate of BCC is about 600 to 700 wintering moose in the Anchorage Bowl, which is the low end of the fluctuating range that has existed in Anchorage over the past 15 years. Current winter populations may be as high as 1,000 moose.

- ***Any hunt should minimize safety hazards and loss of public land access to non-hunters.*** Based on survey results, hunt opponents have concerns about safety issues and loss of access to public land during hunts. Any hunt should therefore be designed to minimize these problems. Requiring short-range firearms or bows, hunter education certification, teams of hunters, extensive monitoring by game officials, weekday and late-season hunts, and removal of the entire animal after harvest are all potential options.

- ***Ensure no dramatic loss of viewing opportunities or populations***. The planning team agreed that even if moose population reductions are necessary, care should be taken to avoid dramatic reductions caused by human means (e.g., hunting or lethal control). In addition, any decision on reduction actions should consider the effects on wildlife viewing opportunities. Hunts or lethal control may eliminate less wary moose, which are generally easier to view, or may change the behavior of moose in general, making them more wary. Survey results suggest that a majority of Anchorage residents (69%) feel there are an acceptable number or even too few moose, while 31% reported there were "too many" or "way too many" moose. This reiterates the notion that social acceptance capacities for moose in Anchorage are high (probably higher than the biological carrying capacity). The planning team generally agrees that robust moose populations, even if they cause some problems, appear acceptable to most Anchorage residents.

- ***Recognition that there may be long-term alternatives to hunts or lethal control programs.*** Even if no hunt or lethal control program is implemented, moose population reductions are likely to occur periodically during harsh winters. The ultimate goal is to prevent these sharp declines over the long-term by stabilizing moose populations at levels that are biologically and socially optimal. If hunts or control programs in some parts of the city are not feasible, it may be possible to make those areas less attractive to moose (or attract moose from residential areas to less developed public lands). The planning team recognizes that this is a long-term process that would require challenging behavior changes among the Anchorage populace (e.g., changes in their landscaping preferences), but it does offer an alternative way to minimize the problem. Another alternative solution, a moose sterilization program similar to those being researched for white-tailed deer, is currently considered infeasible and too costly for Anchorage moose.

Moose management is likely to remain an on-going issue in Anchorage, even if a controlled moose hunt is authorized and held. Anchorage residents have a diversity of complex attitudes toward moose, the problems they may cause, and the hunts or lethal control actions that might be used to manage their numbers. The planning team is under no illusion that decisions about moose populations will become less controversial through a step-down planning effort, but it hopes that some of the issues will be less contentious with additional information and continued interaction between the people and groups with opposing viewpoints.

Bear Population Management

This plan does not recommend reductions in either brown or black bear populations in Anchorage. However, throughout the Draft Plan comment period and over the course of the 1999 summer, there has been increasing concern about bear conflict problems. As noted in Chapter 4, calls to ADF&G about nuisance or aggressive black bears have increased dramatically in the past two summers. While some people have called for reductions in black bear populations, there is a lack of information about whether increased conflicts are population- or behavior-driven. Accordingly, the planning team is recommending development of a step-down plan to explore this issue in greater detail.

The Alaska Department of Fish and Game has agreed to lead this effort, which is expected to be organized along similar lines to the Anchorage Waterfowl Working Group (developed to address geese management issues). The timeframe for this planning effort is fall and winter 1999-2000.

Although agencies and existing authorities (particularly ADF&G and the Board of Game) will ultimately be responsible for any bear population management decisions, the working group is expected to include representation from a diversity of other public agencies and citizen advisory boards with responsibilities relative to bear management in Anchorage. These include the Anchorage Fish and Game Advisory Committee, the Chugach State Park Citizen's Advisory Board, the military reservations, BLM, and the Anchorage Municipality Division of Parks and Recreation. The working group is also expected to provide opportunities for interest groups and interested individuals to become active participants in the planning effort or to provide comments.

As this group begins its work, the planning team urges systematic consideration of a number of issues in addition to population management. Readers should also note that several policies and actions

recommended in this plan are designed to work together to help reduce bear conflict problems. These include 1) the explicit bear conflict response policies that are likely to remove "repeat offender" bears ; 2) an urban wildlife position/program designed to monitor and respond to conflicts; 3) conflict response training for law enforcement staff; 4) a coordinated bear encounter safety program to teach people how to behave appropriately in conflict situations; and 5) a coordinated bear attractant ordinance and education program designed to help remove attractants that may encourage bears to become dependent on human food sources, and may lead to aggressive behavior. The latter part of this chapter addresses the conflict response policies, while sections in Chapter 6 address the various prevention actions.

Canada Goose Population Management

Anchorage has a growing number of breeding Canada geese (*Branta canadensis*) which are causing some safety, economic, and nuisance problems, as well as potential health risks to geese and people. The collision between geese and an Air Force plane at Elmendorf Air Force Base in September 1995, killing 24 people, was the most devastating outcome of these problems to date.

In response to these problems, the Anchorage Waterfowl Working Group (AWWG) was formed in 1995 to collect and share information on goose population dynamics, goose habitats, and ways to help manage and minimize geese problems. At least two important planning documents have been developed in cooperation with this group. The first was an Environmental Assessment developed by the U.S. Fish and Wildlife Service in March 1998. This EA states that there would be no significant impact to Alaska goose populations if Anchorage's population was maintained at 2,000 geese. The second document was an Anchorage Goose Management Plan (April 1998), which recommended a number of actions including the reduction of geese populations from 4,600 to about 2,000 by the year 2002.

To avoid duplication, this plan has not revisited geese management issues. Instead, this plan fully supports the work and decisions made in the AWWG effort. For completeness, however, we have summarized the major decisions in the Anchorage Goose Management Plan as given below.

Background. The number of Canada geese nesting and residing over the summer in the Anchorage Bowl has increased more than 10-fold during the past two decades. This increase is a result of changes in the urban environment that initially attracted a few geese, then allowed for successful reproduction and high rates of survival. In the summer of 1998 the Anchorage goose population was estimated at more than 4,600. With growth rates as high as 14.6 percent per year since 1974, unchecked growth could result in as many as 15,000 to 20,000 geese in Anchorage by 2007. Based on these data, it is clear that the biological carrying capacity for geese in Anchorage is considerably higher than current population levels.

In the last 40 years, humans have inadvertently created ideal goose habitat in Anchorage by enhancing two habitat features: 1) open expanses of short grass in the form of mowed lawns and parks; and 2) accessible water in the abundant natural and artificial lakes and ponds. As Anchorage grew, particularly during the 1970s and early 1980s, natural forested and bog habitats that previously supported few geese were converted to residential neighborhoods, commercial developments, and public facilities. Geese able to adapt to urban conditions found ideal grazing habitat. As these geese reproduced successfully, their offspring returned to nest within two or three years, and the population increased rapidly. We know from banding studies that most of the geese currently in Anchorage did not come here from elsewhere in the state – they were hatched here.

Anchorage's geese have developed certain behaviors which are different from geese found in wild habitats. They congregate in large numbers where food is readily available – particularly where people feed them. Geese in wild habitats do not congregate like this. They can also become aggressive and attack when disturbed, while geese in wild habitats are very wary and rarely aggressive. Finally, Anchorage goose families with goslings will form multi-family groups (several adult pairs and their goslings), a behavior that is rare in wild habitats. Anchorage's Canada geese are still wild birds, but these behavioral differences with their counterparts in wild habitats are significant.

Population management goals and means. The Anchorage Goose Management Plan recommends reducing geese populations to 2,000 by 2002. These reductions are to be accomplished by using a combination of control methods. During summers in 1998 and 1999, this included egg collection, gosling relocation (goslings removed will generally return to the new location), harassment, habitat alteration, and limited lethal control. The focus of these efforts was the area around airports, but it included other areas where geese congregate.

In general, the plan recommends a dramatic focused effort to reduce geese populations in the next three years, so that fewer geese will need to be destroyed over the long-term. The Environmental Assessment estimated 350 geese would have to be destroyed annually to maintain the population at 4,000, while only 150 would need to be destroyed annually to maintain the population at 2,000 birds.

Alternative long-term solutions. The goose management effort has also explored alternatives to lethal control and other population management efforts. The best long-term solution to minimizing human-goose conflicts in urban areas is to replace expansive, grassy lawns to with habitat less attractive to geese. Unfortunately, many people prefer grassy lawns and parks, and there is no widely acceptable substitute for grass on golf courses and athletic fields. Recent AWWG efforts are exploring alternative grasses that may be less palatable to geese, and the development of an outreach program that will educate the Anchorage public about geese issues, management options, and ways they may be able to help reduce geese problems. These outreach programs emphasize how the public can help reduce geese problems by retaining or planting native vegetation (e.g., shrubbery, wildflowers, trees) in place of lawns, and by supporting efforts to have natural vegetation retained or planted in portions of parks or other public areas. This plan fully supports these efforts. If possible, AWWG hopes that alternative measures will obviate the need for lethal control, although in the short term it appears that some population measures will be necessary.

Costs and Funding Sources. Anchorage International Airport, Elmendorf Air Force Base, and Merrill Field spent about $1 million annually on goose hazing and habitat alteration in 1997 and 1998. These costs may be cut substantially if the goose population is reduced and geese learn that airports are places to avoid. The outreach geese education program is being led by US Fish and Wildlife Service, Elmendorf Air Force base staff and the AWWG group, and is supported by cooperating agencies through staff salaries.

Non-Native and Feral Animal Population Management

One objective in the plan is to reduce non-native wildlife populations to socially acceptable levels. Although the 1996 survey of residents did not address these species, ADF&G staff suggest that there may be problems associated with growing pigeon, starling, and feral rabbit populations (domestic rabbits who escape or are released into the wild and then thrive). In response, the plan recommends halting the population growth of these species and, if possible, significantly reducing their numbers. In addition, the plan also recommends the development and distribution of educational advice to homeowners and businesses to minimize problems caused by these animals.

Pigeons. Pigeons or rock doves are relative newcomers to Anchorage, with the first flock established in the downtown area in the late 1960s. Audubon volunteers have tallied increasing numbers of pigeons (>900) during their December bird count in recent years, but these counts tend to underestimate actual populations. The U.S. Department of Agriculture Wildlife Services Program (formerly Animal Damage Control) has trapped and destroyed about 1,000 pigeons/year in Anchorage since 1996, suggesting pigeon populations are at least twice as high as the Audubon counts for the Anchorage Bowl.

Pigeons carry diseases that can affect other birds and people. A salmonella epidemic has killed thousands of native birds such as redpolls and pine grosbeaks at birdfeeders in recent winters, and this may have been nurtured in the growing pigeon population. Pigeons in the city also compete with native ravens and magpies in winter when food is scarce. Pigeons roost and nest in buildings and other man-made structures. They often cover roof tops, fresh-air ventilation equipment, ledges, and sidewalks with their droppings.

The USDA Wildlife Services office in Palmer has contracts with businesses and condominiums throughout Anchorage to eliminate flocks of pigeons. They have the expertise and equipment to trap and destroy pigeons, but require a funding source. At Wildlife Service's current level of response, pigeon control costs are approximately $8,750 per year. The bulk of these costs are born by the individuals or organizations experiencing pigeon damage. Increased efforts might be funded through city or state appropriations. Reducing these populations dramatically in one year would lower costs in the long term, and would reduce the number of pigeons that need to be eliminated in subsequent years. However, such an effort would initially require annual funding in excess of current levels.

European starlings. Starlings are dark, robin-sized birds. Their light speckling may not show at a distance. Since their introduction to North America from Europe in the 1890s, starlings have spread across the continent. They arrived in Anchorage within the last decade, and are now year-round residents in the Anchorage Bowl.

Biologists are concerned about the growing population of starlings in Anchorage. Starlings aggressively compete for nest sites with native cavity-nesting birds such as swallows, chickadees, nuthatches, and woodpeckers. In other states, this competition has caused a severe drop in populations of native birds. Once established, effective reduction of starling populations is extremely difficult. Huge roosts in buildings or trees create filth, noise and odor. Slick accumulations of droppings are safety hazards. Starling droppings may also allow soils to develop a fungus that may cause histoplasmosis, a disease humans can contract. In addition, flocks of starlings have caused fatal aircraft accidents in other parts of the country, making them a management challenge at airports.

The USDA Wildlife Services office in Palmer will control starlings at the request of property owners as they do for pigeons. However, there is as yet no organized effort to eradicate starlings from Anchorage. Reducing the starling population now would considerably lower long-term costs, and would reduce the total number of birds that need to be eliminated in the future. However, this type of effort would require a funding source.

Feral rabbits. Feral rabbits have become established in Anchorage in recent decades after people released them into the wild or they escaped. Small breeding populations are now scattered throughout the Anchorage Bowl, notably on the Hillside and at the Clitheroe Center in west Anchorage. Total numbers probably exceed several hundred and may be as high as 1,000. Rabbits compete for food with Alaska's native snowshoe hares (the two species do not inter-breed), although rabbits are unlikely to out-compete hares except in rare circumstances. They are also considered a nuisance in some neighborhoods because they kill ornamental shrubs and flowers and eat garden produce. Unlike hares, rabbits are good burrowers and can easily dig under a fence or house, causing other types of damage as well.

As with pigeons, USDA Wildlife Services have the expertise and equipment to conduct rabbit control; however, they will need a funding source, which could come from state or city appropriations.

Wildlife Conflict Responses

The Alaska Department of Fish and Game (with help from other public safety authorities such as state troopers, city police, and airport police), currently respond to most wildlife conflict situations in the Municipality, particularly involving potentially dangerous animals such as moose and bears. However, different agencies and land managers have slightly different conflict response policies for their lands. The following section describes ADF&G's general policies, and is followed by information about additional response policies for Chugach State Park, in BLM's Campbell Tract, and the two military reservations.

Decisions about whether to destroy the animal (or take other actions) in these situations are based on professional judgments that consider a number of factors outlined in ADF&G guidelines. These guidelines, however, have been developed without significant public input. In this planning process, ADF&G has taken the opportunity to summarize and invite comment about them. These guidelines were developed based on traditional agency responses, but also consider information from the 1997 survey of residents, which contained a number of questions about the acceptability of response actions. Upon adoption of this plan, these guidelines will become active (identifying these as "now" decisions rather than "intention" decisions).

Readers should note that all responses to wildlife conflicts involve professional judgments by the responding authority. A number of definitions and policies in this summary are also subject to some interpretation. For example, while definitions attempt to distinguish between "nuisance" and "aggressive" animals, there is obviously a continuum of behavior that we are splitting into two categories. Similarly, there is obviously some judgment required when assessing whether a moose has charged a person or pet "with little apparent provocation" or from beyond "a substantial distance." All of the following policies should be thus be considered guidelines rather than strict rules, and authorities need to assess all of the available on-scene information before deciding how to classify an animal and respond appropriately.

Overall ADF&G Conflict Response Principles *(in order of priority)*

- Ensure public safety (avoid human injuries and/or deaths).
- Minimize damage to private property or pets (although property owners are expected to take reasonable precautions to protect their property and avoid attracting wildlife).
- Minimize adverse effects to wildlife populations.
- Use humane methods during response or control actions.
- Inform the community about the situation and response that just occurred in order to help educate residents and visitors how to avoid these situations in the future. (Note: Education to prevent these situations in the first place is perhaps the highest priority, and is addressed in several actions in Chapter 6).

ADF&G Moose Conflict Response Policy

Definitions:

- ***Overly defensive behavior.*** Moose that threaten, bluff charge or attack people or pets when they are cornered or defending a calf or calves are exhibiting normal defensive behavior. *Overly* defensive moose refer to those that persist in an attack after a threat has been removed or retreated, or when a moose attacks a human or pet from a substantial distance with little apparent provocation.
- ***Deliberate approaches.*** These occur when a moose follows or directly approaches humans. This is not natural behavior and is usually associated with a moose that has been fed; it may escalate into an attack without warning.
- ***Nuisance moose.*** A nuisance moose is one whose behavior prevents human access to homes, businesses, or other structures, or behavior that results in property damage (eating gardens, ornamentals, etc.). Nuisance behavior is distinct from aggressive behavior (see below).
- ***Aggressive moose.*** An aggressive moose is one whose behavior appears intended to intimidate or harm a human or pet. This may include kicking, stomping, bluff charges, charges, rearing on hind legs, "overly defensive behavior," or "deliberate approaches."

Summary of major moose response policies:

- In general, ***nuisance moose*** will be herded from school grounds or heavily used public areas where they create an obvious safety hazard. This needs to be undertaken by trained ADF&G staff, school officials, or public safety/law enforcement officers. Training for individuals who might be involved in these responses is a priority action in this plan.
- In general, ***nuisance moose*** will not be herded from yards, gardens, school bus stops, roads or recreational trails. Residents and visitors need to learn how to live with moose in these settings, and ADF&G will provide advice on ways that individuals can safely deal with the moose or encourage it to leave. An education program designed to develop and distribute information on these types of situations is a priority action in this plan.
- In general, ***aggressive moose*** will be destroyed, although the circumstances involved in each incident will be considered. If the moose is approached after an incident and is no longer acting aggressive, it may be allowed a second chance. A moose exhibiting any *pattern* of aggressive behavior will be destroyed.
- An ***aggressive moose*** may be captured and relocated if: 1) a suitable release site is located at least 30 miles from the capture site; 2) the release site has an adequate supply of browse for the remainder of the winter; 3) the release site is at least five miles from residences and popular recreation areas; and 4) staff and funds are available. There is currently no funding source for this type of action.
- When necessary, moose will be dispatched with a 12-gauge shotgun with rifle sights and slugs. Law enforcement authorities will be contacted before shooting. Prior to killing a moose on private property, landowner permission should be obtained and adjacent residents should be forewarned to the extent possible. Moose deaths will be reported to law enforcement so a charity can salvage the meat.
- If possible, nuisance moose will be herded without use of rubber slugs, cracker shells, or roman candles. If these are needed, law enforcement authorities will be notified. Use of this equipment

requires care to avoid property damage or inhumane treatment of the moose. A priority action in the plan involves increasing moose situation training for law enforcement staff.

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ADF&G Bear Conflict Response Policy

Definitions:

- ***Attraction behavior.*** Attraction refers to a bear that repeatedly searches out and feeds on human food sources (garbage, dog food, or birdseed). This behavior creates safety problems for people and is to be strongly discouraged. A bear-attractant ordinance and education program is a priority action in this plan; it is designed to help residents discourage this behavior.
- ***Habituation behavior.*** Habituation refers to situations where an animal ignores a stimulus; it is commonly confused with attraction. A bear may be in the habit of raiding trash cans, but this is attraction, not habituation. However, habituated bears are unafraid of humans, which may lead to opportunities to find non-natural food sources, and then ultimately lead to attraction and aggressive behavior. In general, habituated bears are appropriate in wildland areas where it is desirable for bears to ignore human activity. In urban or suburban areas, avoidance behavior is desirable (see below).
- ***Avoidance behavior.*** This behavior refers to bears that avoid and move away from humans or human environments. This is the "natural" behavior of bears that fear humans, and is generally desirable among an urban bear population. Bears exhibiting this behavior may live near in residential areas but remain secretive and present fewer safety risks to humans or their pets.
- ***Non-aggressive bear.*** A bear that is simply seen in a residential or developed area, but has not been seen feeding on human food sources and not approaching humans or pets is characterized as non-aggressive. Non-aggressive bears generally display avoidance behavior around humans and their pets.
- ***Nuisance bear.*** A nuisance bear is one that is repeatedly seen in a residential or developed area, and may occasionally be seen feeding on non-natural but available food sources (pet food, trash, or bird feed intentionally or unintentionally left by humans for bears to scavenge). In general, nuisance bears are habituated (unafraid) of humans. However, nuisance behavior is distinct from aggressive behavior (see below).
- ***Aggressive bear.*** An aggressive bear is one that either: 1) acts aggressively toward humans or pets for no apparent reason (when it is not defending a cub or food source); 2) kills or attempts to kill livestock; 3) deliberately approaches humans or dogs; 4) repeatedly attempts to break into structures (e.g., sheds, houses, vehicles) that contain food or garbage; or 5) has become chronically attracted to human environments and has become a problem and threat to humans. A bear that is protecting a natural food source or cubs is behaving defensively and is not automatically presumed to be aggressive.

Summary of major response policies:

- ***Non-aggressive brown bears*** in less developed residential parts of the city (e.g., Eagle River, Chugiak, Girdwood, or Hillside) will generally be monitored, but no other action will be taken. Residents are expected to learn how to live with brown bears that are behaving naturally.
- ***Non-aggressive brown bear*****s** sighted in heavily developed areas in western or downtown Anchorage will be "herded" by ADF&G or other qualified law enforcement staff to undeveloped areas *if* the sighting occurs on weekends or between 6 p.m. and 7 a.m. At other times, this type of action is inappropriate because there are likely to be too many people or activity in areas where the bear may be herded, increasing the potential for encounters.

- Under extraordinary circumstances, ***non-aggressive brown bears*** sighted in these developed areas may be darted and relocated. These circumstances include: 1) the availability of ADF&G or other qualified staff to conduct the darting and translocation; 2) the ability to eliminate risk of human-bear encounters in the area while the darting is in process; 3) the availability of a release location at least 75 miles from Anchorage. There is no current funding source for this type of translocation. A released bear that returns to Anchorage will be destroyed.
- In general, ***nuisance brown bears*** in developed or residential areas will be destroyed. Brown bears are dangerous enough that even a single incident of attraction behavior is cause for concern. Capturing and releasing the bear is dangerous, expensive, and does not appear to work for most classes of bears (bears often return to their home range or may be unable to survive in the new location because it is occupied by other bears) (McArthur, 1981; Rogers, 1986; Bostick, 1997). In addition, releasing a nuisance brown bear to a new location may only be transferring the problem.
- In all cases, ***aggressive brown bears*** or brown bears that present a significant threat to human life will be destroyed.
- ***Non-aggressive black bears*** seen in developed areas or residential neighborhoods do not require any action. Residents and visitors are expected to learn how to live with black bears that are behaving naturally.
- At the discretion of the area biologist, ***nuisance black bears*** may be darted and relocated to a remote location (at least 50 miles from Anchorage) and at least two miles from a private residence or established recreation area. However, there is no current funding source for this type of action, and studies indicate it is rarely successful for bears that have some history of food conditioning (Bostick, 1997).
- In general, ***nuisance black bears*** will not be dispatched. Residents are expected to learn to live with bears by removing food attractants; occasional incidents where a black bear finds an available human food source is not sufficient to kill the bear. However, ADF&G will attempt to monitor these bears.
- If a ***nuisance black bear*** continues to find food sources or becomes more aggressive in its search for human food, it will be considered an ***aggressive bear*** and destroyed.
- In general, ***aggressive black bears*** will be destroyed.
- When necessary, bears will be destroyed with a 12-gauge shotgun with rifle sights and slugs. Law enforcement authorities will be contacted before shooting. Prior to killing a bear on private property, landowner permission should be obtained and adjacent residents should be forewarned to the extent possible. Bear meat, hides and skulls will be salvaged to the extent possible for charity, educational, or research purposes.
- If a female bear with cubs is destroyed, the cubs will be captured and held at the Alaska Zoo provided space is available. Cubs will be destroyed after seven days if no zoo will take them.
- Crowd control and general assistance from other law enforcement are desirable during bear response actions in developed areas. A spokesperson will also be used in these situations to inform the media of the situation.

Responses to a Bear Mauling

Whenever a bear mauling (a bear injures or kills a person) occurs in Anchorage, ADF&G will help assess the circumstances and aid in decisions about the appropriate response. In Chugach State Park, the military bases, and on BLM's Campbell Tract, the lead managing agency will have final decision authority about the agency response. In other areas of Anchorage, ADF&G assumes final authority.

Details of response procedures are available from ADF&G. In general, however, the following steps and principles apply:

- ***Locate and identify the bear.*** ADF&G will use investigative skills to identify the location and identity of the bear through hair samples, blood, saliva, tracks, etc.
- ***Determine initial circumstances.*** An initial attempt will be made to determine the circumstances of the attack. In keeping with bear conflict response guidelines, any aggressive bear that is an immediate threat to human life or rescue attempts will be destroyed.
- ***Dart, tag, and radio collar the bear.*** If there is no immediate threat from the bear and it can be located, it should be darted, tagged, and fitted with a radio collar.
- ***Determine whether the bear should be destroyed.*** At this point, representatives from the land managing agency should consult with the regional supervisor, the regional biologist, the area biologist, and a bear biologist to determine whether to destroy the bear. Criteria include:
  - Positive identification of the bear involved in the attack
  - The provocation for the attack (was the human approaching a bear?)
  - The severity of the attack (did the bear make a single charge and leave?);
  - Previous behavior by the bear (had it approached other humans?);
  - Potential for future attacks;
  - The location of the attack (in a high use or developed area versus backcountry).
- ***Monitor the bear if it is not destroyed.*** If the circumstances do not warrant destruction of the bear (e.g., it was acting naturally in defending cubs, or a natural food source and has shown no past or continued aggressive behavior), it will be released with a radio collar for future monitoring. If it shows additional aggressive behavior, it will be destroyed.

Additional Bear Conflict Policies and Information

Moose carcasses on or near Chugach State Park trails. If a moose carcass is reported on or near (within 300 feet) of a park trail, it presents a significant hazard to park visitors using the trail. A moose carcass is likely to have been killed or found by a bear, who may actively be feeding on it or may return to it. Even if the moose death was from other causes, it is likely to be an attractant to bears.

Policy: As soon as practical, park staff (preferably a park ranger), will temporarily close the trail with flagging and a sign to conduct a field evaluation. If a bear is not present and the carcass can be removed, it will be. If it cannot be removed, the trail shall remain closed until the carcass has been consumed or deteriorated and is no longer an attractant to bears. Public notice of the trail closure may also be made through postings at trailhead and or media releases.

Moose carcasses on or near BLM Campbell Tract trails or other public use areas. BLM makes decisions about removal of a moose carcass on case by case basis. In general, however, BLM also will remove carcasses that likely to attract bears if they are close to trails or public use areas, or close the trail or area to use until the threat has diminished.

Bear studies on Elmendorf Air Force Base. Elmendorf Air Force Base authorities have conducted studies to determine the utility of various bear management efforts over the past decade, including experiments with aversive conditioning and an extensive translocation program (Bostick, 1997). Results suggest that bears can become habituated to (learn to ignore) even systematic aversive conditioning efforts, and that translocation efforts have limited success, except among female brown bears without a history of attraction to human food sources. Results also suggest that sub-adults appear to learn about human food sources from particular sows, who may be responsible for several sets of "repeat offenders." Finally, the Elmendorf bear program suggests that attempts to remove garbage attractants at recreation areas (by installing bear-proof cans) were successful at reducing the number of problem bears after some initial "repeat offender" bears were removed from the area. The success of these types of efforts points to the need for coordinated bear management efforts that remove attractants and the most aggressive bears.

ADF&G Responses to Conflicts with Beavers

Beavers are common along Anchorage's waterways and their dam-building efforts provide important benefits to salmon habitat. However, beavers have the potential to cause extensive damage to human property when they build lodges and dams. In addition to the individual trees they cut down in these pursuits, beaver activity can clog culverts and flood extensive areas.

Because most stream courses in Anchorage are on public land (the Military reservations, Campbell Tract/Far North Bicentennial Park, and along the greenbelts) and development is out of the floodplain, beaver control is not generally required. If beaver activity appears likely to create major property damage (e.g., flood a building or a road; creating numerous hazard trees in a recreation area), however, ADF&G will consider beaver removal on a case-by-case basis. In general, this will involve trapping individual beavers.

ADF&G Responses to Conflicts with Other Mammals

Several other mammal wildlife species also have the potential to become involved in conflicts with humans or their pets. Both wolves and coyotes have occasionally attacked dogs (usually free-running dogs), and other animals may also pose certain dangers in an urban environment.

Decisions about whether to destroy individual animals in conflict situations are made on a case-by-case basis following the general principles discussed above, particularly those related to black bears: 1) if the conflict represents an isolated case, or the damage/harm is minor, the situation will only be monitored; and 2) if a pattern of conflict is documented, the individual animal will be destroyed.

Bird Conflict Response Policy

At certain times during the year, certain species of birds may act aggressively toward humans to protect territory, nests, young, or food sources. Birds may also establish nests in, on, or near human structures and become nuisances to the people that live or work there. Federal and state laws protect native wild birds, limiting the responses available in these bird conflict situations. The U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game implement these laws to solve conflicts. The USDA Wildlife Services program offers advice and assistance to the public and government agencies to minimize conflicts, and under permit from the other two agencies, may kill birds in conflict situations.

Federal and state laws do not permit native wild birds to be harmed for nuisance behavior alone. In natural settings, including areas along recreation trails, agencies will not move or destroy nuisance birds. Instead, the focus is on increasing public awareness of the potential conflict and attempting to educate people on how to avoid the problem (e.g., a swooping goshawk) by keeping away from the nest, territory, and so on.

In some cases, of course, the bird may pose a significant public safety hazard, or prevent use of a house or building. When there are clear threats to public safety, authorities will attempt to relocate or harass the bird away from the area; if these measures fail, they will then consider destroying the bird(s). Although federal law allows birds to be taken for damage to agriculture, livestock, or other interests under certain circumstances, current Alaska state law issues permits for birds to be killed in response to the damage they cause, including agricultural or property damage. In all situations, education and awareness are held as the key to addressing bird conflicts, which usually are short in duration.

Bird conflicts also occasionally result in injuries to birds. Federal and state laws limit who may possess wild birds. Only permitted bird rehabilitators may care for injured wild birds, although anyone who finds an injured bird may possess it for the time it takes to carry it to a rehabilitator. There are facilities in Anchorage (Bird Treatment and Learning Center) that treat injured birds, and the proposed Potter Marsh Nature Center (see next chapter) would upgrade these as well as provide educational opportunities focused on Anchorage bird life, human-bird interaction, and the treatment of injured birds.

Some Final Notes on Wildlife Conflicts

The above discussion on human-wildlife conflicts focuses primarily on responses to minimize consequences for people. However, it is also obvious that conflicts also have consequences for wildlife as well – and not just from human responses to those conflicts. Whenever people interact with wildlife, there are impacts (Knight and Gutzwiller, 1995). In many wildland settings, these impacts are often small and may not endure; in urban settings, because of the potential for more interaction, they may be larger.

Living with wildlife in Anchorage may require certain behavior changes among the people who live here. Residents and visitors should recognize their potential impacts, and work to control both their pets and their children (particularly adolescents) who may not understand how wildlife harassment might affect the health of wildlife.

Similarly, ethologists (animal behavior specialists) increasingly recognize the ability of many wildlife to learn complex behavior from their direct experience (Whittaker and Knight, 1998), and some studies show that higher species may transmit learning across generations (Bonner, 1980). It thus becomes important to behave consistently around wildlife, so that both people and animals know what to expect. For example, if some people feed a moose, while others throw snowballs at it, and a third party lets their dog chase it, the potential for conflict increases. The moose doesn't know how people will behave, and its own behavior is similarly unpredictable.

Several actions in the next chapter address these issues, encouraging increased education about pet control, how to prevent and respond to interaction situations, and how to store garbage so that dangerous wildlife are not attracted to human areas. Taken together, the goal is to have the best informed urban population in the country about how to behave around wildlife, in the hope that conflicts will be minimized.