Living with Wildlife in Anchorage: A Cooperative Planning Effort

April, 2000

BOB HALLINEN/ANCHORAGE DAILY NEWS

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April 24, 2000

Dear Reader:

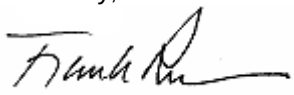
This plan captures the results of a pioneering effort, led by the Alaska Department of Fish & Game, to help Anchorage residents and visitors co-exist with the multitude of wildlife living in and around the nation's seventieth-largest city. No other city of its size boasts the number and diversity of wild animals found throughout the Municipality of Anchorage, a point of pride to most residents and a major factor in their quality of life.

Managing wildlife in an urban setting is extremely complicated and challenging, however. There are numerous competing interests to consider, as well as serious safety concerns. The public and a wide array of local, state, military and federal organizations worked together to develop this Plan, at considerable cost of time and effort over the past three years. It is an accomplishment of which every participant, including the members of the public who generously shared their time and thoughts, can be proud.

The plan is referenced in *Anchorage 2020: The Anchorage Bowl Comprehensive Plan*, an action strongly supported by all of the contributing organizations. Adding a wildlife component to the master plan that will guide Anchorage's development over the next several decades helps to ensure that wildlife remains an integral part of life in Alaska's largest city. And, because the comprehensive plan is revised and updated on a regular basis, it provides the incentive and flexibility for similar revisions regarding wildlife.

Given the unique nature of this planning effort, I think you will agree with me that this first edition of *Living with Wildlife in Anchorage: A Cooperative Planning Effort* represents a bold first step in assuring the conservation of wildlife in Anchorage for the benefit of its residents.

Sincerely,



Frank Rue
Commissioner

Acknowledgments

Development of this plan would not have been possible without the commitment of many agencies and organizations which worked together over the past three years to address the wildlife issues of Anchorage. The full list of participants is included in Chapter 2, and speaks to the broad array of organizations and agencies who claim a stake in the future of Anchorage's wildlife, and who contributed substantively to this plan.

Individuals and agencies deserving recognition for their valuable, substantive contributions to the plan, as well as their perseverance, include (in no particular order): Malcolm Ford of the Anchorage Audubon Society; Karen Deatherage of the Alaska Wildlife Alliance; Evie Witten of The Great Land Trust; Ray Reekie and Patrick Wright of the Anchorage Fish & Game Advisory Committee; Thede Tobish of the Municipality of Anchorage, Community Planning & Development; Judi Ramage of the Chugach State Park Advisory Board; Al Meiners, Superintendent of Chugach State Park; Kate Wedemeyer and Tom Liebscher of U.S. Air Force, Elmendorf Air Force Base; Bill Gossweiler and Laurie Angell of U.S. Army, Ft. Richardson; and Karen Laing and Maureen de Zeeuw of the U.S. Fish and Widlife Service. These representatives consistently offered valuable insight and contributions to the substance of the plan, and gave freely of their materials, time and good will at public meetings. Their expertise, dedication and patience are sincerely appreciated.

We extend our special thanks to several individuals:

- to David Fulton (Alaska Department of Fish and Game) who structured the process, formed the group, and led the process through its first, critical year;

- to Maureen de Zeeuw (U.S. Fish and Wildlife Service), who gave generously of her time to incorporate photographs and professionally edit the manuscript;

- to Rick Sinnott (Alaska Department of Fish and Game), who shared his considerable expertise as Anchorage's Area Biologist;

- to Jonne Slemons (Alaska Department of Fish and Game), who managed the project; and

- to Doug Whittaker (Three Rivers Research, Inc.), who led the group and the process during the final two productive years, who maintained focus in the maelstrom, and who "brought it all together," writing the lion's share of the final manuscript.

Finally, we would like to thank the many members of the Anchorage public who attended both working meetings and public meetings; who took the time to call and write with their comments and suggestions; and for whom this plan is written.

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Chapter 1: Introduction

Anchorage is a city with abundant wildlife, including hundreds of moose and both black and brown bears -- animals that no other cities of 260,000 people can boast as their own. Extensive natural areas in and around the city provide habitat for these and other species, including Dall sheep, mountain goats, wolves, wolverines, coyotes, lynx, beavers, bald eagles and other raptors, loons, swans and other waterfowl, shorebirds, and numerous species of migratory and resident songbirds. Marine mammal species, including beluga whales, are also present in the nearby waters of Cook Inlet.

These distinctive wildlife populations offer outstanding recreational opportunities to Anchorage residents and visitors, contributing to a quality of life unmatched in urban areas across the nation. Many of these species are also valued as symbols of wild Alaska, and most Anchorage residents have some appreciation for the wildlife that live here. Wildlife is truly an integral part of the Anchorage community.

As Anchorage continues to grow, however, interactions between wildlife and people are also increasing, leading to some conflicts. Burgeoning moose populations present hazards to drivers on slick winter roads, they can damage considerable amounts of landscaping and gardens in summer, and they may become dangerously aggressive towards humans in certain situations. Similarly, geese and other waterfowl damage lawns, ball fields and golf courses, and present risks to aircraft. Attracted to food sources available in human environments, bears, coyotes and wolves also pose increasing risks to people or their pets, or become "nuisance" animals, some of which are killed by residents or authorities each year.

In addition to conflicts between people and wildlife, growth in Anchorage has also diminished or degraded some types of natural habitat and increased lawn and other "urban habitats," changing wildlife population levels, wildlife behavior, or relationships between wildlife species. Wildlife dependent upon freshwater wetlands, for example, have decreased in the past several decades, while increased populations of exotic species such as starlings and pigeons may out-compete or spread disease among native bird species.

The obvious management goal is to enhance the benefits of wildlife while minimizing wildlife-related problems. However, this can be challenging. Urban settings provide uneven patterns of land use and wildlife habitat, and the actions of different landowners, government agencies, and the public may have profound effects on wildlife populations and behavior. In addition, there is considerable diversity of opinion among urban residents about how people should live with wildlife. As Anchorage continues to grow, changes in wildlife habitat and species are inevitable; the challenge is to manage that change so that both people and wildlife benefit.

This plan is the first step in trying to meet this challenge. Offering a broad vision for wildlife management in Anchorage, the plan is a pioneering attempt to coordinate and integrate decisions by local, state, and federal government. Initiated by the Alaska Department of Fish and Game, the plan has been developed by a team of people from a variety of local, state, and federal agencies with wildlife responsibilities, as well as people from other wildlife-related interest groups and the general public. The plan outlines general wildlife management goals for the Municipality, and then identifies actions and policies that may help Anchorage residents enjoy and minimize problems with the city's wildlife.

WILLIAM GOSSWEILER

Why does Anchorage need a wildlife plan?

While many cities have wildlife management issues, few have developed comprehensive plans addressing multiple species. Although some people question the need to formally coordinate wildlife decision-making in Anchorage, there are several compelling reasons for this planning effort.

Wildlife are a valued part of Anchorage life. A recent survey of Anchorage residents suggests that wildlife makes Anchorage "interesting and special," even if it causes some problems. There is probably no other large city in North America with similar populations of large animals and diverse migratory birds. This plan is a pioneering attempt to ensure that a large and growing city can enjoy and maintain its wildlife.

Development and human population growth have decreased some kinds of wildlife habitat. Anchorage has grown dramatically in the past few decades, and this growth has resulted in considerable loss of open space and wildlife habitat. Well over half of the area's wetlands have been lost to development since the 1950s, there has been considerable loss of spruce forest, and riparian, or streamside, areas have also been degraded from pollution and development. A plan is needed to identify and protect the important habitat that remains, including tracts of undeveloped natural areas and the corridors that link them.

Increasing demand and funding for wildlife recreation. Demand for wildlife-related recreation opportunities has been increasing in recent years, and a significant increase in federal funding for these appears likely. Cities with developed plans will be poised to capture and efficiently use these funds.

Development favors certain generalist species that out-compete others or become nuisance wildlife. Increased development has created new ecological niches that favor generalist species (e.g., pigeons, starlings, Canada geese, gulls and feral rabbits) that do well in urban settings. Some of these species out-compete native species, or amass in numbers that create conflicts with people.

Increased human-wildlife conflicts. There have been increasing human-wildlife conflicts in Anchorage as more people, more development, and increasing numbers of some wildlife species (particularly moose, bears, and geese) share the same environment. Potential actions to address some of these issues (e.g., hunts, lethal responses) are controversial, while others require coordinated public efforts to be effective (e.g., education programs to minimize bear or geese attractants, or landscaping that reduces nuisance wildlife situations).

Need for coordinated wildlife management. There are multiple agencies in Anchorage with wildlife-related responsibilities, or whose decisions affect wildlife-related problems. Coordination between them is currently *ad hoc.* Wildlife do not recognize agency jurisdictions or land management boundaries, so what happens in one part of the city can affect how wildlife behave somewhere else. The plan provides a formal mechanism for developing a consensus vision and coordinating actions. The public does not care how agencies divide wildlife responsibilities, but they do care that those responsibilities are met. This plan can help.

Need to develop and share wildlife information. Planning efforts provide an impetus to collect, organize, and share wildlife information that is crucial to making good resource decisions.

Integration with the Municipality's Comprehensive and Open Space plans. The Municipality is in the process of updating its Comprehensive Plan, as well as the affiliated Parks, Recreation and Greenbelt Plan, which will affect a number of land use patterns and policies in the area. This is an excellent opportunity to integrate wildlife concerns into that effort. It is proposed that this plan be adopted as a part of the Comprehensive Plan.

Need for a long-term vision for wildlife. If government is going to be an agent for positive change, it needs to avoid the "tyranny of small decisions." This requires a formal process that can be used to develop a broad vision, set long term goals and objectives, and collaborate with the wide range of wildlife interests present in a large city. This planning effort provides such an opportunity.

ALASKA DEPT. OF FISH & GAME

Plan Purpose

The purpose of this plan is to outline wildlife management goals and objectives, and identify priority actions that can be taken by local, state, and federal agencies to enhance the benefits of wildlife to the community while minimizing human-wildlife conflicts.

The plan is a "vision" document that attempts to outline common goals for Anchorage wildlife management. However, it is important to recognize that the plan will not be the final word on Anchorage wildlife decision-making. Instead, the plan is intended to provide a framework for agency-specific decisions. Specific tasks in the plan include:

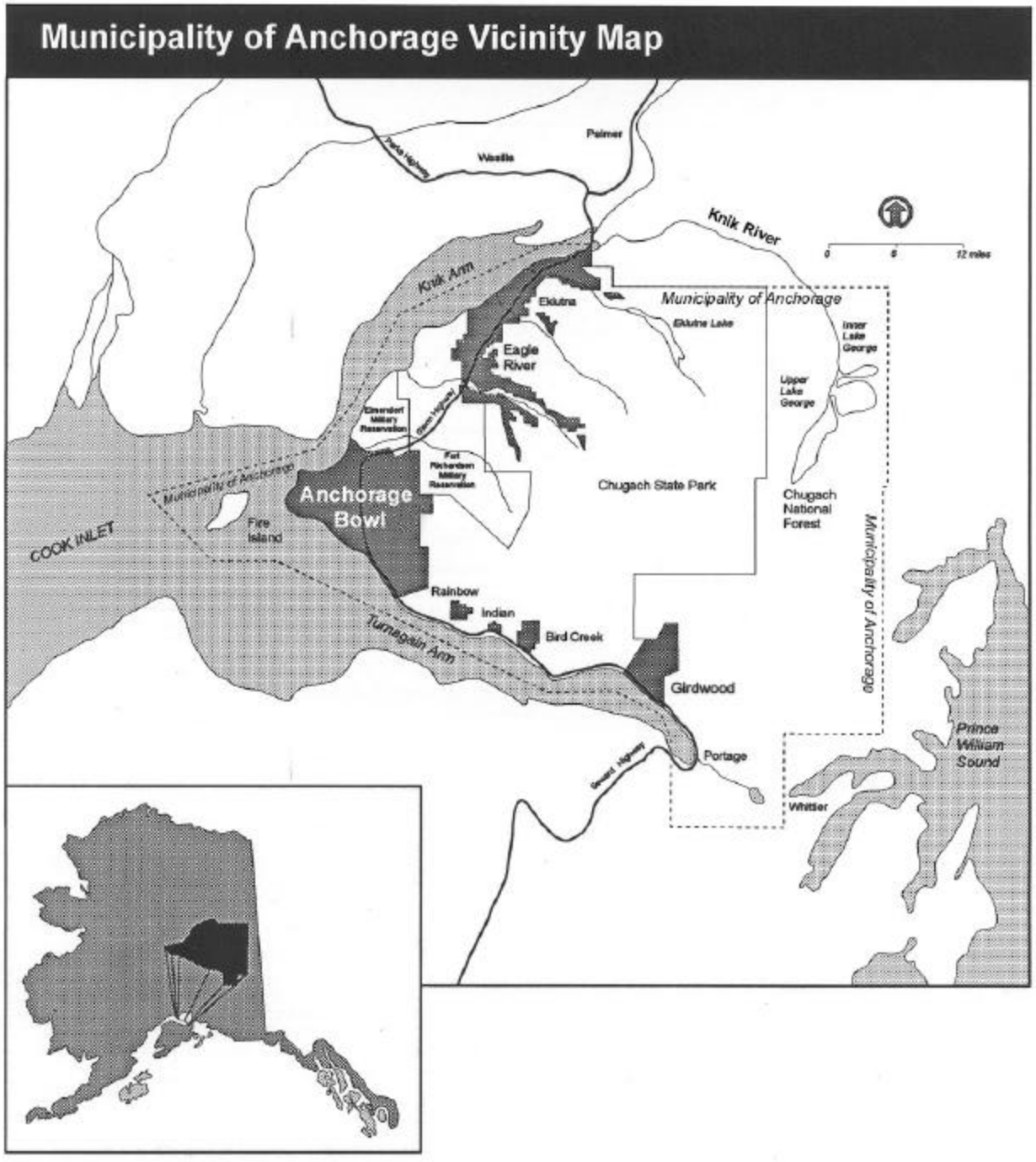
- Develop population goals for different wildlife species.
- Review actions that could reduce or enhance populations out of step with those levels.
- Develop thresholds for acceptable wildlife conflict levels and identify actions to minimize conflicts.
- Outline wildlife conflict response policies.
- Recommend a process for prioritizing desirable wildlife habitat to be conserved on public land.
- Develop/prioritize actions to encourage private land owners to protect critical habitat on their lands.
- Develop/prioritize projects that would increase wildlife recreation or education opportunities.

The plan is being developed by multiple agencies and interest groups, each with their own missions, regulations, policy guidelines, and bureaucracies. As a result, the plan will not be a legally binding list of agency policies and projects. Many actions in this plan will require greater specificity, the approval of other governmental agencies, and environmental compliance analysis before they can be implemented.

Instead, this plan should be considered a collaboratively developed "to do" list. After the plan is adopted, it will be up to Anchorage's individual agencies and groups, as well as the public, to implement the actions identified and prioritized in these pages.

Geographic Area

The plan addresses the entire Municipality of Anchorage from the Knik River to Portage. This area includes Elmendorf Air Force Base, Fort Richardson, and Chugach State Park. However, the plan often focuses on wildlife issues in the Anchorage Bowl and other developed areas (e.g., Eagle River/Chugiak, Girdwood). The map on the following page shows the geographic boundaries of the plan.



Map 1. Anchorage and the Anchorage Bowl. The plan addresses the entire Municipality, but focuses on issues in the Anchorage Bowl and developed areas such as Eagle River/Chugiak and Girdwood. *(Map courtesy of Municipality of Anchorage.)*

Plan Limitations

As discussed above, the plan will not be legally binding. It is simply a collaborative attempt to identify the major wildlife management priorities in Anchorage. Because it covers the full range of wildlife management issues in the city, the plan is also limited in the level of specificity it provides for many actions or policies. Most actions in the plan will need to be developed in greater detail to assess public support, legal and physical constraints, potential environmental impacts, financial costs, and agency responsibilities.

The plan also limits its focus to terrestrial wildlife, and does not address fisheries and marine mammals. Parts of the plan, however, will address opportunities to integrate fish and wildlife management in Anchorage, in keeping with the principles of ecosystem management.

WILLIAM GOSSWEILER

Relationship of This Plan to Other Plans

This plan is designed to complement and complete the Municipality's Comprehensive Plan and the associated Parks, Recreation and Greenbelt Plan. In order to avoid duplicating the work being done in those efforts, this plan generally does not comment on detailed land use decisions and specific open space priorities. However, it does establish wildlife-related goals and objectives, and a list of recommended actions designed to be incorporated in the Municipality's plans. A Memorandum of Understanding (MOU) developed among the agencies (provided at the end of this plan), formally describes agency perspectives toward plan recommendations. Additional discussion of the Parks, Recreation and Greenbelt Plan is also provided in the Chapter 6 discussion of habitat actions.

This plan also supports actions associated with several other wildlife-related planning efforts already underway within Anchorage (e.g., the Anchorage Waterfowl Working Group; the planning and fund-raising effort to build the Potter Marsh Nature Center), or wildlife-related planning efforts which have been completed for other significant land tracts in the Municipality (e.g., Fort Richardson, Elmendorf Air Force Base, Chugach State Park, or BLM's Campbell Tract). In no case does this plan intend to duplicate or supplant those efforts, which are typically more detailed. When we have included information about those efforts or actions, our intent is to provide support for them, or help explain how they can be integrated into the city's larger wildlife management context.

Finally, as discussed under plan limitations, this plan does not address Anchorage fisheries management, which is covered by a series of other plans and documents. Accordingly, this plan supports several existing policies, including: the existing river and lake stocking plan (currently undergoing environmental review), the "natural rebuilding" salmon stocking plan for Chester Creek (as advocated by community councils), the general ADF&G policy addressing illegal introductions of northern pike or aquarium fish into area lakes and streams, and fishing regulations developed through the Board of Fish. In a few cases, however, this plan does identify areas where wildlife and fisheries management could be integrated to a greater extent. For example, this plan includes actions concerning the protection of loon and other bird nesting areas from lake users (including anglers, boaters, and photographers), and the need to educate recreation users about bear hazards along salmon streams. While fisheries in the Anchorage area might also benefit from a parallel effort that coordinated local, state, and federal planning, this is a lower regional priority for the Alaska Department of Fish and Game, which would be the logical agency to lead such an effort.

Organization of this Document

The plan is divided into six chapters. **Chapter 2** summarizes **the planning process**. This describes the history of the planning effort, lists the involved agencies and interest groups, and reviews how the public was invited to participate. This chapter also details a list of "planning principles" that were used to guide decision-making in the plan.

Chapter 3 presents the **goals and objectives** of the plan. These are broad, value-based statements about the importance of wildlife in Anchorage and how it should be managed. These goals and objectives form the foundation of the plan.

Chapter 4 describes **the state of the Municipality's wildlife in 1999**. It begins with a list of wildlife issues and describes area wildlife species, including estimated current population levels and planning team consensus about preferred population levels (or ranges). This chapter also provides some information from a recent survey of Municipality residents about wildlife issues, characterizing the state of public attitudes toward wildlife. Finally, the chapter ends with some wildlife conflict statistics and identifies standards that define acceptable levels of conflict.

Chapter 5 describes recommended **actions and policies** related to **wildlife population management and wildlife conflict responses**. It begins with separate sections on moose, bears, geese, and feral animal population management; it then defines conflict response policies (what is done after certain types of human-wildlife conflicts occur).

Chapter 6 describes forty **actions to enhance wildlife benefits or prevent wildlife conflicts**. This includes longer descriptions of a "top twenty-five" actions and shorter descriptions of fifteen other supported but lower priority actions. The top priority actions are grouped by the general goals they are designed to address, and short prefaces to these groups suggest how they can be integrated to achieve desired objectives. The chapter concludes with actions considered but rejected.

Finally, the **Memorandum of Understanding** closes out the document, identifying the public agencies and interest groups that are signatories to the plan, and formally describing their intention to help implement the plan as funding and other constraints allow.

JULIE WHITTAKER

Appendices list references, a list of wildlife species in Anchorage, a summary of wildlife population estimation methods, and a listing of acronyms used in this plan. Maps of critical habitat and wildlife concentration areas are published separately for the Municipality's Parks, Recreation and Greenbelt Plan.

Chapter 2: The Planning Process

This chapter describes the effort and ideas involved in developing this plan. It begins with a brief history of the plan, and describes the major steps in the process. It also includes a list of participating agencies and interest groups, and reviews how the public was invited to participate in the process. Finally, it provides a list of "planning principles" that were used to guide decision-making in the plan.

A Chronology of the Planning Effort

Oct. 1993-Sep. 1995	Several wildlife conflict incidents result in human deaths. (Woman killed by moose, Oct. 1993; man killed by moose, Jan. 1995; two people killed by bear, Chugach Park, July 1995; 24 people killed in aircraft collision with Canada geese, September 1995.)
Winter 1994-1995	Harsh winter results in 25 to 30% decline in moose population, including a record number of moose-vehicle collisions (resulting in 239 moose deaths).
November 1995	Representative Con Bunde holds a legislative hearing on moose problems and solutions in Anchorage.
1995, 96, 97, and 99	Board of Game considers controlled moose hunt in Chugach State Park.
February 1996	Focus groups on moose hunt conducted for ADF&G.
Winter 1996-1997	General population survey on wildlife issues initiated by ADF&G. Public meeting on survey issues, Alaska Public Lands Information Center (APLIC).
1997	Municipality begins Anchorage Bowl Comprehensive Plan.
Fall 1997	Public meeting on survey results held at Campbell Creek Nature Center.
Fall 1997	Creation of planning team.
Winter 1997-1998	Agreement on planning team group process, etc.
February 1998	Public meeting to identify planning issues, goals/objectives held at APLIC.
Spring 1998	Planning team develops plan goals and objectives.
Spring/Summer 1998	Inter-agency commitment documented via development of Memorandum of Understanding (MOU).
Fall 1998	Planning team develops actions.
January 1999	Public meeting/open house to review actions held at Fairview Recreation Center.
Spring 1999	Planning team prioritizes actions and begins drafting plan.
May 1999	Public Review Draft Plan and newsletter summary released.
May-June 1999	Public meeting on Public Review Draft Plan, and public comment period.
July-October 1999	Planning team responds to public comments and revises document
November 1999	Final draft released for coordination with Municipality of Anchorage.
April 2000	Final plan released.

Steps in the Process

The planning effort followed a standard comprehensive planning process. The basic steps were to: 1) review issues; 2) collect information about issues; 3) develop goals and objectives; 4) develop actions that could be used to meet goals and objectives; and 5) choose among these alternative actions. By calling them steps, this process implies tasks were approached serially; however, the planning team revised goals, objectives, and alternatives throughout the process. A brief discussion of these steps is given below.

Issues. **"**Scoping" and the development of a list of issues was the starting point for the plan. These were developed by the planning team but included input from public meetings held in fall of 1997 and February 1998. The list of issues is provided in Chapter 4.

Goals and objectives. These are broad, qualitative statements about what managers are trying to accomplish in the plan. Goals attempt to reflect broad public values toward wildlife and the environment, while objectives are more concrete. The planning team spent considerable time on this step through the winter of 1997-98 so they could be included in the goals and objectives of the Anchorage Municipality Comprehensive Plan. Information from the February 1998 public meeting and the survey of residents was useful during this step. Chapter 3 presents the goals and objectives for the plan.

Indicators/standards. This step involves choosing measurable variables to define and give meaning to the qualitative objectives above. Indicators and standards define healthy population ranges for different species, and establish tolerance thresholds for wildlife conflicts. The planning team implicitly developed these throughout the process, but explicitly defined them in the Public Review Draft. Information from the survey of residents and the public meeting/open house in January 1999 was useful for this step. Indicators and standards are presented in Chapter 4 on the state of wildlife in Anchorage.

Developing and prioritizing alternatives. The bulk of the planning effort in the past eight months has focused on brainstorming actions that could be used to meet the goals, objectives, and standards in the plan. Much of this work was done in planning team meetings, but included consideration of survey results and information from the public meeting/open house held in January 1998. The list and description of actions are the heart of the plan, and are presented in Chapters 5 and 6.

Draft and final plans. A Public Review Draft was developed in the spring of 1999 and was also summarized in a newsletter. As with any draft plan, the goals, objectives, standards, and actions in the plan were considered proposals, and the planning team received considerable public comment about them throughout the summer of 1999. Several revisions in the plan were based in part on those comments, and are discussed in sections of this Final Plan, which was prepared in August-September 1999.

Agency and Interest Group Participation

The following lists the agencies and interest groups that participated in the planning effort. The list includes primary contacts for each agency.

Alaska Department of Fish and Game	David Fulton, Gay Muhlberg, Rick Sinnott, Jonne Slemons, Barry Stratton, Doug Whittaker (consultant)
US Fish and Wildlife Service	Maureen deZeeuw, Karen Laing
US Army – Fort Richardson	Laurie Angell, Bill Gossweiler
US Air Force -- Elmendorf	Tom Liebscher, Kate Wedemeyer
Bureau of Land Management, Anchorage Office	Jeff Denton, Bruce Seppi
Chugach State Park	Al Meiners
Chugach State Park Advisory Board	Judi Ramage
Municipality of Anchorage:	
Community Planning & Development	Thede Tobish
Cultural and Recreational Services	Jerry Walton
Heritage Land Bank	Michelle Weston York
Anchorage Fish & Game Advisory Committee	Ray Reekie, Patrick Wright
The Great Land Trust	Beth Silverberg, Evie Witten, Abby Wyers
Alaska Wildlife Alliance	Greg Brown, Karen Deatherage
Anchorage Audubon Society	Malcolm Ford , George Matz
Eagle River Valley Community Council	Bob Carlson
South Addition Community Council	Karen Cameron
Bayshore Klatt Community Council	Smiley Shields
US Forest Service, Glacier Ranger District	Susan Oehlers
Risk Management, Anchorage School District	Tom Bibeau
Anchorage Convention & Visitors Bureau	Barbara Bryant
Anchorage Chamber of Commerce	Sean Skaling
Parks & Recreation, Girdwood Board of Supervisors	Norman Starkey
Nordic Ski Association	Dirk Sisson, Kimberly Griffin

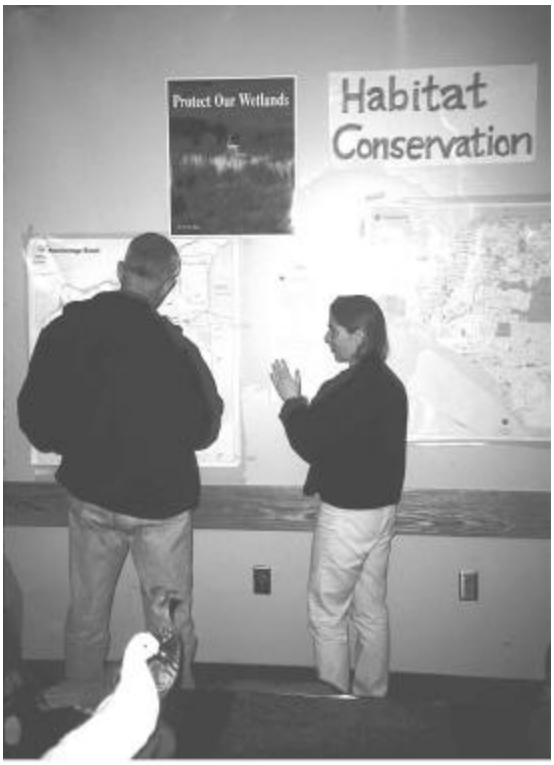
Public Involvement

Interest groups and the public had a number of opportunities to assist in developing the plan. Public involvement was essentially built into the process along three tracks.

First, the planning team was developed with representatives from several agencies or interest groups with wildlife responsibilities. While certain groups chose not to participate to a significant degree, they were kept informed throughout the process via summaries of planning team meetings. This collaborative process provided excellent opportunities for diverse voices in the community to express their views and shape the plan.

Second, periodic public meetings/open houses were held to keep interested individuals informed about the process. As shown in the chronology above, five public meetings were held during the development of the plan. All public meetings were advertised in the newspaper, and the meetings on actions and the draft plan were also publicized through a planning newsletter sent to wider mailing lists of individuals who might be interested in the effort.

Finally, values and attitudes of the general public were assessed through a scientific survey of residents (Whittaker and Manfredo, 1997). This survey was initiated in the beginning of the process, but anticipated a number of issues in the plan. A summary of the survey results is available from ADF&G.



DOUG WHITTAKER

The public was invited to comment on the plan throughout the process. (Open House to brainstorm plan actions at Fairview Recreation Center, January, 1999.)

Planning Principles

In developing the plan and preparing this document, the planning team was asked to consider a number of "planning principles," listed below. The intent was to design a process appropriate to the need for a collaborative, integrated vision for Anchorage wildlife management. These "principles" helped define content needed in the plan, and encouraged an informal but effective decision-making environment.

The plan must be clear and understandable; the general public is the target audience. The public is largely unimpressed by planning efforts. They often view planning as a ritualistic exercise that rubber-stamps decisions that have already been made, or as a long, drawn-out process that keeps bureaucrats employed writing unreadable documents. To combat this problem, the plan should be as accessible as possible with explicit statements about what government agencies would like to do and why.

The plan should be comprehensive, but based on available information. The "comprehensive" planning ideal requires consideration of all possible information about an issue and consultation with all possible publics and stakeholders. In reality – mostly because of funding or schedule constraints – this plan must be developed with available information and open but limited opportunities for public involvement. When a decision cannot be made because we do not have enough detailed information, that decision should be deferred and information needs identified.

Recognition that the plan will be non-binding, but important. As a plan that addresses the authorities and interests of several agencies and groups, we recognize that complete agreement is unlikely and that no agency will be able to commit to every idea in the plan. Accordingly, the plan is not designed to be legally binding. However, agencies should not underestimate the power of this kind of "vision plan." In developing this plan, agencies are committing to seriously consider and utilize this plan in the making more detailed plans or other decisions relevant to their Anchorage wildlife management responsibilities.

Recognition of a limited planning time horizon (about ten years). Plans are based on snapshots of information and reflect the interests and priorities of the time in which they are developed. The goal is to anticipate future issues and resources, but the ability to accurately predict is always limited. Accordingly, the plan should generally consider a ten-year planning horizon. If new information or circumstances create the need to revise decisions in the plan during the ten year period, amendments to the plan offer an explicit way for agencies to re-think positions and actions.

Recognition of differences between "now" decisions, and intentions. Plans can have many different types of decisions. Some are "now" decisions designed for immediate implementation (e.g., policies on how to deal with wildlife conflicts). Others are "intentions" – what government should do if funding or other resources became available. The key to good planning is to recognize and clearly identify which kind of decisions are being made.

The goal is to make decisions, even on controversial issues. A fault of many plans is that they only get agreement on the "easy" decisions. However, there is little point in planning only to satisfy the "lowest common denominator." Accordingly, the goal is to push the team as far as it can go on every decision.

If the planning team can't reach consensus on a decision, a deferred decision is acceptable. In some cases, consensus may not be possible. In these cases, we will not use a majority vote to make a decision that will not be generally supported by all agencies. In these cases, our obligation is to document the

points of disagreement and defer the decision; we will also offer a specific process, timeline, and lead agency for tackling these issues in the future.

Recognition of complexity and diversity in developing urban wildlife plans. Urban wildlife plans are usually more complex than those for rural or wildland areas. In this plan, decisions will address multiple species, issues, interests, and agencies.

Recognition that Anchorage is likely to continue growing in both population and development levels. Anchorage has grown dramatically in the past three decades, and indicators suggest the city will continue to increase in population and development levels in the foreseeable future. The issue in this and other natural resource plans is to manage that growth so it does not diminish the characteristics, function, and benefits of the resources (e.g., wildlife and open space) that enhance the quality of life for residents and visitors.

Recognition of the limitations of managing wildlife in urban areas. Urban wildlife plans are challenging because most of the land is not in public ownership, and lands that are public are managed for a variety of specific purposes that may or may not be compatible with wildlife goals. Many actions will need to include education/regulation options in addition to direct actions that can be contemplated for public lands.

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Recognition that cities are essentially "non-natural" areas. Urban areas are modified environments – there is little sense in thinking they can be managed to provide the full diversity of "natural" ecosystems. More importantly, plan choices may often need to be based on social values toward various species and habitat types, not full ecological potential. These decisions require both social and biological information.

Recognition that there are few models for urban wildlife plans. There are few (if any) good models of multiple-species urban wildlife plans. In this effort, the planning team faces a challenge, but also has an opportunity to pioneer new ideas and think beyond the boundaries of more narrow agency mandates.

Distinction between representing interest groups/agencies and representing the interests of the greater Anchorage public. Each planning team member represents an agency/group and will be expected to represent that agency at certain times in the process. However, there are other times when team members should remove their "agency hat" and put on a "community hat." Wildlife do not respect land ownership boundaries, and there is good evidence that the public is unconcerned about the fine line of agency jurisdictions. The goal in this effort is sound, integrated wildlife management for Anchorage; this is more likely with a focus on the larger picture.

Chapter 3: Plan Goals and Objectives

This chapter presents the goals and objectives of the plan. These are broad, value-based statements about the importance of wildlife in Anchorage and the principles upon which it should be managed. Although different planning frameworks define these terms differently, we have followed the Anchorage Municipality's planning model in developing the goals and objectives below. More quantitative standards or "performance measures" for the plan are presented in Chapter 4.

Some comments on the Public Review Draft Plan urged planners to prioritize these goals and objectives because it is possible that some situations may place them in conflict. Although the planning team recognizes this potential, no priority for them has been established. Ultimately it is hoped that this plan and subsequent actions will address them all in some substantial way.

Overall Goal

In order to enhance the quality of life for Anchorage's residents and visitors, conserve and enhance a wide diversity of native wildlife and their habitats throughout the Municipality, while allowing species to prosper in harmony with the community.

Goals and Objectives

1. Conserve, enhance, and restore optimal populations of native wildlife and their habitats in the Municipality of Anchorage.
    - Identify, map, and evaluate wildlife habitat availability and wildlife population levels of key species.
    - Identify and conserve, enhance, or restore areas of important wildlife habitat on public lands, including the corridors that connect those habitats in order to avoid net losses in functional habitat types or abundance.
    - Identify areas of important wildlife habitat on private lands in Anchorage and promote ways to conserve, enhance, or restore those areas in an effort to avoid net losses in functional habitat types or abundance.
    - Promote educational efforts for agency staff, land use developers, the public and others that describe the characteristics and importance of wildlife habitat and the ways it can be conserved, enhanced, or restored.
    - Maintain native wildlife populations at biologically and socially optimal levels. If these levels conflict, the lower of the two will take precedence in most situations. In balancing these dual objectives, social capacities should generally receive greater weight in developed areas while biological criteria should generally receive greater weight in undeveloped or natural areas (e.g., Chugach State Park, Bicentennial Park/Campbell Tract).
    - Enhance declining native wildlife populations so they can return to biologically and/or socially optimal levels.
    - Reduce non-native wildlife populations to socially acceptable levels.
    - Identify ways the public can conserve or enhance habitat.

2. Maximize opportunities for positive interactions between wildlife and people.

   - Provide for a diversity of wildlife recreation opportunities through the development and maintenance of recreation facilities such as trails, interpretive stations, visitor centers, etc.
   - Provide for a diversity of wildlife learning opportunities through the development of wildlife education programs and facilities.
   - Develop and distribute information that helps residents and visitors take advantage of the diversity of wildlife recreation and natural history learning opportunities available in the area.

3. Minimize opportunities for conflicts between wildlife and people, while responding to conflict situations as required.

   - Promote educational efforts that help residents and visitors avoid wildlife conflict situations and respond appropriately when they arise.
   - Promote education and/or regulation efforts to minimize attraction of "nuisance" wildlife to areas with high potential for human-wildlife conflicts.
   - Design and maintain recreation facilities to minimize the risk of human-wildlife conflicts.
   - Respond to wildlife conflicts in ways that balance public safety needs with humane wildlife control methods.

4. Foster a sense of stewardship for wildlife and their habitats among the public, non-governmental organizations, and local governmental agencies.

   - Promote cooperative efforts that help the variety of public agencies share and integrate information and resources dedicated to wildlife management.
   - Promote increased public involvement in wildlife stewardship through the development of volunteer projects.

5. Promote the economic, social and other benefits related to wildlife and their habitats.

   - Support research efforts that will help identify the benefits of wildlife.
   - Develop wildlife education programs that help residents and visitors recognize the benefits of wildlife and their habitat.

Chapter 4: Wildlife in Anchorage, 1999

This chapter describes the state of Anchorage's wildlife in 1999. It begins with a list of wildlife issues, and describes prominent city wildlife species, including estimated and preferred population levels (standards). The chapter also provides information about residents' general attitudes toward wildlife. It concludes with a section on wildlife conflict statistics and standards that define acceptable levels of conflict.

Wildlife Issues and Concerns

The following list summarizes issues and concerns developed by the planning team with input from the public. The items are meant to be evocative of the issues discussed at meetings, not exhaustive or comprehensive. They are organized within categories that roughly correspond to plan goals and objectives (see Chapter 3).

Habitat and Population Level Issues

- Habitat fragmentation and loss due to increasing development
- Impacts (disturbance) to species from increasing human use on public land
- Loss of wetlands and wildlife corridors
- Wildlife habitat concerns that do not become integrated into land use decision-making (e.g., zoning, road improvement landscaping choices)
- Current development trends that favor exotic species (pigeons, starlings, etc.)
- Loss of critical habitat for some species (loons, cranes, other wetland species, etc.)
- Lack of wildlife-related inventory data (population trends, biological carrying capacity estimates, etc.)

U.S. FISH AND WILDLIFE SERVICE

As the human population and development in Anchorage increases, many people are concerned about wildlife habitat losses

NANCY TANKERSLEY FAIR

Wildlife-oriented recreation is increasingly popular for residents and visitors

Wildlife Recreation and Learning Issues

- High interest in and demand for viewing opportunities by residents and visitors
- Need for more wildlife education (facilities and interpretation services and materials)
- Demand for increased Anchorage hunting opportunities

Wildlife Conflict Prevention and Response Issues

- Lack of information about human/wildlife conflicts (When, where, why, how many, what kind?)
- Concern about the number of moose-vehicle accidents
- Concern about the number of aggressive moose encounters in neighborhoods and on trails
- Concern about the extent of landscaping damage by moose
- Concern about the number of and potential for bear-human encounters on area trails and in neighborhoods
- Increasing attraction behavior by bears in response to garbage, dog food, and birdseed around homes.
- Goose-aircraft accident risk
- Concern about the amount of goose droppings in parks, ball fields, lakes and on lawns
- Liability concerns regarding human/wildlife conflicts
- Agency responsibilities and jurisdictions for responding to wildlife-human conflicts
- Educating residents (especially new residents) on appropriate behavior around wildlife
- Lack of coordinated government/organizational programs to reduce wildlife conflicts
- Lack of training of public safety officials to deal with wildlife conflicts
- Conflicts between domestic animals/pets and wildlife
- Concern about landscaping that attracts wildlife and exacerbates conflicts (at schools, along roads)
- Concern that salmon fishery development may be attracting bears into the city
- Concern about other conflict problems: pigeons, gulls, beaver, coyotes, wolves, etc.

SUE DAYTON

Wildlife conflicts are an important issue in Anchorage. For example, bears that become attracted to garbage, pet food and birdseed can become public safety hazards.

Other Issues

- Need to promote the benefits of wildlife in the city
- Lack of recognition of wildlife benefits within some government agencies
- Need to integrate wildlife agency decision-making among multiple agencies at local, state, and federal level

A Summary of Anchorage's Wildlife

This section describes the state of Anchorage's wildlife by species or group. For each major species or group, we attempt to provide population estimates and trends, as well as short descriptions of preferred habitat and management issues. When available, citations and sources for the information in this section are provided. In most cases, however, information is based on current (1999) professional judgments of biologists with the Alaska Department of Fish and Game. This information is not necessarily definitive, and is offered to provide readers with a general view of the wildlife situation in Anchorage. Actions in this plan are designed to address the lack of more comprehensive information for several species in the future.

This section also suggests population goals for several species, in an attempt to identify those that need to be enhanced or reduced. **Establishing a population goal that is lower than current levels, however, does not necessitate any particular action.** These population goals simply highlight the potential for increased wildlife conflicts or biological capacity problems. Additional discussion of population management policies and actions are given in Chapter 5.

Throughout this section, the "Anchorage area" refers to the entire Municipality from Knik River to Portage, including Chugach State Park. In contrast, the "Anchorage Bowl" refers to the land from the Chugach foothills to Cook Inlet, and from Potter Marsh to the military bases; it does not include Fort Richardson, Elmendorf Air Force Base, Chugach State Park, Eagle River/Chugiak/Peters Creek, or Turnagain Arm communities.

Readers should also note that **fish and other aquatic species are not included within the scope of this plan** (see Chapter One, Plan Limitations).

General Biodiversity. Overall, the Anchorage area supports 52 species of mammals, and at least 230 bird species (with about 150 bird species likely to be regular visitors or year-round residents) (Scher, 1993). That's about half of the bird species recorded in the whole state. Anchorage has one native amphibian species (the wood frog), and no reptiles. There are also a myriad of insect species and other invertebrates, few of which have been studied specifically in Anchorage.

WILLIAM GOSSWEILER

Black Bears. An estimated 250 black bears live in the Anchorage area (between the Knik River and Portage), including Chugach State Park. Perhaps one-third of these bears spend at least part of the summer in or adjacent to residential areas in the Anchorage Bowl, Eagle River/Chugiak, or Girdwood. Black bears in Anchorage prefer forested habitat, including steam corridors. Judging by the number of cubs, the black bear population is probably increasing; this is further supported by the number of calls to ADF&G from residents, which have sharply increased in recent years. Black bears can easily become attracted to human food sources such as trash, pet food, and birdseed, making them potentially dangerous to humans and their pets or livestock (some Anchorage residents have rabbits, chickens, or other small livestock).

Brown Bears. About 60 brown bears live in the Anchorage area, and four or five are regularly seen in residential areas each summer (e.g., in the Anchorage Bowl or other developed areas such as Eagle River/Chugiak or Girdwood). However, subdivisions are expanding rapidly into bear habitat adjacent to Chugach State Park, particularly in Eagle River, along Hiland Road, and on the Hillside. Large lots and dense natural vegetation allow bears to use these subdivisions without being seen. Brown bears are generally likely to avoid humans and human environments, but can also learn to associate food opportunities (trash, fish offal, or small livestock) with people. They are also occasionally attracted to the Anchorage Bowl by winter-killed moose, abundant moose calves in spring, and spawning salmon in streams. Because of their size and potential aggressiveness, brown bear use of residential areas presents a definite human safety risk.

The number of both black and brown bears in the Anchorage area has increased in the last three decades, due to hunting restrictions and availability of human food sources. Black bear hunting was eliminated in the Eagle River valley, in the Anchorage Bowl (south of Tudor Road), and in adjacent portions of Chugach State Park in 1987. Black bear hunting in the rest of the Municipality allows only one black bear per hunter per year. Brown bear hunting has been prohibited in Chugach State Park and the Anchorage Bowl since 1973.

RICK SINNOTT

About 60 brown bears live in the Anchorage area, but only about five inhabit residential areas

Moose. The moose population in and around Anchorage has remained high since the 1970s, with about 1,900 animals in the entire Municipality (including Chugach State Park) in 1998. In the Anchorage Bowl, moose are also abundant, with approximately 200-300 in the area year-round, and about 700-1,000 moose in the winter. The winter moose come from adjacent areas (Fort Richardson, Elmendorf Air Force Base, and the mountains east of town in Chugach State Park). In Anchorage, moose are concentrated in area parks, greenways and undeveloped open space, but may frequently visit suburban neighborhoods.

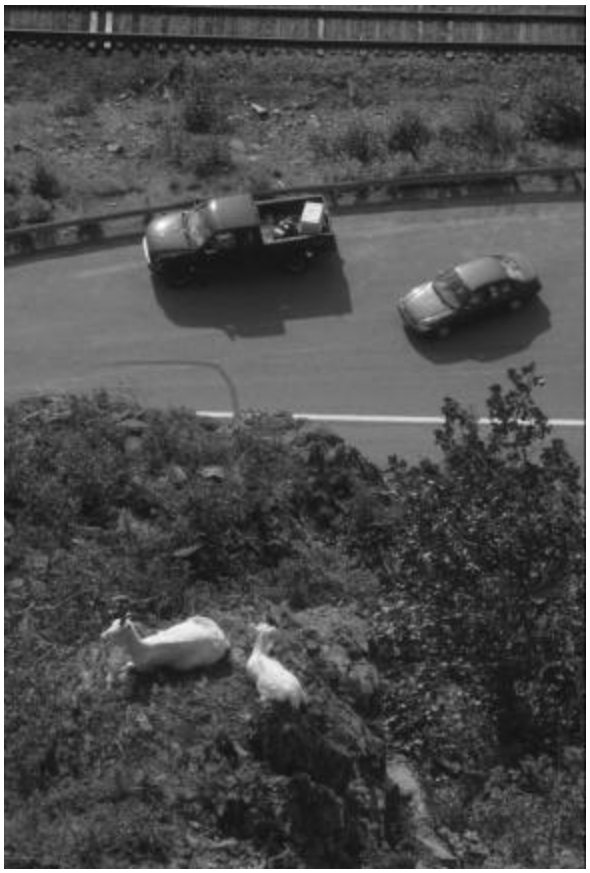
The Anchorage moose population is controlled primarily through starvation, vehicle collisions, some calf predation from bears and wolves, and limited hunts on the two military reservations. Despite this, moose populations appear to be rising again to the peak levels that were experienced in 1994. At that time, there were an estimated 2,100 moose in the Anchorage area and probably over 1,000 wintering moose in the Anchorage Bowl. This was followed by a sharp decline during the harsh winter of 1994-1995, when nearly a third died. In recent years, habitat in many areas also appears to have been over-browsed, particularly on Fort Richardson and in the Anchorage Bowl. From 1994 to 1999, an average of about 156 moose were killed in vehicle collisions in the entire Anchorage area each year, with the high year being 1994-95 (when there were 239 documented kills by collisions). About 100 moose are harvested annually in local hunts, most of which occur on the military reservations.

Moose are symbolically linked with Anchorage (the town mascot used by the Convention and Visitor's Bureau is a moose named "Seymour"), and they provide residents and visitors with exceptional viewing opportunities, especially in winter. However, they are also a hazard to drivers during the winter, and individual moose can become aggressive when under stress or protecting their young or territory. Certain human behaviors toward moose (e.g., people who feed them, individuals who harass them with snowballs) can exacerbate human-moose interactions, with damaging results. People have been stomped to death by moose in Anchorage (in 1993 and 1995), as many as 50 to 100 dogs are injured (some killed) annually, and cross country skiers and dog mushing teams using city trails have been charged on numerous occasions. There is concern among some trail users (particularly dog mushers) that moose are becoming more aggressive toward humans in the past decade. ADF&G has to destroy some individual aggressive moose each year.

RICK SINNOTT

Moose are very common in Anchorage, with winter populations in the Anchorage Bowl approaching 1,000. They provide superlative viewing opportunities, but also create the potential for conflicts.

Dall Sheep. Sheep are numerous in Chugach State Park (which has an estimated population of 2,400), and dozens of sheep can be seen on the hillsides above the Anchorage Bowl. Sheep generally live in the steep, rocky alpine terrain of the Chugach Mountains, but will visit lower elevations to access mineral deposits. One mineral lick, at Windy Point on the Seward Highway, has become a popular sheep viewing area, but traffic congestion at this relatively undeveloped site affects the quality and safety of viewing opportunities. Planned highway and viewing facility improvements (as advocated in the actions section of this plan) are likely to address some of these problems. Sheep populations in the park and at the Windy Point viewing area appear to be stable.



Dall sheep are common in Chugach State Park and are readily viewable along Turnagain Arm

RICK SINNOTT

Mountain Goats. In addition to Dall sheep, there are also an estimated 200 mountain goats in the mountains of Chugach State Park, with over 500 more goats in portions of the Municipality east of the Park. Mountain goats live in steep alpine terrain, and are less likely to be seen along roads or on the slopes above the Anchorage Bowl. The goat population appears to be increasing slowly.

Beaver are also common in Anchorage, living along stream corridors

WILLIAM GOSSWEILER

Beaver. The number of beavers in the entire Municipality is unknown, but there are an estimated 150 in the Anchorage Bowl. Beavers live along area streams, which are largely within publicly-owned parklands and greenbelts or on the military bases. Beaver activity provides important benefits to salmon and water quality. Their ponds create rearing and overwintering habitat for juvenile salmon; provide invertebrates, trapped organics, and other nutrient input including spawned-out salmon carcasses essential to the food web of the stream; and help water quality by allowing fine sediments to settle out. Large woody debris and ponds add complexity to a stream, which is vital to healthy fish habitat. Beavers occasionally cause damage on developed or private lands by cutting down trees or building dams that cause flooding. The beaver population in Anchorage appears to be stable.

Wolves. There are four or five packs (a total of 25-30 wolves) in the Anchorage Municipality, and two packs active in the Anchorage Bowl (about 12 wolves total). Wolves can inhabit a wide variety of terrain, and may have huge territories. In Anchorage, wolves appear to be relatively adept at avoiding humans, but may still be involved in some conflict situations. For example, wolves appear to kill up to about five dogs each year in the Anchorage area (although most of these dogs are found to have been running free). Wolf populations in Anchorage appear to be stable at this time.

WILLIAM GOSSWEILER

Two packs of wolves are active in the Anchorage Bowl, while other packs may use parts of Chugach State Park

RICK SINNOTT

There are a number of small mammals in Anchorage, including porcupine

Other Furbearers and Small Mammals. A variety of other furbearers are present in the Municipality of Anchorage, including wolverine, coyote, lynx, snowshoe hare, red fox, mink, weasel, and marten. Other small mammals include porcupine, red and northern flying squirrels, hoary marmot, little brown bat, and mice, voles, and shrews. (See Appendix C for complete list of mammals.)

Coyote and red fox numbers are unknown, but they appear to be stable or increasing, based on sightings. Lynx populations fluctuate in cycles with snowshoe hare populations, and appear to number 15-20 in the Anchorage Bowl in 1999. Lynx sightings in Chugach State Park appear to be increasing in the past two years. There is generally little trapping of these species in the Anchorage area.

Feral Rabbits. There are probably hundreds of feral rabbits in the Anchorage Bowl, all descended from tame rabbits released by humans. Adept at surviving in urban and suburban environments, they appear to be increasing. They are currently not a threat to native snowshoe hares through competition or interbreeding. (Snowshoe hares number in the thousands and also appear to be stable within a cyclic population range.) However, feral rabbits may transmit diseases, they do compete with snowshoe hares, and they can create property damage with their burrows and feeding habits.

Anchorage is the largest city in North America with nesting loons. Habitat conservation and measures to prevent disturbance appear necessary to maintain these populations.

This is a common loon. Pacific loons, with gray head and bright throat patch, also nest in Anchorage.

US FISH AND WILDLIFE SERVICE

Loons. Anchorage is the largest city in North America with nesting loons, and up to thirteen pairs of loons attempt to nest each year on city lakes (Fair, 1998). This includes up to seven pairs of Pacific loons (most on lakes in the Anchorage Bowl) and up to six pairs of common loons (most on lakes on the two military reservations). Although there are 45 lakes of suitable size for loon nesting, only about fourteen lakes have been actively used by loons since 1994. In the period from 1982-1994, twenty-one different lakes were used by at least one pair in one year. Since 1994, an average of 4.8 nesting pairs of common loons have fledged an average of 5.5 chicks annually, while an average of 4.5 pairs of Pacific loons have fledged an average of 2.0 chicks annually. The Pacific loon reproductive rate is lower than necessary to sustain the local population (an estimated 0.5 chicks per pair per year is required). Both of these breeding populations are vulnerable to local extirpation because of their low current numbers and geographic

isolation from other loon populations. Both of these species have been identified by the planning team as needing greater protection and management attention to prevent future population losses.

Grebes. Anchorage lakes also support breeding populations of both red-necked and horned grebes, although the latter are much less common or prolific in this area. Like loons, horned grebes appear to be more sensitive to human disturbance while nesting, and population stability may require habitat conservation or enhancement efforts.

Cranes. Sandhill cranes nest and raise young along the coast and in remaining large, open wetland areas. They can be sensitive to disturbance during nesting and migration. Crane populations in Anchorage appear to be stable at this time, but have probably declined from mid-century when development levels were lower and there were more extensive wetlands.

While most noticeable in Anchorage when giving their loud, gurgling call during migratory flights, sandhill cranes also nest in our coastal wetlands.

US FISH AND WILDLIFE SERVICE

Canada Geese. Geese began nesting in Anchorage in the early 1960s and were not reported here before that time. There are several subspecies of Canada geese. Most Anchorage geese are lesser Canada geese. Geese both feed and stage in Anchorage, and prefer habitat that features available grass adjacent to open water. Summer goose population levels have grown to about 4,600, and they are increasing at about 6% per year even as wildlife authorities have attempted to check increases through an egg collection and gosling translocation program.

Geese are a significant threat to aircraft (an Air Force plane crashed in 1995 after colliding with a flock of geese and 24 people were killed), and local air fields all have active harassment programs designed to keep geese from those areas. Geese can also become a nuisance around lakes and at parks, ball fields, and golf courses. Their feces make areas unattractive to many people and may contribute to the dispersion of a parasite that causes swimmer's itch. Chapter 5 contains a section summarizing the extensive management efforts associated with this species.

US FISH AND WILDLIFE SERVICE

Anchorage has over 4,000 resident geese, and many others fly through the area during their annual migration

ELMENDORF AIR FORCE BASE

Large numbers of resident geese can create some hazards or nuisances for humans. Authorities around airports and airfields have developed programs to prevent aircraft-geese collisions.

Mallards and Other Waterfowl. Like Canada geese, mallards and some other waterfowl species have increased in the Anchorage area in recent years. Based on the Audubon Society's Christmas Bird Count (CBC),[1] about 3,000 mallards now remain in the Anchorage area each winter. Most of these live in the Bowl, and are attracted by human hand-outs and open water. The mallard population is generally increasing, but may have dropped for a year or two after a 1996 road reconstruction reduced the amount of open water near the Spenard Road side of Westchester Lagoon. In more recent years, population numbers have returned to about 3,000 birds in winter. This high mallard population contributes to the nuisance problems identified with geese.

[1] The Christmas Bird Count has been held periodically in mid-winter in Anchorage since 1941, and continuously since 1960.

Waterfowl are attracted to the area's lakes, streams, and wetlands, but the wetlands have significantly decreased since the 1950s. Ducks and geese are hunted in the Anchorage Coastal Wildlife Refuge, with about 1,000 harvested annually.

Other waterfowl that migrate through Anchorage include swans, northern pintail, goldeneyes, mergansers, green-winged teal, bufflehead, scaups, and several other duck species. Additional information about waterfowl species and their abundance is needed for Anchorage, and actions in this plan are designed to increase our knowledge.

Anchorage wetlands and bodies of water provide habitat for many waterfowl like this wigeon

US FISH AND WILDLIFE SERVICE

Shorebirds. Forty species of shorebirds have been recorded in the Municipality (Scher, 1993), but only ten (including common snipe, lesser yellowlegs, short-billed dowitcher, least sandpiper, semipalmated plover, and spotted sandpiper) appear to regularly nest in the Anchorage Bowl. Other species, including Hudsonian godwits, may occasionally breed in the area (C. Maack, personal communication, 1999). Because considerable wetlands in the Bowl have been drained since 1950, breeding populations of these water birds have probably also declined (L. Tibbitts, personal communication, 1999). Retention of remaining wetlands within the Bowl will help ensure persistence of breeding species; protection of nesting areas from human disturbance may also be important and is addressed through recommended actions in this plan.

US FISH AND WILDLIFE SERVICE

Semipalmated plovers sport a bright orange bill and legs. They nest regularly in open habitat in Anchorage.

Many other shorebirds depend on the wetlands and upper Cook Inlet mudflats during spring and fall migration. Species that migrate through in high numbers include short-billed dowitchers, Hudsonian godwits, greater and lesser yellowlegs, and least and pectoral sandpipers. In general, population levels of migrants seem to be stable at this time but protection of tidal areas remains critical (L. Tibbitts, personal communication, 1999; B. Andres, personal communication, 1999).

Gulls and Terns. Eighteen species of gulls and terns have been recorded in the Municipality (Scher 1993). During the last two decades, numbers of glaucous-winged and herring gulls increased dramatically, overtaking numbers of the smaller mew gull which was formerly the most common gull in Anchorage. Retention of wetlands within the Bowl, particularly the Anchorage Coastal Wildlife Refuge, can help maintain populations of other species, such as Arctic tern, which are less adaptable to urban environments.

US FISH AND WILDLIFE SERVICE

Arctic terns nest in Anchorage wetland areas such as Potter Marsh.

Protection of remaining wetlands is critical to maintain these and other birds, such as shorebirds and less common gull species.

Glaucous-winged and herring gulls adapted easily to the increase in human garbage available in Anchorage, and are commonly seen at dumpsters. Although population surveys have not been conducted, biologists have counted more than 100 ground nests on a single empty lot in midtown Anchorage each spring. Large gulls become nuisances by vigorously defending nests on roofs and other structures, destroying roofing, fouling water, spreading avian diseases, and increasing nest predation on other birds. In 1999 natural resource agencies received more calls complaining about gulls than about any other birds. The USDA Wildlife Services program had contracts with 10 local businesses to remove gull nests where aggressive gulls threatened human safety, and the Municipality removed gull nests from several problem areas. Elimination of waterfowl feeding, and better attention to covering dumpsters, might help reduce the numbers and problems associated with large gulls.

JON NICKLES, USFWS

Bonaparte's gull is one of Anchorage's smaller gulls

Bald Eagles. There are probably dozens of bald eagles resident in the Municipality, and there are at least 9 nesting pairs in the Anchorage Bowl, with higher population numbers in winter. Eagles generally live and feed along streams, lakes, or the coast, but eagles occasionally scavenge human trash in Anchorage, particularly in winter. The eagle population in Anchorage appears to be stable or increasingly slightly.

US FISH AND WILDLIFE SERVICE

There may be nine or more nesting pairs of bald eagles in the Anchorage Bowl, and populations appear stable

Hawks. Thirteen species of hawks have been recorded in the Anchorage Bowl (Scher 1993). Although quantitative data are not available on population trends for these species, forest-dwelling birds, including sharp-shinned hawk, northern goshawk, red-tailed hawk and merlin, have likely declined due to forest fragmentation caused by urban development. Populations of alpine-breeding species such as golden eagle, northern harrier and gyrfalcon have probably remained unchanged, because their habitat has not been altered by human development.

Owls. Seven species of owls have been recorded in the Anchorage Bowl (Scher 1993). Resident species include the forest-dwelling great horned owl, boreal owl, and northern saw-whet owl. Boreal owls have likely declined as forests have been cut for development during the past three decades. Forest loss may not have affected great horned owls as much, because they use forest openings, which may actually increase as forests are fragmented. The Anchorage population status of the little saw-whet owl is uncertain, and is currently under study (B. Dittrick, personal communication, 1999). Snowy owls, great gray owls, northern hawk owls and short-eared owls reside in the area in winter or during migration, although northern hawk owls may also occasionally nest in the Municipality.

Seven species of owls, including great horned owl, may be found in Anchorage

WILLIAM GOSSWEILER

Migratory Songbirds and Other Small Land Birds. Anchorage supports year-round resident songbirds as well as many migratory species that arrive in the spring to breed. Other species occur here occasionally. Over 90 species of land birds have been recorded in the Anchorage Bowl (see Appendix C for list of most common species). About 58 species, including the 29 year-round resident species, breed here (Scher, 1993). This group includes families such as kingfishers, woodpeckers, flycatchers, jays and ravens, swallows, chickadees, thrushes, warblers, sparrows and finches.

Townsend's warbler, with olive back and a mask of mustard yellow and black, is one of Anchorage's most striking songbirds. The male's singsong voice is heard from the tops of mature spruce trees from late May to early July.

This banded bird is part of a study to determine effects of the recent bark beetle infestation on this spruce-dependent species

STEVE MATSUOKA, USGS

The Christmas Bird Count suggests that 40 to 50 bird species (not all of them songbirds) are regularly seen in winter. The most common land birds recorded in winter are rock dove (pigeon), black-billed magpie, raven, black-capped chickadee, red-breasted nuthatch, Bohemian waxwing, pine grosbeak, redpoll, and six species of sparrow. Grouse and ptarmigan species are local resident land birds more commonly found in less developed forested and alpine areas of the Municipality.

Alaska's state bird is the willow ptarmigan, which is found year-round in the Chugach Mountains

US FISH AND WILDLIFE SERVICE

Many local songbird nests, like this one belonging to a golden-crowned sparrow, are built on the ground.

Ground-nesting species are particularly vulnerable to free-roaming pets and to the common landscaping practice of removing the protective forest understory.

US FISH AND WILDLIFE SERVICE

Collection of quantitative data on population changes in songbirds and their allies has only recently begun. However, loss and fragmentation of forests and wetlands within the Anchorage Bowl have likely reduced breeding populations of some species. Many species require larger tracts for sufficient foraging or nesting habitat. Retention of large tracts of remaining spruce-birch forest and wetlands would benefit numerous songbird and raptor species. Retention of forested *corridors* which connect smaller tracts would help these tracts function as larger tracts, and also facilitate the dispersal of young birds.

Another habitat factor that has significant effects on biological diversity (numbers of species) and population sizes is the vertical structure of the forest. When the *understory* (shrubs and other plants growing naturally under the forest canopy) is removed, many birds lose nesting, foraging, and protective habitat. The problem of protective understory loss is made worse by the increase in free-roaming domestic cats as the city grows. Cats are efficient songbird predators; biologists estimate that cats kill hundreds of millions of birds each year in the United States alone.

Hairy woodpecker is one of about 30 species of land birds that live in Anchorage year-round

USGS

Biologists and birders have recently noticed several interesting changes in bird populations. Although they remain relatively uncommon, populations of downy, three-toed, and black-backed woodpeckers appear to have recently increased as a result of the spruce bark-beetle outbreak in the late 1990s (B. Andres, personal communication, 1999). In contrast, other songbird species (e.g., Townsend's warbler, ruby-crowned kinglet) have probably lost habitat as a result of the outbreak. The long-term effects of the spruce bark-beetle infestation on these and other bird species are still unknown. Recent outbreaks of bill deformities in black-capped chickadees and avian salmonella in redpolls and pine siskins have been noted, but the causes are presently unknown.

Ravens. There are probably over 1,000 ravens in the Anchorage Bowl in winter and the population seems stable. There is a noticeable seasonal movement of these birds, with only about 200 birds resident in summer. Ravens are intelligent birds with the ability to live in a variety of environments, and are adept at scavenging human food. This can occasionally create conflicts with humans who do not secure their trash.

RICK SINNOTT

The raven is among the most common bird species in Anchorage during winter

Rock Doves (non-native). The rock dove or pigeon is an exotic species that may number over 2,000 in the Municipality, with about half that number in the Anchorage Bowl. This population is growing, and they may be out-competing several other native bird species, or harboring diseases such as avian salmonella that affect other birds or people. Pigeons are all descended from tame birds that were released, and can successfully live in urban environments, especially when people feed them. One positive consequence of rock dove populations in Anchorage is that they may be attracting avian predators (e.g., gyrfalcon, which have been regularly observed since rock doves arrived in the city).

European Starlings (non-native). This is another exotic species that has spread across North America since its introduction from Europe in the 1890s. Starlings arrived in Anchorage in the last decade and are now year-round residents in the Bowl. The starling population in Anchorage is unknown and appears to be small but growing. They are a concern to biologists because starlings aggressively compete with cavity nesters such as woodpeckers and chickadees, their large roosts in buildings and trees can create noise and odor nuisances, and their droppings may allow a soil fungus to spread histoplasmosis, which humans can contract. Pests in many lower-48 communities, once their populations have been established they have proven nearly impossible to control.

Invertebrates. In addition to birds, mammals, fish, and wood frogs, there are thousands of invertebrate species in Anchorage, each with roles in the larger ecosystem. While it is beyond the scope of the current plan to identify and discuss conservation issues with regard to these species, the planning team would like to recognize their importance.

Of particular concern are aquatic insects such as stoneflies, mayflies, caddisflies, blackflies, craneflies, and midgeflies, all of which are present in the city's streams. They are essential to the fish and wildlife food web, and may be good indicator species for water quality because they are sensitive to pollution. Similarly, dragonflies and damselflies are prominent species around lakes, ponds, and other freshwater wetlands. Mosquitoes, of course, are another important insect species in the ecosystem, despite their obvious nuisance qualities to humans and their pets. As the city has become more developed and both wetlands and heavy brush decrease, it is likely that certain insect species such as mosquitoes have decreased.

Summary of some major Anchorage mammal species

Table 1. Summary of some major Anchorage mammal species. (Note: See text for a discussion of sources.)

Species	Population		Trend	Population Goal
	Summer	Winter		
Black bear	~250 in Municipality ~30 to 50 in Anchorage Bowl		Stable or increasing	Maintain population; encourage avoidance behavior.
Brown bear	~60 in Municipality ~5 in Anchorage Bowl		Stable	Maintain population; encourage avoidance behavior.
Moose	~1,900 in Municipality ~200-300 in Bowl	~700 to 1,000 in Anchorage Bowl	Fluctuating; limited by available forage	Possibly reduce (see discussion in Chapter 5)
Dall sheep	~2,400 in Municipality		Stable	Maintain population in park and at Windy Corner area.
Mountain goat	750 in Municipality		Stable	Maintain population.
Beaver	~150 in Anchorage Bowl		Stable	Maintain population.
Wolf	4 to 5 packs in Municipality (~25-30 wolves) 2 packs in Anchorage Bowl (~12 wolves)		Stable	Maintain population.
Red fox	Unknown		Stable or increasing	Maintain population.
Coyote	Unknown		Stable	Maintain population.
Lynx	Unknown		Cyclic	Maintain population range.
Snowshoe hare	Unknown		Cyclic	Maintain population range.
Feral rabbit	Hundreds in Anchorage Bowl		Increasing	Reduce or eliminate population.

Summary of some major Anchorage bird species or families

Table 2. Summary of some major Anchorage bird species or families. (Note: See text for sources.)

	Population			
Species/group	**Summer**	**Winter**	**Trend**	**Population Goal**
Common loon	Max. of 6 pairs	0	Stable	Enhance/protect population due to its small size.
Pacific loon	Max. of 7 pairs	0	Declining	Enhance/protect population due to its small size
Sandhill crane	Unknown	0	Stable	Maintain population.
Canada goose	~4,600 in Bowl	0	Increasing	Reduce existing population, and maintain at 2,000 in Anchorage Bowl.
Mallard	Unknown	~3,000 in Bowl	Increasing	Maintain population at current levels.
Shorebirds	Unknown	0	Stable in recent years.	Maintain populations.
Gulls	Unknown	Unknown	Some increases; some stable	Maintain populations.
Arctic tern	Unknown	Unknown	Unknown	Maintain population.
Bald eagle	Dozens in Bowl		Stable or increasing	Maintain population.
Hawks	Unknown	Unknown	Stable in recent years.	Maintain populations.
Rock dove (pigeon)	>2,000 in Bowl		Increasing	Reduce or eliminate population.
Owls	Unknown	Unknown	Stable in recent years.	Maintain populations.
Migratory songbirds and other small land birds	Unknown	Unknown	Some species stable in recent years; others unknown	Maintain populations.
Common Raven	< 200 in Bowl	>1,000 in Bowl	Stable	Maintain population.
European Starling	Unknown	Unknown	Increasing	Reduce or eliminate population.

General Values and Attitudes toward Anchorage Wildlife

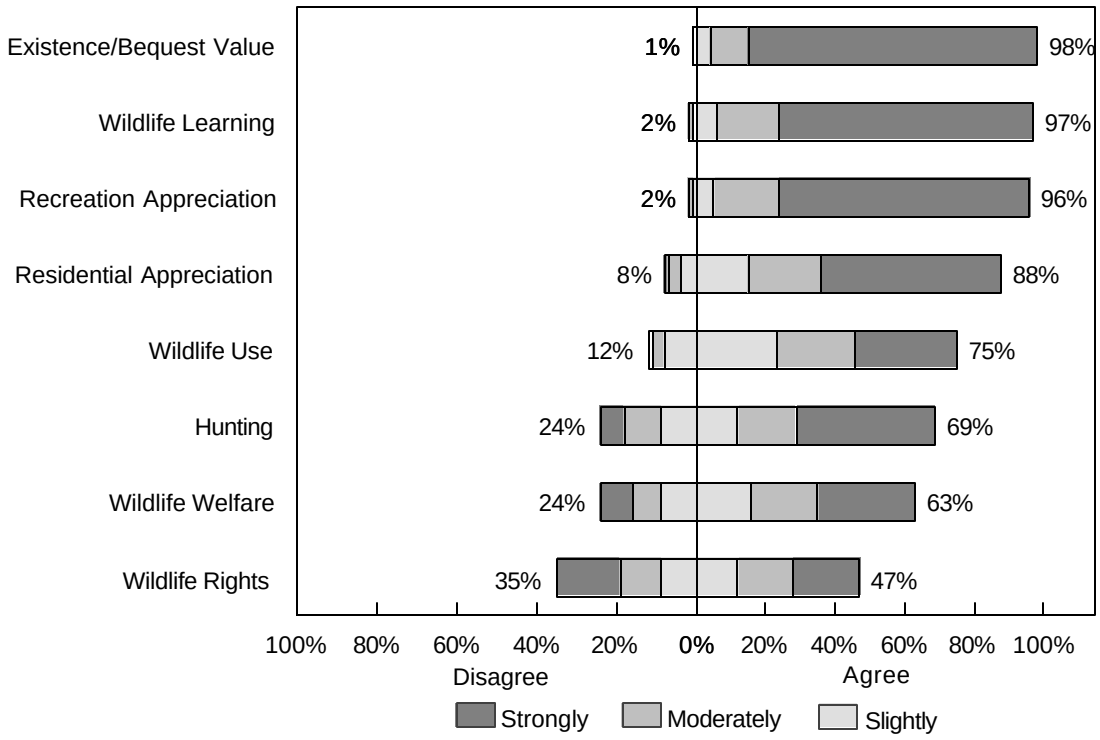
This section provides a sample of information from the 1997 study of Anchorage residents' attitudes toward wildlife and wildlife issues. It is useful for characterizing current wildlife interest levels and general values toward wildlife. Readers interested in more information about the survey findings are referred to the summary report (Whittaker and Manfredo, 1997), available from the Alaska Department of Fish and Game.

Wildlife Recreation Participation

Anchorage residents appear to be highly interested in wildlife recreation. Well over one-third (39%) report they have taken trips explicitly to view wildlife, and very high majorities report having enjoyed watching moose (96%) and geese (92%) in Anchorage. Over one-quarter of residents also report having fed geese, suggesting a significant minority of residents feel a strong affiliation with this species. Almost half of the residents surveyed also reported past or current participation in hunting. Over one quarter (28%) reported being current hunters, while another 20% reported they have hunted in the past.

Basic Wildlife Beliefs

People's attitudes toward wildlife species, problems, and management actions are thought to be influenced by their beliefs and values toward wildlife in general. The survey asked people about 29 statements that reflect eight different "basic wildlife beliefs." Combining results into eight scales reveals general patterns of attitudes toward wildlife, as shown below and discussed on the following page. (Note: "neutral" responses are not shown).



Wildlife Existence/Bequest Value Beliefs. Four questions measured existence and bequest value of wildlife. Existence questions focused on the importance of maintaining wildlife populations even if people don't see them, while bequest questions focused on maintaining wildlife populations for future generations. Almost all residents agreed with these types of statements.

Wildlife Learning. Three questions measured wildlife learning beliefs, focusing on whether residents enjoy learning about wildlife and whether they think wildlife learning is important. Almost all residents agreed with these statements, although there was variation in their strength.

Appreciation in Recreation Settings. Three questions measured residents' appreciation for wildlife in recreation settings, focusing on whether people enjoy watching wildlife on trips, or whether wildlife is an important reason for taking trips. Almost all residents agreed with these statements, although there was variation in their strength.

Appreciation in Residential Settings. Four questions measured appreciation for wildlife in residential settings, focusing on whether people enjoy watching wildlife around their homes and whether they are interested in attracting wildlife to their neighborhoods. Most residents agreed with these statements, but to a slightly lesser degree than for other "appreciation" beliefs.

Wildlife Use. Four questions measured wildlife use beliefs, focusing on whether wildlife populations should be managed for human benefit and whether it is acceptable for wildlife use to cause the loss of individual animals as long as populations are not threatened. A majority (75%) of residents hold pro-use beliefs, indicating general interest in a wildlife stewardship ethic.

Hunting. Six questions explored hunting beliefs, focusing on whether it is considered safe, humane, and whether it helps hunters appreciate wildlife and natural processes. Taken together, a majority of residents agree with pro-hunting beliefs while less than a quarter hold anti-hunting beliefs.

Wildlife Welfare. Two questions measured wildlife welfare beliefs, focusing on whether people should minimize wildlife pain and suffering if it is caused by human activities. A majority of residents generally agreed with a welfare position, indicating concern about the humane treatment of animals.

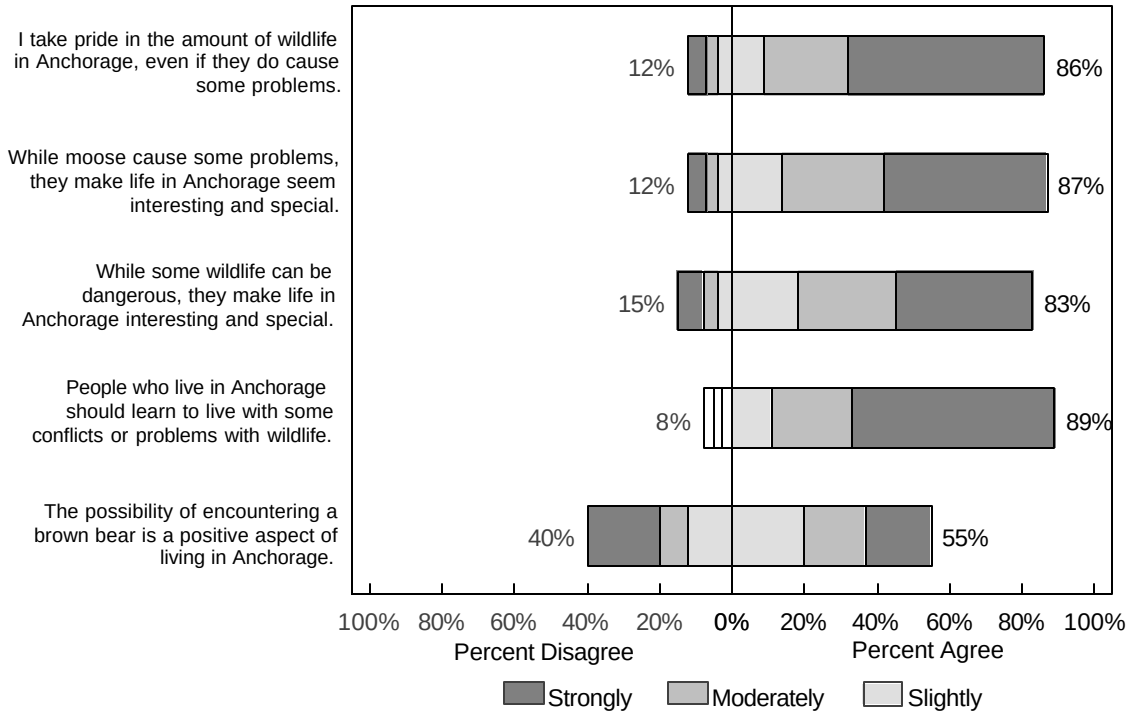
Wildlife Rights. Three questions measured whether human needs were more important than wildlife rights, or whether human and wildlife rights were equally important. While more people agree than disagree with wildlife rights, there was greater polarization over these beliefs.

Summary. Overall, these results suggest two general conclusions. First, very large majorities of Anchorage residents show appreciation for wildlife. They are interested in learning about them, seeing them during outdoor recreation and around their homes, and conserving them for future generations.

Second, while most residents hold use-oriented beliefs, a majority also agrees with some wildlife welfare or rights positions. This may seem initially inconsistent, but could simply reflect complexity among peoples' beliefs. For example, it is possible to be both pro-use and pro-welfare; many hunters are concerned with the humane treatment of wildlife even during harvest.

Pride in Anchorage's Wildlife

The survey also asked respondents to agree or disagree with five statements relating to "wildlife place-identity," the extent to which people symbolically link wildlife with Anchorage's quality of life and a sense of place. Results are given in the following figure (showing the percent that slightly, moderately, and strongly agreed/disagreed with each).



Results suggest that a majority of Anchorage residents take pride in the city's wildlife, even if these animals cause some problems. For many residents, it appears that wildlife problems actually enhance the quality of life in the city because they make it seem "interesting and special." A large majority also agreed that "people who live in Anchorage should learn to live with some conflicts or problems with wildlife," although a smaller majority thought that the possibility of encountering brown bears was a positive aspect of Anchorage life.

Summary

On balance, these survey results show Anchorage residents to be highly appreciative of wildlife, as well as relatively tolerant of wildlife problems in the city. Results also suggest that a majority of residents support the use and management of wildlife species, while also showing concern that uses and management activities are conducted in humane ways and without threatening long-term population levels. The planning team considered these general values and attitudes throughout the planning process. More specific survey results were also considered when choosing among actions, and are presented in this plan where relevant.

Wildlife Conflict Statistics and Standards

Wildlife in Anchorage do cause some problems, and while most residents seem willing to tolerate existing levels, many are concerned about any increase in conflicts. This section provides some information on current wildlife conflict levels in Anchorage, and develops initial "standards" that define the point at which levels go from being acceptable to being unacceptable.

Exceeding these standards does not require any particular action, but they are seen as the "alarms" that signify a problem in need of increased attention. In general, the standards are set to reflect the acceptability of current conditions, but they also suggest the need to avoid any substantial increase.

Public comments during the draft planning stage suggest that some people prefer standards at levels significantly lower than current levels, particularly those related to black bears. The planning team accordingly revised bear-conflict standards to reflect conditions in 1997 rather than those in 1999.

Because conflict levels can fluctuate in any given year, these standards are not intended to be rigid and inflexible (i.e., a large increase in any single year because of aberrant weather or other factors may not be cause for over-concern). However, they suggest serious intent to maintain levels at or below the standards over time.

We also recognize that some of these conflict variables may be susceptible to manipulation by individuals or groups who have a strategic interest in demonstrating a conflict problem. People who favor the dramatic reduction of moose populations, for example, could conceivably lodge complaint calls about encounters with aggressive moose that never happened. While we do not think such manipulations are likely, we want the plan to explicitly recognize the potential. There are weaknesses in using some of these standards to decide when there is a conflict problem in Anchorage. However, until more systematic information about conflicts (and people's tolerances for them) can be developed, we feel these offer useful, measurable ways to assess how much conflict is occurring.

Finally, the standards also do not imply that it is desirable to have a certain level of conflicts; the obvious goal is to have as few as possible. However, with a city of 260,000 people and abundant wildlife, standards set at zero are unrealistic.

Several actions described in Chapters 5 and 6 of this plan offers ways to address wildlife conflict prevention and responses. In this section, we are simply identifying information that helps define when we have a problem.

Moose-Vehicle Accidents

An average of 156 moose were killed in moose-vehicle collisions each year in the Anchorage Bowl from 1994 to 1999. The record was in the winter of 1994-1995, when 239 moose were killed. However, there are probably many other collisions that only injure moose, or accidents and near-accidents that are caused by people attempting to miss a moose. This compares with about 9,000 total vehicle accidents in Anchorage each year. In a study in rural Alaskan areas (Thomas, 1995), moose collision damage averaged $15,100 (including repairs, insurance, medical costs, and lost wages). In this same study, most accidents were shown to occur during dark hours (by a 3:1 ratio).

Standard:

- Less than 150 moose-vehicle accidents in the Anchorage Bowl resulting in a moose death per year over any three-year period.

KATE WEDEMEYER

Since 1994, an average of 156 moose were killed in collisions with vehicles each year. Standards in this plan recognize the need to prevent this number from increasing even if Anchorage's population and traffic levels increase.

Moose Encounters

The Alaska Department of Fish and Game receives an estimated 1,000 calls per year about nuisance or aggressive moose in Anchorage. More than 100 people are charged each year by moose. Many of these are "bluff" charges that do not result in any physical contact between the moose and person. However, all of these are potentially serious, and 5 to 10 are estimated to result in human injuries each year. Since 1993, two people have been killed by moose. In addition, it is estimated that as many as 50 to 100 dogs are injured by moose each year, including those along trails designated for sled-dog racing. On average, about 10 aggressive moose are killed by wildlife authorities each year.

Standards:

- Less than 1,000 calls per year about nuisance or aggressive moose (until an improved system can monitor actual incidents of various types; actions in Chapter 6 address this issue).
- Less than 10 human injuries from moose charges per year.
- Less than 10 aggressive moose killed by wildlife authorities or in defense of life each year.

JULIE WHITTAKER

Moose may act aggressively toward humans for a variety of reasons. Standards in this plan recognize the need to prevent increases in the number of aggressive moose encounters.

Moose Property Damage

Moose eat ornamental trees, shrubs, and gardens throughout the year. Damage estimates are in the hundreds of thousands of dollars, but no statistics are available. Landowners are expected to find their own means to protect their property from this damage (usually an 8 foot high or electrified fence is required). Accordingly, we have not established a standard for the amount of acceptable moose property damage. Note: Even without a standard, the plan has actions designed to help landowners protect themselves from this damage.

Black Bear Encounters

Black bears are attracted to residential areas because of natural foods as well as available human garbage, pet food, and birdseed. In the past several years, ADF&G received 300 to 400 calls about nuisance bears per summer. In 1998, however, this rose sharply to about 1,500 calls, and in 1999 the number of calls remained high.

Black bears may kill pets (although no accurate statistics are available) and occasionally injure people, but there has never been a reported human fatality from a black bear in Anchorage. By comparison, there are 600 reported dog attacks (on humans) in Anchorage each year.

From 1995-1998, between 9 and 16 black bears have been shot per year in defense of life or property, or by law enforcement or wildlife authorities for public safety. This is up from the years 1990 through 1994, when this number averaged only about 3 black bears dispatched per year.

Standards:

- Less than 300 calls per year about nuisance or aggressive black bears.
- No injuries to humans by black bears in any year.
- Less than 5 black bears killed in defense of life/property or by wildlife authorities on average each year.

In recent years, calls about aggressive black bears have increased dramatically, and the number of bears killed by residents and wildlife authorities has also increased. Standards recognize that current conflict conditions are unacceptable and should be reduced.

(photo shows brown bear)

RICK SINNOTT

Brown Bear Encounters

Brown bears are also occasionally attracted into residential areas because of natural foods as well as available human garbage, pet food, and discarded fish offal. In the past several years, ADF&G received about 50 calls about nuisance brown bears each year. Brown bears are particularly dangerous animals, and occasionally attack livestock or pets, or chase bikers or joggers on city trails. Two people were killed by a brown bear in Chugach State Park in 1996, and a brown bear injures someone in Anchorage about every two to three years. In recent years, between one and three brown bears have been shot per year by residents (in defense of life or property), or by wildlife authorities (for public safety).

Standards:

- Less than 50 calls per year about nuisance or aggressive brown bears in the Anchorage Bowl.
- No injuries to humans by brown bears in any year.
- No more than 1 brown bear killed in defense of life/property or by wildlife authorities on average each year.

Canada Geese Aircraft Strikes and Property Damage

Canada geese are a significant hazard for aircraft and can damage the aesthetic appeal of lakes, lawns, ball fields, and golf courses.

An active and more detailed plan to address these problems has been developed by the Anchorage Waterfowl Working Group, so no standards are developed for these conflicts here. For a summary of the geese management efforts being led by this group, refer to Chapter 5.

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.

Chapter 6: Priority Actions

This chapter describes 40 actions designed to enhance wildlife benefits in the community or to minimize human-wildlife conflict situations. These actions are divided into 25 high priority actions, and 15 supported actions as shown below. They are also organized into four general groups that address plan goals and objectives, although many actions are designed to address several objectives. The chapter also includes a list of actions considered but currently rejected.

Habitat and Species Conservation Actions

Top Priorities:
1. Wildlife Habitat Assessment
2. Key Species Population/Capacity Assessment
3. Conservation Tax Incentive Education
4. Habitat Conservation Ordinance Review
5. Acquisition Options for Conserving Habitat
6. Habitat Consequences Review Program
7. Stream Restoration Projects
8. Critical Habitat Reserves

Supported Actions:
Browse Improvement on Public Land.
Habitat Awards Program
Bicentennial Park Development Concern

Conflict Prevention Actions

Top Priorities:
9. Recreation Trail Design Guidelines
10. Road Improvements to Prevent Moose Collisions
11. Urban Wildlife Position/Program
12. Wildlife Encounter Safety Program
13. Bear Attractant Ordinance/Education Program
14. Moose/Bear Conflict Response Training
15. Wildlife Feeding Education Program
16. Pet Control Education Program

Supported Actions:
Avian/Small Mammal Predator Enhancement
Injured Bird and Bird Conflict Program
Trailhead Bear Warning Program
Neighborhood Moose Warning Program
Moose Accident Prevention: Education Options

Wildlife Recreation and Education Actions

Top Priorities:
17. Anchorage Wildlife Festival
18. Anchorage Watchable Wildlife Guide/Video
19. Expand Wildlife Education in Schools
20. Expand Visitor Center Interpretation Programs
21. Potter Marsh Nature Center
22. Potter Marsh to Girdwood Planning
23. Girdwood Nature Center

Supported Actions:
Coastal Trail: Kincaid to Potter Marsh
Campbell Creek Interpretive Trails
Greenway Interpretive Stations
Eagle River Viewing Tower
Eagle River Campground Interpretive Trail
Glen Alps Interpretive Stations
Middle Fork Campbell Creek Interpretive Trail

Other Actions

24. Habitat Planning for Military Lands (if those are relinquished)
25. Formalize Interagency and Wildlife Interest Group Cooperation

Habitat and Species Conservation Actions

As human population and development increase in Anchorage, wildlife habitat is often lost or changed. The following eight priority actions have been identified to address the need to protect, enhance, or restore the remaining quality wildlife habitat in Anchorage, and are discussed in greater detail in subsequent pages. The overall goal is to avoid net losses in functional habitat types and abundance. Taken together, these actions are designed to both identify important habitat in the Municipality and then ensure those lands are recognized and managed appropriately.

This goal begins with two research and inventory actions designed to develop better scientific information about Anchorage's wildlife habitat and key species. Although biologists have studied many aspects of wildlife in Anchorage, there is a lack of comprehensive information about the type, abundance, and functional quality of the city's habitat and the numbers of wildlife it supports. As part of both this wildlife plan and the Municipality's Parks, Recreation and Greenbelt Plan, we have made an initial assessment of habitat and population levels. But this effort has clearly suggested the need to learn more. Urban areas are complicated settings for measuring ecological health and potential, and there is more to learn about the optimal size, shape, and characteristics of habitat needed to support Anchorage's wildlife. This information may also prove useful in developing a consensus about optimal population for certain species such as moose (see previous chapter).

As Anchorage population and development increase, preventing the net loss of wildlife habitat will be challenging.

The Habitat and Species Conservation actions are designed to identify important habitat and ensure those lands are managed appropriately.

WILLIAM GOSSWEILER

Upon completion of these research and inventory efforts, we have identified three actions to help encourage private landowners to protect, enhance, or restore wildlife habitat on their lands. An incentives education program is one approach, and is designed educate landowners about existing tax or other incentives that encourage habitat protection. The development of land use ordinances that protect specific types of habitat is a second approach, and could be applied if the habitat assessment efforts can identify land use practices that offer clear benefits for wildlife at reasonable costs to the landowner. A final option is to have government purchase or otherwise acquire (i.e., through land trades) private lands with important habitat qualities.

This plan does not identify specific properties or habitats that need to be protected. The Municipality's Parks, Recreation and Greenbelt planning effort is poised to begin this process, and other existing Municipal planning documents also address this issue. This plan supports those efforts and documents. However, we also believe that habitat assessment information may suggest the need for additional protection efforts in the future. The hope is that the actions described here may be able to be applied toward that end.

Similarly, this plan does not identify specific tax incentives or land use ordinances needed to protect specific types of habitat, or to prevent specific types of land uses. The Open Space Plan and other portions of the Anchorage Bowl Comprehensive Plan revision will include identification of immediate needs in this area, but additional incentives and ordinances focused on wildlife are likely to be necessary in the future. This plan sets up a process for identifying these actions, but political bodies (e.g., the Municipal Assembly or State Legislature) are the authorities responsible for implementing them. In this plan, we are outlining the possibilities and an initial course of action.

Another action in the habitat conservation group is a "habitat implications review program" to ensure that public land decision-making considers wildlife. With multiple public agencies managing public lands for a variety of purposes, it is possible for one government entity to work at cross purposes to another without even knowing it. With this action, a specific review program coordinates government actions so we can avoid the simple errors.

The final two priority actions in this group identify the need to restore streams in Anchorage, as well as to protect particularly sensitive wildlife habitat areas. Riparian, or streamside, corridors have been identified as providing the links between many species and habitats, and have been degraded in some parts of the city. Similarly, protecting specific sites, such as nesting areas, are central to the notion that some wildlife areas in Anchorage deserve priority over human uses, at least at some times of the year.

1. Wildlife Habitat and Corridor Assessment Project

Description: This project is a scientific effort to learn more about wildlife habitat in Anchorage. It involves development of detailed habitat maps that will help us understand what habitat exists and has been lost through the years, as well as identify areas of critical habitat, and the wildlife movement corridors between them. This action will also develop measures of ecosystem health for various habitat types, allowing agencies to conduct cost-effective monitoring of habitat trends over time.

Initial habitat surveys and maps for over 100 wildlife species in the Anchorage Bowl have been completed by the Great Land Trust, an Anchorage-based private non-profit land conservation organization. The Trust used a "key informant" method to inverview more than 21 local scientists who provided information on critical wildlife habitats, wildlife corridors, sensitivity during different life stages, interdependence of species, current status within the Anchorage Bowl and sensitivity of species to disturbance. This information was then coded into a Geographic Information System (GIS) database.

With the completion of this project, the Municipality has its first baseline survey of critical habitat lands for numerous wildlife species, including regionally rare species. While the Great Land Trust project provides a good initial assessment of Anchorage resources, additional research could enhance scientific knowledge of existing habitat and wildlife requirements. Ongoing research projects at Alaska Pacific University, for instance, appear to be addressing some wetlands habitat issues.

The proposed project is a major research effort that will focus on vegetation and other habitat indicators throughout the municipality. We recommend a modified version of the methods used by the military in 1995-1998 to map and evaluate habitats on Fort Richardson, with adjustments in the size and scale of the project to assess the entire Municipality at a reasonable cost. Those methods included aerial photo interpretation coupled with field work, the creation of a GIS database, and statistical analysis for validation. Color aerial photos of the Anchorage area taken in 1997 at a 1:500 foot scale could be used in a hierarchical evaluation that would delineate along a continuum from vegetated areas to non-vegetated areas. Next, the vegetated areas would be selected for a finer scale evaluation of habitat type, use by wildlife species, and wildlife species preferences. Like the habitat evaluation of Fort Richardson, we recommend the Anchorage project be based on *The Alaska Vegetation Classification* (Viereck *et. al.*, 1992) but with modifications to make the classification suitable for urban and semi-urban habitats.

As Anchorage population and development increase, preventing the net loss of wildlife habitat will be challenging. This action is designed to identify important habitat and ensure those lands are managed appropriately.

Example of vegetation classification map courtesy of Fort Richardson Natural Resources Office

Rationale: Wildlife habitats in Anchorage have never been evaluated in a holistic fashion, yet understanding the types, amount, and connections between habitats are key to understanding wildlife population dynamics and making informed land use and management decisions. This habitat assessment will provide the basis for identifying prime habitat lands for conservation protection (Action 3), for targeted tax incentives (Action 4), for targeted habitat conservation ordinances (Action 5), and for assessing Heritage Land Bank lands for potential withdrawals from disposal (an issue related to Action 3).

Responsibilities: ADF&G, USFWS, and the Municipality should co-lead this action, which will require additional inter-agency cooperation from Chugach State Park, the military reservations, BLM, and the University of Alaska –Anchorage. The project could be contracted with researchers from universities or independent firms with the capability to do the work.

Schedule: After funding is secured and a contractor selected, the project will take an estimated 18 to 24 months to complete. For greatest efficiency, the project should be started in the late summer to allow at least two full summer seasons for data collection.

Costs and Funding Sources: Assessments of this type can cost in excess of a million dollars, but may also be scaled back with more limited sampling and field work. Discussions with researchers suggest a high quality assessment as outlined here would range between $150,000 and $200,000. Funding sources have not been identified, but could include funds from the Conservation and Reinvestment Act (CARA). State appropriations to ADF&G or the Municipality are unlikely to cover the costs of a project this large, but might assist to some degree.

Constraints: The high cost of the project is the primary constraint; environmental compliance issues are unlikely to be a problem as most of the work would occur on public land and be short in duration. Some permission to conduct fieldwork on undeveloped private lands may also be a constraint.

2. Key Species Population and Capacity Assessment Program

Description. This action is designed to develop improved information about key wildlife populations and trends, their biological carrying capacities, and public "social acceptance capacities." It would involve 1) periodic scientific efforts to assess wildlife population levels and 2) periodic public surveys (similar to the 1997 effort associated with this plan) to determine tolerance levels for impacts caused by key wildlife. Key species of concern (based on an assessment of management issues) include moose, black and brown bears, Canada geese, wolves, lynx, snowshoe hares and loons. Additional indicator species for assessing biological health might include particular songbirds (for assessing boreal habitats), shorebirds (for assessing wetland or coastal habitats), or macro-invertebrates (for assessing water quality in aquatic habitats).

Rationale. As discussed in Chapter 5, wildlife populations have biological carrying capacities, which are typically defined as the maximum number of individual animals that the existing habitat can support from year to year. Urban wildlife populations also have a "social acceptance capacity," which is the maximum number of individual animals that a community can tolerate given the impacts those species have on city life. Social acceptance capacities may be higher or lower than the biological capacities for different species, with either case having important implications for management.

For example, a 1997 survey of Anchorage residents suggest that moose populations in Anchorage are probably below social acceptance capacity, while ADF&G biologists suggest they are probably at or above the area's biological carrying capacity. In contrast, survey results suggest Canada geese populations have exceeded Anchorage's social acceptance capacity, while they appear well below the area's biological carrying capacity. In both of these cases, however, biologists do not have all the information required to make definitive statements about these issues. This action addresses this shortcoming with a program of periodic population and capacity estimates for key species.

KAREN LAING

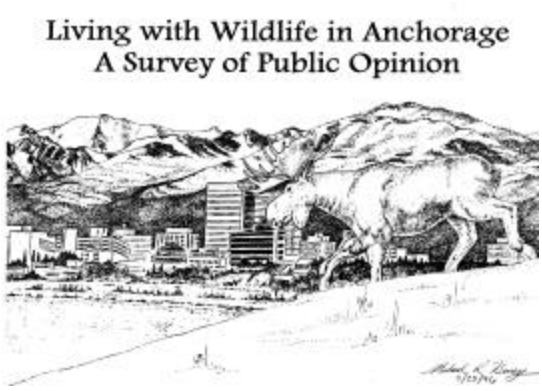
Accurate estimates of wildlife populations are a starting point for understanding biological carrying capacity issues

Responsibilities. The Alaska Department of Fish and Game has the authority and expertise to census wildlife populations and determine biological carrying capacities, but funding is limited. Appendix B summarizes current monitoring efforts. This action endorses additional funding to support additional work by ADF&G. The recommended periodic social survey could be conducted by ADF&G, or contracted to universities or consultants. Experts from other wildlife agencies in Anchorage would be encouraged to review and help design any survey efforts.

Schedule. Increased scientific research in these areas would not need to occur on an annual basis. However, major efforts for these key species should be made periodically (i.e., every five years). A systematic rotation of population studies would be optimal, but this depends on a stable funding source. Public surveys that explore social acceptance capacities are probably needed at least every ten years, but might be conducted more efficiently as part of a local university's research program on natural resource issues.

Costs and Funding Sources. Estimating population size and assessing the biological carrying capacity for a single species in the Anchorage area ranges from $5,000 to $25,000, depending upon the species and precision required. In this plan, we recommend an annual budget of $50,000 per year to be used on a rotating basis for the key species listed above. Existing wildlife management funding for Anchorage does not cover the cost of these more extensive efforts. CARA is one potential funding source, because state legislative appropriations are less likely to be available for this purpose. Studies of social acceptance capacities similar to that conducted in 1997 are estimated to cost about $50,000 to $80,000, although a single study can address several species. It may also be possible to conduct such social science efforts on a more limited scale or in cooperation with local universities' existing research programs, in which case costs may be reduced by half or more.

Constraints. It is difficult and often expensive to count wild animals under the best of circumstances, although new technologies and methods may lower costs in the future. Similarly, new technologies may help identify other indicators of biological carrying capacity for various species, but these have yet to be tested in Anchorage.



Periodic assessment of public attitudes toward wildlife can help determine "social acceptance capacities" in Anchorage

3. Conservation Tax Incentives Education Program

Description. This action is designed to increase awareness of existing tax incentives available to private landowners for conserving or restoring wildlife habitat on their land. There are several existing or potential incentives for landowners to consider, but many people may be unaware of them. Potential incentives vary in the effort required for qualification, the strength of the protection they provide, and the strength of the incentive. Incentive options include voluntary agreements (registration, cooperative management agreements), but typically focus on the establishment of conservation easements. Alaska statutes require local authorities to recognize conservation easements in their tax assessments.

This action would fund one additional position in ADF&G or a local land trust organization to: 1) utilize habitat assessment information to identify appropriate lands for protection; 2) review incentive options for protecting important habitat, and 3) work with landowners to implement options. The position will focus on education of, and assistance to, landowners so they can understand the needs, options and rewards of habitat protection on their privately-owned lands.

The education effort will focus on specific protection options. Non-binding voluntary agreements could recognize landowner participation by listing their names or properties on "wildlife registers" or in "wildlife count" lists. Conservation easements on private property may offer landowners financial incentives in at least three ways: 1) reduced property tax assessments offered by the Municipality of Anchorage; 2) charitable income tax deductions; and 3) estate tax deductions. Upon the grant of a conservation easement, the assessed value of the land affected could be reduced in proportion to the value of the easement, because the landowner is surrendering development potential and therefore the "highest and best use" of the property. The level of restrictions on easements vary depending upon the specific conservation values that are being protected, and could be determined in part by the information collected in the habitat assessment project (see Action 1). The program could also provide education about funding sources available to private landowners for fish and wildlife restoration (see Action 7).

Establishing and taking advantage of these incentives can be challenging. Various requirements exist for different types of tax incentives. For example, the donation of a conservation easement for federal tax purposes is a tax-deductible charitable gift only if the easement is perpetual and donated for conservation purposes to a qualified organization or public agency. For estate taxes, a conservation easement that reduces the fair market value of property will reduce the total value of the estate and the resultant tax owed by heirs of the property, decreasing the likelihood of land subdivision to pay for estate taxes. For property taxes, conservation easements generally reduce development potential and the fair market value of properties. To establish a reduced value and reduced tax assessment, landowners need to specifically apply for a reduction and justify the amount of the claimed reduction with an appraisal.

Rationale. This action is important because most of the land in the Anchorage Bowl is privately owned and not protected for wildlife habitat. Tax incentives provide landowners with a financial reason to protect or restore habitat, but many landowners are unaware of the options available to them. With this action, government and wildlife organizations can target information toward landowners with important habitat.

Responsibilities. This position should ideally be located within not-for-profit land trusts such as the Great Land Trust or The Nature Conservancy, but could also be housed within city or state government. The habitat assessment proposed in Action 1 is obviously a precursor to this effort, because it would identify important habitat.

Schedule. This action could be initiated quickly after funding. After identifying and prioritizing parcels for protection/restoration, contact with possible landowners could occur periodically. Because landowners themselves are the final decision-makers about whether to take advantage of these incentives, the ultimate schedule for positive action is unknown and long-term in nature.

Costs and Funding Sources. Annual costs for a habitat protection education specialist are about $50,000 per year, including salary, benefits, and support equipment. Potential funding sources include monies from the Conservation and Reinvestment Act (CARA), appropriations from the state legislature, the municipal assembly, or from dedicated trust monies.

Constraints. Some funding sources may not be able to support staff positions, as agencies may be reluctant to hire positions on soft money. Continuity of the program will be important to its success, however, particularly in regard to the weaker protective measures, education and voluntary registration/participation.

MARK SCHROEDER, USFWS

Grant programs to restore habitat are only one of the financial methods available to help and encourage conservation efforts of private property owners

4. Habitat Conservation Ordinance Review and Modification

Description. A number of local ordinances or land use and development regulations should also be applied to protect, enhance and connect wildlife habitats within the Municipality. The Municipality of Anchorage Title 21 Land Use Code currently includes few ordinances or regulations that *directly address* wildlife habitat, although many Municipal land use decisions commonly *affect* wildlife habitat. None of these are actually presented in the context of wildlife habitat and there is little coordination of land use planning efforts that link these ordinances to wildlife habitat conditions or preservation.

This action recommends modifying Anchorage's Land Use Code to reference wildlife and the conservation of important wildlife habitat features or functions. By changing language and statements of intent, a modified Land Use Code would empower the Municipality to target wildlife habitat conservation through land use planning tools such as subdivision and zoning regulations, land use and building permit reviews, and site-specific land use planning documents. While specific ordinance changes have not been identified in this plan, this action identifies the need to review the Land Use Code for regulation modifications that encourage private landowners to maintain natural landscape features. These changes could also help guide how Municipal departments manage public lands and facilities.

The timing of this new focus on wildlife habitat within the Municipality fits with the on-going revision process for the Anchorage Bowl Comprehensive Plan. In the early stages of this revision, public comment clearly suggested that Anchorage's wildlife, wildlife habitats, and other natural areas are an important part of life in the city. The Municipality has also been directed through the community visioning process to address urban wildlife issues and the protection of natural areas. The formal representation of this vision has been embraced in the Comprehensive Plan's goals and objectives, which direct actions in the Plan's strategies and implementation sections. In addition, the Municipality's Parks, Recreation and Greenbelt Plan may also suggest ordinance amendments that address wildlife issues and habitat protection. This plan endorses those processes as the appropriate forum for ordinance changes, which would eventually require Assembly approval (see below).

Rationale. This action is also important because most of the land in the Anchorage Bowl is privately owned and not necessarily protected for wildlife habitat. The options that could be applied under this action would encourage landowners to protect some of the beneficial habitat features of their land, and could help guide future development to minimize impacts on wildlife species and ecosystem function.

Responsibilities. The Municipal Department of Community Planning and Development is the lead agency that makes modifications to Anchorage's Land Use Code. With the assistance of ADF&G wildlife biologists, planning department staff will identify sections of the Municipal Title 21 where wildlife habitat and wildlife management issues and actions can be added or incorporated. Depending upon the section of the code, planning staff will draft wildlife conservation revisions and forward the packet of changes to the Planning and Zoning Commission. The Commission then makes changes to the ordinances and forwards the packet, with amendments, to the Municipal Assembly and Mayor for final approval and formal incorporation into Title 21. This ordinance revision process incorporates the participation of the public via the Community Councils, as well as extensive Municipal agency review. Comments from these reviews become part of the record and are incorporated into the Planning Department's recommendations. Public Hearings for ordinance changes are also required in formal changes to Title 21.

Schedule. If it becomes possible to merge all wildlife habitat-related changes to Title 21 into one packet, the process for formal adoption via Assembly approval would take approximately three months. As a preliminary exercise, this ordinance revision action will require an analysis and identification of pertinent code sections. This review will begin upon adoption of this plan, while development of the ordinance changes are expected to occur as the Open Space Plan and Phase II of the Anchorage Bowl Comprehensive Plan are completed. Based on current schedules, ordinance revisions for wildlife habitat are expected to be developed during the winter of 1999-2000. Once Title 21 changes are formalized, it typically takes a few additional months to be reviewed and packaged for consideration by the Assembly and Mayor.

Costs and Funding Sources. At this time, there does not appear to be a need for additional funding for this exercise. State and Municipal staff would likely do the work required for ordinance review and revision as part of their Open Space and Comprehensive Plan activities.

Constraints. Because the Title 21 revision process is done via Municipal ordinances, the entire process is subject to public hearings before the Planning and Zoning Commission and the Municipal Assembly. Both of these forums, but particularly at the Assembly level, may feature politically-driven review processes, and review boards have the ability to modify both the original language and the intent of ordinance revisions as forwarded by staff.

5. Acquisition Options for Conserving Prime Habitat

Description. A wide variety of property acquisition options could be used to enhance, maintain, or restore prime habitats and wildlife corridors in Anchorage. This action recommends more focused efforts to apply these options upon conclusion of the Municipality's Parks, Recreation and Greenbelt Plan, the revision to the Municipality Comprehensive Plan, and wildlife habitat assessment described in Action 1. The idea is to protect high priority habitats on private land through purchase, land trades, or other acquisition mechanisms with willing landowners. This action also identifies the need to take advantage of endowments, gifts, and other lesser priority acquisitions as these opportunities become available. While conservation organizations such as the Great Land Trust can manage donated lands, government can play a similar role, particularly if they manage adjacent lands. Ideally, the best way to preserve important habitat is fee-simple acquisition that places parcels into public ownership.

Rationale. This action addresses the critical need to preserve, re-establish, and acquire crucial components of the wildlife habitat in Anchorage in order to maintain the long-term integrity, diversity, abundance, and distribution of Anchorage's wildlife habitat resources. Anchorage is rapidly depleting the connections, quality and quantity of wildlife habitats in the face of increasing population and development. This action plays a crucial role in identifying and protecting lands that would otherwise be developed and lead to a net loss of important habitat.

Responsibilities. Several agencies and wildlife groups participating in this plan could play roles in acquiring important habitat in Anchorage. While land trust organizations such as The Nature Conservancy and Great Land Trust are particularly adept at raising funds and applying these options for smaller properties, government participation may be necessary with larger parcels. As a result of Anchorage's Open Space Planning efforts and the Anchorage Bowl Comprehensive Plan revision, the Municipality may initiate new habitat and natural open space acquisition efforts. These purchases would likely include expansion of the city's greenbelt program managed by the Cultural and Recreational Services Department. BLM, ADF&G, and Chugach State Park also manage land tracts in Anchorage and have the capacity and ability to add to those.

Schedule: The action should be initiated after priority habitat areas have been identified by the habitat assessment or through the Parks, Recreation and Greenbelt Plan, but could be implemented for certain properties at any time. Once the assessment is complete, a tracking system of donations, endowments, gifts, exchange properties, and potential acquisitions needs to be developed by a multi-agency working group. Finally, a comprehensive mapping effort should be created to identify current habitat in conservation ownership status, determine how ongoing acquisition efforts are proceeding, and how future acquisitions might compliment protected habitats. This mapping effort would overlay with the habitat assessment project and help identify habitats that need greater acquisition attention.

Costs and Funding Sources: Many of the funding sources are already in place with conservation organizations or governmental programs like the Land and Water Conservation Fund. Congressional, State legislative, or local governments may also participate through general appropriations, or through new programs such as CARA. Once the Municipality finalizes the Open Space Plan, and identifies acquisition implementation measures in the Comprehensive Plan revision, Municipal funding mechanisms will also be formalized, and may include bond packages, Capital Improvement Projects (CIP) and other similar actions. Individual community councils and organizations could also play a key role in proposing acquisitions in localized portions of the community. Again, a working group would be needed to focus and centralize Anchorage efforts by a number of parties.

6. Habitat Consequences Review Program

Description. This action recommends the creation of a cooperatively-funded program to review draft public land use decisions and public works projects for wildlife habitat and conflict consequences. While ADF&G and USFWS habitat biologists regularly review major capital improvement projects in the city for significant environmental impacts on wildlife habitat associated with wetlands and fish-bearing waterways, this action envisions more extensive review efforts for projects and actions that do not normally receive attention from a habitat specialist.

The program would involve at least one staff person who would form a coordinating link between local, state and/or federal offices and contractors involved in development projects. The program would also provide comments on any decisions that include road landscaping, public park and open space landscaping, public facilities landscaping and trail design. These projects have a direct and significant impact on human-wildlife interactions across Anchorage, but are not currently reviewed for these impacts.

This review process is distinct from a legal review as might be required under changes in the Anchorage Land Use Code (Title 21). With this review program, we are concerned with some of the more subtle details of a development project, and alternative ways to achieve development goals while still protecting important habitat or minimizing the potential for human-wildlife conflict. For example, projects would be reviewed for their ability to 1) maximize viewing opportunities when appropriate; 2) provide/enhance habitat for certain species; 3) attract particular species away from conflict areas (i.e, to help minimize wildlife-vehicle collisions, bird-window and bird-wire strikes, or destruction of costly plantings); 4) discourage certain species from other areas; and 5) consider or retain wildlife corridors where appropriate. Habitat functions that attract wildlife include providing food, shelter, and cover for movement from place to place, and habitat for breeding and the rearing of young. Affected wildlife may include songbirds, water birds, raptors, moose, bear, small mammals, and fish.

Additionally, this program would contribute to cooperation and comprehensive, cost-effective, long-term visions for land use planning. For example, various utilities and road construction agencies plan their development projects separately, and one parcel of land may face repeated and costly impacts over time with each construction project. This program would encourage awareness of all planned projects, a cooperative planning process, and construction and landscaping methods that would reduce adverse habitat impacts and maximize habitat improvements to degraded areas.

As an illustration of how this action could be implemented, consider a proposed road landscaping project. A habitat review staff person would be consulted to determine whether the landscaping was appropriately designed to minimize automobile-wildlife conflicts, and whether there would be impacts on wildlife use and movement in the surrounding area. The staff person would familiarize him/herself with any related adjacent or future projects and any potential methods of improving cost-effective cooperative planning related to habitat issues. Potentially dangerous areas would be delineated, and plants would be chosen for their ability to avoid attracting moose. Structural components of the project may be designed to discourage unsafe wildlife crossings or which would allow for safe passage. Impacts on other wildlife species in the area would also be considered. For instance, shrubbery that provides appropriate shelter for songbirds without obscuring driver vision might be considered for an area where increased bird-automobile collisions are unlikely.

This staff person would be available to be a member of project planning teams, or could simply be consulted as a regular part of the review process. Coordination between funding, planning, design, and maintenance agencies and contractors would be organized to jointly consider a variety of wildlife, conflicts, cost, and future planning considerations. In addition, this staff person would work with the Municipality's Cultural and Recreational Services Department and other appropriate maintenance personnel to ensure that wildlife issues are considered in the maintenance of landscaping and open space.

Rationale. Maximizing opportunities for positive human-wildlife interactions and minimizing opportunities for human-wildlife conflicts are two important goals of this plan. Despite the direct and significant impact of the development, landscaping, and maintenance projects described above on human-wildlife interactions across Anchorage, there has been no formal and regular process to address these issues, and they are often overlooked. Awareness of wildlife issues affected by proposed projects, coordination, and accountability are lacking. The emphasis of this program would be on awareness, communication and cooperation.

Development projects in wetlands and adjacent to anadromous fish creeks are already reviewed for their effects on fish and wildlife; this action is not intended to duplicate those processes. However, other habitat-related issues generally do not receive detailed reviews. Recent development projects which might have benefited from this kind of review program include the landscaping choices on Northern Lights Boulevard (where birch planted in the median attracts moose and creates a safety hazard) and the proposed site of a new elementary school (which became controversial because initial designs did not adequately consider impacts on wildlife habitat and adjacent recreation areas). Through this action, we are simply endorsing a more comprehensive review process by qualified biologists.

Responsibilities. The planning team did not reach consensus on which agency should house and support this type of position. There are both advantages and disadvantages to having these responsibilities in either state or municipal government, not to mention the usual political, institutional, and funding barriers. Regardless of where this position is located, the planning team agrees that the person who fills it will need to work across agency boundaries to become familiar with a variety of local, state, and federal road and public facilities projects, as well as large scale private and utilities development. Because of their knowledge and jurisdictional responsibilities for wildlife, as well as the necessary coordination on projects involving state and federal funding, ADF&G and USFWS would be major cooperating agencies even if this position is located within the Municipality.

Schedule. This action could be implemented within six months after funding (time required to advertise and fill the position). It would take about two months after hire for the review program to develop coordination procedures for various types of public works projects.

Costs and funding sources. Annual costs for the program, which is currently envisioned as a single staff biologist position, is about $50,000 per year, which includes salary, benefits, and support equipment. Potential funding sources could include CARA, state legislative appropriations, or city appropriations.

Constraints. Funding sources may be difficult to secure during a period of fiscal austerity, and agencies may be reluctant to hire positions on soft money such as likely to be provided by CARA. As discussed above, there are also significant institutional hurdles in developing such a program, which might be cooperatively funded by city, state, and federal monies, and would be working across all those agency boundaries. However, the program as envisioned could be parallel to municipal wetlands or state habitat review programs which are already in place, and which also work across those boundaries.

7. Stream Restoration Projects

Description. This action endorses stream and riparian restoration projects for Chester Creek, Campbell Creek and Ship Creek. Specific restoration efforts will be coordinated with projects being planned or considered by Alaska Waterways Council, ADF&G, US Fish and Wildlife Service, Army Corps of Engineers, and the Municipality. In all cases, projects are expected to be developed within stream watersheds in cooperation with local community councils.

Specific stream restoration projects are being developed by three "watershed" groups, and are expected to be available in late 1999. Those groups are in the early stages of their work and project details have not been completed. These groups are expected to identify specific locations and major actions to be taken, estimate costs (if available), and identify participating agencies. One project which has been developed and is expected to be completed this year provides an example:

- ***Westchester Lagoon "Duck Walk" Project.*** This $80,000 project will restore degraded bank area with shrub transplants, coir logs,and sedges, as well as additional tree and shrub plantings in adjacent grassy areas to Chester Creek and Westchester Lagoon. It also includes developing light penetrating walks and a gravel trail to prevent future vegetation impacts from wildlife viewers at this popular waterfowl area. The vegetation in the area is designed to minimize waterfowl congregations on shore, where they, too, may also cause erosion and create safety hazards as they move across Spenard Road. Finally, interpretive signage at the site will focus on geese management issues in Anchorage and an anti-feeding message (see Action 16). This project is being led by the Municipality Parks and Beautification Division, in cooperation with ADF&G, Anchorage Waterways Council, USFWS, and the U. S. Army Corps of Engineers.

When the natural riparian vegetation of stream and lake shores is degraded, water quality is affected.

This portion of Campbell Creek has lost the erosion control and filtering properties of the shrubs that were once present.

MARK SCHROEDER, USFWS

GARY WHEELER, USFWS

Restored native riparian (streamside) vegetation also provides many essential habitat functions. For example, it lowers water temperature (important to salmon); slows water velocity and provides shelter for young fish and waterfowl; and provides habitat and movement corridors for many songbirds and small mammals.

Rationale. Collectively, these actions are necessary to conserve and restore critical riparian habitat in Anchorage. These three major streams in the Anchorage Bowl are the key corridor links between the large undeveloped habitat tracts east of town (the military lands, Campbell Tract/Bicentennial Park, and Chugach State Park) and the coastal areas. In addition to the aquatic and bird species that live along these riparian corridors, many wildlife species use them as travel routes. The streams have also been degraded by development and pollution. These actions address some of this degradation, and attempt to restore functioning riparian corridors.

Costs and funding sources. Several funding sources are available to assist both public and private landowners with habitat restoration programs. Examples include tax incentives (see Action 3), the Wildlife Habitat Incentives Program (WHIP) administered by the National Resource Conservation Service (NRCS), and the Partners for Fish and Wildlife Program administered by USFWS.

MARK SCHROEDER, USFWS

Restoration projects along Anchorage's streams can help improve riparian habitat as well as minimize wildlife conflicts, provide improved viewing and education opportunities, and beautify the area

8. Critical Habitat Reserves: Education/Regulation Protection Options

Description. Certain bird species native to Anchorage have apparently declined concurrent with increased human populations, activity levels, and habitat losses over the past thirty years. Examples include loons, sandhill cranes, arctic terns, and olive-sided flycatchers and other songbirds. Other wildlife species of high local interest (e.g., nesting bald eagles) are also susceptible to human disturbance, and may benefit from efforts to protect their nesting areas from human approaches or other activities. Many people are also unaware that a large number of local songbird and other small land species nest on the ground, increasing their vulnerability to cats, dogs, and humans. Finally, certain bird species are very protective of nesting areas (e.g., goshawks, great horned owls) and present a safety hazard to humans. In essence, this action would establish an education program and "critical habitat reserves" around nesting areas during sensitive time periods.

The first part of this action involves developing recommendations for appropriate distances and timing windows for distancing people appropriately from known nesting areas of various species. These will be based on existing research, and will be explored via a thorough literature review. The literature review will also examine alternatives that other natural resource managers may have used to help mitigate human impacts on nesting wildlife.

The second part of this action involves identifying sensitive bird species based on the literature review, identifying sensitive nesting sites in Anchorage, and implementing educational strategies to help residents and visitors recognize and avoid approaching them. While the Open Space planning process has already identified several important nesting areas through the "key informant" approach, some "ground-truthing" will also be necessary. If needed, this component of the action may include increased enforcement of existing federal and state regulations to back-up the educational strategies. The primary educational effort is likely to focus on posting known nesting sites, or certain trail segments, with warning signs.

Sandhill crane chick and pipping egg.

Many bird species are sensitive to human activity or approaches. This action would help develop education and regulation efforts to prevent disturbances during sensitive times.

CAL LENSINK, USFWS

Rationale. This action is needed because high human activity levels around sensitive nesting species can prevent them from being successful. It is important to protect nests not only from nearby development, but also from wildlife viewers, anglers, or others who may approach birds at sensitive times.

Responsibilities. Co-lead agencies for this action are ADF&G (which has been active in developing similar informal education program for loons) and USFWS (which has primary responsibility for migratory bird management as well as expertise in managing bird nesting areas). In addition, support is expected from various conservation groups (e.g. Anchorage Audubon Society, Alaska Center for the Environment, National Wildlife Federation).

Schedule. Once funding for this effort is developed, the first phase of the effort could be completed within six months. Identifying known nesting sites and developing educational materials would take an additional year. If regulations need to be developed, these are also likely to take about a year to be adopted. Note: Some existing efforts, specifically targeted at loon nesting areas, already occur without the benefit of formal regulations. Similarly, education efforts could begin at known sites upon completion of this plan.

Costs and Funding Sources. This action would cost approximately $60,000 in the first year (half-time for a wildlife biologist ($35,000) and half-time for an education specialist ($25,000)). In subsequent years, costs would be about half this level as nesting sites become recognized and educational materials have been developed. These costs include salary, benefits, and support equipment. The federal Conservation and Reinvestment Act (CARA) and similar bills are a possible funding source.

Constraints. No permitting is anticipated for this project. If regulations are deemed necessary, there is an established Municipality process for developing them. Final approval of these regulations would be required by the Municipal Assembly.

Other Supported Habitat and Species Conservation Actions

Browse improvement on public land. This action applies specifically to the military installations and BLM's Campbell Tract; they have existing plans to improve moose browse on public lands to entice moose to remain in those undeveloped areas. The planning team supports these efforts.

Habitat awards program. This could be developed as part of the Anchorage Wildlife Festival (Action 17) a priority action in the wildlife recreation category. It would honor private landowners who conserve, enhance or restore habitat. It also has similarities to potential incentive options (Action 3). These should ideally be organized by non-profit organizations, but might involve judges from wildlife agencies such as ADF&G and USFWS.

Bicentennial Park/Campbell Tract development concern. The planning team has particular concerns about public land development in the Tudor Road lands adjacent to the Bicentennial Park/Campbell Tract area, which has lost considerable habitat in recent years to public facilities. The large tracts of forested habitat in this complex are considered crucial to the long term sustainability of Anchorage wildlife populations. The planning team recommends that the Open Space Plan and Anchorage Bowl Comprehensive Plan revision recognize the importance of this property and protect it from future development.

Conflict Prevention Actions

These eight priority actions (and five supported actions) are designed to minimize the potential for wildlife conflicts. Many are designed to modify human behaviors that lead to human-wildlife conflicts, hoping to minimize the number and severity of conflicts that require responses described in Chapter 5.

The first two actions focus on "technical fixes" to wildlife conflicts. Both trail and road design can affect the probability of certain kinds of human-wildlife interactions (e.g., moose-vehicle collisions, encounters between recreationists and moose or bears on trails); these actions simply require trail and road designers to consider these issues as new projects are developed.

The remainder of the priority actions in this group focus on education efforts to modify human behaviors that can lead to or exacerbate conflicts. These start with the development of a more substantial urban wildlife program to systematically monitor and develop education efforts to prevent wildlife conflicts. ADF&G currently takes responsibility for conflict prevention in the Anchorage area, but the number and frequency of conflicts in recent years has led the agency to operate in a reactive/response mode rather than a proactive/prevention mode. This plan recommends additional efforts to help wildlife authorities direct more attention to the latter.

The additional actions in this group help define the activities of this expanded program. Recommended actions include developing bear and moose safety education materials and workshops, developing education materials and ordinances to encourage residents to secure bear attractants such as trash, and expanded conflict response training for public safety officers. This program will also enhance education efforts to minimize the impacts of human-wildlife conflicts on wildlife (e.g. programs to limit wildlife feeding and minimize harassment of wildlife by pets).

Other lower priority but supported actions in this group include enhancing small mammal and avian predators to control certain nuisance wildlife species, an education program focused on addressing bird conflicts and injuries, an organized bear trailhead warning program, and the development of a moose-vehicle accident reporting system to heighten awareness of this particular problem.

Readers should note that both moose and bears are expected to be the focus of individual "step-down" planning efforts expected to be initiated by the Alaska Department of Fish and Game in the winter of 1999-2000. While the focus of moose management planning is likely to be on biological carrying capacity and associated population issues, the focus on bears is more likely to be on conflict prevention and responses. Several of the actions suggested in this plan are designed to work collectively to change both bear and human behaviors that appear to contribute to the increasing level of conflicts.

9. Managing Recreation Use Impacts on Trails: Design Guidelines

Description. This action recommends development of Anchorage trail design guidelines that address potential impacts of recreation use and facilities on wildlife habitat, wildlife recreation quality, and the risk of human-wildlife conflicts. These guidelines would address three central issues:

- Paved multi-use trails (e.g. Chester Creek Trail, Coastal Trail) encourage faster trail travel but also have limited sight distances in certain areas, thus increasing the potential for surprise encounters with wildlife.
- Wider and straighter trails may change the type of wildlife viewing opportunities available and upgrading walking trails to multi-use trails may destroy trailside habitat. Some wildlife viewers (particularly birders) prefer more primitive, narrower trails.
- Wider and more developed trails may have other ecological impacts (e.g., may impede water drainage, cleave contiguous habitat, create impacts that prevent songbird nesting).

This action recognizes that there are different types of recreation trails in Anchorage, and does not advocate wholesale trail re-construction to address the problems outlined above. However, the planning team would like to see a task force develop a short list of wildlife-oriented guidelines that could be used when new trails are being developed (or old ones reconstructed because of maintenance needs).

Responsibilities. The guidelines would be developed with a task force of trail design and trail advocate individuals from a variety of agencies and groups. ADF&G and USFWS habitat biologists and Municipal planners would form the core members of the group, but to be successful the guidelines would also need to be developed in cooperation with trail designers and trail advocacy groups. The National Park Service's Rivers and Trails Conservation Assistance Program and Anchorage Trails Coalition are possible participants.

Schedule. These guidelines would require a series of meetings over a relatively short period (probably less than six months). Assuming that agency participation is available, the action could begin shortly after this plan is finalized. The task force would be expected to produce a "guidelines" document a few months after the meetings have ended, and distribute them to Anchorage trail managing agencies for consideration as trails are developed or reconstructed.

Costs and funding sources. Few direct costs are expected to be needed to complete this action, assuming that agencies are willing to donate some staff time to attend the series of meetings and write sections of the guidelines document. It might make sense to have one agency (or a consultant) lead and coordinate these meetings, in which case $5,000 to $10,000 might help compensate for staff time dedicated to the action. In addition, it might cost about $2,000 to professionally edit, print and distribute the final guidelines. This funding may be available from the participating wildlife or trail agencies; the NPS Rivers and Trails Assistance program specializes small, cooperative projects and has annual funding available on a competitive basis.

Constraints. Chief constraints are associated with developing multiple agency commitments to the project, although the level of commitment is relatively small.

10. Road Improvements to Prevent Moose-Vehicle Collisions

Description. This action involves two phases. First, it would convene a task force from relevant agencies to review known information about moose-vehicle collisions in the Anchorage area and identify priorities for roadside improvements that might reduce their number. Potential improvements include lighting, passive and active warning systems, fencing, or the creation of parallel moose trails to discourage moose crossings in certain areas.

Second, it would integrate task force recommendations into the on-going road reconstruction projects being led by the State Department of Transportation through the Anchorage Metropolitan Area Transportation Study (AMATS) Transportation Improvement Program (TIP). Potential upcoming projects include several roads where ADF&G has documented repeated moose-vehicle accidents, including:

- DeArmoun Road (Westside to Hillside Road).
- O'Malley Road (New Seward Highway to Hillside Road).
- Old Glenn Highway (North Eagle River Interchange to Peters Creek).
- Eagle River Loop Road (Old Glenn to Eagle River Road).
- Abbott Road (Lake Otis to Birch Road).
- Eagle River Road (MP 5.3 to MP 12.6).
- Huffman Road (Old Seward to Lake Otis Parkway).

These projects are in various phases of development, with the earliest on-the-ground construction planned for 2002, while other projects may be five to seven years from preliminary engineering to construction. All of these projects involve Federal Highway Administration (FHWA) funds, which have well established planning, design, and construction procedures. Integrating options designed to reduce moose-vehicle accidents is possible, but needs to occur early in the process. In past years, ADF&G review of these projects has been generally limited to habitat impacts (particularly regarding wetlands and effects on aquatic resources); under this action, additional expertise developed during the first phase of the action will be integrated into the planning and design efforts.

Rationale. Moose accidents are a considerable problem in Anchorage. In the survey of residents (Whittaker and Manfredo, 1997), while 69% reported that moose populations were not too high, majorities nonetheless reported that there were too many moose deaths from accidents (60%) and too many moose-vehicle accidents (54%). Survey results also showed that many residents (54%) were willing to pay a $10 dollars per year per vehicle increase in registration fees for highway improvements to address this problem. While these fees were not actually being proposed (they were included in the question to suggest a realistic payment format for people to use in weighing the financial costs of these improvements), support for the fees indicates significant interest in spending public money on these kinds of remedies.

Responsibilities. The first phase of this action would be led by ADF&G, but would require participation from DOT and other city and state public works experts to be successful. The second phase of the action is ongoing and long term, and would require additional ADF&G staff resources to participate more intensively in road reconstruction planning and design. It is possible that these staff resources could be integrated with the staff requirements of Action 6 (habitat review program), and the position could be cooperatively-funded through the Municipality's planning department.

Schedule. ADF&G envisions a series of 4-5 short meetings over the course of a six month period to complete the first part of this action. Pilot programs and continued monitoring of accidents would then be considered over the next several years, with perhaps a single annual meeting to review whether certain options appear to be successful. Implementation of useful options would then be integrated into more extensive projects that follow from established DOT project schedules.

Costs and funding sources. Task force costs would be minor, but it does require commitment of staff time from the relevant agencies. Federal Highway Administration (FHWA) funding cannot be used to implement pilot projects or planning, although costs to implement improvements may be covered by FHWA reconstruction funds if those were integrated into planning and design efforts programmed through the AMATS Transportation Improvement Program.

Constraints. There is considerable environmental compliance work involved with any major reconstruction project, and this would also apply to possible moose accident prevention remedies such as increased lighting, fences, active warning systems, or even passive warning signs. The task force would focus on developing a list of possible issues, which could then be explored in subsequent pilot projects. Note: Implementing moose accident prevention projects on roads that are not being reconstructed is also possible in Anchorage, but would face both funding and environmental compliance hurdles because of the well-established procedures for road development through FHWA.

11. Create an Urban Wildlife Specialist Position

Description. This action would create and fund one or more urban wildlife specialists within ADF&G or the Municipality. This specialist would oversee a series of conflict prevention education efforts and be able to help ADF&G respond to conflict situations. Examples of tasks include promoting positive aspects of wildlife in the city (including wildlife viewing areas and education), training school administrators and school children in moose safety, educating residents about bear/garbage problems and enforcing the recommended bear attractant garbage ordinance (see Action 12), coordinating Canada goose and non-native/feral animal control programs (see Chapter 5), educating residents and visitors about habitat-friendly landscaping and available funding for habitat restoration, and coordinating with the Habitat Consequences Review Program (Action 6).

Rationale. Anchorage is like many other cities with growing populations of Canada geese, pigeons, and other nuisance birds. Anchorage is unique in that it also has several species of large, potentially dangerous mammals – moose, brown bear, black bear, and wolves – that frequent residential areas. However, local government has no staff dedicated to wildlife education or conflict prevention and response. Some similar-sized cities in the Lower 48 and Canada have urban wildlife specialists to focus on these issues; this action is needed to provide much-needed, similar levels of public service.

Responsibilities. The State or the Municipality could employ an urban wildlife specialist. If employed by the state, the position would be a Wildlife Biologist I or II under the supervision of the Anchorage Area Biologist. If employed by the Municipality, the position could be assigned to the Cultural and Recreational Services department; however, the person's duties would also include planning, enforcement, and coordination outside of city park boundaries. A municipal wildlife biologist would also be expected to serve as a liaison with state and federal wildlife biologists with jurisdiction in Anchorage. While financial and political barriers complicate the creation of this position in either state or local government, the planning team re-emphasizes the need for it.

Schedule. This action could be implemented within a few months of funding, and would be on-going. In future years, this program might need to be expanded to two or three positions in response to workload demands and community support.

Costs and Funding Sources. Annual salary, benefits, and support equipment for a Wildlife Biologist I costs about $50,000. Potential funding sources might include CARA, state or local appropriations.

Constraints. As noted above, even aside from funding for this type of position, considerable jurisdictional/institutional issues need to be resolved concerning the location of the program. There are advantages and disadvantages to housing it in either the Municipality or ADF&G; in either case, cooperative agreements and recognition of joint wildlife responsibilities are necessary for the person to be able to successfully complete the varied and cross-boundary tasks.

12. Moose & Bear Encounter Safety Program

Description. Anchorage's relatively high turnover rate of its human population present a challenge to the task of public wildlife safety education. However, if Anchorage is going to "live with wildlife," the pubic must learn more about how to respond to wildlife encounters. A program to educate Anchorage residents and visitors on how to avoid and respond to wildlife interactions is the focus of this action, which would coordinate existing education efforts, and develop new materials and programs. Elements of this action include:

- ***Distribution of existing information.*** Products such as ADF&G's *Bear Facts* pamphlet, State Park's *Playing the odds in bear country* poster, British Columbia's Ministry of Forestry's *Bear Aware* video, and other existing products need to be made more readily available to the public in an economically feasible manner.
- ***Work with the media.*** Agency representatives, biologists, park rangers, Anchorage police officers and others need to cooperate with the media (print, TV, radio) to increase awareness of wildlife safety issues. Talking points include: treatment of food and refuse, recognizing signs of animals and their emotional states, avoiding animals, proper response in encounter situations, and respect for wildlife.
- ***Special programs.*** Special programs on wildlife safety given by biologists, researchers, or park rangers are generally well-attended and reach the critical audience of outdoor recreationists. These programs should be held each spring when the public is thinking about upcoming summer outings, but is kept in town by breakup. Weeknight programs may have the highest attendance. Program locations could include the Wilda Marston Theater, REI, Eagle River Nature Center, Campbell Creek Science Center, Rabbit Creek Rifle Range, the Anchorage Convention Center, or the Alaska Public Lands Information Center (APLIC). These programs could also be coordinated with the Anchorage Wildlife Festival (see Action 17).
- ***Teach wildlife safety in the schools.*** Continue and expand efforts to teach school children about "living with wildlife." Develop special tools for teachers; these could be coordinated with expanded wildlife education efforts for schools, some of which already exist through state and cooperative (APLIC) programs (see Action 19).
- ***Community warning programs.*** The community of Girdwood has independently convened interested publics in an informal bear warning program to help residents recognize when bears have been active in certain neighborhoods. They have a "bear log book" in the community post office, and developed signs to be posted in areas where bears have been recently seen. While this model may be less applicable in areas with larger populations, increasing awareness of bear conflict potential is likely to be useful in any case.

KAREN LAING

Educating Anchorage residents and visitors about how to interact with potentially dangerous wildlife is a critical plank in any conflict prevention program

Responsibilities. Wildlife safety education efforts are not currently coordinated among Anchorage wildlife agencies; under this action the Urban Wildlife Specialist (see Action 11) would organize and integrate these and other agency efforts.

Costs and funding options. Aside from the salary costs associated with the urban wildlife specialist (covered in Action 11), there are few additional specific costs associated with this action. There are likely to be some costs associated with developing and printing additional brochures and posters, or renting locations for workshops, but these could be cooperatively distributed among the several agencies that would use these materials. Corporate or non-profit contributions are possible sources of funding for some of these materials.

13. Bear Attractant Ordinance and Education Program

Description. Anchorage currently has an ordinance to deter people from attracting bears into residential areas and city parks, but it is rarely enforced. This action recommends amending the existing ordinance to include all sources of bear attractants (such as summer bird feeders and outdoor pet foods), and increasing both enforcement and education efforts to help establish city-wide behavior norms for securing bear attractants. The ordinance would likely recognize geographic areas where bear attractant issues are more and less severe, and thus require correspondingly more and less stringent regulations.

Rationale. The Municipality has an ordinance that requires residents to keep garbage away from wild animals and state law prohibits bear feeding. However, the ordinance is seldom, if ever, enforced and the state has not prosecuted violators unless they have been personally warned not to feed bears by public safety officers. Many Anchorage residents are careless about storing garbage and pet food. Bears are entering residential areas in increasing numbers to eat garbage, pet food, and birdseed, and are becoming bolder. Black bears only recently learned to eat birdseed in the Anchorage area. Since 1995 this has become one of the most common bear attractants.

At least 250 black bears live in the Anchorage area. Perhaps one-third of these bears spend at least part of the summer in or adjacent to residential areas. Subdivisions are also expanding into bear habitat. Many Anchorage residents tolerate, or even enjoy, having a few black bears in the neighborhood. However, about one-third believe there are too many bear encounters on trails and in neighborhoods, and a majority believe too many bears are getting into garbage (Whittaker and Manfredo, 1997). In discussions with wildlife staff, they express concern about pets and livestock as well as the risk to human safety, especially small children playing in yards. Black bears also kill several dogs and many domestic rabbits, chickens, and ducks each year. The risk to human safety is low, but not unfounded. Black bears have stalked people, even in Anchorage, and people in other places have been occasionally attacked and killed by black bears.

Bears may be legally shot in defense of life or property, including livestock and pets. An increasing number of black bears are shot in Anchorage every year, mostly by homeowners. From 1991 to 1994, 13 black bears were shot, about 3 per year. From 1995 to 1998, at least 38 black bears were shot, about 10 per year. Some of these shootings were not justified, and missed shots have endangered neighbors.

The most important factor in reducing dangerous black bear-human encounters is to stop attracting the bears into town. Other communities with similar problems have enacted ordinances to encourage residents to store garbage properly. A focused public awareness program may also decrease problems, at least to a point, but education coupled with enforced regulations offers the best hope of changing this human behavior.

Responsibilities. Any bear-attractant ordinance must be introduced and passed by the Municipality Assembly and signed by the Mayor; it would have to be enforced by city public safety officials. A bear awareness education program could be led by ADF&G, although current staff levels within wildlife education sections are insufficient. In order to carry out this action, funding of the Urban Wildlife Specialist described in Action 11 would also need to occur.

Schedule. An amendment to the garbage ordinance was drafted in 1996, but was never enacted due to a combination of public apathy and some active opposition. A new amendment would have to follow the Municipality's ordinance process, which takes three months to a year, depending upon its complexity and public support. As with any action that requires approval from a political body, predicting a precise schedule can be difficult.

Costs and Funding Sources. Under this action, homeowners and businesses would pay costs, if necessary, for rental or purchase of adequate garbage storage containers on their property. (Anchorage Refuse rents proper garbage enclosures for $10/month.) Municipal parks contain hundreds of garbage receptacles without lids that might also need to be replaced, in areas likely to be visited by bears. These would have to be purchased by the city ($50,000 - $200,000 depending on number and type), suggesting that there are also significant government costs associated with this action. Innovative funding sources might be used for these purchases, however, with receptacles sponsored by organizations or businesses (similar to groups that have volunteered to clean-up road segments). Additional costs for education efforts under this alternative might run between $5,000 and $10,000 per year for developing printed materials, bumper stickers, and so on. Increasing city wide awareness and compliance will be challenging and not inexpensive.

Constraints. New laws and increased enforcement will receive resistance among some people in the community, particularly homeowners and businesses in bear areas where the ordinance/education efforts would be directed. While general public support for this action appears likely, specific support for an ordinance might be less. Education efforts, without supporting regulations and enforcement, are unlikely to be effective.

14. Moose/Bear Conflict Response Training

Description. A variety of public safety and other officials have responsibilities to interact with wildlife in conflict situations. The Anchorage Police Department (APD) and State Troopers may often be the first to arrive at a situation, while airport police, military base officials, city parks and recreation officials, and school officials may also be required to respond quickly and appropriately to wildlife problems. This action would provide training so that when these individuals respond, they know what to do, and when to call for help from ADF&G or the proposed Urban Wildlife Specialist.

This action envisions two half-day training sessions annually that allow members of a variety of organizations to take advantage of the program. Certification would be provided. The ultimate goal is to have all on-the-ground public safety officers in the city receive periodic conflict response training.

Rationale: Decision-making by untrained public safety officers can lead to less-than-humane wildlife conflict responses, or may increase public safety risks. There is the potential for lack of consistency in how situations are handled, which may add to the difficulty of communicating to the public how to respond to wildlife conflict situations.

Responsibilities. ADF&G, or the proposed new Urban Wildlife Specialist, would organize and conduct the training, while target agencies would be cooperators in requesting their staff to attend. The list of agencies which might benefit from these kinds of training workshops include: APD, state troopers, airport police, Elmendorf and Fort Richardson military police, Chugach Park rangers, Municipal Parks and Recreation race officials, and representatives from Anchorage schools.

Costs and funding sources. Training costs would be relatively small, but would include staff time to prepare and conduct efforts. However, the time that participating agencies would need to dedicate to have their staff participate may be considerable, depending upon the number that attend. Training facilities would also need to be determined; the hope is that those may be available through existing training infrastructure at APD or the troopers.

Constraints. Public safety officers already undergo considerable training, and must make choices in how to budget their training hours. Although this training effort is likely to be short, there will be challenges in developing police and trooper cooperation and support for these efforts.

15. Wildlife Feeding Education and Regulations

Description. This action envisions the development of multimedia materials on the problems caused by human feeding of wildlife. It also recommends the development of city or state regulations that prohibit certain kinds of wildlife feeding, or increased enforcement of existing regulations.

The contemplated education campaign could be coordinated with the goose outreach plan that has thoroughly considered target audiences, messages, themes, and sources. Persuasion campaigns of this type are most effective when they utilize multiple channels, come from multiple sources, and target multiple groups.

Enforcement efforts could also be improved, but regulations associated with education efforts are more likely to establish new behavior norms. It is obvious that residents need to "police" each other for this to work. The development of volunteer efforts to warn and tell people about the problems with feeding wildlife are an additional possibility.

This education effort may also include information about habitat-friendly landscaping in contrast to landscaping that may encourage wildlife nuisance problems.

Rationale. While some wildlife feeding ordinances exist, few are seriously enforced, and there is no significant education campaign to discourage feeding aside from some passive signs at popular feeding areas. This action recognizes that considerably more could be done to discourage a behavior that generally works to decrease wildlife diversity, may harm individual animals (who eat less nutritionally-rich foods, may lose their ability to secure natural food, and may alter their natural migration patterns), and attracts wildlife concentrations that can become a nuisance or affect natural wildlife behavior.

Responsibilities. This action would be co-led by ADF&G, USFWS, and the Municipality (particularly if the wildlife specialist is housed there).

Costs and Funding Sources. Costs should be relatively small and could be associated with the proposed Urban Wildlife Specialist position. Materials and signage are estimated to run about $10,000 per year.

JULIE WHITTAKER

Feeding wildlife needs to be discouraged in Anchorage through a coordinated education/regulation program.

Feeding may decrease general wildlife diversity, harm individual animals (who eat less nutritional foods and lose normal migration patterns), and attract animals into concentrations that increase the potential for conflicts.

16. Pet Control Education and Enforcement

Description. This action recommends development of a public education campaign and multimedia materials focused on the problems that loose dogs and cats create for wildlife. This action would be coordinated with the Municipal Animal Control to distribute information about existing regulations, as well as consider further opportunities for expanding education efforts. This campaign could also involve coordination with the Anchorage School District to develop optional curricula materials which address skill development under the theme of pet responsibility and wildlife stewardship.

Some of the conflicts that will be addressed in these materials and programs include: free-roaming cats killing birds, effects on overpopulation of cats and dogs caused by unaltered free-roaming pets, dogs harassing moose calves and other wildlife, attraction of animals like magpies and bears to open pet food, effects of dogs and cats on ground-nesting birds, and the effects of trampling and pet waste to sensitive wetlands and streams. Methods to protect birds, wildlife, and their habitats from the adverse effects of uncontrolled pets will also be covered, as well as adverse effects on pets and humans (e.g. aggressive moose encounters) caused by failure to control pets, and alternative methods of exercise and confinement for pets.

Possible materials include a slide show or video for use in schools, community council and other civic meetings; regular television, radio, sign (e.g., People Mover buses), and print media announcements; news media stories; brochures; and school curricula materials. Ball caps, t-shirts, and other attractive ways to involve the public would also be considered, as would fair booths and other similar participation in public events. This campaign may be coordinated with other Living with Wildlife Plan actions, such as the Anchorage Wildlife Festival (Action 17).

Rationale. This action addresses several of the goals of the plan, including conserving optimal populations of native wildlife and their habitats, minimizing human-wildlife conflicts, and fostering a sense of stewardship for wildlife and their habitats among the public.

As human population size grows, so do the pet population and the number of pet-wildlife conflicts. These conflicts can pose dangers to pets, humans, wildlife, and wildlife habitat. Each year in the United States hundreds of millions of birds are killed by free-roaming cats. Millions of small mammals are similarly killed, causing the loss of important food sources for such wildlife as weasels, owls, and lynx. Anchorage's sensitive wetlands and fish-bearing streams also face increasing adverse effects from pet waste and trampling.

Anchorage has more than 50,000 dogs and 35,000 cats. Most are not a problem, but unsupervised dogs and cats can affect wildlife. Dogs chase moose, injuring adults and sometimes killing calves. Many cat owners also let their pets run free, and yet they are unaware of the true extent of killing. Others may mistakenly assume that only "common" bird species are affected, or be unaware that if one mate is killed, it can mean the entire nest fails. A study of cat predation in a rural area of southern Sweden found about 100 cats killed about 40,000 voles and mice, 3,500 rabbits and hares, and hundreds of birds in an average year.

Responsibilities. This action would allow the widest possible opportunity for education on these issues by taking the form of a coordinated campaign. Lead agencies would be ADF&G and USFWS, in cooperation with the Municipality (perhaps including public service announcements by city officials such as the Mayor), Animal Control, and possibly the Anchorage School District. Officials or staff from

APLIC, ANHA, Campbell Creek Science Center, and other facilities with wildlife education responsibilities may also want to be involved.

Schedule. This action would take at least six months to implement once funding is secured and depending on other duties of staff. Implementation involves choosing staff, research, coordination among agencies and offices, creation of materials, and distribution to or sharing with the public.

Costs and Funding sources. Assuming that some staff time could be donated by agencies, initial improvement in educational efforts might cost about $20,000 per year. Depending on the scope of the campaign and the level of integration and coordination with other agencies, additional salary, materials, and media costs could range as high as $40,000 per year. Potential funding sources may include CARA.

Constraints. Funding sources may not be able to support staff time. Agencies may not be able to dedicate staff time.

Other Supported Conflict Prevention and Response Actions

Avian and Small Mammal Predator Enhancement. This idea reflects planning team interest in maintaining population levels of small mammal and avian predators (e.g., wolverines, martens, hawks, owls, peregrines) in Anchorage, which help reduce populations of some nuisance wildlife such as feral rabbits and pigeons. Enhancement options generally focus on habitat protection which is expected to be developed from the habitat assessment effort (Action 1).

Injured Bird and Bird Conflict Program. This action calls for increased funding for injured bird treatment and education programs to be utilized by existing non-profit organizations and USFWS programs. These programs are chronically under-funded, but have the potential to offer important dividends for individual birds, bird populations, and residents and visitors who are interested in avian wildlife.

Trailhead Bear Warning Program. This action would develop a simple "bear hazard" information system at area trailheads. The planning team envisions a system similar to fire hazard warnings used in National Forests across the country ("the fire danger today is…low, medium, high"). Although trail managers have concerns about suggesting that bear dangers are ever "low," there is little question that trail users would be interested in knowing whether there have been recent sightings in the area. This action cannot be implemented unless there is an Urban Wildlife Specialist for Anchorage who can coordinate such a system, as well as volunteers to make it work. This action is not a priority action because of these and liability concerns. Additional discussions among Chugach State Park officials, ADF&G, the proposed Urban Wildlife Specialist, and trail users groups will be needed to implement it in the future.

Neighborhood Moose Warning Assistance. Moose occasionally become stubborn and obstinately block the use of school bus stops or walking routes in neighborhoods. This program could help neighborhoods organize systems for warning families of the presence of these hazardous animals and arrange for developing alternative places for kids to be picked up. These programs will always need to be neighborhood-based and staffed by residents as volunteers, but the proposed Urban Wildlife Specialist could develop guidelines for organizing such groups.

Moose Accident Prevention: Education Options. In addition to road improvements, it may also be possible to increase awareness of moose-vehicle accident risks on certain roads by disseminating information about where accidents tend to occur and how often. For example, newspapers on the Kenai Peninsula habitually provide moose accident statistics for the area, although these are not broken out by road. Although the planning team believes the effectiveness of such efforts will be limited (most moose accidents occur on commuter roads by people who drive them every day and can easily become complacent about the hazard), any increased awareness might help.

Wildlife Recreation and Education Actions

These seven actions address the need to increase opportunities for residents and visitors to learn about wildlife and participate in wildlife-oriented recreation. These actions are designed to improve facilities, promote wildlife opportunities, and increase staff in interpretive and education programs. If these actions can be accomplished (and some are admittedly longer-term projects), Anchorage will have one of the best wildlife recreation education and learning opportunities of any large urban area in the country.

These actions recognize that residents and visitors are interested in a diversity of wildlife-related recreation and learning opportunities. Accordingly, these actions address the needs of the young and old, the active and less active, and those with an intense or more transitory interest in wildlife.

These actions begin with the development of an Anchorage Wildlife Festival to promote the variety of benefits that wildlife bring to the community, and a paired Anchorage Watchable Wildlife video and guide to suggest wildlife-recreation and learning opportunities in the city.

The next two actions address the need to more fully staff existing wildlife education programs in Anchorage's schools and visitor centers, while another two actions identify demand for two additional visitor centers, at Potter Marsh and Girdwood, which would complement the existing nature/interpretive facilities downtown (APLIC), in Eagle River, and in BLM's Campbell Tract. A final high priority packages a series of actions along the corridor from Potter Marsh to Girdwood, which has unparalleled diversity of wildlife viewing and learning opportunities.

Finally, this section identifies a series of supported (but lower priority) wildlife recreation facility actions in Chugach State Park, along city greenways, and on BLM land. Many of these proposals are in existing plans or have been previously proposed. This plan simply endorses those projects for their wildlife components.

17. Anchorage Wildlife Festival

Description. This action would provide for a variety of wildlife education opportunities, encourage wildlife volunteerism, and generally promote the benefits of Anchorage's wildlife. It might also include a wildlife count effort and could be integrated with a habitat awards program as described earlier. Moose, bear, lynx, loons, geese and songbirds are among the many animals that could be highlighted. This event would be the first of its kind in Anchorage. It will provide an opportunity for residents to learn more about preserving and enjoying the diverse and unique wildlife of Alaska's largest city.

This action could include displays and educational materials from wildlife-related agencies, conservation organizations, businesses, tourism interests and others. An "Anchorage Wildlife Week" could be proclaimed, during which a one-day festival, daily workshops and wildlife awareness could all be promoted. This action could also serve as the foundation for promoting the Municipality as a premiere wildlife viewing destination for tourists coming to Alaska.

This action might also be coordinated with existing wildlife-related public events, including the International Migratory Bird Day (which is typically celebrated with festivities in Kincaid Park in mid-May), the Alaska Loon Festival (also held in May), the Alaska Bear Festival, or the U S Fish and Wildlife Service Open House (held every three years in the fall, drawing over 1,000 people).

Rationale. This action would provide the public forum for advocating several goals and actions of the Anchorage Wildlife Plan. For example, guidelines and agency experts would be available to answer specific questions from participants on human-wildlife conflicts. A GIS map of wildlife habitat in and around the city would be on display for residents and developers alike. A wildlife count would aid in population assessment and monitoring. An Anchorage Wildlife Viewing Guide could be effectively distributed.

Responsibilities. The lead organization could be the Alaska Wildlife Alliance, a non-profit dedicated to protecting Alaska's wildlife. Wildlife conservation groups would be invited to co-sponsor the event, along with ADF&G, USFWS, BLM, the Municipality, and the military installations. The multi-agency Watchable Wildlife Committee, the Alaska Visitors Association, and other municipal/community leaders would also be encouraged to participate. Materials, events, and networking would be of interest and use to a wide range of adults, children, residents, tourists, businesses, and schools.

Schedule. An Anchorage Wildlife Festival could be scheduled as early as the spring, summer, or fall of 2000. A summer date may prove more beneficial in that tourists could attend, and allow for a large-scale outdoor event. The disadvantage to a summer date is that a wildlife festival would compete in a crowded summer events schedule. As an alternative, a spring or fall date could be coordinated with the existing wildlife events, but may be more focused on residential wildlife issues.

Costs and Funding Sources. The costs of a wildlife festival would depend on the size of the event. A recent festival for Alaska's bears cost $4,000 and was held in the Loussac Library with approximately 500 participants. Organization and input was mostly voluntary. The Anchorage Summer Solstice Festival sponsored by AWAIC draws thousands of people and costs $30,000 to produce. An urban wildlife festival could start small and be allowed to grow to a full-scale municipal, tourist, and possibly school event. Potential funding sources for this type of event are almost limitless. Immediate possibilities are wildlife conservation foundations. Corporate sponsors, local businesses, and national urban wildlife interests might also be explored as funding sources.

Constraints. The constraints for this action would depend upon the scale of the event. Organization, funding, and marketing are the greatest challenges. Of course, an outdoor event's success can also be weather-dependent.

ANN RAPPOPORT, USFWS

An Anchorage Wildlife Festival would be a fun event where people could share information about local wildlife and wildlife issues.

ANN RAPPOPORT, USFWS

18. Anchorage Watchable Wildlife Guide and Video

Description. Produce a twenty-minute narrated video tape and accompanying booklet/guide that would:

- Introduce the viewer to a number of popular wildlife viewing sites and scenic places within the Greater Anchorage Area.
- Provide guidance on how to behave around different wildlife from both an ethical and safety standpoint.
- Develop the theme that Anchorage is a special city with abundant wildlands and wildlife at its doorstep. Anchorage without its "wild" would lose the charisma and charm that makes it an exciting place to live and visit.

The video should emphasize that the conservation of wildlife and natural resources require attention and commitment from both residents and visitors.

Rationale. A tape and booklet would have many uses. They could be used in schools to create interest in wildlife, instill appropriate wildlife ethics and values, and provide safety information that could prevent potential conflicts. They could be used by hotels, local businesses and tourist enterprises as a service to the public. Scouts and other youth groups and organizations might also find them beneficial. They could be used at conventions and business meetings. The video could be made available to public TV and the outdoor channel so it could potentially reach a wider audience.

Responsibilities. The lead on this action is likely to be ADF&G, which should at least have a major technical role in providing factual information. Chugach State Park would also be an informational contributor, as the video is likely to focus on many opportunities in the park. However, there are many options regarding the writing of the script and actual production. For example, Colorado State University has produced several excellent videos and other public information materials for the military in Alaska regarding training and environmental/natural resource subjects. One of these productions received a "Telly Award" in 1998, a prestigious international award for documentary productions. They have excellent writers, production expertise and familiarity with Alaska and the Anchorage area. There is also the possibility of contracting with one of the several local video production companies.

Costs and Funding Sources. Production estimates for a high quality 20-minute video approach $45,000. The cost of duplicating tapes after the initial production costs should be in the neighborhood of $3 to $4 each. Cost for production of a brochure can vary widely ($3,000 to $10,000) depending on style, size, paper type, use of artwork or photos, maps etc. Costs of running copies after the initial design can vary between $1 and $3.50 each depending on level of detail and sophistication.

Potential sources of funding include federal CARA funds, the Anchorage Chamber of Commerce, Dept. of Tourism, federal, state, and municipal agencies, and local businesses and organizations.

19. Expand Wildlife Education in Anchorage Schools

Description. This action would increase funding of wildlife education in Anchorage public schools. There are several existing programs (e.g., Project Wild, Alaska Wildlife Curriculum, Project Learning Tree, Anchorage Committee for Resource Education, Alaska Natural Resource and Outdoor Education Association) that provide teacher training and materials on wildlife education issues. In addition, programs at the Alaska Public Lands Information Center (APLIC) also provide age-appropriate information and facilities for up to 6,000 school children visits per year. However, these programs are generally short-staffed and are unable to meet recognized demand from schools and other groups who would like their help in implementing wildlife education efforts. This action would expand these programs in the Anchorage area (while recognizing that this is a problem state-wide as well).

Many states fund these programs at higher levels. In Colorado, for example, students in the sixth grade attend a six-week environmental education field camp. In Alaska, training is typically provided for less than 200 teachers per year, and staff have a very limited ability to participate in actual wildlife education opportunities with teachers. In general, the problem is a lack of staff, not the lack of materials.

This action would fund two additional positions to coordinate and staff existing programs. One position each would be located in ADF&G and USFWS. They would focus on teacher training and conducting some wildlife education classes themselves. They could also help coordinate curricula changes that focus on Anchorage wildlife.

Rationale. This action addresses the need for additional wildlife education in Anchorage, a major planning goal. Schools and other youth organizations have demonstrated high demand for more training and activities; this action would allow area agencies to fulfill that demand. This would not detract from other subjects because wildlife education can be a *theme* used to teach basic skill development in English, math, science, or other subjects.

Responsibilities. Lead agencies are ADF&G and USFWS, both of which operate wildlife education programs. Anchorage school district is a major cooperating agency, as it would be the chief beneficiary of specific work. Officials or staff from APLIC, ANHA, Campbell Creek Science Center, and other facilities with wildlife education responsibilities may also want to become involved. Cooperation with Anchorage School District is also important, although actual demand tends to be driven by teachers on an individual basis.

Schedule. This action could be implemented very quickly if funding were secured. Both ADF&G and USFWS have the ability and expertise to hire and supervise potential positions.

Costs and Funding Sources. Annual costs for a wildlife education position are about $50,000 per year, which includes salary, benefits, and support equipment. Total cost for two positions is thus $100,000 per year. Potential funding sources include CARA, or other appropriations through Congress or the state legislature. Anchorage wildlife education programs would be beneficial even if staff were assigned statewide responsibilities because roughly half the state lives in the Anchorage area.

Constraints. Funding sources may not be able to support staff positions. Agencies may be reluctant to hire positions on “soft” money developed through grants or one-time legislative appropriations.

20. Expand Wildlife Education/Interpretation Programs at Area Visitor Centers

Description. This action would increase funding for interpretive positions at the variety of Anchorage nature centers (including the Alaska Public Lands Information Center, Eagle River Visitor Center, Campbell Creek Science Center, and the proposed nature centers at Potter Marsh and Girdwood). The intent is to cooperatively fund these positions and rotate interpreters through the various visitor centers in the Anchorage area. This will increase cooperation and integration of interpretive efforts among the various centers, as well as help meet latent demand for interpretive activities.

Rationale. This action would also address the need for additional wildlife education in Anchorage, a major planning goal. In this action, however, the focus is on area interpretive visitor centers, particularly in the summer. There are several visitor centers that provide wildlife information to Anchorage residents and visitors, but some have chronic funding shortfalls. This action would provide funding for additional positions so that operating hours can be extended, and more activities and programs produced.

Responsibilities. The three existing visitor centers have funding structures in place through Alaska State Parks, BLM, and the Congressionally-mandated but cooperatively funded APLIC.

Schedule. This action could be implemented immediately upon funding. As discussed above, demand for interpretive programs and longer visitor center hours is during the summer months, so positions could be seasonal.

Costs and Funding Sources. Interpreters cost about $3,000 per month and could be hired on a seasonal basis. As a starting point, we envision the need for approximately two positions to be rotated among visitors centers over a seven-month summer season (April – October). Possible funding sources could include CARA, or other state and federal legislative appropriations.

Constraints. Developing multi-agency cooperative positions (so interpreters can rotate their efforts at several interpretive facilities in Anchorage), and establishing funding sources.

21. The Alaska Bird Center at Potter Marsh, and Potter Marsh Boardwalk Expansion

Description: The Bird Treatment and Learning Center (Bird TLC) is developing the Alaska Bird Center at Potter Marsh (Center), a joint-use educational facility and bird rehabilitation clinic. Bird TLC is a non-profit group dedicated to treating injured wild birds and providing education about wild bird conservation, but it does not have a permanent, consolidated facility for these services. Bird TLC has purchased a 4.3 acre building site overlooking and adjacent to Potter Marsh, a state wildlife refuge.

The Center's mission is the conservation of Alaska's birds and their habitats through public education, and rehabilitation of injured and orphaned wild birds. Educational exhibits, programs and activities will be developed around the theme that Potter Marsh is part of a network of valuable wetlands and wildlife habitats and that its conservation depends on human actions. A market study in 1998 predicted the Center could attract 218,000 residents and visitors per year at a $12 admission price.

Potter Marsh is one of the most popular fish and wildlife viewing areas in Anchorage, featuring nesting bald eagles, spawning salmon and a variety of nesting and migratory water birds. Current facilities include a 1,550-foot boardwalk with interpretive signs accessible from a small parking lot off New Seward Highway. The ADF&G estimated nearly 45,000 visitors used the Potter Marsh boardwalk during the summer of 1997. ADF&G has obtained federal highway funds to design parking lot improvements and an extension of the boardwalk to link to the Center site.

THE ALASKA BIRD CENTER AT POTTER MARSH

Rationale. This project helps meet several wildlife education and recreation goals outlined in this plan, as well as treat injured birds. It most directly serves the goal of providing for wildlife education and recreation opportunities in an area with abundant summer wildlife.

Responsibilities: Bird TLC has developed a partnership with the ADF&G (which manages Potter Marsh), Alaska State Parks (which manages nearby Chugach State Park), the U.S. Fish and Wildlife Service, and the non-profit Friends of Potter Marsh (FOPM) to develop the Center and cooperate on educational services. ADF&G is responsible for coordinating the boardwalk link to the marsh.

Estimated Schedule. Design and environmental review of the boardwalk and Center is on-going and will be complete when construction begins in 2001. The Center is expected to open in 2003-04.

Costs and Funding Sources. Phase II/Planning would cost $475,000; Phase III/Construction and Start-up is estimated at $13 million. Both public and private funding is being solicited.

Constraints. The Center and boardwalk development are subject to local, state and federal government permitting, and obtaining adequate funding.

22. Wildlife Recreation Planning for Potter Marsh to Girdwood Corridor

Description. This action envisions a coordinated planning and development effort to improve and integrate a series of wildlife-oriented recreation opportunities along a corridor from Potter Marsh to Girdwood. The state Department of Transportation (DOT) is involved with significant highway re-constructions along this corridor, and a multiple-use trail is expected be built in conjunction with them. This action recommends beginning a planning effort to coordinate those projects and ensure they include several related wildlife recreation and learning opportunities. In addition, this type of planning could ensure that the provision of these opportunities minimizes adverse impacts on the wildlife and natural resources that draw people to the area.

Specific projects likely to be considered and recommended during this planning effort include:
- Viewing improvements and interpretive stations at Beluga Point.
- Viewing improvements, parking, and interpretive stations at Windy Corner.
- A beaver pond overlook and interpretive trail at Bird Point.
- A tidal marsh overlook and interpretive station at Girdwood Marsh.
- The Alaska Bird Center at Potter Marsh (see Action 21).

The ultimate vision is of a series of connected recreation and learning opportunities, along with nodal infrastructure (on private lands) so that visitors may be able to step out of Anchorage hotels and connect with trails that will take them 40 miles to Girdwood. The combination of scenery and wildlife viewing (along with some history) is compelling. With planning, we have the chance to conserve and enhance these opportunities.

Rationale. The area between Potter Marsh and Girdwood captures some of Alaska's most spectacular views. It provides a landscape that intersects land and sea, mudflats and tundra, and caters to colorful horizons. With the exception of Dall sheep at Windy Corner, beluga whales, and free-ranging bald eagles, wildlife currently plays only a supporting role.

Visitors and Alaskan residents more often travel the corridor to get somewhere – a string of places and activities that symbolize Alaska during its frenetic warmer months. In fall and winter months, even fewer travelers focus on the road, with its brooding, majestic, powerful, dangerous, and reflective landscapes. Both automobile and train travelers are removed from this environment and its wildlife inhabitants, steered by internal clocks and insulated by glass – they don't step far afield.

Wildlife recreation planning could help shape an alternative. It is by definition more invasive and yet can also allow greater subtlety. Unless carefully planned, the incremental loading of bicycles and recreational hikers will wear out its welcome. The issues are challenging: when to encourage interface and when to build imaginary fences to prevent unacceptable impacts; how to support access, but discourage exploitation. In order to meet this challenge, a public planning effort based on "limits of acceptable change" and other visitor impact planning frameworks is crucial.

Responsibilities. Alaska State Parks is the lead agency for these projects, but will need assistance from other governmental agencies and local conservation and trail advocates. The Department of Transportation is also a critical player, as it oversees the major road reconstruction that opens the door for many of these other possibilities.

Schedule. Some of these site projects and the longer multiple use trail are already being planned and developed. This action envisions additional planning to coordinate these projects and develop an overall vision for wildlife-related recreation in the corridor. This action could begin upon completion of this plan, if funding can be found. A one-year planning effort is envisioned. Some of the projects being proposed will likely be developed in the next two or three years; others are longer term efforts and would involve substantial government and private sector interest.

Costs and funding sources. An overall planning effort of this nature would require at least one full-time planner to organize over a one-year period at about $50,000. Additional agency participation might also cost significant amounts. CARA and Land and Water funding are possibilities for specific projects, as is ISTEA funding associated with road reconstruction. Planning money is less easy to secure.

Constraints. Finding funding for additional planning is a chronic problem, particularly when some of the projects under consideration are already in progress. However, it is increasingly important to coordinate these projects to fit with a larger vision of regional opportunities.

NANCY TANKERSLEY FAIR

The corridor from Potter Marsh to Girdwood features a diversity of wildlife viewing and learning opportunities. This action recommends a coordinated planning effort to develop and integrate both public and private facilities to enhance these opportunities.

23. Girdwood Nature Center

Description. The development of a nature center on public or private land in Girdwood would showcase a diverse northern rain forest ecosystem and provide a node for exploring the wealth of nearby local trails as well as links to trail systems in Chugach State Park and Chugach National Forest. The addition of a fifth visitor center in the area (after the proposed Alaska Bird Center at Potter Marsh joins the existing downtown APLIC, Eagle River, and Campbell Creek nature centers) would also ensure that there are wildlife and natural resource education opportunities in all corners of the Municipality.

A future Girdwood Nature and Historical Center must differentiate itself from the Forest Service Begich-Boggs Visitor Center at Portage. In addition to Girdwood natural areas, a visitor center can reach out to Turnagain Arm and explore its rich diversity. Girdwood boasts the farthest extension of the Northwest temperate rainforest, local creeks support small populations of all five salmon species, beluga whales ply the waters of the Arm, and landscape-scale changes (including sunken trees) wrought by the 1964 earthquake offer additional thematic opportunities.

Rationale . The combination of geography, climate, and location makes Girdwood the ideal place for a nature and historical center. The juxtaposition of the northernmost temperate rainforest, Glacier, Virgin, and California creeks, and an extensive wetland ecosystem support a range of plant and animal communities. Girdwood is a hotspot for birders and botanists. Visitors and "Birdathon" fund-raisers have long raked Girdwood trails and bird-feeders with their binoculars, while plant ecologists and fungi experts comb the forest for species closely associated with both Turnagain and Prince William Sound ecosystems.

The Iditarod Trail draws history buffs and romantics, and Crow Creek Mine (an historic gold mine) draws recreational gold panners. Large, now silent, steam boilers associated with mining at higher elevations along the Crow Creek Trail await those seeking a physical challenge. Crow Creek Trail also returns the prepared hiker and camper to Eagle River and Anchorage through Chugach Mountains and valleys. The trail offers regular black and brown bear viewing, river crossings, and the Eagle River Visitor Center at trail's end.

Tourism and recreational use continue to expand in southcentral Alaska. Girdwood has a world-class hotel and ski resort and is a natural stopping point for travelers going between Anchorage, Portage Valley, and the Kenai Peninsula. Within a short time, the Alaska Railroad is slated to reopen a station in the lower region of the valley.

Finally, new and planned bicycle and walking trails suggest a future for those visitors choosing to walk the planned Turnagain Trail from Anchorage or points on the Kenai Peninsula. A Girdwood Nature Center would enhance and partner well with this trail system.

Responsibilities. A lead agency or organization needs to emerge; cooperators could include Chugach National Forest, Chugach State Park, the Municipality, or the community of Girdwood. Conservation organization support appears crucial, as might corporate or visitor industry support.

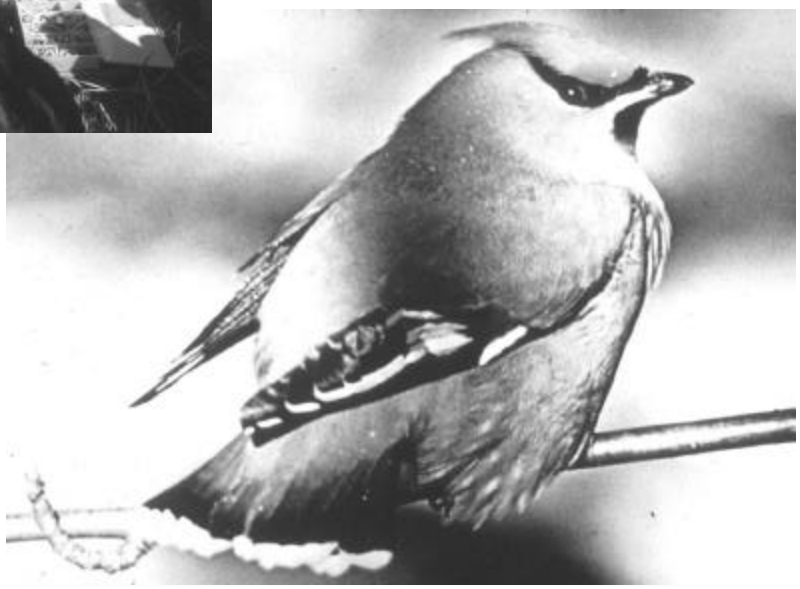
Schedule. This is a longer term project. It is a relatively new idea that needs to gain momentum before funding, design, and construction can begin. This plan is formal endorsement of this project, which should receive additional attention after the Alaska Bird Center at Potter Marsh is completed.

Costs and funding sources. It is difficult to estimate costs when a clear vision of the size and scope of the center have yet to be defined. This is a large project that could cost several million dollars.

Constraints. Location and property options are one constraint, as will be funding and environmental compliance. As noted above, this is a long-term project that requires additional planning to be realized.

NANCY TANKERSLEY FAIR

A Girdwood Nature Center would enhance many recreational and educational opportunities in a key location rich with wildlife



ALASKA DEPARTMENT OF FISH AND GAME

Other Supported Wildlife Recreation and Learning Actions

Coastal Trail Connection: Kincaid to Potter Marsh. The planning team supports the idea of extending the Coastal Trail to Potter Marsh, a high priority among Anchorage trail advocates. The team also supports the idea of having that trail connect, in places, to overlooks on the bluffs above the Anchorage Coastal Wildlife Refuge. However, the team did not find consensus on whether the trail should travel through the Refuge, where a multiple-use trail might have negative habitat impacts and encourage wildlife-human conflicts. There is clearly a need to develop more information and consider more public comment about these trade-offs before the trail is designed and constructed.

Interpretation Stations on Campbell Creek Science Center Trails. The BLM has identified and plans to build interpretation kiosks and stations along some trails near the Campbell Creek Science Center, which is supported in this plan.

Interpretation Stations on City Greenway Trails. The planning team believes there are excellent interpretive opportunities along the city's multi-use trails (e.g., Chester Creek, Coastal Trail, Campbell Creek), and that a few coordinated kiosks or other interpretive stations might be able to reach many Anchorage residents and visitors. These projects were viewed as a lower priority because, although these *areas* are important wildlife corridors, the primary focus of most of these *trails* are not wildlife-oriented. The Municipality would be lead on any projects.

Eagle River Viewing Tower. The salmon viewing area along Eagle River (below the Visitor Center) has occasionally been an area with high bear and moose populations. An adjacent viewing tower would offer residents and visitors the opportunity to see these animals more often (because vegetation in the area is thick), as well as provide a "safe haven" if a bear moves directly into the area. Alaska State Parks has proposed and expects to complete the planning for this action.

Eagle River Campground Interpretive Trail. This action would develop a short interpretive trail along the river from the campground. It would feature several overlooks and interpretive stations that would focus on riparian wildlife and ecology. Alaska State Parks is lead.

Glen Alps Interpretive Stations; Middle Fork Campbell Creek Loop Interpretive Trail. Both of these actions would develop interpretive stations along popular trails on the Hillside in Chugach State Park. In both cases, Alaska State Parks is the lead and has planning in place to develop these if funding could be found. CARA may be able to provide funding.

Other Actions

The final two priority actions in the plan are associated with future planning and the need to continue to integrate wildlife management activities among the various local, state, and federal agencies and interest groups. The first identifies the importance of the habitat on the military installations, which could be jeopardized in the future if those bases are relinquished and developed. This action identifies the need for cooperative wildlife and natural resource planning in such an eventuality.

The second identifies the need for wildlife agencies and groups in Anchorage to continue to meet and integrate expertise and resources, and share information even after this plan is finalized. Integrating agency information and activities is not something that just happens on its own; it requires leadership and some level of institutionalization. While the planning team recognizes that the creation of another bureaucracy is less than useful, everyone wants to see the existing ones working together. There is good evidence that many members of the public cannot distinguish between land managing agencies, but they still remain interested in the decisions those agencies make. With this action, we recommend that agencies meet at least annually to review accomplishments and share information, and thus explicitly support a cooperative management paradigm.

24. Planning for Wildlife Habitat on Future Excess Federal Property in Anchorage

Description. Fort Richardson and Elmendorf Air Force Base contain large land areas with significant wildlife habitat value. In the event any of these lands are no longer needed for federal military purposes, several agreements, as authorized by Congress, are in place to determine the future ownership of these lands. The agreements include the North Anchorage Land Agreement (authorized by Section 1425 of ANILCA) and the Cook Inlet Land Exchange.

The North Anchorage Land Agreement identifies a greenbelt along Eagle River, the Eagle River Flats and key moose habitat east of the Glenn Highway for state ownership to protect fish and wildlife values. The agreement also directs the Municipality of Anchorage (MOA) and Eklutna, Inc. to prepare a generalized land use plan for any remaining land in the two military reserves. This action recommends that ADF&G and other wildlife agencies assist NALA parties by defining additional public interest lands for fish and wildlife habitat purposes.

The Cook Inlet Land Exchange directs the disposition of any excess or surplus military lands south of the east-west running line separating Townships 13 and 14 North. ADF&G and other interested wildlife agencies should also be prepared to assist the DNR and MOA in defining fish and wildlife habitat or other natural resource concerns on these lands.

No specific action is required if the installations continue to be actively managed by the U.S. Army and Air Force. If these lands are surplused, however, we believe that a natural resources assessment should be completed before any lands are transferred or disposed. While a NEPA process is required before any Base Realignment and Closing (BRAC) action can be taken, it is unclear whether this would include any examination of public interest in habitat conservation issues. A natural resources assessment is therefore recommended in concert with any BRAC NEPA effort. This assessment should consider wildlife, fish, and other ecological resources, as well as recreation opportunities associated with those resources and environments.

Rationale. Together with Chugach State Park, the two military installations play a critical role in maintaining the ecology, watersheds, and wilderness character of greater Anchorage. These large land tracts, which remain relatively undeveloped and contain large portions of the Ship Creek, Chester Creek, and Campbell Creek watersheds, act as "ecosystem reservoirs" from which many wildlife flow. Military control of public lands adjacent to Anchorage, especially Fort Richardson, has resulted in the retention of healthy functioning ecosystems full of thriving wildlife. In general, the military mission has been compatible with these ecosystems, and recent environmental directives require maintenance of biodiversity and viable ecosystems to ensure natural training settings and scenarios.

The fate of these military lands has been the source of considerable concern in recent years. Although the Army has not announced any intention of relinquishing these lands, Congressional authorization of land agreements suggest that some local development is inevitable if the land is surplussed. This action simply urges careful planning to ensure that any development does not substantially impair the wildlife habitat and function which is currently provided on these lands.

Responsibilities. The lead organization would be ADF&G. Any wildlife or ecological assessment of these lands should also involve Chugach State Park, the Municipality, the US Fish and Wildlife Service and local wildlife interest groups. If the military is relinquishing these installations, their planners and environmental experts may not be in a position to be decision-makers, but could provide valuable

expertise. Given the development potential of the area, those interests would also play critical roles in the process.

Schedule. At this time there is no schedule or intention to close or surplus lands from either of these military installations. The North Anchorage Land Agreement directs the MOA and Eklutna, Inc. to prepare a generalized land use plan and to meet annually to review and update the plan. To date, the parties have not prepared this generalized land use plan.

Costs and Funding Sources. No action is currently proposed. Conducting an ecological assessment of the installations would be a substantial cost, but might be covered as part of base closing costs.

WILLIAM GOSSWEILER

WILLIAM GOSSWEILER

Fort Richardson and Elmendorf lands are vital to the health of Anchorage's ecosystem, including its creeks and wildlife

25. Formalize Interagency and Wildlife Interest Group Cooperation

Description. This action would recognize the need for continued coordination and integration of agencies and organizations with wildlife responsibilities or interests in Anchorage. It would formally establish annual meetings to review wildlife management actions being undertaken in Anchorage.

Over time, it is hoped that this group would be respected as an entity with special broad knowledge and expertise on wildlife issues in the greater Anchorage area. If this were to occur, the group might be able to help influence and direct development and natural resource decisions in the city.

Rationale. This cooperative planning effort is the first step in coordinating and integrating wildlife management responsibilities among a number of agencies and interest groups. In order to continue the process, however, there needs to be some formalization of the effort into the future. Annual meetings to review actions and successes urged by the plan are a simple mechanism to keep this momentum going.

Responsibilities. Every agency, organization and interested individual that has been involved in this planning effort or who would like to commit to future cooperative planning work would be welcome to participate. However, special responsibilities fall to the lead agencies in this effort, including ADF&G, USFWS, State Parks, BLM, and the Municipality.

Constraints. The press of daily work is a chief constraint.

Actions Considered but Rejected

Large Mammal Predator Enhancement. While additional large predators in Anchorage might help naturally reduce populations such as moose, the planning team recognized that increasing the numbers of bears and wolves in Anchorage is probably not desirable for most residents.

Moose Sterilization Research. Although recent contraceptive technology improvements suggest that some ungulate populations (particularly white-tailed deer) can be reduced through sterilization programs introduced into wildlife feed, the planning team did not think this expensive technology should be pursued for Anchorage's moose.

Trail connections from Bicentennial to Chugach State Park; convert Tour of Anchorage Trail for summer use. These two suggestions from the public would create additional trails in the Bicentennial Park/Campbell Tract area, but were not supported by the planning team for wildlife purposes. There are extensive existing trails in this area for hikers, and the general concern was that upgraded trails that would encourage additional multiple uses and reduce available habitat would have habitat impacts that would not be offset by the increased wildlife recreation opportunity.

Twin Peaks Overlook Interpretive Station. While the planning team supports the existing trail and overlook on this mountain, they did not feel that additional expenditures on an interpretive station that would increase development levels on this low-use trail were appropriate. The trail currently provides excellent sheep viewing opportunities, but they are primitive in nature.

Trailhead moose warning program; neighborhood bear warning program. Both of these options were rejected as likely having little utility because of the difficulty in providing up-to-date information in a cost effective manner.

Appendix A

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Appendix B

Methods Used to Estimate Numbers of Wildlife in the Anchorage Area

Black bears and brown bears. Accurate and reliable estimates of bear populations are difficult and costly to obtain (Miller *et al*. 1997). Bears are typically wide-ranging, low-density species that are difficult to observe directly in most areas. An accurate technique developed in Alaska uses a standard capture-mark-resight technique. A search area is selected containing representative proportions of different habitats used by bears throughout a year. Bears are captured by darting them from helicopters and fitted with radio collars. A year or more later an aerial survey determines the number and identity of radio-marked bears present in the search area in early summer. At the same time, an independent visual search using fixed-wing aircraft (usually Piper Supercub PA-18) determines the number of marked bears among the total number of bears observed in the search area. The flight pattern is designed to maximize the likelihood of seeing bears – usually flight patterns are large circles in forested and tall shrub habitats, straight lines in open tundra or low shrub habitats, and along elevation contours in steep terrain or narrow drainages. The entire search area is usually searched on a single day to minimize the possibility that unmarked bears would be counted more than once. These flights are replicated on other days.

This technique has not been used in Anchorage due to the difficulty in sighting bears in the heavily forested terrain found in most of the Anchorage lowlands, and the expense (Miller *et al*. 1997). However, the technique has been used for black bears in the middle portion of the Susitna River drainage and on the Kenai Peninsula, and for brown bears in several locations in southcentral Alaska (Miller *et al*. 1997). The estimate of brown and black bear numbers in the Anchorage area is based on a subjective extrapolation from density estimates in similar habitats in southcentral Alaska (Miller 1993, Miller *et al*. 1997). Because the Anchorage estimates are based on extrapolations of short-term studies in other areas, it is impossible to determine annual population fluctuations, except in a subjective sense based partly on public calls about nuisance bears and other bear sightings.

Moose. Moose populations are estimated using a census technique developed in Alaska (Gasaway *et al.* 1986), accompanied by trend counts. In the Anchorage area, only Fort Richardson (including the upper Ship Creek drainage) and Elmendorf Air Force Base are censused. Using a modified Gasaway technique, the two military reservations were divided into 14 survey areas using natural terrain features. As soon as possible after the ground is covered with fresh snow, these survey areas are flown by pilot and observer teams using fixed-wing aircraft (usually Piper Supercub PA-18). The flight pattern is designed to maximize the likelihood of seeing moose--usually flight patterns are straight lines in forested habitats and along elevation contours in steep terrain or narrow drainages. All moose seen are circled to identify sex and antler size and search for other moose, especially calves. Moose are differentiated by adult/calf, bull/cow, and small/medium/large bulls based on body size and antler presence and size. Each survey area is searched on a single day to minimize the possibility that moose would be counted more than once. Immediately after a survey area is censused, a small, predetermined portion of the area is resurveyed much more intensively by flying tight, overlapping circles with the goal of seeing every moose. This allows a statistical estimate of the percentage of moose missed in each of the 14 survey areas, which is

used to calculate moose population size and confidence limits. Usually both military reservations can be censused in two to three days.

Trend counts are conducted in predetermined drainages. Survey areas are selected each year based on funding level and management interest. Areas with a higher density of moose and more hunting pressure have the highest priority. In Anchorage these survey areas include the drainages of Peters Creek, Knik/Hunter Creek, upper Campbell Creek/Anchorage Hillside, and the Twentymile/Portage/Placer rivers. Other areas are surveyed as time and money allow. In Anchorage these survey areas include Eagle River, Bird Creek, Glacier Creek, and Kincaid Park. Trend counts use the same methods as the Gasaway technique; however, small areas are not resurveyed to determine a sightability correction factor. Instead, the average sightability correction factor for the Fort Richardson/Elmendorf census is used to calculate an estimate for all of the trend count survey areas.

An estimate for the entire Anchorage area is calculated by totaling estimates from the Fort Richardson/Elmendorf census, all trend counts, and subjective extrapolations from survey areas not counted (based on comparing population trends in other survey areas with the most recent counts in unsurveyed areas). It is possible to determine trends in annual fluctuations in the Anchorage moose population. The surveys cost approximately $5,000 each for flight time.

Dall sheep and mountain goats. Dall sheep and mountain goat populations are estimated by aerial counts. Dall sheep are relatively easy to see because they are white against the neutral or dark background of alpine slopes (Nichols 1970) and experienced observers can count over 90% of adults and nearly 90% of lambs (Lawson and Johnson 1982). Goats are more scattered than sheep and tend to inhabit more broken terrain. They also spend the warmer midday on snowfields or in shrub habitat and tend to hide from planes by flattening against cliff faces or under overhangs. Therefore, they are more difficult to see than sheep.

Dall sheep surveys are flown every summer in the Anchorage area, if the weather permits. After most of the snow has melted in the Chugach Mountains (late June-early August), a survey is flown by a pilot and observer team using a Piper Supercub PA-18. The flight pattern follows elevation contours above treeline. All sheep are circled to accurately count individuals in groups (especially lambs among groups of ewes) and identify horn length. Sheep are classified into adult rams (categories include ½ to ¾-curl horns, ¾ to full-curl, and full-curl or greater), “ewe-like” sheep (includes all ewes and yearling rams and some 2-year-old rams with less than ½-curl horns), and lambs. The survey takes about three days and costs about $3,000 for flight time. Because almost all the sheep are presumably seen, the total count usually serves as the population estimate.

Mountain goats are counted annually during sheep surveys. However, most of the goat population inhabits Lake George, Twentymile River and Glacier Creek drainages and these are not included in sheep surveys (because they have little or no sheep habitat). A mountain goat survey is flown in these drainages every two to four years to monitor population trends. This survey is flown in August because goats tend to be found at higher elevations than sheep, where the snowpack lasts longer. The survey is also flown late in the evening when goats tend to be more active and visible. A pilot and observer in a Piper Supercub PA-18 follow elevation contours above treeline. Goats are classified into adults and kids. The survey takes about two days and costs less than $2,000. The total count in recent surveys has been 500-600; however, a higher population estimate is obtained by adding a correction factor of 25-50% to

account for missed goats and unsurveyed drainages. Population trends can be determined for both sheep and goats.

Wolves and wolverines. Wolves and wolverines can be counted from the air during winter using a method developed in Alaska (Becker 1991, Becker *et al.* 1998). Wolves and wolverines are not trapped or hunted in Chugach State Park or the Anchorage Bowl; therefore, monitoring population levels is not a high priority. One aerial survey using this technique was conducted in the Anchorage area in 1995 (Sinnott 1996). The survey area included all potential wolf and wolverine habitat in the Municipality.

The survey was conducted by two teams of a pilot and observer using a Piper Supercub PA-18. Potential wolf and wolverine habitat was partitioned into 3x3-mile square sample units. Sample units were grouped into strata depending on the presumed likelihood (high or low) of observing a fresh wolf or wolverine trail after a snowfall. Stratified random sampling selected a greater proportion of units with high likelihood than low. The aerial census was conducted on 23-25 February, beginning about 24 hours after a snowfall. Most of the sample units were censused in the first two days. When fresh tracks were found in a sample unit they were backtracked to the point where they were no longer considered fresh, and then followed forward to the animal(s). By using stratified random sampling and noting the number of animal groups, the number in each group, and all the sample units that the fresh tracks intersected, this method allows an accurate population estimate with confidence intervals. The survey cost approximately $4,000 for flight time. Since 1995, the wolf population estimate has been adjusted slightly based on trapper sealing records, trapper reports, and other incidental observations.

Beavers. An aerial survey was conducted in the Anchorage area by a pilot and observer team using a Piper Supercub PA-18 in October 1995 (Sinnott 1997). The survey attempted to locate all beaver colonies in the Anchorage Bowl and on Fort Richardson and Elmendorf Air Force Base. Streams, ponds, and lakes were searched for dams, food caches, lodges, and freshly cut trees. Lower Ship Creek (below Post Road) and lower Campbell Creek (below Campbell Airstrip) and lakes and ponds in west Anchorage were searched on foot in late October and early November because the low-level, looping survey technique conflicted with air safety near the major airports. Beaver colonies were counted if dams and lodges included fresh material and fresh cuttings were observed, and an average of 5 beavers were assumed to live in each colony. The aerial survey cost approximately $700. Since 1995 several other colonies have been found in the Anchorage Bowl.

Feral rabbits. No one has attempted to count feral rabbits in the Anchorage Bowl. The population estimate is based on observations of one to several dozen rabbits at numerous sites on the Anchorage Hillside--but also at the Clitheroe Center in west Anchorage and several sites in midtown—and homeowner complaints to the Department of Fish and Game.

Bald eagles. Eagle nests are monitored annually. Active nests are usually reported to the Department of Fish and Game by Anchorage residents. The rough population estimate includes two adults for each active nest plus eaglets and older juveniles.

Mallards, pigeons, and ravens. Every winter, usually in late December, the Anchorage Audubon Society attempts to count as many birds as possible in a day and within a 7.5-mile radius of downtown Anchorage and Eagle River. These “Christmas bird counts” have been conducted by volunteers for several decades and are reported in American Birds magazine and on the Internet (http://birdsource.cornell.edu/cbc). Although many birds are presumably not counted, mallards, pigeons,

and ravens are large and relatively easy birds to see in urban areas in winter. The population estimates for these species assume that half to one fourth of the birds are counted. Population trends can be determined from these counts.

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Appendix C
Fish and Wildlife (Vertebrates) of Anchorage, Alaska
Mammals

This list includes 48 indigenous species and four feral introduced species known or suspected to occur in Anchorage, Alaska. Footnotes identify introduced and suspected species. All others are either well-known residents or are represented by specimens at the University of Alaska Museum in Fairbanks or published reports in scientific journals.

Common Name	Scientific Name
INSECTIVORES	
Shrew family	Soricidae
Common (or masked) shrew	*Sorex cinereus*
Pygmy shrew[1]	*Sorex hoyi*
Tiny shrew[1]	*Sorex minutissimus*
Dusky shrew	*Sorex monticolus*
Water shrew	*Sorex palustris*
Tundra shrew	*Sorex tundrensis*
BATS	
Vesper bats	Vespertilionidae
Little brown bat	*Myotis lucifugus*
PRIMATES	
Hominids	Hominidae
Human	*Homo sapiens*
CARNIVORES	
Dog family	Canidae
Coyote	*Canis latrans*
Wolf	*Canis lupus*
Red fox	*Vulpes vulpes*
Dog[2]	*Canis familiaris*
Cat family	Felidae
Lynx	*Lynx canadensis*
Cat[2]	*Felis domesticus*
Weasel family	Mustelidae
River otter	*Lutra canadensis*
Wolverine	*Gulo gulo*
Marten	*Martes americana*
Ermine (short-tailed weasel)	*Mustela erminea*
Least weasel	*Mustela nivalis*
Mink	*Mustela vison*

Bear family	Ursidae
Black bear	*Ursus americanus*
Brown bear (grizzly)	*Ursus arctos*
PINNIPEDS	
Steller's sea lion	*Eumetopias jubatus*
Harbor seal	*Phoca vitulina*
WHALES	
Orca (killer whale)	*Orcinus orca*
Beluga (white whale)	*Delphinapterus leucas*
Gray whale	*Eschrichtius robustus*
Minke whale	*Balaenoptera acutorostrata*
HOOFED MAMMALS	
Deer family	Cervidae
Moose	*Alces alces*
Caribou	*Rangifer tarandus*
Sitka black-tailed deer[1]	*Odocoileus hemionus sitkensis*
Goat/antelope subfamily	Caprinae
Mountain goat	*Oreamnos americanus*
Dall sheep	*Ovis dalli*
RODENTS	
Squirrel family	Sciuridae
Hoary marmot	*Marmota caligata*
Arctic ground squirrel	*Spermophilus parryii*
Red squirrel	*Tamiasciurus hudsonicus*
Northern flying squirrel	*Glaucomys sabrinus*
Beaver family	Castoridae
Beaver	*Castor canadensis*
Jumping mouse family	Dipodidae
Meadow jumping mouse	*Zapus hudsonius*
Mouse family	Muridae
Northern red-backed vole	*Clethrionomys rutilus*
Singing vole or tundra vole	*Microtus oeconomus*
Long-tailed vole[1]	*Microtus longicaudus*
Meadow vole	*Microtus pennsylvanicus*
Alaska vole	*Microtus miurus*
Brown lemming[1,3]	*Lemmus trimucronatus*
Muskrat	*Ondatra zibethicus*
Northern bog lemming[1]	*Synaptomys borealis*
House mouse[2]	*Mus musculus*

New World porcupine family	Erethizontidae
Porcupine	*Erethizon dorsatum*
LAGOMORPHS	
Pika family	Ochotonidae
Collared pika	*Ochotona collaris*
Rabbit and hare family	Leporidae
European rabbit[2]	*Oryctolagus cuniculus*
Snowshoe hare	*Lepus americanus*

[1] Probable, but not substantiated.
[2] Introduced species.
[3] See Chernyavsky, F. B., Abramson, N. I., Tsvetkova, A. A., Anbinder, E. M. and Kurysheva, L. P., 1993, Zoologicheskii Zhurnal 72:111-121.

Fish

This list includes species confirmed on both Fort Richardson and Elmendorf Air Force Base.

Common Name	Scientific Name
pink salmon (“humpy”)	*Oncorhynchus gorbuscha*
chum salmon (“dog”)	*Oncorhynchus keta*
coho salmon (“silver”)	*Oncorhynchus kisutch*
sockeye salmon (“red”)	*Oncorhynchus nerka*
chinook salmon (“king”)	*Oncorhynchus tshawytscha*
Dolly Varden	*Salvelinus malma*
arctic char	*Salvelinus alpinus*
rainbow trout (stocked)	*Onchorynchus mykiss*
three-spine stickleback	*Gasterosteus aculeatus*
nine-spine stickleback^	*Pungitius pungitius*
slimy sculpin^	*Cottus cognatus*
arctic grayling	*Thymallus arcticus*

^ Confirmed on Elmendorf AFB only.
Sources: Gossweiler, W.A. 1984. Fort Richardson Natural Resources Plan. Table 4 and Rothe, et al., 1983. Natural Resource Inventory of Elmendorf Air Force Base, Alaska.

Amphibians and Reptiles

Common Name	Scientific Name
wood frog	*Rana sylvatica*

No reptiles occur in Anchorage.

Birds

The following list includes common, uncommon, rare, and casually-seen species that occur within the boundaries of the Municipality of Anchorage. Many other species may occur here, but so rarely that they are referred to as "accidental", and are not included in this list. For an indication of how common or rare, etc. the different species are, see *Birds of Anchorage, Alaska checklist* (Anchorage Audubon Society, 1993) and *Anchorage Area Military Reservations checklist* (Department of Defense Partners in Flight, Elmendorf AFB and Fort Richardson). Species are grouped in taxonomic order.

Common Name	Scientific Name
LOONS AND GREBES	
common loon	*Gavia immer*
Pacific loon	*Gavia pacifica*
red-throated loon	*Gavia stellata*
red-necked grebe	*Podiceps grisegena*
horned grebe	*Podiceps auritus*
SHEARWATERS AND PETRELS	
fork-tailed storm-petrel	*Oceanodroma furcata*
CORMORANTS	
double-crested cormorant	*Phalacrocorax auritus*
HERONS	
great blue heron	*Ardea herodias*

CRANES

sandhill crane	*Grus canadensis*

WATERFOWL

tundra swan	*Cygnus columbianus*
trumpeter swan	*Cygnus buccinator*
greater white-fronted goose	*Anser albifrons*
snow goose	*Chen caerulescens*
brant	*Branta bernicla*
Canada goose	*Branta canadensis*
mallard	*Anas platyrhynchos*
gadwall	*Anas strepera*
green-winged teal	*Anas crecca*
American wigeon	*Anas americana*
Eurasian wigeon	*Anas penelope*
northern pintail	*Anas acuta*
northern shoveler	*Anas clypeata*
blue-winged teal	*Anas discors*
cinnamon teal	*Anas cyanoptera*
canvasback	*Aythya valisineria*
redhead	*Aythya american*
ring-necked duck	*Aythya collaris*
greater scaup	*Aythya marila*
lesser scaup	*Aythya affinis*
common eider	*Somateria mollissima*
Steller's eider	*Polysticta stelleri*
black scoter	*Melanitta nigra*
white-winged scoter	*Melanitta fusca*
surf scoter	*Melanitta perspicillata*
harlequin duck	*Histrionicus histrionicus*
oldsquaw	*Clangula hyenemalis*
Barrow's goldeneye	*Bucephala islandica*
common goldeneye	*Bucephala clangula*
bufflehead	*Bucephala albeola*

MERGANSERS

common merganser	*Mergus merganser*
red-breasted merganser	*Mergus serrator*
hooded merganser	*Lophodytes cucullatus*

RAILS

Fulica americana	American coot

SHOREBIRDS

semipalmated plover	*Charadrius semipalmatus*
blackbellied plover	*Pluvialis squatarola*
lesser golden plover	*Pluvialis dominica*
marbled godwit	*Limosa fedoa*
bar-tailed godwit	*Limosa lapponica*
Hudsonian godwit	*Limosa haemastica*
whimbrel	*Numenius phaeopus*
greater yellowlegs	*Tringa melanoleuca*
lesser yellowlegs	*Tringa flavipes*
solitary sandpiper	*Tringa solitaria*
spotted sandpiper	*Actitis macularia*
wandering tattler	*Heteroscelus incanus*
Wilson's phalarope	*Phalaropus tricolor*
red-necked phalarope	*Phalaropus lobatus*
red phalarope	*Phalaropus fulicaria*
short-billed dowitcher	*Limnodromus griseus*
long-billed dowitcher	*Limnodromus scolopaceus*
common snipe	*Gallinago gallinago*
ruddy turnstone	*Arenaria interpres*
black turnstone	*Arenaria melanocephala*
surfbird	*Aphriza virgata*
rock sandpiper	*Calidris ptilocnemis*
dunlin	*Calidris alpina*
sanderling	*Calidris alba*
semipalmated sandpiper	*Calidris pusilla*
western sandpiper	*Calidris mauri*
least sandpiper	*Calidris minutilla*
Baird’s sandpiper	*Calidris bairdii*
pectoral sandpiper	*Calidris melanotos*

JAEGERS, GULLS, AND TERNS

parasitic jaeger	*Stercorarius parasiticus*
long-tailed jaeger	*Stercorarius longicaudus*
Bonaparte's gull	*Larus philadelphia*
common black-headed gull	*Larus ridibundus*
ring-billed gull	*Larus delawarensis*
mew gull	*Larus canus*
herring gull	*Larus argentatus*
California gull	*Larus californicus*
glaucous gull	*Larus hyperboreus*
Thayer's gull	*Larus thayeri*
slaty-backed gull	*Larus schistisagus*
glaucous-winged gull	*Larus glaucescens*
black-legged kittiwake	*Rissa tridactyla*
arctic tern	*Sterna paradisaea*
Aleutian tern	*Sterna aleutica*
Caspian tern	*Sterna caspia*

AUKS AND PUFFINS

common murre	*Uria aalge*

VULTURES, HAWKS AND FALCONS

golden eagle	*Aquila chrysaetus*
bald eagle	*Haliaeetus leucocephalus*
northern harrier	*Circus cyaneus*
sharp-shinned hawk	*Accipiter striatus*
northern goshawk	*Accipiter gentilis*
red-tailed hawk (Harlan's hawk)	*Buteo jamaicensis*
rough-legged hawk	*Buteo lagopus*
osprey	*Pandion haliaetus*

American kestrel	*Falco sparverius*
merlin	*Falco columbarius*
peregrine falcon	*Falco peregrinus*
gyrfalcon	*Falco rusticolus*

GALLINACEOUS BIRDS

spruce grouse	*Dendragopus canadensis*
white-tailed ptarmigan	*Lagopus leucurus*
rock ptarmigan	*Lagopus mutus*
willow ptarmigan	*Lagopus lagopus*

PIGEONS AND DOVES

rock dove (pigeon)	*Columba livia*

(This bird is a non-native, introduced species.)

OWLS

short-eared owl	*Asio flammeus*
great horned owl	*Bubo virginianus*
great gray owl	*Strix nebulosa*
snowy owl	*Nyctea scandiaca*
northern saw-whet owl	*Aegolius acadicus*
northern hawk owl	*Surnia ulula*
boreal owl	*Aegolius funereus*

HUMMINGBIRDS

rufous hummingbird	*Selasphorus rufus*

KINGFISHERS

belted kingfisher	*Ceryle alcyon*

WOODPECKERS

northern flicker	*Colaptes auratus*
downy woodpecker	*Picoides pubescens*
hairy woodpecker	*Picoides villosus*
northern three-toed woodpecker	*Picoides tridactylus*
black-backed woodpecker	*Picoides arcticus*

PERCHING BIRDS

olive-sided flycatcher	*Contopus borealis*
western wood-pewee	*Contopus sordidulus*
Say's phoebe	*Sayornis saya*
alder flycatcher	*Empidonax alnorum*
horned lark	*Eremophila alpestris*
tree swallow	*Tachycineta bicolor*
violet-green swallow	*Tachycineta thalassina*
bank swallow	*Riparia riparia*
rough-winged swallow	*Stelgidopteryx serripennis*
cliff swallow	*Hirundo pyrrhonota*
barn swallow	*Hirundo rustica*
Steller's jay	*Cyanocitta stelleri*
gray jay	*Perisoreus canadensis*
black-billed magpie	*Pica pica*
northwestern crow	*Corvus caurinus*
common raven	*Corvus corax*
black-capped chickadee	*Parus atricapillus*
chestnut-backed chickadee	*Parus rufescens*
boreal chickadee	*Parus hudsonicus*
brown creeper	*Certhia americana*
red-breasted nuthatch	*Sitta canadensis*
winter wren	*Troglodytes troglodytes*
arctic warbler	*Phylloscopus borealis*
golden-crowned kinglet	*Regulus satrapa*
ruby-crowned kinglet	*Regulus calendula*

Townsend’s solitaire	*Myadestes townsendi*
Swainson's thrush	*Catharus ustulatus*
gray-cheeked thrush	*Catharus minima*
hermit thrush	*Catharus guttata*
varied thrush	*Ixoreus naevius*
American robin	*Turdus migratorius*
northern wheatear	*Oenanthe oenanthe*
northern shrike	*Lanius excubitor*
American pipit	*Anthus rubescens*
American dipper	*Cinclus mexicanus*
bohemian waxwing	*Bombycilla garrulus*
European starling	*Sturnus vulgaris*
warbling vireo	*Vireo gilvus*
orange-crowned warbler	*Vermivora celata*
yellow-rumped warbler	*Dendroica coronata*
Townsend’s warbler	*Dendroica townsendi*
blackpoll warbler	*Dendroica striata*
yellow warbler	*Dendroica petechia*
Wilson's warbler	*Wilsonia pusilla*
northern waterthrush	*Seiurus noveboracensis*
savannah sparrow	*Passerculus sandwichensis*
song sparrow	*Melospiza melodia*
American tree sparrow	*Spizella arborea*
dark-eyed junco	*Junco hyemalis*
white-crowned sparrow	*Zonotrichia leucophrys*
golden-crowned sparrow	*Zonotrichia atricapilla*
fox sparrow	*Passerella iliaca*
Lincoln's sparrow	*Melospiza lincolnii*
Lapland longspur	*Calcarius lapponicus*
snow bunting	*Plectrophenax nivalis*
red-winged blackbird	*Agelaius phoeniceus*
rusty blackbird	*Euphagus carolinus*
brown-headed cowbird	*Molothrus ater*
pine siskin	*Carduelis pinus*
red crossbill	*Loxia curvirostra*

white-winged crossbill	*Loxia leucoptera*
pine grosbeak	*Pinicola enucleator*
common redpoll	*Carduelis flammea*
hoary redpoll	*Carduelis hornemanni*
brambling	*Fringilla montifringilla*

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Appendix D

FWS70181-9-K235

MEMORANDUM OF UNDERSTANDING

REGARDING

A COMPREHENSIVE WILDLIFE MANAGEMENT PLAN,

Living with Wildlife in Anchorage: A Cooperative Planning Effort

FOR

ANCHORAGE, ALASKA

among the

Alaska Department of Fish and Game
Alaska Department of Natural Resources
Division of Parks and Outdoor Recreation
U.S. Fish and Wildlife Service Region 7
Bureau of Land Management
USDA Forest Service
U.S. Army, Fort Richardson
3rd Wing, Elmendorf Air Force Base
and the Municipality of Anchorage

I. BACKGROUND:

The Municipality of Anchorage is a unique urban and suburban environment containing a diversity of wildlife species. Extensive natural areas in and around the city provide habitat for moose, black bears, brown bears, Dall sheep, wolves, coyotes, lynx, beaver, bald eagles and other raptors, loons, swans and other waterfowl and shorebirds, as well as numerous species of migratory songbirds. Marine mammal species, including beluga whales, are also present in the nearby waters of Cook Inlet. The Anchorage area also offers unique recreational fishing opportunities in an urban environment. Wild and hatchery stocked salmon runs support popular fisheries and viewing opportunities on several area streams.

These distinctive wildlife and fish populations offer outstanding recreational opportunities to Anchorage residents and visitors and contribute to a quality of life in Anchorage that is unparalleled in other large urban areas. Many of these species are also valued as symbols of wild Alaska and almost all Anchorage residents have some appreciation for the wildlife that exist in the area. Wildlife and fish resources are truly an integral part of the Anchorage community.

Human-Wildlife Conflicts

Unfortunately, the abundant wildlife and large human population lead to numerous human-wildlife conflicts as well. Conflicts include human safety issues (e.g. aggressive encounters with moose and bears, and wildlife-related aircraft and vehicle crashes) and wildlife nuisance complaints (e.g., pets injured or killed by wolves, bears, coyotes, and moose; trees felled by beavers; moose eating ornamentals; and Canada geese on ballfields and lawns).

One challenge of planning for wildlife in the Anchorage area is determining how to minimize the conflicts that are occurring with wildlife while enhancing the opportunities for positive interactions with wildlife. Lethal control of individual problem animals is not acceptable to most Anchorage residents except when human life is threatened.

Maintaining or increasing populations of moose, geese, and bears will likely maintain or increase wildlife nuisance and hazards, while efforts to decrease populations could decrease wildlife viewing and hunting opportunities. To the greatest extent possible, creative solutions for resolving human-wildlife conflicts must be developed for Anchorage's urban environment.

In addition, there is a need to clarify and agree on roles and responsibilities among local agencies and the public in reducing wildlife conflicts, and dealing with those that do occur.

Enhancing the Benefits of Wildlife

Considering the abundant wildlife resource in Anchorage, relatively little has been done to enhance opportunities to enjoy and learn about wildlife. Opportunities to use wildlife through hunting and trapping have been drastically reduced in the Anchorage Bowl due to increased human population and residential developments. At the same time, services, programs and facilities to provide wildlife viewing opportunities and educate the public about wildlife have not been widely developed.

Such programs could help decrease human-wildlife conflicts, increase community stewardship of wildlife and wildlife habitats, and provide substantial economic benefits to the community. Increasing wildlife-related education and recreation opportunities in and near Anchorage could help retain tourists in the city for additional days as well as encourage residents to spend more leisure time within the city. Both would increase money spent for local goods and services.

The key to capitalizing on the economic potential of local fish and wildlife resources is maintaining local habitat for wildlife distributed throughout the Anchorage Bowl. Additional benefits could be realized by increasing natural history interpretation and local tours along Anchorage's extensive trail system. An example of specific programs that could enhance the benefits of wildlife is the proposed Potter Marsh Nature Center. Potter Marsh boardwalk is one of the sites most visited by Alaska's tourists and attracts 30,000-40,000 visitors annually, mostly to view and learn about birds and spawning salmon.

II. PURPOSE

The purpose of this MOU is to:

1. Recognize the cooperative planning effort among local government, state and federal agencies, the public and the business community which has resulted in a comprehensive plan for managing wildlife in the Municipality of Anchorage;

2. Accept the overall purpose of the comprehensive wildlife plan, to:
   - Minimize conflicts between humans and wildlife;
   - Maintain and enhance the benefits of wildlife in Anchorage;

3. Affirm the intention of the signatories to implement actions recommended in the comprehensive wildlife plan to the greatest extent possible.

Such a cooperative planning effort has many benefits, including enhanced recreational, educational, conservation, and economic opportunities. This agreement will enhance continuing efforts of public

agencies and private organizations to conserve wildlife and fish resources in Anchorage while seeking to reduce human-wildlife conflicts.

III. Authority

This MOU is made and entered into by and among the Alaska Department of Fish and Game (ADF&G); Alaska Department of Natural Resources (DNR), Division of Parks and Outdoor Recreation (PARKS); U.S. Fish and Wildlife Service Region 7 (FWS); Bureau of Land Management (BLM); USDA Forest Service, Chugach National Forest (USFS), U.S. Army, Fort Richardson (Army), 3rd Wing, Elmendorf Air Force Base (Air Force); and the Municipality of Anchorage (MOA) under provisions of:

1. ADF&G: A.S. 16.05.050(13)
2. Parks: A.S. 41.21.010-.020 and A.S. 38.05.295
3. Army and Air Force: Sikes Act, as amended 1998, 16 U.S.C. ## 670a-670f (1988).
4. BLM: Federal Land Policy and Management Act of 1976, 43 U.S.C. # 1701-1782 (1988); an Act approved October 24, 1984, Pub. L. No. 98-540, 98 Stat. 2718; MOU between ADF&G and U.S. Department of Interior, Bureau of Land Management, for cooperative management of fish and wildlife resources, 8/22/83; 16 U.S.C. 679 et. seq., and BLM/ADF&G Sikes Act Agreement, 5/25/76.
5. FWS: Fish and Wildlife Act of 1956, 16 U.S.C. # 460k-2 (1988); Fish and Wildlife conservation Act of 1980, 16 U.S. C. ## 2901 et seq (1988); and Fish and Wildlife Coordination Act, 16 U.S.C. # 661 (1988);
6. MOA: A.M.C. Title 7.

IV. Introduction

The parties to this agreement have responsibilities or interests in conserving wildlife and their habitats and in addressing wildlife-human conflicts within the geographic area defined by the boundaries of the Municipality of Anchorage. The parties agree that increased efforts should be made to improve coordination of wildlife conservation and management. The parties further recognize and agree that a cooperative approach should be followed whenever practical.

The ADF&G represents the wildlife agency with the lead responsibility for conserving and managing wildlife and providing for public use statewide. In this role, ADF&G will initiate and assist development of this partnership to enhance the conservation and management of wildlife and fish resources within the Municipality of Anchorage.

The participating municipal, state, and federal agencies have a variety of responsibilities in managing their diverse lands and programs. Among some of these are the responsibilities to provide wildlife-

associated recreation opportunities, and to ensure and manage the abundance and diversity of wildlife and their habitats. Even though these agencies have different mandates and policies, many opportunities exist to enhance wildlife conservation and management, and the social and environmental benefits related to wildlife resources.

Local advisory groups, community councils, visitor and tourism based businesses and other private organizations and individuals have an interest in the conservation of wildlife resources, and strategies for addressing conflicts between humans and wildlife within Anchorage. These entities therefore have participated with cooperating municipal, state and federal agencies and other public organizations by assisting in the development and implementation of the Comprehensive Wildlife Management Plan to address wildlife issues within Anchorage.

In summary, it is the mutual belief of the signatories that implementation of this MOU will help to achieve the following goal and related objectives:

Goal: Conserve and enhance a wide diversity of fish, wildlife and their habitats throughout the Municipality of Anchorage that live in harmony with the community.

Objective 1—Identify and conserve biologically and socially optimal population levels of native wildlife and their habitats in the Municipality of Anchorage (MOA).

Objective 2—Identify and conserve wild and natural fish populations and their habitats in the MOA.

Objective 3—Maximize positive interactions with fish and wildlife and minimize conflicts between people and their pets and fish and wildlife in the MOA.

Objective 4—Promote the economic, social and other benefits related to fish, wildlife and their habitats in the MOA.

Objective 5—Foster a sense of stewardship for fish, wildlife and their habitats among the public, organizations and agencies within the MOA.

Objective 6—Integrate fish, wildlife, habitat and corridor issues into land use planning and decision-making within the MOA.

V. IT IS MUTUALLY AGREED AND UNDERSTOOD BY AND BETWEEN THE SAID PARTIES THAT:

1. Each public agency will adopt by this Memorandum of Understanding the goals, objectives, strategies, and actions identified in the Comprehensive Wildlife Management Plan subject to applicable laws, regulations, policies, and land use and activity plans for the affected area, and subject to approval by an authorized official of the agency administering the area involved;
2. Participating agencies will assume joint responsibility for implementing the Comprehensive Wildlife Management Plan, with each agency taking lead responsibility on lands they manage or control;
3. Any party may provide leadership for implementation and monitoring of the Plan developed pursuant to this agreement and supplemental to this agreement.
4. Nothing in this agreement will be construed as obligating the participating parties to expend, or involve the United States, the State of Alaska, the Municipality of Anchorage, or any other party in any obligation for future payment of money, except for appropriations authorized by law and administratively allocated for these purposes.
5. The federal government's liability will be governed by the provisions of the Federal Tort Claims Act (28 U.S.C. 2671-80).
6. This agreement may be revised as necessary, by mutual consent of all parties, and by issuance of a written amendment signed and dated by all parties.
7. Any party may terminate participation under this agreement by providing 30 days written notice to all other parties. Unless terminated by written notice of all parties, this agreement will remain in force indefinitely, subject to a 5-year review.
8. Each party agrees that it will be responsible for its own acts and the results thereof and each party shall not be responsible for the acts of the other party; and each party agrees it will assume to itself risk and liability resulting in any manner under this agreement.
9. Each party will comply with all applicable laws, regulations, and executive orders.
10. Nothing herein is intended to conflict with federal, state, or local laws or regulations. If there are conflicts, this agreement will be amended at the first opportunity to bring it into conformance with conflicting laws or regulations.

Appendix E

Acronym List

ABC	Alaska Bird Center at Potter Marsh
ADFG	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AFB	Air Force Base
AMATS	Anchorage Metropolitan Area Transportation Study
ANHA	Alaska Natural History Association
ANILCA	Alaska National Interest Lands Conservation Act
APD	Anchorage Police Department
APLIC	Alaska Public Lands Information Center
AWAIC	Alaska Women's Aid In Crisis
AWWG	Anchorage Waterfowl Working Group
BCC	biological carrying capacity
Bird TLC	Bird Treatment and Learning Center
BLM	Bureau of Land Management
BOF	Board of Fish
BOG	Board of Game
BRAC	Base Realignment and Closing
CARA	Conservation and Reinvestment Act (HR 701/S25)
CBC	Christmas bird count
CIP	Capitol Improvement Project
COE	(U.S. Army) Corps of Engineers
DLP	defense of life and property
DOT	Department of Transportation
EA	Environmental Assessment
FHWA	Federal Highway Administration
FOPM	Friends of Potter Marsh
GIS	Geographic Information Systems
ISTEA	Intermodal Surface Transportation & Efficiency Act (of 1991)

MOA	Municipality of Anchorage OR Memorandum of Agreement
MOU	Memorandum of Understanding
NALA	North Anchorage Land Agreement
NEPA	National Environmental Protection Act
NRCS	Natural Resources Conservation Services
SAC	social acceptance capacity
TIP	Transportation Improvement Program
USAF	U.S. Air Force
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WHIP	Wildlife Habitat Incentives Program