

Wildlife Management responses within the City of Calgary

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Executive Summary

Wildlife comes under Provincial and Federal jurisdictions, it is considered a crown-owned resource. Municipalities are given authorisation to manage certain species deemed "pests" but cannot deal with any other issues. Wildlife management has traditionally focused on maintaining population levels for the species considered desirable, those hunted or trapped. Urban growth has engendered issues regarding wildlife inhabiting our city parks and green spaces that seem to be ignored or dealt with summarily by authorities, without much thought to long-term ramifications. The same wildlife issues appear each year and elicit various responses in public opinion. Issues regarding open space management practices, wildlife population targets and the tolerance capacity of residents in terms of their values, beliefs and attitudes do not appear to be appropriately considered when making decisions.

Since managing land for its wildlife values is not part of the mainstream planning agenda, some valuable wildlife habitats are lost to development. The land that is protected may not be the most valuable to wildlife, but rather is selected because it cannot be developed and falls outside the ten-percent municipal reserve. Lethal control appears to be the selected method for dealing with wildlife populations deemed over-abundant. Other control methods are not considered or play minor roles. Consequently, the same issues appear each year since the problem is not resolved by one technique alone. Rather, an integrated approach to selecting appropriate tools that will provide a long-term resolution to the issues need to be considered. Setting the population targets for urban wildlife should take into consideration residents' tolerance capacity. Beliefs, values, and attitudes of residents are not well understood by managers who make decisions based on anecdotal information, often giving weight to people's fears and misconceptions arising from the lack of knowledge.

What is most needed is a shift in current decision-making processes as well as a movement towards taking a co-operative approach among the many organisations dealing with various aspects of urban wildlife management. There is already a wealth of technical expertise in the Federal, Provincial, and Municipal governments regarding wildlife management and environmental education. Adding to this wealth are the non-profit organisations that operate within city limits that provide ongoing wildlife monitoring services, invaluable public education opportunities or deal with situations that require specialised knowledge and equipment. Since urban wildlife is considered an integral component to maintaining a high quality of life for many residents, it needs to become part of the mainstream planning and development processes, not an afterthought when problems arise.

Purpose of project

This research examines current policy responses from various levels of government and interest groups to the management of urban wildlife within the City of Calgary. New policies and changes to existing ones are proposed to effectively cope with the increasing experiences of human-wildlife conflicts.

A review of current issues and trends that influence the ability of various stakeholders to effectively manage urban wildlife is performed through research of applicable legislation, policy documents, management plans as well as personal interviews with key stakeholders. The information gathered is analysed to establish needed policy changes and direction. Policy alternatives are proposed and evaluated to establish feasible and applicable recommendations. An evaluation process provides the tools to measure the effectiveness throughout the implementation phases.

Methodology

The research consisted of undertaking a survey of the current Federal, Provincial and Municipal legislation concerning wildlife, biodiversity management as well as related natural heritage conservation. City of Calgary policies, management plans and strategies were also reviewed during the research. One municipal planner and a provincial wildlife enforcement officer were contacted to determine current issues they perceived as critical in the management of urban wildlife.

Pertinent sections of each legislation, management plan and strategy were extracted and the issues regrouped for ease of discussion.

PART 1: Problem Definition, contextual influences and institutional framework

Background

Calgary possesses a wealth of natural areas that provide suitable habitats for numerous wildlife species. This urban wildlife has an effect, both positive and negative, on the quality of life of Calgary residents. Recent studies suggest that wildlife and nature-related activities are important to Calgary residents.

"In a major planning process in the 1990s, calgarians clearly expressed their love and concern for the many natural areas that are found throughout the city."¹ Not only do calgarians enjoy the use of many planned and maintained green spaces, they also value the wildlife which inhabits these protected spaces.

Although specific information is not available for the city of Calgary alone, the 1996 survey on the *Importance of Nature to Canadians* reveals that "1.9 million Alberta residents, 15 years and over, participated in a wide range of nature-related activities."² An estimated 142,000 albertans joined or contributed to nature-related organisations.

Figures 1 to 3, drawn from the survey on *Importance of Nature to Canadians*, help to demonstrate the importance of wildlife-related activities to Alberta residents in comparison to other Canadians. Figure 1 shows that 88.9 % (1.9 million) of Albertans participated in nature-related activities in 1996. Figure 2, demonstrates that 50.5 % (1.1 million) of Alberta residents participated in outdoor activities in natural areas in 1996. Figure 4, demonstrates that 36.4 % (779,000) of Albertans participated in residential wildlife-related activities such as feeding birds or photographing backyard wildlife.

Figure 1: Percentage of Canadians participating in nature-related activities in 1996, by Province or territory of residence. (Government of Canada, 1999)

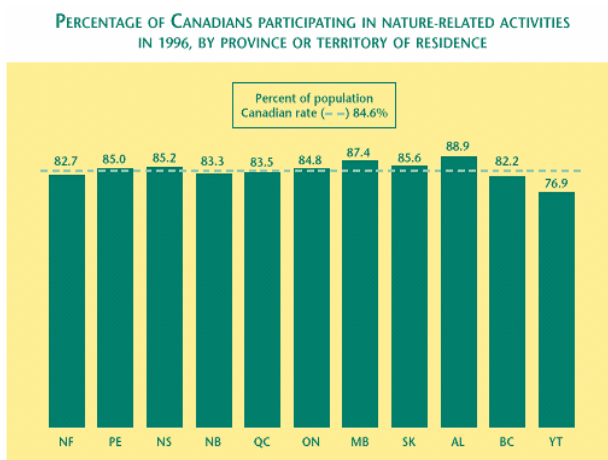


Figure 2: Percentage of Canadians participating in outdoor activities in natural areas in 1996, by Province or territory of residence. (Government of Canada, 1999)

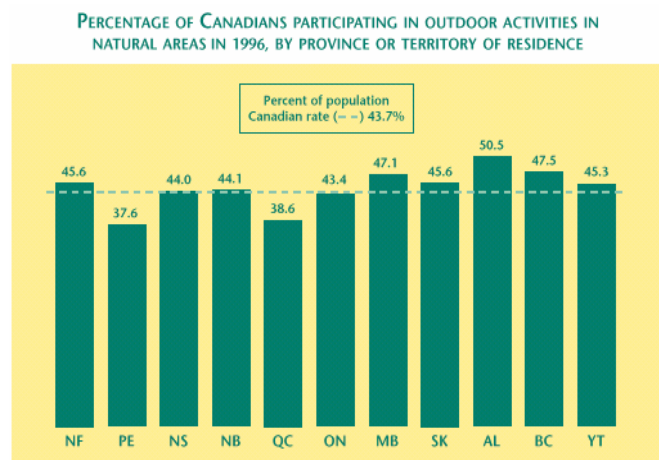


Figure 3: Percentage of Canadians participating in residential wildlife-related activities in 1996, by Province or territory of residence. (Government of Canada, 1999)

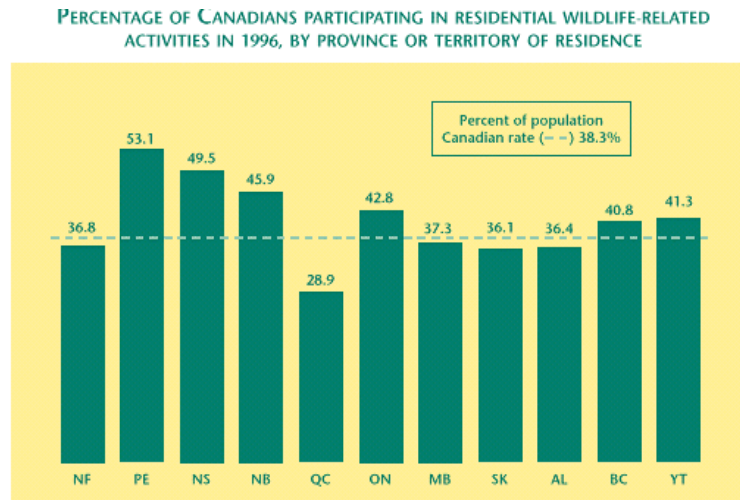


Table 1: Comparison of participation rates between Canada, Alberta and Calgary residents*

Activity	Residents		
	Canada average	Alberta	Calgary
Engage in nature-related activities	84.6 %	1.9 million 88.9%	681,915
Participate in outdoor activities in natural areas	43.7 %	1.1 million 50.5 %	387,364
Took part in residential wildlife-related activities	38.3 %	779,000 36.4 %	279,209

* Calgary resident numbers are extrapolated based on the number of residents identified in the 1996 Civic Survey.

1. *The Calgary Plan, Municipal Development Plan*, City of Calgary, 1998
 2. *The Importance of Nature to Canadians: Survey Highlights*, Environment Canada, 1999
 3. *Civic Census Summary*, City of Calgary, 2001

According to the Calgary *Civic Census*, there were 767,059 residents in 1996.³ Extrapolating from the percentages detailed in the figures 1 to 4, there would have been:

- * an estimated 681,915 residents engaged in nature-related activities;
- * 387,364 residents participating in outdoor activities in natural areas;
- * 279,209 residents who took part in residential wildlife-related activities such as feeding wildlife in their backyards.

These figures help to demonstrate the existing public interest in wildlife and nature through the participation in related activities. The continued urban sprawl into farmland and previously unoccupied areas surrounding Calgary as well as increased density within existing neighbourhoods are expected to impact the natural areas and protected spaces within the city and add pressure to the urban wildlife populations.

Traditionally, wildlife managers have concentrated their efforts on maintaining healthy and balanced wildlife populations in ecosystems outside of urban centres. Determining population levels and management actions required to achieve increases in the *desirable* wildlife species, those hunted or trapped, and reductions in those considered *less desirable* was fairly straightforward, having few stakeholder groups with which to work. Increasingly, stakeholder groups with different perspectives, beliefs and attitudes about ideal wildlife populations and management goals have voiced their opinions and influenced the wildlife management decision-making process. Understanding the issues related to urban wildlife will contribute to implementing management practices that reflect stakeholder interests and ensures that wildlife species are managed to achieve and maintain diverse, self-sustaining and healthy populations in harmony with local ecological and social values.

What wildlife management processes are in place in Calgary and how are decisions to reduce the number of certain species taken? A study of the current issues and trends in habitat and wildlife management arising from the urban growth and development of Calgary will facilitate the identification of the management options and policies that will help achieve long-term benefits for all concerned.

Issues Identification

Habitat management issues

Habitat management issues can be grouped into three major areas: increased isolation of wildlife habitats through encroachment of housing developments; increased use of natural areas for recreation; and, loss of habitat integrity and quality through infrastructure development to support increased use.

Although Calgary boasts a wealth of open spaces, parks and other protected areas, most have as primary function the provision of recreational opportunities for residents. Seen as valuable to the maintenance of high quality of life standards, access to open spaces plays an important role in the economic value of residential areas. The needs of wildlife populations within these areas are subordinate to this use, except for areas such as *preservation or wildlife refuge zones* identified in the Natural Environment Parks (City of Calgary, 1994), where public access maybe limited or closed for periods. Since the inception of the *Natural Areas Management Plan (1994)*, the City has identified and begun managing some areas for their wildlife habitat values. Noteworthy examples are Nose Hill, Weaselhead, Inglewood and Fish Creek parks.

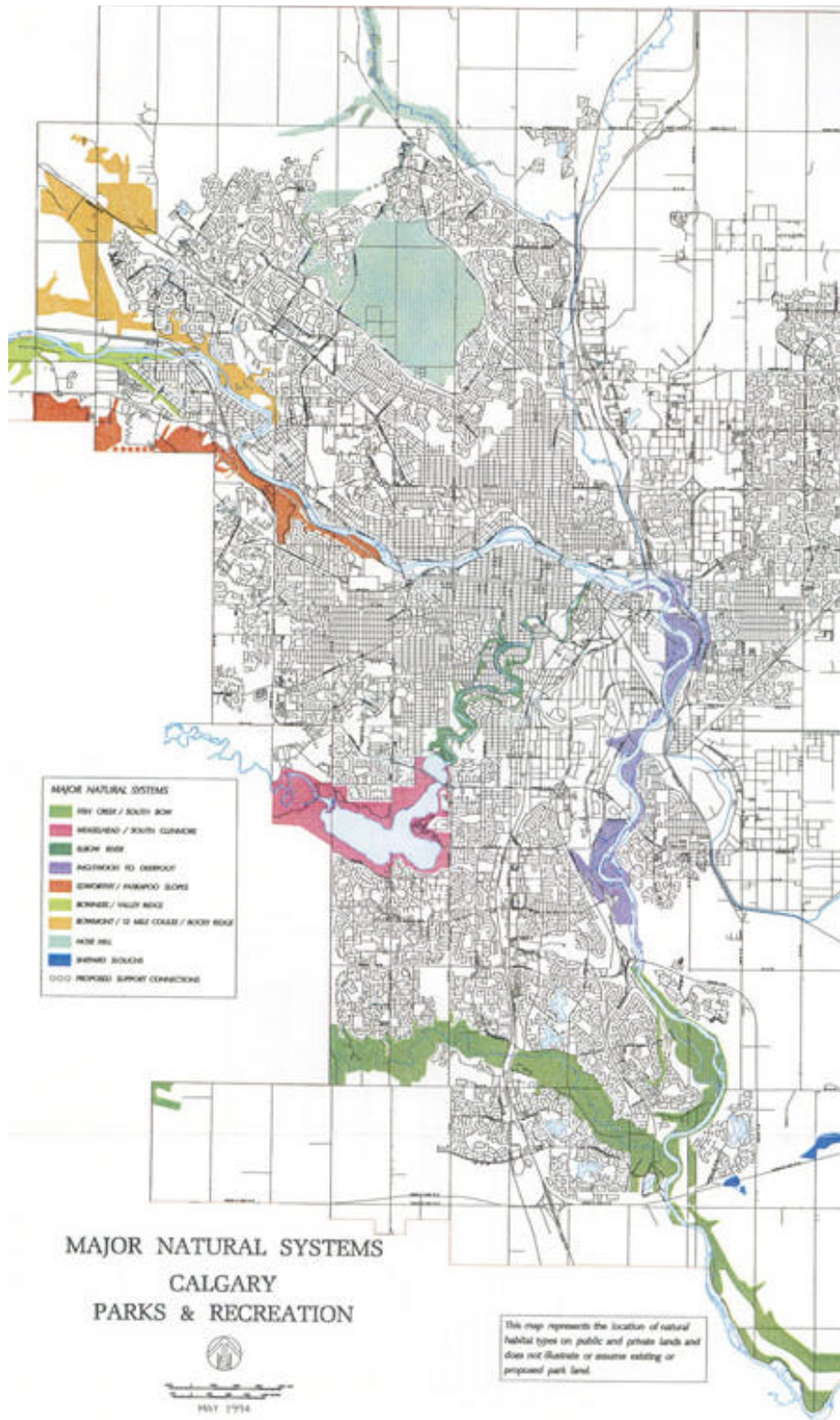
The natural communities of these areas exhibit a variety of habitats that support diverse wildlife populations. In some instances, these natural areas are linked to others by corridors of green spaces which allow for wildlife movements, but for many, these passages do not exist or only provide travel opportunities for certain species. For example, "development in Northwest Calgary has left Nose Hill Park as an island of natural habitat, connected to natural areas beyond the city limits by natural gullies that wind through housing subdivisions."⁴ The development of trails and road networks further increase the fragmentation of the natural areas, creating isolated islands. As Calgary continues to grow, increased pressure on the protected spaces will persist.

The City of Calgary map in Figure 4 demonstrates the isolation of Calgary's major natural systems. A major natural system as defined in the City of Calgary, Parks and Recreation's *Natural Area Management Plan (1994)* has the following features:

- includes juxtaposed vegetation communities;
- retains significant native character;
- includes appropriate wildlife corridors;
- exhibits a moderate diversity of habitats or is a rare intact habitat type where diversity is not moderate;
- has significant connectivity;
- is located within a dominant or group of landscape features;
- exhibits city-wide ecological significance, and;
- may continue beyond city limits but is not illustrated in the plan.

4. *Friends of Nose Hill* website (<http://www.cadvision.com/davideo/FNH/>)

Figure 4: Major Natural Systems in Calgary (City of Calgary, 1994)



Along with wildlife's loss of ability to travel from one area to another, the continued expansion and growth of Calgary's population increases the demand for recreation opportunities. This further increases the use of the parks for various recreation pursuits, putting people in closer contact with wildlife and increasing the potential for human-wildlife conflicts. Managing the open spaces to meet the needs of wildlife and people will be the challenge for urban planners.

The Municipal Government Act (1995), a provincial legislation, sets the maximum aggregate amount of land that can be allotted for municipal reserves at ten percent. Municipal reserves are typically used for public parks, recreation areas, school zones or for other civic purposes. Land identified as environmental reserves usually cannot be developed. They consist of swamps, gullies, ravines, coulees or natural drainage courses, land subject to flooding or adjacent to a river or body of water. Although the amount of land that can be withdrawn from development is dictated by this legislation, the management of activities within these areas is under municipal control.

Wildlife management issues

Wildlife management is a federal and provincial matter. The federal government is responsible for managing species or issues of international concern such as migratory birds or wildlife whose range extends across our borders. Provincial authorities are responsible for management of all other species. The municipality is granted authorisation from the provincial legislation to manage certain species considered "pests" within their jurisdictions. This limits the ability of urban managers to set wildlife management targets and implement them.

Issues concerning the appropriate management response to introduced wildlife species and those species perceived as over-abundant will dominate the future of urban wildlife management decision-making processes. It is assumed that the ultimate goal of any management intervention would be to maintain the biological diversity within city boundaries.

Introduced wildlife species such as Eastern Grey Squirrels, Rock Doves and English Sparrows compete with native wildlife for resources. Since introduced species tend to be aggressive, they often out-compete native wildlife, fuelling the concerns regarding the conservation of native wildlife where introduced species occur. Combined with the fact that their populations in urban areas can grow to large numbers gives rise to the perception of introduced species as "pests". This is the current perspective of the City of Calgary managers as described in the *Integrated Pest Management Plan*. Any management actions regarding these species will elicit a host of reactions from various stakeholders depending on their tolerance capacity for the species.

Some native wildlife species have adapted very well to our urban environment. Canada Geese, Coyotes and White-tailed Deer are all examples of wildlife that have benefited from altered urban habitats. Populations of Canada Geese, for example, have flourished with increased manicured lawns of city recreation parks and golf courses. Setting population management targets for these species is a difficult process. It

requires an understanding of the habitat carrying capacity as well as stakeholder perspectives, beliefs and attitudes about ideal wildlife populations and management goals.

Only a few methods available to control wildlife are currently utilised across the city. Without an integrated approach to resolving wildlife dilemmas, the problems are doomed to reoccur every year. This is very costly and inflicts unnecessary pain and suffering to the animals. Table 2 details some of the control methods available to maintain wildlife populations at desired levels.

Table 2: control methods available to maintain wildlife populations at desired levels

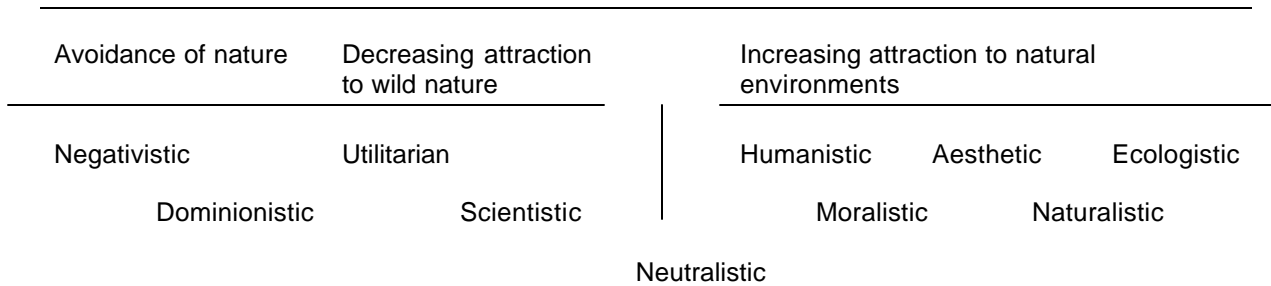
Control methods		
Habitat	Wildlife	Human dimensions
Diversion	Lethal	Changing human behaviour
Exclusion	Fertility	Increasing appreciation, knowledge and tolerance – removing fear and misunderstanding
Habitat manipulation	Relocation	
	Fear provoking stimuli	
	Chemical repellents	

Human dimensions of urban wildlife management

In the case of determining the appropriate actions to deal with over-abundant and introduced species, the ability to establish parameters for numbers of animals that are perceived as acceptable, and the methods that can be used to reduce the populations are essential. Resident perceptions and attitudes play a critical role in limiting the available options and targets for urban wildlife management.

Understanding the tolerance capacity of stakeholders will also help managers find appropriate resolution to human-wildlife conflicts. Human-wildlife conflicts occur for a variety of reasons and under a wide range of circumstances. Conflicts can result from lack of knowledge of animal behaviour on the part of residents. A coyote using neighbourhood yards as a travel corridor between suitable habitats, for example, can be perceived as a threat from local residents. The use of parts of dwellings such as attics and basements for nest sites or the consumption of garden plants as food source can occasionally cause distress and annoyance for residents. These situations can readily be remedied through information campaigns to help residents deal with the issues themselves. The scale of human attitudes described in Figure 5 is helpful to understand the wide range of perspectives that can exist in the community. The attitudes included in this figure are described in more details in appendix 1.

Figure 5: A scale of attitudes towards natural environments (redrawn from *The Planning and Management of Environmentally Sensitive Areas*, Paul F.J. Eagles)



Some situations require careful consideration for their serious consequences to human life and health as well as safety of wildlife. Large mammals using highway corridors for instance can pose grave dangers to motorists travelling at high speeds. Each year, vehicles strike many animals. In most cases, there is only minor damage to the vehicles, but the animal is killed. There are instances where people are gravely hurt or killed following wildlife collisions. The current management response to wildlife along major arteries within Calgary is to attempt to move large animals away from busy roads, and if unable to accomplish this, the animal is shot by police officers or conservation agents. Management options available to deal with this situation involve the redesign of road infrastructures to allow wildlife crossings at selected sites. Because of the capital-intensive nature of such projects, authorities are reluctant to consider them. Bird strikes on aeroplanes can have serious consequences. Strikes during take-off and landing can prove very dangerous for the safety of the passengers. Airport authorities are principally left to deal with this issue on their own. Zoonoses, diseases that can be transmitted from animals to humans such as rabies, are also a major consideration.

Institutional Framework

Jurisdictional authority to manage most wildlife species rests with federal and provincial organisations.

Federal

The Canadian Wildlife Service of Environment Canada is the delivery arm for wildlife management of the Federal Government. They deal with wildlife matters that *include the protection and management of migratory birds and nationally important wildlife habitat, endangered species, research on nationally important wildlife issues, control of international trade in endangered species, and international treaties* (Federal Government website, 2001).

The federal and provincial governments share the responsibility for wildlife management.

Provincial

Provincial wildlife agencies are responsible for all other wildlife matters. These include conservation and management of wildlife populations and habitat, issuing permits for fishing, hunting, and trapping, as well as outfitting policies.

The Alberta provincial Government states that it is *committed to the wise use and conservation of fish and wildlife resources. We want to preserve the intrinsic value they add to the environment as well as the enjoyment of Albertans now and in the future* (Alberta Government, 2000).

The Fish and Wildlife Division of the Sustainable Resources Development Department is the delivery arm for these services. Among other priorities, their stated goal is to *ensure that viable populations of wildlife species are maintained*. Ensure viable fish populations are maintained (Alberta Government, 2000).

Non-profit organisations

Many non-profit organisations across the country have taken on the challenges of delivering community programs, educating the public on wildlife matters as well as developing and delivering school programs to build wildlife awareness. Noteworthy among the many national, provincial, and local organisations are:

- Canadian Wildlife Federation
This organisation is responsible for the delivery of the *Project Wild* initiative that reaches children throughout Canadian schools. They also promote and co-ordinate efforts to host the annual celebration of *National Wildlife Week*. The aim of the organisation is to encourage people to conserve wildlife and its habitat.

- Federation of Alberta Naturalists
This organisation's stated goal is to promote the enjoyment, conservation and study of Alberta's natural history. They stipulate the following objectives
 - To provide a unified voice for naturalists on conservation issues.
 - To encourage Albertans to increase knowledge and understanding of natural history and ecological processes.
 - To organise field meetings, conferences, nature camps, research symposia and other activities.
 - To promote the exchange of data among clubs and societies.
 - To promote the formation of new natural history clubs in all areas of the province. (FAN website, 2001)

One noteworthy education initiative undertaken by FAN was the publication of a *NatureScape* guide (M. Pearman & T. Pike, 2000). This document provides Alberta residents with a wealth of information on developing backyard habitats for wildlife. It also suggests ways of resolving and preventing conflicts with urban wildlife.

- *Friends of Natural Area Parks*,
Many of the Natural Areas Parks designated under the City of Calgary *Natural Areas Management Plan* have Friends associations whose mandate involves disseminating information to Calgarians as well as gathering biodiversity information on their respective parks.
- Calgary Field Naturalists' Society has for mandate to encourage the appreciation, observation, study, conservation and protection of all components of the natural world (CFNS website, 2001) Their objectives are :
 - To promote and assist in the preservation of native habitat and of natural features
 - To provide publications and educational opportunities for the membership and the public.
 - To promote the collection of natural history observations for statistical and educational purposes.
 - To engage in any activity ancillary to the achievement of the above objectives.

Policy Framework

Federal Government

Migratory Birds Convention Act, 1994

This is the most important piece of legislation governing the management of bird species across the country. The regulations concern the conservation and protection of migratory birds. They control all activities related to migratory birds, their nest or eggs. Activities designed to reduce the damage migratory birds cause to crops or other property and the danger they pose to aircraft are also legislated under this act.

Permits may be issued to kill migratory birds, which may become seriously injurious to the agricultural or other interests in a community. The Minister may issue a permit to kill on the airport grounds migratory birds that are considered a danger to aircraft operating.

Provincial Government

Municipal Government Act, 1995

This act sets out the formal duties, powers and obligations for Alberta municipalities. It defines *environmental reserve* as consisting of:

- a) a swamp, gully, ravine, coulee or natural drainage course,
- b) land that is subject to flooding or is, in the opinion of the subdivision authority, unstable, or
- c) a strip of land, not less than 6 metres in width, abutting the bed and shore of any lake, river, stream or other body of water for the purpose of
 - preventing pollution, or
 - providing public access to and beside the bed and shore.

These are usually considered lands that cannot be developed.

The aggregate amount of land that may be required for municipal and school reserves may not exceed the percentage set out in the municipal development plan, which may not exceed 10percent of the parcel of land less the land required to be provided as environmental reserve and the land made subject to an environmental reserve easement.

This imposed limit of land that can be withdrawn from development as municipal reserves constrains the management options for the municipality.

Wildlife Act, 1984

The Wildlife Act states: *A damage control licence authorises its holder to engage in the wildlife depredation control, including hunting, that is described in section 38(1) or 96(1)(w) of the Act and that is specified in the licence, or to authorise in writing another person to do so, in accordance with the conditions set out in section 96 of this Regulation and on the land described, and during the periods and in the manner specified, in the licence. A damage control licence is*

the licence referred to in the Act as the licence authorising the control of wildlife depredation.

The municipality's authorisation only extends to certain species considered "pests" listed under the *non-licensed animal* section of the provincial wildlife regulations. Municipalities under a damage control permit can deal with some species, called non-licensed wildlife. Examples of these species include: Richardson's Ground Squirrel, Gray Squirrel, Porcupine, Raccoon, Striped Skunk, Rock Dove, American Crow, Black-billed Magpie, Red-winged Blackbird, and House Sparrow.

Municipal Government

The Calgary Plan – Municipal Development Plan, 1998

The *Municipal Development plan*, required by the Municipal Government Act, 1995, provides a framework to facilitate the co-ordination of policies, programs and capital investments. As such, it provides a foundation for all policies, management plans and strategies which supply more details on specific objectives and action plans.

Natural Areas Management Plan, 1994

The goal of the *Natural Area Management Policy* is to protect, maintain, or reclaim significant natural habitat types and their relevant ecological associations. The document sets out the framework required to identify and establish *Natural Areas Parks* and it provides management guidelines.

Urban Parks Master Plan, 1994

This plan sets out management guidelines for lands along river corridors. The management of these areas provides opportunities for creating wildlife movement corridors.

Open Spaces Plan, 2001

The Open Spaces Management Plan is set for public review in early November. It is anticipated to be the umbrella document which will connect the Natural Areas Management Plan, the Urban Parks Management Plan and other strategies guiding the development and operations of all environmental and municipal reserves to the objective and policies stated in the Municipal Plan.

Integrated Pest Management Plan, 1998

The Integrated Pest Management Plan provides detailed information on how to prevent and manage pests on lands within the City of Calgary. Pests are defined as injurious insects, plants, diseases and animals. This is the policy document that sets out prescriptions, strategies and methodologies for the control of animals deemed to be "pests" such as Beaver and Richardson Ground Squirrel on municipal lands.

Summary of Research Findings (SWOT Analysis)

Strength (resources)

1. There are existing policies to protect and manage wildlife habitat.
The effectiveness of these strategies to maintain healthy wildlife habitats will vary from one natural area to another and will be dependant on political will.
2. Several NGOs with accumulated knowledge and information on wildlife species and individual natural areas biodiversity are active within the City.
They already have gained public respect and support. They are positioned to play active roles in the development of wildlife management strategies and delivery of public education campaigns.
3. Growing interest, knowledge and support of environmental issues among Calgary residents

Weakness (constraints)

1. Municipal reserves are limited to 10% by Municipal Government Act which limits the amount of open spaces that can be dedicated to wildlife.
2. Provincial authority on wildlife management has created a lack of municipal power or resources to manage urban wildlife effectively. Municipal government has the ability to manage "pests" only
3. Natural Areas Parks are becoming more isolated because of increasing development pressures creating "green islands". Lack of appropriate movement corridors is increasing contact between people and wildlife in several ways. One is to increase vehicle collisions, putting people and animals at risk, and the other is to bring wildlife closer to residences, which exacerbates the potential for conflict situations.
4. Parks and recreation staff are dealing with "problem" wildlife without effectively bringing substantial habitat modifications to resolve the conflicts and prevent cycle from repeating annually. There is recognition of the need to alter habitats as described in the *Integrated Pest Management Plan*, but changes or slow to take root.
5. There is currently only anecdotal information on public perception of urban wildlife. The lack of tangible information on tolerance capacity of residents towards urban wildlife makes decision-making difficult.
6. Government agencies and NGOs offer wildlife-related services, but these organisations work in relative isolation from one another. A co-ordinated approach would provide more efficient, cost-effective services to the community.

Opportunities

1. New mayor and council may be willing to pursue substantial changes to wildlife management practices., perceiving it as improving quality of life for residents.
2. Newly created Parks and Recreation Division – Natural Areas Management Section can help co-ordinate work group and move agenda forward.

3. Friends of Natural Areas Parks (Nose Hill, Weaselhead / Glenmore, Bowmont, Paskapoo Slopes, Elbow River, Bearspaw, Shepard Slough, Inglewood & Fish Creek Parks) actively involved in gathering natural resources information and delivering public education.
4. Other NGOs operating in city, across province and nationally can contribute to enhancing urban wildlife management and response to conflict situations (i.e. Calgary Field Naturalists, Sustainable Calgary, Calgary Wildlife Rehabilitation Society, Federation of Alberta Naturalists, Canadian Wildlife Federation)

Threats

5. New mayor and council may see this issue as an impediment to economic growth. There may be a lack of political will to see any changes done.
6. The demand for increased reserve areas may be perceived as a threat from housing development associations and individual businesses because of competition for lands open for development.
7. Municipal and Provincial governments' fiscal constraints restricting ability to provide technical support.

PART 2: Recommendations for new policy or proposed changes, evaluation of policy alternatives, system for monitoring and evaluation

Vision of urban wildlife management for Calgary

One community sustainability principle advanced by Sustainable Calgary in its *State of our city report* (2001) states that "a sustainable community lives in harmony with the natural world. It protects the air, water, soil, flora, fauna, and ecosystems on which it depends for its survival. These are the life support systems for all human communities."

Building on this sustainability principle, ecological landscape planning, as described by the Centre of excellence for sustainable development (website 2001), "advocates the study of the biophysical and socio-cultural systems of a place to determine optimal land use patterns. The approach strives for an understanding of the many and complex relationships that influence communities within the context of a bioregion." Sustainable land use planning must then consider a wide range of factors such as transportation, natural corridors and open spaces, as well as urban growth management.

If this vision were put into a concise statement for urban wildlife management, it would be:

The City of Calgary boast diverse, self-sustaining and healthy urban wildlife populations and natural areas in harmony with values, attitudes, and beliefs of residents where wildlife and people coexist without conflicts.

Goals

Achieving this vision will take co-operative work from the many organisations currently involved in urban wildlife management as well as the businesses and residents of the community.

Land use planners must integrate the concepts of ecological landscape planning into mainstream urban development processes in order to achieve progress in protecting critical wildlife habitats and the wildlife that uses them. These concepts must apply to all aspects of urban growth from roadway engineering to suburb planning. This can only be achieved with the collaboration of land developers. In addition, because of the complexities involved in performing biophysical assessments to determine wildlife values of specific areas, a multi-disciplinary team could achieve a more balanced evaluation of the impacts of development, the costs, and benefits in a more effective way.

Three goals can be stated to help guide the process towards meeting our stated vision for Calgary. These are:

1. Create an integrated network of healthy wildlife sanctuaries interconnected through movement corridors of appropriate dimension for identified urban wildlife species.
2. Manage urban wildlife populations within the tolerance levels that can compatibly coexist with the local human populations.
3. Foster increased awareness and appreciation for the benefits as well as the economic, recreational, scientific, ecological and intrinsic values of urban wildlife through community outreach and education programs.

Details of Objectives, Strategies, and Actors

Goal 1 Create an integrated network of healthy wildlife sanctuaries interconnected through movement corridors.

Objectives

- 1.1 Identify and protect significant wildlife habitats as well as wildlife movement corridors to ensure connection between protected habitats.

Strategies

- Develop an inventory of potentially significant wildlife habitats using data from the Provincial Government as well as NGOs such as the Calgary Fields Naturalists.
- Using established biophysical assessment criteria, work with NGOs to evaluate sites and develop priority ranking of critical habitats for protection.
- Develop alternative methods to acquire lands (due to 10% Municipal reserve restriction) that can be developed and are owned by private developers. These methods could include land purchase, conservation easements, land swaps, or donation to NGOs that specialise in land conservation.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit as well as Planning Unit

Collaborators:

Federal Government: Canadian Wildlife Services

Provincial Government: Sustainable Resources Department, Fish and Wildlife Division, Regional Biologist

Land Developers and their professional associations

NGOs: (volunteers and staff)

Nature Conservancy of Canada

Ducks Unlimited Canada (wetlands)

Calgary Field Naturalists Society

Calgary Area Outdoors Council
"Friends" Associations for individual municipal and provincial parks

Objectives

- 1.2 Establish management strategies for Natural Areas Parks that will maintain integrity of protected areas and reduce fragmentation of wildlife habitats.

Strategies

- Direct trails and other recreation infrastructure towards the periphery of protected areas to reduce fragmentation of wildlife habitats.
- Temporarily close public access to sensitive areas during critical life cycle periods (nesting periods)
- Restore degraded areas to enhance features that will attract desired wildlife species.
- Manipulate habitats to control establish wildlife populations at a desired level and reduce unwanted animals or behaviours as part of an integrated management approach.
- Use a wide range of habitat control methods such as exclusions and habitat manipulation to achieve desired mix of wildlife habitats and diminish conflicts between wildlife and people.
- Using the biophysical assessment as baseline information for each site, perform annual assessments of the use of the areas to prevent habitat degradation.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit as well as Planning Unit

Collaborators:

NGOs: (volunteers and staff)

Ducks Unlimited Canada

Calgary Field Naturalists Society

Calgary Area Outdoors Council

"Friends" Associations for individual municipal and provincial parks

Objectives

- 1.3 Support programs dedicated to enhancing and restoring wildlife habitats across the city.

Strategies

- Promote the benefits of wildlife habitat restoration programs in municipal parks, schoolyards, business and corporate properties, golf courses and private backyards.
- Establish monitoring program to determine effectiveness of habitat modifications in reducing the numbers of conflicts with wildlife.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit, Parks and Recreation Environmental Education Unit as well as Planning Unit

Collaborators:

Golf Courses

NGOs:

Calgary Field Naturalists (Nature Scape program)

Audubon Co-operative Sanctuary System of Canada

Canadian Wildlife Federation (Wild about gardening program)

Calgary Wildlife Rehabilitation Society

Homeowners

Goal 2 Manage urban wildlife populations within the tolerance levels that can compatibly coexist with the local human populations.

Objectives

2.1 Establish inventory and monitoring programs across municipal green spaces to assess changes in wildlife populations and prevent conflict situations.

Strategies

- Determine extent of current wildlife population conflicts by performing a systemic inventory for all green spaces within the city.
- Develop survey methodologies and techniques that allow volunteers to participate while maintaining consistent data gathering processes.
- Monitor the health and diversity of urban wildlife populations through consistent surveys and inventories.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit, Parks and Recreation Environmental Education Unit as well as Planning Unit

Collaborators:

Federal Government: Canadian Wildlife Services

Provincial Government: Sustainable Resources Department, Fish and Wildlife Division, Regional Biologist

NGOs: (volunteers and staff)

Ducks Unlimited Canada

Calgary Field Naturalists Society

"Friends" Associations for individual parks

Objectives

2.2 Establish desired wildlife population targets for species currently identified as "pests" or perceived as either over-abundant or unwanted considering habitat capacity as well as community interests, values, and beliefs.

Strategies

- Determine residents' values, beliefs and attitudes towards wildlife to help establish population targets.
- Establish cultural carrying capacity index through public survey and open houses.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit and Planning Unit

Collaborators:

Provincial Government: Sustainable Resources Department, Fish and Wildlife Division, Regional Biologist

NGOs: (volunteers and staff)

Ducks Unlimited Canada

Calgary Field Naturalists Society

Calgary Area Outdoors Council

"Friends" Associations for individual municipal and provincial parks

Objectives

2.3 Encourage sound, integrated habitat and wildlife management approaches.

Strategies

- Establish acceptability of various control methods such as lethal, fertility, relocation, fear provoking stimuli, chemical repellents, and diversion.
- Develop incentive programs for property owners such as golf courses who experience annual wildlife conflicts to alter the habitat in the problem areas

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit and Planning Unit

Collaborators:

NGOs: (volunteers and staff)

Ducks Unlimited Canada

Calgary Field Naturalists Society

Calgary Wildlife Rehabilitation Society

"Friends" Associations for individual parks

Goal 3 Foster increased awareness and appreciation for the benefits as well as the economic, recreational, scientific, ecological and intrinsic values of urban wildlife through community outreach and education programs.

Objectives

3.1 Identify and integrate stakeholder values, attitudes, and beliefs into wildlife management decision-making process.

Strategies

- Encourage the participation of diverse stakeholder groups in the assessment, planning and implementation of wildlife and habitat management projects.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit, Parks and Recreation Environmental Education Unit and Planning Unit

Collaborators:

NGOs: (volunteers and staff)

Ducks Unlimited Canada

Calgary Field Naturalists Society

Calgary Area Outdoors Council

"Friends" Associations for individual municipal and provincial parks

Objectives

- 3.2 Develop public education and outreach services to foster public awareness, understanding, and appreciation for the diversity of wildlife living within our city.

Strategies

- Develop information campaigns to help residents effectively resolve wildlife conflict situations in a humane and efficient way that prevents the problem from reoccurring.
- Co-ordinate delivery of consistent messages from various organisations regarding urban wildlife to eliminate myths, fears, and misunderstandings.

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit, Parks and Recreation Environmental Education Unit and Planning Unit

Collaborators:

NGOs: (volunteers and staff)

Calgary Field Naturalists Society

"Friends" Associations for individual municipal and provincial parks

Objectives

- 3.3 Co-ordinate delivery of services across the various organisations involved in wildlife management.

Strategies

- Prevent duplication of efforts and remove gaps in information services to the public.
- Increase accessibility of services for residents confronting conflict situations

Actors

Institutional lead:

Municipal Government: Parks and Recreation Division, Natural Areas Management Unit, Parks and Recreation Environmental Education Unit and Planning Unit

Collaborators:

Provincial Government: Sustainable Resources Department, Fish and Wildlife Division, Regional Biologist

NGOs: (volunteers and staff)

Calgary Field Naturalists Society

"Friends" Associations for individual municipal and provincial parks

GAP Analysis

The most obvious gap in urban wildlife management is the void of services between the provincial and municipal levels. Wildlife is an issue that comes under Provincial and Federal jurisdictions, but there are no services offered to municipalities to deal with urban wildlife management problems. The City is left to its own resources to remedy an array of issues for which it is not equipped to deal. Stopgap measures are implemented to deal with crises such as wildlife on highways, which can pose a risk to human safety. In other instances, management decisions are taken in absence of tangible information and managers are left dealing with public outcry when they oppose the measures taken, especially in the case of lethal wildlife control measures.

The City of Calgary has made efforts to protect some areas for their ecological values. These areas, known as environmental reserves in the Municipal Act come under the category of lands that cannot be developed. In some instances, high quality habitats are lost to development because of lack of tools to protect them due to the 10 percent limitations on Municipal Reserves imposed by the Provincial Government. Other methods of protecting habitats have not been investigated thoroughly. Alternative methods to protect lands that can be developed and are owned by private developers could include land purchase, conservation easements, land swaps, or donation to NGOs that specialise in land conservation. Having an inventory of the areas with high wildlife values, assessed through a standardised biophysical process, would provide a measure of certainty to land developers and municipal planners to help in this endeavour.

Though Calgary residents value wildlife, the reality is that for most, there is a lack of knowledge about wildlife, some misconceptions, and even fear. People have little understanding of the diversity of life that inhabits the natural areas of our city. Having people participate in the decision-making process for wildlife management is critical to gain credibility and harness support from the residents who have the most at stake, those for whom wildlife is important. It is critical that management responses to urban wildlife be based on cultural carrying capacity

which is defined as " the number of animals that can compatibly coexist with local human population" (Conover, 2001) Figure 6, demonstrates the spectrum of public participation. Currently, the public involvement tends to concentrate in the range of information and consultation. A shift towards more collaborative public participation would ensure a substantial change in the level of public understanding and appreciation.

Figure 6: Spectrum of public participation



There are currently many organisations involved in public awareness and education campaigns, all are working in isolation with varying degrees of success. The Provincial and Municipal governments both have environmental education services. Also, NGOs offer various public education events hosted by local experts. All this activity is occurring without much co-ordination of efforts and messages. A network of ideas and efforts would make more efficient and effective use of the current resources expended towards public information and education.

Policy Recommendations

Policy formulation

What is most needed is a shift in perceptions and attitudes towards urban wildlife. Many wildlife managers do not perceive urban wildlife as contributing to specie's overall population health. Since funding is a limiting factor in most government endeavours, policy changes will need to be directed to the methods of program and service delivery. For the most part, the current staffing levels are probably adequate to deliver required services.

The policy changes are directed towards altering the current isolated approach to resolving urban wildlife management issues. As such, they would involve increasing the collaboration between the voluntary sectors; residents and interest groups such as NGOs or businesses and the direct services provided by governments. Increased participation by NGOs and their many volunteers can greatly contribute to service delivery to the public as well as providing valuable assistance in monitoring populations and habitats. Financial inputs might be required to help staffing required to support continued involvement by NGOs on specific project by project basis.

Policy implementation

1. Establish working group (task force) composed of representatives from:
 - CWS (Federal),
 - Department of Fish and Wildlife (Provincial),
 - Natural Areas Management and Parks and Recreation departments (Municipal), and
 - NGOs and "Friends" of parks

The mandate of the group would be to **inventory and evaluate** undeveloped areas within and surrounding the city to establish a record of valuable wildlife habitats requiring protection. This record will help city planners to target specific areas for negotiation with developers before they are urbanised. It would give development businesses greater certainty since areas in potential contention for their wildlife values would be known, avoiding possible public outcry over the loss of habitats. This provides certainty for both the development industry as well as wildlife protection.

As a second mandate, this group could develop **monitoring and evaluation methodologies** that could be used with some measures of consistency by volunteers. The volunteers, or staff hired for specific projects from various NGOs could perform the monitoring tasks after some training to ensure consistency of data gathering. This is a more cost-effective method of monitoring the health of areas protected for their wildlife values than to have government employees do

this work. It also provides involvement and training opportunities for residents, ensuring continued knowledge and support for the goals of the projects.

A third mandate would be to establish desired **wildlife population targets** for all urban species of concern based on habitat carrying capacity as well as established residents' tolerance capacity.

All of these efforts may be time consuming at the onset, but will carry long-term benefits associated with increased community involvement and collaboration.

2. Municipal planners should explore and integrate alternative methods to acquire lands that can be developed and are owned by private developers. These could include land purchase, conservation easements, land swaps, or donation to NGOs that specialise in land conservation.

This task will be simplified following a detailed inventory of potentially valuable wildlife habitats. Criteria for priority or importance would be required to help evaluate and rank sites.

Including wildlife concerns should be integrated into mainstream planning processes, not just be an after-thought when there is public outcry over the lost of an area considered important. It should be part of all planning activities related to subdivisions, road development, and open spaces allocation.

3. Establish environmental education network across provincial, municipal and NGOs to co-ordinate messages and delivery of public education programs and services.

Sharing information across the many organisations would facilitate co-ordination of services. It would also provide opportunities for public inquiries to be directed to the organisation best equipped to answer the question or provide the service. This would reduce the frustration sometimes experienced by residents trying to resolve conflict situations or deal with other wildlife-related questions.

4. Provide staff support and financial assistance to encourage the creation of NGO partnership programs to increase delivery and co-ordination of public education and outreach campaigns.

Both the Municipal and Provincial governments have environmental education services already established. Also, many NGOs deliver education programs to schools and host special events to raise public awareness and appreciation for wildlife. These are all delivered in isolation with very little co-ordination. There is often duplication of services, competition for the public's attention, and sometimes, there are conflicting messages regarding the same issue. More could be accomplished with the same financial outlay by supporting NGO involvement and encouraging greater participation of volunteers.

Policy outcomes

Habitats

Wildlife considerations are part of all planning activities from initial land subdivision, road engineering, to the final stages of development.

All levels of government work jointly with community residents through NGOs and local businesses to maintain diverse, self-sustaining, and healthy wildlife populations and natural areas.

Valuable wildlife habitats interconnected by corridors of suitable size to allow wildlife movements are protected.

Integrated habitat management practices, which reduce the need for pesticide use or annual intervention to control undesired populations or wildlife behaviours.

Wildlife

Urban wildlife species are managed to reflect residents' values, beliefs, and attitudes.

Wildlife and people coexist and have as little negative impact on each other as possible.

Residents

Residents appreciate the economic, recreational, scientific, ecological and intrinsic values of urban wildlife.

Residents possess knowledge of the sources information where they can obtain answers to inquiries or resolution to concerns.

Policy monitoring and evaluation process

Several indicators can be used to determine the effectiveness and efficiency of the policy changes.

Indicator 1: The amount of land with high wildlife values withdrawn from development, with participation from land developers.

Indicator 2: Amount of pesticide used to eliminate weeds.

Indicator 3: Annual wildlife monitoring (mammals and birds) through volunteer-performed surveys. Examples of surveys currently performed include the annual Christmas bird count and the springtime breeding bird surveys.

Indicator 4: Number of wildlife conflicts recorded by the various organisations contacted most frequently by residents in search of answers.

Indicator 5: Number of animals reported killed on city roads through vehicle collisions. (Major indicator species would be white-tailed and mule deer)

Appendix 1

Societal attitudes towards nature and associated characteristics (redrawn from *The Planning and Management of Environmentally Sensitive Areas*, Paul F.J. Eagles, adaptation from Bos, Brison and Eagles, 1977; Eagles 1980; Kellert, 1981)

<i>Attitude</i>	<i>Key indicators</i>	<i>Common manifestations associated with attitude</i>	<i>Examples of activities</i>	<i>Associated institutions</i>
1. Negativistic	Common feature is the desire to avoid nature Typical feelings are: indifference; fear; dislike; superstition; separation and alienation from wildlife.	Includes a number of actions ranging from avoidance to the actual killing of animals Animals often perceived as evil, supernatural, beyond the control of man Very anthropocentric view No sense of empathy or kinship with nature.	Actual killing of wildlife for no particular reason Killing to protect own life, crop or livestock Manifestation of dislike and indifference	Land drainage subsidies Wildlife bounties Land clearing incentives
2. Dominionistic	Featured by a sense of superiority and a desire to master nature Nature regarded from the perspective of providing opportunities for dominance and control Associates with animals in order to gain a feeling of challenge, prestige, skill and superiority	Actions which display desire to control, dominate and compete with nature Expressions of prowess and skill in competition Considerable attachment to animals may be present	Horseback riding Trophy hunting Trophy fishing Obedience training such as circuses Dog training Mountain climbing	Trophy hunting clubs Circus Rodeo
3. Utilitarian	Nature perceived in terms of practical or profitable qualities Regarded largely for its material benefits to humans Indifference to issues of animal welfare which do not affect the animal's performance or practical value Profitable qualities of wildlife are emphasized (recreation)	Animals many times perceived as an inexhaustible resource Nature perceived as valuable if it can be used directly for some pragmatic purpose	Wildlife management, harvesting and conservation activities Hunting, fishing Commercial fishing Trapping Game laws Conservation (not preservation)	Wildlife management areas Camping area in park Wildlife management department Resource management
4. Neutralistic	A neutral view of nature Little feeling either towards or against Apathy	Disinterest Little contact with or concern for natural environment	Absence of nature-oriented activities Nature ignored	
5. Scientific	Objective, intellectualised, somewhat circumscribed perspective of animals Animals are regarded more as physical objects of study Perceived as means for acquiring specific	Experimentation applied on animals to acquire physiological, biological and taxonomical knowledge Animals offer opportunities for problem-solving	Experimentation on animals for curiosity of knowledge Scientific study	Biology department Scientists

	<p>knowledge Emotional detachment Curiosity often constitutes the primary motivation for interest in nature</p>	<p>Accepts experimentations on and killing of animals for laboratory purpose Considered to be a value-free approach</p>		
6. Aesthetic	<p>Associated with emotional detachment Central interest is the beauty or symbolic properties of the animals, plants, natural environment</p>	<p>Interest towards nature is almost exclusively on its artistic appeal Remains aloof from physical nature which appears to have no beauty</p>	<p>Photography Painting Sculpture Movies Viewing Animal showmanship</p>	<p>Nature art Animal books, animal painting Horticulture</p>
7. Naturalistic	<p>Profound attraction to wildlife and outdoors Pets are seen as inferior to wildlife Wildlife as valued particularly for the opportunities it provides for activities in the natural environment Represents the "romantic" idea of the wild Knowledge of nature usually present</p>	<p>General interest in animals, specifically wildlife and wilderness Satisfaction from direct personal contact with wilderness Atavistic reward derived from experiencing wilderness as an escape from the perceived pressures and deficiencies of modern industrial lives</p>	<p>Bird watching Wildlifers Outdoor clubs</p>	<p>Wildernwss areas Naturalist clubs</p>
8. Ecologistic	<p>Primarily oriented towards wild and natural settings Major emphasis and affection is for species of animals in their natural settings and habitats Tends to concentrate on a systems approach including the behavioural, physical and biological components</p>	<p>Marked by considerable knowledge of animals and plants Perceives man and animals as equals in a system Futuristic outlook Emphasis on preservation</p>	<p>Study natural habitats and wildlife in wilderness Protect wildlife</p>	<p>Environmental management Environmental studies departments</p>
9. Humanistic	<p>Strong personal affection for individual animals, typically pets rather than wildlife Love felt for animals can often be compared to that felt for human beings Philosophical and ethical principles behind empathy and concern for wildlife human centred</p>	<p>General concern for the well-being of all animals Animals viewed as friends Identification with St-Francis Plants, abiotic elements given lower emphasis than animals</p>	<p>Humane society Protects animals</p>	<p>Humane Society Pet store</p>
10. Moralistic	<p>Great concern for the welfare f animals, both wild and domesticated Has consideration for all animals and is typically more philosophical Tendency to perceive a kinship, a sense of equality between humans and animals</p>	<p>Opposed to the exploitation and infliction of any harm, suffering or death of animals Concern usually strongly held</p>	<p>Association of animal rights Humane Societies Protects and preserve wildlife</p>	<p>Green Peace movement Fund for Animals Anti-hunting organisations</p>

Appendix 2 Policy Inventory

1. Federal Government
 - a) Migratory Birds Convention Act,
 - b) Species at Risk Act
 - c) National Wildlife Policy, 1990 (Co-operative Wildlife Health Network)
 - d) North American Waterfowl Management Plan
 - e) North American Agreement for Environmental Co-operation (NAAEC – environmental side of Free Trade)
 - f) Canadian Biodiversity Strategy

2. Provincial Government
 - a) Municipal Government Act, 1995
 - b) Wildlife Act, 1984
 - c) Natural Heritage Act, 1990
 - d) Sustainable Resources Development, Business Plan, 2001

3. Municipal Government
 - a) The Calgary Plan – Municipal Development Plan, 1998
 - b) State of the Environment Report, 1998
 - c) Sustainable Suburbs Study: Creating More Fiscally, Socially and Environmentally Sustainable Communities, 1995
 - d) Natural Areas Management Plan, 1994
 - e) Urban Parks Master Plan, 1984
 - f) Open Spaces Plan, 2001
 - g) Calgary Parks and Recreation, Policies and Priorities, 1988 - 1992
 - h) Calgary Parks and Recreation, Policy and System Plan, 1981
 - i) Environmental Policy, Principles and Goals,
 - j) Integrated Pest Management Plan, 1998

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