This DRAFT Report will not be final formatted until all edits are implemented into the Final Report. Please review for content, typos, etc. and not formatting issues.

Final formatting will include:
Cover page
Table of Contents
Spacing
Page breaks
Table numbers added and linked
Figure numbers added and linked
Photographs inserted
Page numbers
Footers
Etc.

Appendices may remain as appendices or may become stand-alone documents

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List of Tables

No table of tables entries found. To be numbered, formatted and listed in Final Report.

List of Figures

No table of figures entries found. To be numbered, formatted and listed in Final Report.

List of Maps

No table of maps entries found. To be numbered, formatted and listed in Final Report.

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Foreword

The City of Longmont shares our spaces with a variety of wildlife from the tiniest of insects to the wandering black bear. Wildlife plays an important role in our community, fulfilling many values. A variety of animals provide our residents with recreational opportunities such as fishing and watching wildlife across the City's network of Open Spaces, Greenways, and Natural Areas. Wildlife provide ecosystem services and sustain our very livelihoods through such actions as pollinating crops. Researchers from the State's higher education institutes study our wildlife to further our understanding of the natural world. Also of value is the deep appreciation and respect for wildlife's intrinsic nature to simply exist.

Our community's appreciation of wildlife is reflected in the support of the City's Open Space Program. A key finding in the 2018 Open Space Master Plan Update was that among the highest priorities of Open Space for residents was to provide habitat for wildlife (City of Longmont, 2018). Goals and policies for the protection of wildlife are also stated in Envision Longmont, the City's comprehensive plan. There are also wildlife and habitat protection measures in Longmont's Municipal Code.

Despite this support from our community, wildlife faces many threats. In a recent report from the United Nations, more than one million species of animals and plants worldwide face extinction (IPBES, 2019). The primary cause of the decline in wildlife is habitat loss, fragmentation, and degradation (National Wildlife Federation, 2019) caused by development, mining, energy extraction, agriculture, recreation, water use, pollution, and climate change (National Wildlife Federation, 2019 and Rondeau et al., 2011). The grasslands, wetlands, and aquatic habitats that make up Longmont's natural habitat are key to our local wildlife's continued existence. In fact, two-thirds of the vertebrate animal species considered at risk in Colorado depend on these habitat types (Rondeau et al., 2011). With Colorado's population surpassing five million people in 2008 and an expectation to double that number by 2050 (Colorado Water Conservation Board, 2019), these threats will increase.

This update to the City of Longmont's Wildlife Management Plan was developed in a response to our resident's appreciation for the values that wildlife provides as well as to address the threats faced by our local wildlife. This plan is the City's action to think globally and act locally to help preserve the biodiversity that makes our City a desired place to call home.

~ Written by Jim Krick, Longmont Natural Resources Specialist

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Rondeau, R., K. Decker, J. Handwerk, J. Siemers, L. Grunau, and C. Pague. 2011. The State of Colorado's Biodiversity. Prepared for The Nature Conservancy by the Colorado Natural Heritage Program, Colorado State University, Fort Collins, Colorado.

Executive Summary

This section of the report will not be completed until all edits have been made to the draft report. The edited information for the suggested section titles below will be summarized and integrated into the Executive Summary of the final report.

A. Background

It is anticipated that City Council will consider some of the key concepts and recommendations in this Plan as separate items to be disapproved or approved and applied on a case-by-case basis. The Plan sets forth overall best management practices that Staff may accept or reject in whole or in part as well as policies that City Council may accept or reject in whole or in part.

B. Major Findings and Recommendations

I. Introduction

In reading this Wildlife Management Plan (WMP) and seeking to understand or apply its concepts, the reader should keep the following in mind:

First, much of the Plan conveys basic ecological information on existing wildlife resources and habitats within the project area and develops a methodology for prioritizing future acquisitions and land management actions to optimize City lands for wildlife. The latter recognizes that some of the existing or future open space lands are subject to other, competing or incompatible uses.

Second, recommendations to assist the City in dealing with conflict wildlife on City lands are secondary to the City's overarching "coexistence with wildlife" philosophy toward wildlife that embodies an emphasis on conflict avoidance and wildlife-friendly solutions. More strident methods for dealing with problem wildlife are intended to be a last resort, applied only under limited circumstances.

Third, recommendations for new or modified land development standards would apply to private land primarily in conjunction with proposed subdivision or annexation or along riparian corridors. They are intended to ensure that Longmont continues to support diverse and abundant wildlife for their intrinsic value and their importance to many Longmont residents. The recommendations are not meant to unduly burden development or infringe on property rights but to maintain Longmont's quality of life.

It is anticipated that City Council will consider some of the key concepts and recommendations in this Plan as separate items to be disapproved or approved and applied on a case-by-case basis. The Plan sets forth overall best management practices that Staff may accept or reject in whole or in part as well as policies that City Council may accept or reject in whole or in part.

A. Project Purpose

The multiple purposes of this project were to:

- ***Update*** the existing plan (2005 Wildlife Management Plan)
- Inventory wildlife resources
- Integrate ecological principles
- Include proven management techniques
- Adhere to City value of "coexistence with wildlife and preservation of wildlife and their habitats"
- Provide opportunities for community participation

This Plan is based upon the best science available at this time, the collective judgment of many of the area's natural resource experts, and reflects the interests and concerns of citizens with a stake in Longmont's wildlife conservation.

B. Project Schedule

In December 2018 at the strategic kick-off meeting involving the full project team, including City staff, partner agency advisors, and consultants, the WMP project schedule was proposed and confirmed. Throughout the project, the team worked diligently to keep the project on-schedule.

Project Task	Dec 2018	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	Jun 2019	Jul 2019
Kick-Off & Information Gathering	X	X	X	X	X			
Findings						X		
Draft Plan Review – - Board of Environmental Affairs - Parks and Recreation Advisory Board							X	
Final Plan Approval								X

C.Relevant Regulations and Planning Guidance

This Plan is intended to be implemented on all City-owned or City-managed lands and, in some cases, to provide guidelines for wildlife management on private lands within the City. It is understood that the City of Longmont has a number of guiding planning documents as well as existing projects that his Plan must consider. Specifically, the 2018 Open Space and Trails Master Plan recognized the need for a consistent ecosystem emphasis between Longmont and neighboring jurisdictions. To address this, this Plan has been integrated with relevant county, state, and federal laws and regional planning documents. Many of these other entities have adopted their own ordinances, regulations, and guidance related to wildlife and habitat management. In cases of overlap, federal and state regulations take precedence over this Plan. In addition, a number of parallel policies incorporated into regional planning and guidance documents mesh with, and are supported by, this Plan. These are summarized below.

Endangered Species Act

The federal Endangered Species Act provides a program for the conservation of threatened and endangered plants and animals and the habitats where they are found. The U.S. Fish and Wildlife Service of the Department of the Interior and the National Marine Fisheries Service of the Department of Commerce maintain the list of 1,275 endangered species (772 are plants) and 388 threatened species (172 are plants). The law prohibits any action that results in a "taking" of a listed species or adversely affects habitat. “Taking” is interpreted broadly to include harassment, interference with critical behaviors (e.g., breeding, feeding), and destruction of nests and critical habitat as well as direct physical harm to individual animals.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act was enacted in 1918, and it implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and Russia. Like the Endangered Species Act, it utilizes the concept of “take” to protect birds. “Taking” is interpreted to any attempt at hunting, pursuing,

wounding, killing, possessing or transporting of migratory birds, their eggs, feathers, or nests. The US Fish and Wildlife Service is the agency tasked with enforcing this act, which protects over 1,000 species of birds. Despite the name, the act protects nearly all native birds, regardless of whether or not they are considered migratory.

Colorado Parks and Wildlife State Wildlife Action Plan

The State Wildlife Action Plan's (SWAP) purpose is to outline and prioritize each of Colorado's conservation needs. Colorado's SWAP documents the status of knowledge about many wildlife species of conservation need, most of which are not hunted or fished, the threats to the species and habitats upon which they depend, and an articulation of strategies that can be employed to lessen those threats. SWAP reflects the fundamental goal of CPW and the state as a whole, which is to secure wildlife populations such that they do not require protection via
federal or state listing regulations. SWAP is not a CPW specific plan, and instead is intended to be used by all interested in conserving aspects of Colorado's natural heritage. Longmont can contribute to a variety of the actions and goals identified in the SWAP through implementation of this Plan.

https://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx

Envision Longmont

The City of Longmont adopted Envision Longmont in 2016. The plan is a multimodal and comprehensive plan that includes a number of goals, policies, and strategies that intersect those in this Plan. Envision Longmont states that the City will continue to expand its resource protection programs and initiatives and work with the community to ensure the City's natural,
historic, cultural, agricultural, environmental, and financial resources are preserved and enhanced for current and future generations. Many of the goals, objectives and strategies in Section 5 of Envision Longmont intersect with, and support, the recommendations of the WMP.

https://www.longmontcolorado.gov/home/showdocument?id=15099

Longmont Land Development Code

The City of Longmont Development Code includes regulations that pertain to acquisition or the management of wildlife habitat, including required environmental site assessments, zoning districts, potential mitigation requirements, and specified setbacks and buffer zone management of specific natural resources. Many of the topics covered by recommendations presented in this Plan are already addressed in the City of Longmont Development Standards. The inclusion in this Plan of those recommendations is intended to highlight specific changes that the City should consider or to emphasize topics addressed by the existing code requirements, particularly those pertaining to setbacks and variance requests.

https://library.municode.com/co/longmont/codes/code_of_ordinances

Longmont Open Space Master Plan Update

The Longmont Open Space Master Plan Update was adopted in July 2018. The goals for the Open Space and Trails Program stemming from this plan are:

- Preserve and enhance natural resources
- Acknowledge and support other planning efforts and potential collaborations
- Shape the identity of Longmont
- Provide connections
- Provide passive, low impact recreation compatible with resource protection goals
- Embrace public engagement

- Ensure funding to fulfill the vision

https://www.longmontcolorado.gov/home/showdocument?id=22970

Resilient St Vrain Project

Resilient St. Vrain is an extensive, multi-year project to fully restore the St. Vrain Greenway and improve the St. Vrain Creek channel to protect people, property and infrastructure from future flood risk. The project, sometimes referred to as RSV or RSVP, was developed after Longmont experienced catastrophic flooding in September 2013. Goals of this project are:

- Fully restore the St. Vrain Greenway
- Protect people and property
- Incorporate environmentally sensitive planning
- Honor previous planning efforts

https://www.longmontcolorado.gov/departments/departments-n-z/water/stormwater-drainage/resilient-st-vrain/resilient-st-vrain-project-goals

Longmont Sustainability Plan

Adopted in 2016, this plan "provides a road map for Longmont to achieve the vision of becoming an engaged community that promotes environmental stewardship, economic vitality, and social equity to create a sustainable and thriving future for all." Relevant aspects of the plan were considered in the development of the WMP.

https://www.longmontcolorado.gov/home/showdocument?id=23600

Boulder County Comprehensive Plan

The Boulder County Comprehensive Plan (BCCP) was updated in March of 2018 and responds to the widely accepted principle that the myriad of future land use decisions affecting the county's lands should be made in a coordinated and responsible manner. The St. Vrain Valley is the most highly irrigated portion of Boulder County and consequently contains the most productive agricultural lands. The environs of St. Vrain Creek contain significant resources for the continued livelihood of the Valley, county and region. Policies as mineral resource utilization, wildlife habitat preservation, and agricultural land use were formulated to guide future decisions affecting the St. Vrain Creek environs as well as other riparian areas of the county. However, the BCCP policies dealing with the St. Vrain Creek have as their underlying intent the preservation of water resources for the continuance of the agricultural livelihood of the Valley with the understanding that the core of development will occur within the municipal boundary of Longmont.

https://assets.bouldercounty.org/wp-content/uploads/2018/10/bccp-boulder-county-comprehensive-plan.pdf

II. Public Process

Creation of this WMP included multiple steps to engage the community's interests in topics related to the Plan. To be in alignment with the City of Longmont's goal to encourage and welcome its residents to be involved in aspects of city processes, the Project Team designed a number of public input opportunities to reflect the "inform" and "consult" level of public engagement. These opportunities included:

- Three public meetings –
    - The first public meeting was held on March 7, 2019. The goal of this meeting was to inform the public regarding Resilient St. Vrain Project (RSVP) and the new prairie dog management code and to consult with the public on issues relating to riparian corridors. Participants at the first meeting comprised of:
        - Community members (50-55)
        - City Council members (2)
        - Parks and Recreation Advisory Board member (1)
        - Staff & Peer Agency Staff (10)
    - The second public meeting was held on April 4, 2019. The goal of this second meeting was to inform the public on 1) best management practices suggested by Colorado Parks and Wildlife for managing native fish, 2) currently identified wildlife conflict issues, existing regulatory conditions, and the City's philosophy of "coexistence with wildlife", and 3) the importance of biodiversity and how wildlife enhances the quality of life of its residents. Goals for this meeting also included consulting with the public on 1) best management practices the City should consider when managing pollinators, 2) identifying any wildlife conflict issues that the City may not be aware of or may not currently be able to address, and 3) understanding what species enhance the lives of Longmont residents. Participants at the second meeting comprised of:
        - Community members (45)
        - City Council members (1)
        - Parks and Recreation Advisory Board member (1)
        - Staff & Peer Agency Staff (9)
    - The third public meeting was held on May 23, 2019. The purpose of this meeting was to share key topic findings and related recommendations. Participants at the third meeting consisted of:
        - Community members (5)
        - City Council member (1)
        - Parks and Recreation Advisory Board member (1)
        - Staff & Peer Agency Staff (7)
- Three presentations to decision-making bodies -
    - Board of Environmental Affairs on May 15, 2019 of preliminary findings and recommendations
    - Parks and Recreation Advisory Board on June 10, 2019 to review the draft WMP
    - City Council on X, 2019 to review the draft WMP
- Engage Longmont, an online engagement platform -
    - Utilization of the Stories and Maps features from February 13-May 19, 2019 to obtain input on the importance of biodiversity, to locate important wildlife habitats, and to collect stories on the importance wildlife and how residents coexist with wildlife.
    - In total, the site had 160 visits with 11 contributors being classified as Engaged (provided content in the available features).

All three public meetings were held at the Sunset Campus, 7 S Sunset Street. Efforts to publicize these meetings included direct emails to interested groups and individuals including the development community, flyers posted at key locations such as the Chamber of Commerce and City Hall, web notification, City project webpage, and distribution on listservs such as Boulder County Nature Association.

Details of the input collected at the first two public meetings and from Engage Longmont can be found in the Appendix. The gathered input helped shape the development of the recommendations of the WMP.

Table X: Roles of the Public and of City Council

Role of the Public	**To help shape the recommendations and outcomes of the update to the WMP**
Role of Longmont City Council	**Decision-maker**

To assist with the development of the WMP, a Technical Advisory Team (TAT) was formed to provide crucial experience and expertise. The TAT comprised of:

- Longmont's Project Manager (Daniel Wolford)
- City of Longmont City Department representatives (Open Space and Trails, Planning and Development, Police/Animal Control, Public Information, Public Works, and Water/Wastewater Utilities)
- Representatives from Boulder County Parks and Open Space and Colorado Parks and Wildlife

Members of TAT and the consultants held internal discussions and conducted the three public meetings together to collect community input. The internal discussions focused on identifying the objectives and approaches for the project, and the public meetings, and reviewing research findings, methodologies, and preliminary recommendations.

III. Location and Ecological Setting

The planning area for the Wildlife Management Plan is the same as that established for the Open Space and Trails Master Plan and is bounded by Yellowstone Road on the north, Weld County Road 7 on the east, Oxford Road on the south, and 65th Street on the west. Map X depicts the planning area, including linkages to the South Platte River and foothills tributaries.

This Plan addresses four types of public open lands within the planning area, regarded collectively as the "open space system." The City of Longmont maintains an Open Space program that manages approximately 4,700 acres of land within the planning area. The City also maintains public parks and golf courses that total 658 and 548 acres, respectively. Approximately 14,000 acres managed by the Boulder County Open Space Department are also located within the planning area. Table X lists the acres of Open Space and Parks lands in the planning area. Map x shows the location of these lands, both within and near the planning area.

Table X. Open Space/Park Lands in the Planning Area (62,000 acres) [1]

Land Type	*Total Area (acres)*	*Percent of Planning Area*
City of Longmont Open Space	4,730	7.6
City of Longmont Parks	658	1.0
City of Longmont Golf Courses	548	0.9
Boulder County Open Space	13,722	22.1
St. Vrain State Park [2]	115	0.2
Total Open Space/Parks Lands	**19,773**	**31.8**

[1] *Includes conservation easements managed by the City.*

[2] *Total area of St. Vrain State Park ≈ 756 acres.*

The planning area includes a variety of wildlife habitats as well as urban, suburban, and rural human habitats and "non-habitats." Map X shows the "false-color infrared" satellite imagery that was used in combination with "true color" imagery and ground truthing to identify major classes of land use and habitat types. Red areas generally represent actively growing vegetation, which at the time of the imagery (late summer 2002) would include riparian areas, wetlands, irrigated lawns, and irrigated croplands. Blue or tan areas include fallow fields, dryland or irrigated crops that have been harvested, and hard surfaces (e.g., buildings and parking lots). Green areas are surface water. Map X shows the major habitat types discernible from the satellite imagery.

Table X presents information on the extent of these major habitat types in the planning area. Note that cropland, including both irrigated and non-irrigated land, represents more than 68 percent of the planning area, while non-habitat (e.g., buildings, streets, and parking lots) adds 15 percent. Riparian habitat—areas along streams and irrigation ditches—constitutes less than 2 percent of the planning area.

Table X. Major Habitat Types and Non-Habitat) in the Planning Area

Habitat Type	*Total Area (acres)*	*Percent of Wildlife Habitats*
Agricultural – Cropland	18,321	68.6
Non-habitat	4,009	15.0
Urban – Non-park	1,603	6.0
Open Water Lakes/Ponds	993	3.7
Agricultural – Pastureland	864	3.2
Urban – Park	580	2.1
Riparian – Perennial Stream	180	0.7
Riparian – Other	170	0.6
Total	**26,720**	**100.0**

Commented [RH1]: This table will be updated once the maps are finalized.

Longmont lies near the western edge of the High Plains Section of the Great Plains Province (Hunt 1967). The High Plains Section is bounded on the west in the Longmont vicinity by the foothills and piedmont of the Front Range of the Southern Rocky Mountains.

Prior to settlement by Europeans, the region consisted of a mosaic of prairie habitats, dominated by shortgrass prairie but with sand prairie on sandy soils and tallgrass prairie on relatively moist areas along drainages (Shelford 1963, Marr 1967). The vastness of the prairie was broken only by ribbons of cottonwoods, willows, and other riparian trees and shrubs along streams, pockets of cattails and other wetland plants along drainages and shallow swales, and areas of shrubs on rock outcrops and the steep slopes of mesas and ridges. Today, the view at Sandstone Ranch Park illustrates this mosaic, with shortgrass and some sand prairie elements (mostly removed by mining) atop the bluffs, tallgrass prairie (entirely replaced by non-native pasture) on the St. Vrain floodplain, and riparian woodland (relatively intact, but modified by flooding, grazing, mining, and other uses) along the river.

Wildlife use during the pre-settlement period was dominated visually by grassland herbivores (bison, pronghorn, elk, and black-tailed prairie dog). The mosaic of prairie habitats also supported abundant and diverse communities of small mammals, ground-nesting songbirds, reptiles, and the various predators (carnivores and raptors) that hunted them. The riparian, wetland, and shrubland communities also supported their own wildlife assemblages, most notably with white-tailed deer, wild turkeys, and arboreal songbirds and raptors in the riparian woodlands and native fishes and water birds in the perennial streams.

By the late 19th and early 20th centuries, much of the prairie ecosystem had been converted to agricultural uses. These included the planting of both irrigated crops and non-irrigated (dryland) crops, establishment of pastures in which the native grasses were replaced with more consistently productive non-native grasses, and the installation of numerous small lakes and ditches associated with irrigation and stock watering. Wildlife use also changed during this period, with increasing areas and numbers of deciduous (broadleaf) trees along ditches and ponds providing increased habitat for arboreal (tree-dwelling) or other riparian species and the numerous ponds attracting water birds. A negative aspect of this period was the removal of native vegetation cover by livestock, coupled with the inadvertent introduction of non-native forbs (broadleaf herbs) and annual grasses during the planting of non-native forage grasses (mostly of Eurasian origin). This led to the invasions of weeds that continue to this day.

The construction of irrigation ditches and lakes during the early agricultural period not only increased riparian and wetland habitats, it created additional east-west movement corridors for species that require cover and water. However, this potential benefit was offset for other species by the concurrent impacts to natural streams and riparian corridors due to runoff from plowed fields and concentrated use (including trampling and excessive herbage removal) by livestock. Introductions of non-native “sport” fish into natural streams, channelization of streams to allow closer farming or development, and diversion of water from streams into ditches and lakes reduced habitat quantity and quality for many native aquatics. Overall, the ecosystem changed from one dominated by large, unbroken blocks of habitat to smaller, more fragmented blocks. These “human-affected” habitats are better suited to use by habitat generalists versus habitat specialists, “edge” species versus “interior” species, and species tolerant of (or even partially dependent on) human influence versus more furtive (wary or secretive) species. Concurrently, hunting or trapping of some species for sport, for meat, or to remove predators and “pests” changed the wildlife communities further.

During the late 20th and early 21st centuries, continued human population growth has led to much of the remaining grassland, as well as much of the farmland, being converted to areas of residential, commercial, industrial, or recreational development. In addition, development has encroached very close to the natural stream corridors and the artificial ditch and lake habitats created decades before. This has continued a trend that began much earlier—i.e., loss and fragmentation of native terrestrial and aquatic habitats and the species they support and shifting of plant and wildlife communities to conditions more strongly reflecting human influence.

Nonetheless, while relatively little of the original landscape of Longmont remains, the City continues to contain some ecologically diverse and productive areas, including much of the St. Vrain Creek corridor, other stream and major ditch corridors, and several significant lakes. These areas, and others, provide an opportunity to maintain and enhance relatively natural (although not pristine or truly native) habitat areas. Some of these lands, as well as remaining croplands and semi-native pastureland, also offer the long-term potential to restore a portion of the ecological values formerly lost and ensure that diverse and interesting native wildlife remain a part of Longmont's landscape.

IV. Species Information and Management Guidelines

As noted in Section 1, the original intent of this Plan was to provide management guidance and develop management policies regarding four broad categories of wildlife:

- Federally Listed Threatened or Endangered Species – Includes wildlife species listed by the U.S. Fish and Wildlife Service pursuant to the Endangered Species Act.
- Other Regulatory Species – Includes species (other than those federally listed as threatened or endangered) having some special legal protection, such as migratory waterfowl, other migratory birds, and the game, nongame, and furbearer species regulated by the State of Colorado. Regarding these species, the City wants to ensure that its actions comply fully with applicable state or federal laws and regulations. Additionally, the presence of one or more of these species in a specific location may affect, or potentially interfere with or preclude, some planned City facility or activity.
- Biodiversity Species – Includes species that contribute to the overall biodiversity in Longmont, either through their own presence (if considered rare or otherwise not commonly associated with human developments) or through their importance to other such species. Many citizens view the presence of these species as adding to the quality of life in Longmont by providing opportunities for wildlife viewing and nature study and being consistent with a policy of "think globally, act locally."
- Problem Wildlife – Includes wildlife that may, under some situations, pose a health or safety risk to people; cause substantial harm to public or private property; interfere with or detract from the ecological, recreational, or visual quality of an area; or create a nuisance to City departments or the public at large. Problem wildlife can represent a considerable cost to the City and its citizens in terms of staff time, damage to City property, and interference with intended land uses.

Furthermore, the conceptual framework of these four basic management categories is viewed in the context of three other considerations:

- First, many species of wildlife may fit into two or more of the management categories. The management importance and public interest or concern of one such species, the black-tailed prairie dog, has led to its being discussed in a separate part of this Plan (Section 4.4).
- Second, management of wildlife often means management of their habitat, whether through preservation, enhancement, or restoration of physical habitat or through other means to accommodate their behavioral and physiological needs.
- Third, management of wildlife on City-owned land is often affected, either positively or negatively, by conditions or actions of citizens on adjacent or connected private lands—i.e., wildlife do not recognize property boundaries, and many species have home ranges much greater than most individual Open Space parcels.

These concepts should be kept in mind throughout the remainder of this section, as well as the following sections of this Plan.

A. Federally Listed Threatened or Endangered Species

The Endangered Species Act provides protection to species in imminent danger of extinction throughout all or a significant portion of its range ('endangered") or likely to become endangered in the foreseeable future throughout all or a significant portion of its range endangered ("threatened"). Regulations under the Endangered Species Act prohibit direct physical harm to a listed species, including harassing as well as wounding or killing. These regulations also prohibit actions that result in indirect harm by impairing essential functions such as breeding, feeding, or sheltering (denning, roosting, etc.). Impairment of these functions could include, for example, levels of human activity that interfere with use of a nest site.

One federally listed threatened species, the Preble's meadow jumping mouse ("Preble's"), is known to occur in or near Longmont.

Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)

Ecological Synopsis

This small mammal occurs in portions of the Front Range region of north-central Colorado and in southeastern Wyoming. It is most commonly thought of as a riparian species (i.e., occurring along streams) but is also known to occur along ditches that provide suitable habitat and on the margins of some reservoirs. Typical habitat components for Preble's include a persistently moist creek or ditch (although not necessarily with perennial flows) with an adjacent community of willows or other shrubs and lush grasses or other herbaceous growth.

Preble's (photo at left, courtesy of Robert Schorr) hibernates from early fall to late spring (October through May), generally in a den beneath riparian trees or shrubs. During the active season, individual Preble's may move considerable distances along or away from the stream or ditch to feed or while dispersing to new areas. The U.S. Fish and Wildlife Service typically defines Preble's habitat as extending 300 feet beyond the 100-year floodplain of a stream or, if no floodplain exists (e.g., along a ditch), 300 feet from its outer edge. Fragmented or isolated habitats that otherwise appear suitable generally do not support Preble's.
Preble's was listed as threatened under the Endangered Species Act due to historic and ongoing impacts to its habitat and mortality or interference with essential behaviors (e.g., feeding, breeding, denning) of individuals. Recognized threats to Preble's include:

- habitat loss or fragmentation from residential, commercial, recreational, industrial, and institutional development
- predation by pets (especially domestic cats) or by concentrations of native predators attracted to areas of human use
- habitat loss or fragmentation related to highway and bridge construction
- agricultural activities, including use of riparian corridors by livestock and growing of crops in proximity to a stream
- modification to stream habitat, including structure and hydrology
- water developments and flood control practices
- mining, particularly sand and gravel operations on floodplains
- spills or releases of hazardous materials or other pollutants from adjacent land uses

Regulatory Compliance

As of the date of this Plan, populations of Preble's have been documented along portions of the St. Vrain west of Airport Road. Captures have been recorded on Boulder County Open Space properties west of the City limits, and these populations appear to have persisted even after the devasting flood of 2013.

Trapping in lower reaches of the St. Vrain and other streams in Longmont have not yielded captures of Preble's, possibly reflecting the habitat fragmentation and lateral confinement that occurred during the expansion of agriculture and subsequent urban/suburban development. However, trapping has been very limited within City limits and on downstream reaches, and almost no trapping has occurred since 2013. Therefore, it is possible that this species currently exists in other parts of the City. Additionally, because Preble's is known to travel considerable distances within a single summer season, or even on a single night, it is possible that currently unoccupied habitats could be colonized in the future.

Where Preble's is documented to occur based on live-trapping presence/absence surveys or assumed to occur based on proximity and connectivity to areas of known occurrence, the U.S. Fish and Wildlife Service has the authority to regulate any activities that may affect its habitat. Exemptions include rodent trapping within 10 feet of, or inside, a structure used by humans; maintenance of actively used ditches; ongoing agricultural activities; ongoing uses of water; maintenance or replacement of landscaping; and control of noxious weeds.

Except for these specific exemptions, the U.S. Fish and Wildlife Service regulates any habitat modification or other actions that could result in the "taking" of one or more individual or jeopardize the survival or recovery of the species. The U.S. Fish and Wildlife Service regulates these potential occurrences as follows:

If another federal agency has the lead role in authorizing the action—e.g., issuance by the U.S. Army Corps of Engineers of a permit (under Section 404 of the Clean Water Act) for impacts to wetlands or other jurisdictional waters of the U.S.—the U.S. Fish and Wildlife Service participates through the interagency consultation process under Section 7 of the Endangered Species Act. In this context, the U.S. Army Corps of Engineers typically requires, as a permit condition, any mitigation measures specified by the U.S. Fish and Wildlife Service. These measures generally involve minimizing habitat impacts, restoring areas of temporary impacts, and offsetting permanent impacts by creating new habitat or enhancing unaffected habitat.

If another federal agency does not have the lead role in authorizing the action, the U.S. Fish and Wildlife Service regulates the action directly. Typically, any action that would result in modification or loss of habitat as defined by the U.S. Fish and Wildlife Service (e.g., extending 300 feet from the 100-year floodplain) requires the preparation of a Habitat Conservation Plan as part of issuance of an "Incidental Take Permit" under Section 10 of the Endangered Species Act. The Habitat Conservation Plan specifies measures that the applicant would take to minimize habitat impacts, restore areas of temporary impacts, and offset permanent impacts by creating new habitat or enhancing unaffected habitat. This may result in reducing the habitat width to less than 300 feet but improving the habitat quality and/or contiguity within the remaining width (e.g., 150 feet).

Habitat Preservation and Management

In addition to complying with legal requirements under the Endangered Species Act, it is the City's intent to aid in the survival and recovery of this species. To this end, the City should:

- Consider the occurrence or potential for occurrence of Preble's as a positive factor when evaluating and prioritizing future Open Space acquisitions.
- For potential Preble's habitat on City lands, address the habitat requirements of Preble's to the extent practicable in conjunction with habitat management for other species or uses.
- For any project in which the City is the applicant/proponent, design the project to avoid or minimize habitat loss to the extent practicable.
- Conduct live-trapping presence/absence surveys on City-owned lands to determine the extent of the Preble's occurrence in the region and to identify restoration priorities.

Future Status
In August 2018, the US Fish and Wildlife Service initiated a five-year listing status review for the Preble's. This review is a regularly scheduled process that is mandated by the Endangered Species Act. Separately, petitions to delist the Preble's were submitted to the US Fish and Wildlife Service in 1999, 2003, and 2017. None of these petitions have resulted in a delisting, and there are currently no active petitions for delisting the Preble's under review.

If, at some point in the future, the U.S. Fish and Wildlife Service determines that Preble's should be delisted, it would continue to qualify as a biodiversity species as that term is used in this Plan (see Section 4.3). Additionally, the types of riparian habitat it uses are also important for other species, as described elsewhere in this Plan. Therefore, delisting of Preble's would not significantly affect the management concepts summarized above, except regarding regulatory compliance.

B. Other Regulatory Species

Bald Eagle (*Haliaeetus leucocephalus*)
Ecological Synopsis
The bald eagle is a large raptor (bird of prey) most commonly associated with rivers and lakes, where it hunts for fish and waterfowl. During the winter, bald eagles occur along areas of open water but may also be attracted to concentrations of other prey such as prairie dogs and cottontail rabbits. Wintering bald eagles use large trees as both diurnal (daytime) perches and nocturnal (nighttime) roosts. Winter roosting can be by individual eagles or in large groups ("communal roosts"). Trees used for perching or roosting commonly include mature cottonwoods and other broadleaf trees along streams, ditches, and lake margins, as well as scattered individuals or small clumps of trees associated with farms and ranches.

Bald eagles are known to roost along the St. Vrain Creek corridor in Longmont, and they also frequent many reservoirs and ponds, especially in the winter months. A communal roost has been identified on Open Space property downstream of the confluence of St. Vrain Creek and Dry Creek.

Beginning in the 1980s, bald eagles resumed nesting in the region, after an absence of a few decades due to population declines associated with pesticide use and other causes. The number of nests has gradually increased, and the City and Colorado Parks and Wildlife now identifies at least three active nest sites in the vicinity of Longmont. Assuming continued availability of adequate prey and large trees for perching, roosting, or nesting, it is likely that the number of bald eagles in Longmont will continue to increase as young raised in nearby nests seek their own territories and as overall populations in the region continue to increase.

Regulatory Compliance
The bald eagle was delisted under the Endangered Species Act in 2007. However, it is still afforded additional protections under the Bald and Golden Eagle Protection Act. This act prohibits the "take" of eagles, their parts, nests or eggs, with "take" being defined as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

The golden eagle is also protected by the Bald and Golden Eagle Protection Act, which was enacted in large part due to shooting of eagles and destruction of their nests, both as "sport" and by ranchers concerned about loss of newly born livestock. Specifically, some immature bald eagles were being shot by people who claimed to have thought that the birds were golden eagles. Therefore, the Bald and Golden Eagle Protection Act protected the golden eagle as a way to help reduce mortality of bald eagles.

To ensure compliance with the Bald and Golden Eagle Protection Act, the City should implement the following protocols.

The City should avoid, to the extent practicable, any construction, maintenance, recreational, or other activity within 0.5 mile of an active nest or occupied communal roost.

If avoidance of a 0.5-mile buffer is not practicable, the City should consult with the U.S. Fish and Wildlife Service and Colorado Parks and Wildlife before implementing any construction, maintenance, recreational, or other activity within the buffer.

Habitat Preservation and Management

In addition to complying with any legal requirements under the Bald and Golden Eagle Protection Act, it is the City's intent to aid in the survival and recovery of this species. To this end, the City should:

- Not conduct prairie dog control, including relocation or extermination, on any colony larger than 100 prairie dogs within 1 mile of an active nest or occupied communal roost.
- To the extent practicable, not remove trees greater than 12 inches in diameter within 0.25 mile of a documented nest site or communal roost, even if the removal would occur when the nest or roost is not active or occupied.
- Consider the documented presence of bald eagle nesting, roosting, or feeding sites as a positive factor when evaluating and prioritizing future Open Space acquisitions.
- For potential bald eagle habitat on City lands (streams, lakes, and large prairie dog colonies), address the habitat requirements of the bald eagle to the extent practicable in conjunction with habitat management for other species or uses.
- For any project in which the City is the applicant/proponent, design the project to avoid or minimize habitat loss and the potential for disturbance to the extent practicable.

Colorado Big Game, Small Game, Waterfowl, Furbearers, Nongame Wildlife, Game Fish and Nongame Fish

Regulatory Compliance

In addition to the federal protection for some species described above, native terrestrial wildlife in Colorado is classified by Colorado Parks and Wildlife as big game, small game, waterfowl, furbearers, and nongame. Fish are classified as game or nongame species. These categories are described here because of restrictions on whether, how, and when they may be taken. Any use of hunting for management or recreation would comply with Colorado Parks and Wildlife hunting regulations. Fishing on any City-owned lands would also comply with Colorado Parks and Wildlife fishing regulations. Harvesting fish as management/recreation tool (e.g., bow hunting for carp at Union Reservoir) is a specialized situation that requires approval by the City manager, who may also choose to provide an opportunity for public comment and a hearing before the Parks and Recreation Advisory Board or City Council.

Big Game – In Longmont, these species include the mule deer (left), white-tailed deer, and black bear. However, the last species is generally not hunted east of the mountains in the Longmont vicinity. Both species of deer may be hunted in the general area, but only in areas where firearms or hunting are not prohibited by local ordinances or restrictions of private landowners. Hunting of big game is on a permit basis administered by Colorado Parks and Wildlife and limited to specific methods, dates, and numbers of males and females. Hunting for big game is not currently practiced on City lands and is not envisioned by this Plan. If hunting is

contemplated as a management tool in the future, it would be limited to limited and specific situations and coordinated with Colorado Parks and Wildlife. Prior to implementing any hunting program, the City would provide an opportunity for public comment and a hearing before City Council.

Small Game – This category includes a broad range of species. As of the date of this Plan, species listed as small game that can be hunted in the Longmont area (if not in conflict with firearms or hunting restrictions) during specified seasons include:

- Mammals: cottontail rabbits, jackrabbits, black-tailed prairie dog, fox squirrel
- Birds: crows, doves, ring-necked pheasant, sora, Virginia rail, wild turkey, wild ducks, wild geese, coot, snipe, merganser, band-tailed pigeons, European starling, house sparrow
- Reptiles: prairie rattlesnake (below left) and common snapping turtle (below right)

Furbearers –badger, beaver, bobcat, coyote, mink, muskrat, opossum, raccoon, red fox, striped skunk, and weasels. These animals may be trapped during certain seasons (the coyote year- round), but with restrictions on the type of trap.

Nongame Wildlife – All terrestrial native wildlife not included in the lists above are classified as nongame in Colorado and may not be killed or captured without a permit. Permits may be issued for scientific rehabilitation, research, the removal of nuisance animals, or some other purposes. This restriction against killing nongame wildlife specifically exempts the killing of bats, mice (excluding the Preble's), voles, rats, porcupines, and ground squirrels that are creating a nuisance or damaging property. It also exempts the capture of up to four individuals annually (twelve in the aggregate) of most reptile species (excluding State-listed Threatened and Endangered Species or Special Concern Species).

Game Fish – All species of fish which currently exist in Colorado or may be introduced (excluding unregulated species, prohibited nongame species, and threatened and endangered species) are classified as game fish. The most commonly sought game fish in Longmont are non-native species introduced to lakes or ponds specifically to provide a recreational resource. This includes (but is not limited to) brown and rainbow trout, largemouth and smallmouth bass, white bass and "wipers" (striped bass/white bass hybrids), black and white crappies, bluegill and pumpkinseed sunfish, walleye, yellow perch, northern pike, and channel catfish.

Native fishes commonly sought, although not necessarily kept by anglers include the green sunfish and bullhead (catfish). Colorado Parks and Wildlife also designates suckers, minnows, topminnows (killifish), and gizzard shad as game fish, although these are seldom sought by anglers. The designation of minnows as game fish does not apply to State-listed Threatened or Endangered Species or Special Concern Species.

For game fish, Colorado Parks and Wildlife establishes limits on the methods of capture and the number of individuals and size classes that may be kept if caught, except that some species (e.g., minnows and suckers) may be open to unlimited takes. Bullfrogs (non-native), the aquatic larvae of tiger salamanders (sometimes erroneously called "mud puppies" or "water dogs"), and some species of crustaceans can also be legally possessed.

Nongame Fish – In Colorado, nongame fishes consist mostly of members of the minnow family, including State-listed threatened or endangered species and Special Concern species (see Section X). Taking baitfish (minnows or other small fishes) is prohibited in natural streams statewide, as well as in all waters of some counties, including Boulder County. One reason for this prohibition is to protect rare species that could be inadvertently captured and used for bait. Two such species in the Longmont area are the northern redbelly dace (below left) and common shiner (below right), which are State-listed endangered and threatened,

respectively. Any State-listed threatened or endangered fish species must be released immediately if caught.

Longmont is uniquely positioned within the Front Range to support a diversity of nongame, native fish species. St Vrain Creek especially is considered a transition zone stream, meaning it provides cool waters that are transitional between cold mountain streams and warmer plains streams. It also supports some species that are considered "glacial relicts," meaning they persist in only a portion of their original range that has changed significantly from the last glacial period. Even with the threats to biodiversity inherent in rapid development along the Front Range, species diversity remains high in St. Vrain Creek as it passes through Longmont. Though most of these species do not provide value as game fish, they support a healthy riparian ecosystem, and in some instances, St. Vrain Creek provides some of the last known habitat for these species in Colorado.

Migratory Birds

Ecological Synopsis

All native birds and their active nests (including the nest structure, eggs, or young) in the U.S. are protected by the federal Migratory Bird Treaty Act. This essentially includes all species except for introduced upland gamebirds, domestic pigeons, European starlings, and house sparrows and is not strictly limited to migratory species in the narrow sense. That is, it also covers native resident species.

All "natural" and nearly all "non-natural" (i.e., human-created) habitats in Longmont support native bird species. Nesting birds may range from a handful of species in relatively homogeneous habitats such cattail marshes to twenty or more species in structurally complex habitats such as riparian woodlands. While the Migratory Bird Treaty Act applies to all native species, concerns about the impacts of habitat loss and fragmentation on avian populations mostly involves specific groups of species. These include:

Raptors – Birds of prey are generally of special interest because they occur in much lower numbers than most small species, require much larger areas of unfragmented habitat, require much larger prey, and are more readily seen and appreciated by the general public. Nesting raptors in the Longmont vicinity include (in addition to the bald eagle) the great horned owl, long-eared owl, burrowing owl, barn owl, American kestrel, osprey, Cooper's hawk, sharp-shinned hawk, northern harrier, ferruginous hawk, red-tailed hawk, Swainson's hawk, and golden eagle. Most of these species, including the red-tailed hawk (right), adapt readily to human presence when sufficient habitat is preserved for nesting, perching, and feeding and when these areas are protected from human disturbance.

Most of the raptors in the Longmont vicinity rely primarily on large trees or structures (e.g., utility poles, abandoned buildings) for nesting, and most also rely on nearby open habitats (grassland, ranchland, farmland) for hunting. Exceptions to the latter include the osprey, which is exclusively a fish-eating species; the Cooper's and sharp-shinned hawk, which generally hunt in woodlands or residential areas with mature trees; and the northern harrier, which nests on the ground in native grasslands. Ferruginous hawks and many of the other species also nests on cliffs, while the burrowing owl nests in abandoned prairie dog burrows.

Wading Birds, Shorebirds, and Waterfowl – These species are of special interest because they are large and spectacular in flight or interesting to observe (great blue heron, black-crowned night-heron, great egret, snowy egret, American white pelican [right]), readily seen and recognized by the public (Canada goose, mallard, killdeer), or relatively rare and secretive (bittern). However, many other water birds occur in Longmont. These include numerous ducks, other swimming birds (coots, loons, grebes), myriad shorebirds (sandpipers and plovers, the vast majority of which are present only during migration), and rails (Virginia

rail, sora). All of these species and other water birds rely to some extent on the presence of aquatic or wetland habitats for nesting and feeding. Depending on the species, they may occur most commonly on open water, along shores, or in adjacent cattail marshes. Herons and egrets nest in trees, particularly in large cottonwoods along rivers and lakes.

Colonial Nesters – Although all native songbirds are protected by the Migratory Bird Treaty Act, colonial nesters are of special interest because an action that affects one nest may simultaneously affect many others. The most common colonial species in the Longmont area is the cliff swallow. This species nests not only on cliffs, but also very commonly under bridges or beneath the eves of farmhouses, ranch houses, and other rural structures. The cliff swallow is a very beneficial species because it feeds on aerial insects, including mosquitoes. Another swallow, the barn swallow, often nests non-colonially but in association with cliff swallows. Yet another swallow species, the bank swallow, nests colonially in burrows that it excavates in steep banks along rivers. The northern rough winged swallow, a more common species than the bank swallow, also nests in holes in riverbanks and, although not colonial per se, often uses closely spaced nests. Great blue herons and related species may also nest colonially in areas of large trees along rivers or lake/pond margins.

Highly Migratory, Rare, Declining, or Specialized Species – While all native birds are protected by the Migratory Bird Treaty Act, special concern is given to species that migrate long distances between Longmont and wintering grounds (including neotropical migrants, which nest in the tropics of Central and South America); are considered "rare" in the broad sense (i.e., present infrequently or in small numbers); are undergoing a significant regional, national, or global decline; are limited to very specific, small, or vulnerable habitats; or are listed by the State. Because these species nest in small numbers or in limited habitat types, relatively minor loss of habitat can have a much larger negative impact than for species that are abundant, more widespread, or more generalized in their habitat needs.

These highly migratory, rare, declining, or specialized species may use a range of habitat types in Longmont but are mostly associated with riparian corridors, large cattail marshes, or relatively intact native grasslands. Examples include various species of flycatchers, vireos, warblers, and grassland sparrows, as well as the yellow-headed blackbird (compared to the much more abundant and generalized red-winged blackbird). They tend not to occur in urban or other highly modified habitats, or the type of patchy, fragmented habitats generally associated with human presence. Additionally, many of these species are included among the "biodiversity" species management group discussed in Section X.

Regulatory Compliance

The Migratory Bird Treaty Act prohibits harming a native bird or destroying an active nest, including eggs or young. Nest destruction includes activities that cause abandonment of a nest that leads to mortality of eggs or young. However, it does not prohibit destroying an inactive nest (i.e., one that is not being actively built or that does not contain eggs or young). From a practical standpoint, however, this law is generally enforced primarily for the species of special interest or concern discussed above. Nonetheless, the statute applies to all native species.

Additionally, language in the Longmont Municipal Code has designated the City as a bird sanctuary. The local ordinance makes it unlawful to "trap, hunt, shoot, or attempt to shoot or molest, in any manner, any bird or wild fowl, or to rob bird nests of wild fowl nests." Therefore, consistent with the Migratory Bird Treaty Act and the City's designation as a bird sanctuary, the City should:

- To the extent practicable, avoid construction or major maintenance projects in bird nesting habitat areas during the appropriate nesting season.

- If nesting seasons cannot be avoided, surveys within a prescribed buffer of the site should be conducted prior to project initiation.
- If an active nest is present, an appropriate nest buffer for the identified species should be applied, as recommended by CPW or the City. Construction activities within the buffer should be delayed at least until the chicks have fledged.

Habitat Preservation and Management

For these species, the issues discussed in this section focus on compliance with the Migratory Bird Treaty Act and consistency with the City's designation as a bird sanctuary. Most of these species are also included in the biodiversity category. Section X provides management recommendations for migratory birds in that category. Avoiding or minimizing habitat loss and disturbance from human activity in areas with native plant communities, and especially in areas along streams and lakes or ponds, would both enhance the preservation of these species and help ensure compliance with the Migratory Bird Treaty Act.

Two specific management measures related to these species are as follows:

- Where practicable, avoid locating trails and paths within 300 feet of known nesting areas for raptors, large wading birds, pelicans, and other sensitive species.
- Where this setback distance is not practicable, be prepared to close trail segments during the period in which a nest of one of these sensitive species is occupied to prevent abandonment due to human disturbance.

C. Species that Increase Longmont's Biodiversity

Ecological Synopsis

In a sense, any species present in Longmont adds to the overall biodiversity of the community, since biodiversity is equivalent to "species richness" (the number of species inhabiting an area). For example, the American robin and fox squirrel are part of Longmont's biodiversity but would be present regardless of any wildlife- or habitat-management actions taken by the City. Therefore, this section focuses on species in one or more of the following more specialized groups:

- Federally listed or State-listed threatened or endangered species or special concern species
- Species on which other biodiversity species are highly reliant
- Uncommon, secretive, habitat-specialist, or interesting species; this includes the Boulder County Nature Association (BCNA) list of birds of special concern (Hallock and Jones 2010)

Species in these groups are summarized in Table X. Note that some fit into more than one group. Appendix X is a list of vertebrate species (mammals, birds, reptiles, amphibians, and fishes) known to occur in the planning area or likely to occur based on their geographic ranges and habitat preferences. The "likely to occur" species do not include the large number of birds that could pass through the area very infrequently.

Table X. Species that Add to Longmont's Biodiversity

Species	Habitat Requirements	Comments Regarding Current or Potential Status in Longmont Area
FEDERALLY LISTED THREATENED (T) OR ENDANGERED (E) SPECIES		
Preble's Meadow Jumping Mouse (T)	Riparian shrublands, moist meadows, and adjacent uplands.	Potentially present along any stream or ditch that provides suitable habitat components. Documented to occur near western edge of area.
STATE-LISTED THREATENED (T) OR ENDANGERED (E) SPECIES		
Burrowing Owl (T)	Prairie dog colonies.	Potentially present in any prairie dog colony.
Brassy minnow (T), Common Shiner (T), Lake Chub (E), Northern Redbelly Dace (E), Suckermouth minnow (E)	Relatively intact perennial streams with diverse habitat and good water quality.	All species historically occurred in St. Vrain Creek near Longmont, but none detected since 2013. If caught while fishing, must be released unharmed.
STATE-LISTED SPECIES OF SPECIAL CONCERN		
Black-tailed Prairie Dog	Shortgrass prairie or abandoned fields and pastures.	Occurs throughout Longmont in vacant lands. Attracts several predator species. Presence negatively affects some species. Native vegetation may be harmed.
Swift Fox	Shortgrass prairie, sand prairie.	Not known or expected in Longmont; occurs in eastern Weld County.
Townsend's Big-eared Bat	Mature trees.	St. Vrain, Lefthand, and Boulder Creek corridors and other areas of cottonwood woodland around lakes, ditches, or farm buildings.
Bald Eagle	Large trees for nesting, roosting, or perching, mostly near rivers or reservoirs. Feeds primarily on fish, waterfowl, and prairie dogs or other small mammals.	Potentially present at any stream corridor, reservoir, or prairie dog colony. Sometimes concentrates at Union Reservoir and St. Vrain Creek in winter. Becomingly increasingly common in area and now nests near Longmont.
Ferruginous Hawk	Grasslands with trees or cliffs for nesting.	Occurs year-round; attracted to prairie dog colonies for prey.
Peregrine Falcon	Lakes and rivers for hunting of waterfowl and other large birds; cliffs for nesting.	Could occur in Longmont as migrant or transient, primarily around larger reservoirs.
Mountain Plover	Shortgrass prairie or areas cropped short by prairie dogs.	Probably extirpated from (i.e., no longer present in) Longmont.

Species	Habitat Requirements	Comments Regarding Current or Potential Status in Longmont Area
Common Garter Snake	Moist grasslands and meadows along stream, ponds, lakes.	St. Vrain, Lefthand, and Boulder Creek corridors, major irrigation ditches, lake margins
Northern Leopard Frog	Ponds, slow-flowing sections of perennial streams.	St. Vrain, Lefthand, and Boulder Creeks, any farm pond or other reservoir
Iowa Darter, Orange-spotted Sunfish, Plains topminnow, Stonecat	Relatively intact perennial streams with diverse habitat and good water quality.	St. Vrain Creek Capturing of any fish for use as bait is prohibited in Boulder County.
BOULDER COUNTY BIRDS OF SPECIAL CONCERN ("RARE" OR "RARE AND DECLINING") – POTENTIAL NESTERS		
Northern Bobwhite	Thickets along streams. May move into open land to feed.	Well-developed riparian corridors and thickets associated with ditches or margins of agricultural fields.
Eared Grebe	Marshes, ponds, lakes. Build platform nests in shallow areas.	Well-developed wetland marshes along lake/pond margins.
Least Bittern	Cattail marshes. Secretive. Requires relatively large habitats.	Well-developed wetland marshes along streams, ditches, and lake/pond margins.
Great Egret	Cottonwood groves. Needs tall trees for nesting.	A nesting colony has become established along the St. Vrain in eastern Longmont. Other colonies could also become established along major streams and lakes.
Northern Harrier	Grasslands and marshes. Nests on the ground, hunts low over open ground.	Needs large blocks of suitable habitat. Can hunt over pastures, but periodic mowing makes these unsuitable for nesting.
Peregrine Falcon	See description above.	See description above.
Long-eared Owl	Thickets and woodlands.	Well-developed riparian corridors and thickets associated with ditches or margins of agricultural fields.
Short-eared Owl	Grasslands and marshes (winter only).	Needs expanses of suitable habitat, including native grassland, agricultural pastures, or wetland marshes.
Black Swift	Mountain cliffs near waterfalls or dripping caves.	Occurs in western Boulder County. Unlikely to occur in Longmont.
Lewis's Woodpecker	Riparian woodlands.	Nests in mature trees, including clumps around ranch or farm buildings. May feed in adjacent cornfields as well as native habitats.

Species	Habitat Requirements	Comments Regarding Current or Potential Status in Longmont Area
Red-headed Woodpecker	Riparian woodlands.	Nests in mature trees, including clumps around ranch or farm buildings. May feed in adjacent cornfields as well as native habitats. Possibly no longer present in the area.
Willow Flycatcher	Riparian areas, generally in the shrub layer.	Well-developed riparian corridors and willow thickets along creeks and streams.
Loggerhead Shrike	Grasslands and farms. Nests in trees or shrubs.	Hunts for small prey, including mice. Generally prefers grasslands or farmlands with scattered trees.
Bank Swallow	Riverbanks.	Nests colonially by burrowing into steep banks. Highly migratory.
Veery	Foothills and mountain riparian habitat.	Well-developed riparian corridors and willow thickets along creeks and streams.
Northern Mockingbird	Riparian and agricultural habitats.	Nests in shrubs or lower portions of trees. Formerly rare but regular breeder in area; now irregular.
Sage Thrasher	Foothills shrublands.	Nests in on the ground or low in shrubs, especially sagebrush.
Brown Thrasher	Thickets and woodlands. Nests in trees or tall shrubs, feeds on the ground.	Well-developed riparian corridors and thickets around ditches and agricultural fields.
American Redstart	Riparian habitats and trees near water.	Recent nesting has been at outer edge of foothills. Formerly nested in Longmont area.
Ovenbird	Breeds in ponderosa pine or mixed conifer forests.	Small contingent observed near Boulder. Unlikely to occur in Longmont.
Lark Bunting	Grasslands. Ground-nester. Colorado state bird.	Needs relatively extensive grassland or semi-natural pasture. Mown pastures are not suitable unless mowing is delayed until after breeding seasons.
UNCOMMON, SECRETIVE, HABITAT-SPECIALIST, OR HIGH-INTEREST SPECIES OR GROUPS		
Bats	Large trees for roosting; many species hunt over water.	St. Vrain, Lefthand, and Boulder Creek corridors and areas of trees along ditches, reservoirs, and ranch/farm structures. Consume large numbers of aerial insects.

Species	Habitat Requirements	Comments Regarding Current or Potential Status in Longmont Area
Black-tailed Prairie Dog	Shortgrass prairie or abandoned fields and pastures.	Occurs throughout Longmont in vacant lands. Attracts several predator species. Presence negatively affects some species. Native vegetation may be harmed.
Carnivores (badger, bobcat, coyote, red fox)	Mostly areas of relatively intact native or semi-natural habitats. Coyote and red fox may occur in agricultural or residential areas.	St. Vrain, Lefthand, and Boulder Creek corridors, areas around ditches and reservoirs, and relatively good-quality grassland/pasture areas. Red fox often attracted to urban areas in search of food or denning sites. Does not include raccoons and striped skunks, which are ubiquitous.
Shrews and Uncommon Small Rodents (pocket mice, kangaroo rats, jumping mice, grasshopper mice, woodrat, prairie vole). Do not include non- native house mouse and Norway rat and abundant native species (meadow vole, deer mouse, harvest mice).	Mostly areas of relatively intact native or semi-natural habitats.	St. Vrain, Lefthand, and Boulder Creek corridors, major ditches and lake/pond margins, and good-quality grassland or semi- natural pasture areas that are not mown, weedy, or overgrazed. Most are active only at night so seldom seen. Small rodents are important prey for carnivores, raptors, and snakes. House cats may take a major toll.
White-tailed Deer	Mostly areas of relatively intact native or semi-natural habitats, especially along streams. Much less abundant and widespread than mule deer.	St. Vrain, Lefthand, and Boulder Creek corridors, areas around ditches and reservoirs, and relatively good-quality grassland/pasture areas. Whitetails are typically more secretive and wary of humans than mule deer. Dogs running at-large can severely impact deer.
Raptors (falcons, eagles, hawks, owls)	Mostly large trees for nesting and unfragmented blocks of woodland, grassland, or reservoirs for hunting. Some “edge” species more likely near human habitations or in habitat mosaics. Prairie dogs are important prey for some species.	St. Vrain, Lefthand, and Boulder Creek corridors. Areas with large trees along ditches, reservoirs, and ranches or farms are used if sufficient hunting habitat is available nearby. Sensitive to human disturbance in area of nest. Major focus of birders in all seasons.

Species	Habitat Requirements	Comments Regarding Current or Potential Status in Longmont Area
Neotropical Migrant Small Birds	Some pass through during migration; others nest in Longmont area. Mostly in relatively intact native habitats, including areas with woodlands, grasslands, and wetlands. Mostly associated with relatively large, unfragmented habitats rather than edges or small patches.	Woodland species – St. Vrain, Lefthand, and Boulder Creek corridors and wooded areas along ditches, reservoirs, parks, and cemeteries. Less furtive species may use large trees around ranch or farm structures and older neighborhoods. Prairie species – Grasslands or semi-natural pastures that are not mown or overgrazed. Wetland species – Cattail marshes or willow wetlands along streams, ditches, and ponds. Most are sensitive to human disturbance, especially in area of nest. Major focus of birders. House cats can inflict a major toll.
Water Birds (wading birds, shorebirds, waterfowl, American white pelican, etc.)	Perennial streams, ponds, or reservoirs for feeding. Herons, egrets, cormorants, and wood duck nest in large trees. Other species nest in marshes or on shoreline. Most shorebirds are migrants only.	St. Vrain, Lefthand, and Boulder Creeks and lakes and ponds (pelicans prefer larger reservoirs). Sensitive to human disturbance in area of nest. Major focus of birders in all seasons, and especially during spring migration.
Winter Migrant Birds	Migrate from higher elevations or latitudes. Include raptors, waterfowl, and songbirds. Mostly relatively intact native habitats, including woodlands, grasslands, and reservoirs.	Woodland species – St. Vrain, Lefthand, and Boulder Creek corridors and wooded areas along ditches, reservoirs, parks, and cemeteries. Prairie species – Grasslands or semi-natural pastures. Water birds – Ice-free areas of larger reservoirs.
Amphibians (salamanders, true frogs, chorus frogs, true toads, spadefoot toads)	Mostly areas of relatively intact native or semi-natural habitats. Some occur in any suitable habitat.	All require water for breeding. Frogs also require permanent water for adult stage. Chorus frogs in marshes; toads and salamanders along streams or ponds, including seasonal ponds; spadefoot toads in seasonal ponds on plains.
Reptiles (lizards, snakes, and turtles)	Mostly areas of relatively intact native or semi-natural habitats. Mostly associated with specific habitat types rather than “edges” or “mosaics.” Pond turtles may occur in any suitable water	Woodland/riparian species – St. Vrain, Lefthand, and Boulder Creek corridors and areas along ditches. Prairie species – Grasslands or semi-natural pastures that are not mown or overgrazed. Aquatic species (pond turtles) – lakes or ponds; (water snakes) – perennial streams, lakes, or ponds.

Species	Habitat Requirements	Comments Regarding Current or Potential Status in Longmont Area
	body.	
Native Fish	Relatively intact perennial streams with diverse and well-developed vegetation, adequate in-channel flows, and good water quality.	Many state-listed species and species of concern have been historically documented in St. Vrain Creek. Presence and abundance of many species is currently unknown.
Pollinators (native bees and butterflies)	Relatively undisturbed native vegetation, especially forbs and shrubs that produce flowers with abundant nectar and/or pollen.	Natural landscapes with native vegetation and native plant gardens both provide valuable habitats and can be incorporated into human environments.
Species on which Other Biodiversity Species are Highly Reliant		
Native Small Rodents	Mostly in native or semi-natural habitats.	Primary prey base for snakes, raptors, and carnivores.
Black-tailed Prairie Dog	Shortgrass prairie or abandoned fields and pastures where vegetation can be kept cropped close to the ground.	Important prey for ferruginous hawks and bald eagles; also prey for some other raptors and for coyotes. Horned larks, deer mice, and grasshopper mice often more common in prairie dog colonies. Abandoned burrows used for nesting by burrowing owls and for denning by cottontail rabbits. Some other species (snakes, salamanders) may also use abandoned burrows as den sites.

Habitat Preservation and Management – General Recommendations

As indicated at multiple points in Table X, the overwhelmingly most important habitats for species that add to Longmont's biodiversity—i.e., by substantially increasing the number of species present in the City compared to typical urban, suburban, and farmland environments in the Front Range region—are the well-developed riparian corridors, native grasslands or semi-natural pastures, and lakes and ponds. This is not surprising and closely mirrors the ranking of habitat types based on the Colorado Parks and Wildlife's statewide ranking (see Section 6).

Based on the importance of these habitat types in maximizing Longmont's biodiversity, which is important to many of its citizens and provides opportunities for nature-oriented passive recreation and outdoor education, the City should:

- Prioritize the acquisition of lands for Open Space that contain riparian, grassland, wetland, and/or aquatic habitats.

- Emphasize the acquisition, preservation, or restoration of areas that either are currently in relatively natural condition or have a high potential for habitat restoration.
- Emphasize large tracts, habitat connectors, or areas adjacent to existing Open Space tracts when acquiring land (see Section X).
- Emphasize the acquisition, preservation, or restoration of suitable buffers around riparian, grassland, wetland, or aquatic habitats (see Sections X and X).
- To the extent practicable, avoid use of Open Space tracts that contain important or high-quality wildlife habitats for recreational or other intensive human uses without sufficient buffers and apply seasonal limitations on use (e.g., trail closures) as appropriate (see Sections X and X).
- To the extent practicable, consider preserving abandoned farm or ranch structures in existing or future Open Space parcels to provide habitat for bats, barn owls, great horned owls, barn swallows, cliff swallows, and other species that inhabit these artificial habitats.
- Develop a long-range schedule and budget for restoring or enhancing riparian, grassland, wetland, and aquatic habitats currently within, or added to, the Open Space system (see Section X).

Implementing the management measures outlined above to optimize Longmont's biodiversity will also help ensure compliance regarding federal threatened or endangered or other regulatory species while maintaining or improving the current quality of life for many of its citizens despite continued development and population growth.

Habitat Preservation and Management – Native Fish

As indicated in Section X, St. Vrain Creek within Longmont provides habitat for a significant number of native fish species. Because of St. Vrain Creek's unique status as a transitional stream, Longmont is in a unique position to prioritize the long-term viability of these fish populations. In order to maximize this opportunity, the City should:

- Promote fish passage at diversions, especially the Beckwith diversion.
- Work with CPW to minimize non-native/game species spillover from stocked reservoirs into St. Vrain Creek and other natural drainages.
- Follow all CPW protocols to avoid introductions of nonnative species, such as the zebra mussel, especially at reservoirs and other boat access points.
- Enhance aquatic habitat wherever feasible by incorporating shading, woody debris, and natural channel design.
- Monitor aquatic populations after restoration and enhancement projects to identify successful strategies.
- Encourage and maintain in-stream flows. Pursue City ownerships and acquire water rights whenever possible.
- Determine where more information is needed and arrange for additional surveys to fill data gaps. Work with CPW as available but arrange for independent surveys as well.
- Work with CPW to explore the potential for species reintroductions in St. Vrain Creek, especially the common shiner which has not been caught since the 2013 flood.

Habitat Preservation and Management – Pollinators

The Longmont community has recognized the importance of insect pollinators and also the serious issues contributing to their global decline. Therefore, separate management recommendations for these species have been prepared to address their specific habitat needs. In order to create pollinator-friendly habitats throughout Longmont, the City should:

- Promote or incentivize native plant gardens on private property.
- Develop a City "pollinator network" where interested parties can collaborate.

- Use native plants in medians and planters throughout the City.
- Install bee boxes on City-owned lands with informational signage.
- Continue City policy of only using neonicotinoids in tree injection treatments. Only use contractors who do the same.
- Continue City policy of only fogging for mosquitoes after West Nile Virus has been positively identified in the area. Time applications to minimize risk to pollinators.
- Establish trial plots for the conversion of turf grass to native grassland.
- Alter City mowing schedules where feasible (i.e. Open Space properties) to allow flowering.
- Continue participation and collaboration with the regional Pollinator Action Team and People & Pollinators Action Network (PPAN).
- Accept a proposed ordinance that would adjust enforcement of existing weed control codes to emphasize the management of State-listed noxious weeds. Dandelions and other forbs that are often considered weedy would not be prioritized for enforcement due to the benefit that they provide to pollinators and other native wildlife species.

D. Black-tailed Prairie Dog (*Cynomys ludovicianus*)

The black-tailed prairie dog (group of young at left) is perhaps the ultimate example of a species that fits into more than one management category. Depending on the situation and the perspective of the person considering the situation, it may be considered as a regulatory species, a biodiversity species, or a management issue. Therefore, prairie dogs are discussed in this separate subsection.

In January 2019, the City enacted an ordinance on prairie dog control. The management recommendations contained in this Plan include both recommendations for amendments to this ordinance as well as general practice recommendations for the City at large. In presenting these management recommendations, the Plan attempts to balance various ecological and societal perspectives:

- First, the presence of prairie dogs is very beneficial to some wildlife species but adversely affects other species.
- Second, some citizens place a high value on being able to observe prairie dogs and knowing that they survive in Longmont, while others consider them a nuisance that interferes with other uses of the land.
- Third, prairie dog colonies are not stagnant but tend to grow in size and to be a source of offsite dispersal.
- Fourth, prairie dogs can, in some situations, represent a threat to public health and safety.
- Fifth, managing prairie dogs—whether by attempting to constrain the size of a colony, impeding dispersal to other properties, or relocating them to another site—can be costly.
- Therefore, no single management policy is perfect from the perspective of every person and every situation. Instead, the goal of the Plan is to ensure that prairie dogs survive as a species in Longmont, for the benefit of other wildlife as well as Longmont's citizens, but in locations and situations that are best for the prairie dogs, appropriate for the land, and mindful of competing land uses and the desires and needs of neighbors of City land.

Ecology

The following description of the black-tailed prairie dog is excerpted from management plans prepared by Walsh Environmental Scientists and Engineers, LLC, for the City of Thornton and the City and County of Broomfield, Colorado.

Taxonomy and Current Status

Prairie dogs are colonial, ground-dwelling members of the squirrel family and, like most members of the family, are diurnal (active during the day). The species in eastern Colorado is the black-tailed prairie dog, which once occurred across vast areas of the High Plains. Nationally, it is estimated that less than 2 percent of historic black-tailed prairie dog populations exist in the U.S. The decrease in abundance and distribution is mostly attributable to loss of habitat due to conversion of prairie to cultivated cropland and, more recently, rapid residential, commercial, and industrial development. Even where prairie grasslands were retained for grazing of domestic livestock, widespread poisoning and shooting of prairie dogs was undertaken by ranchers to reduce competition with livestock for forage and eliminate the perceived risk to livestock from stepping into a burrow and injuring a leg.

In 2009, the US Fish and Wildlife Service issued a determination that listing the black-tailed prairie dog under the Endangered Species Act was not warranted. Notwithstanding the reported historic 98-percent decline in populations of this species, no evidence exists that it is nearing extinction. The species continues to thrive in seemingly inhospitable of sites, and small, isolated colonies appear to be able to sustain themselves indefinitely.

Habitat Preference and Modification

Historically, the black-tailed prairie dog was found in areas of shortgrass and midgrass prairie. Prairie dogs need low vegetation to allow good visibility of predators, including raptors and carnivores. In areas with scattered tall vegetation, prairie dogs “clip” or “crop” the taller plants to the ground, in part through consumption of the plant material, to keep the area free of visual obstructions. However, they avoid areas of dense, tall vegetation, which was a major factor in shaping the eastern edge of their historic range. On a localized scale, prairie dog activity can maintain short vegetation in areas that otherwise would gradually shift to taller species because of favorable moisture.

Prairie dogs and prairie grasses have coexisted for millions of years. In areas of relatively intact prairie, the dominant grasses are able to withstand the constant consumption of foliage by prairie dogs, in part because of enormously extensive root systems. Other species have not adapted to this intensive loss of foliage, and the composition of plant communities is markedly different between areas with and areas without prairie dogs. Some large herbivores (plant-eaters), notably bison and pronghorn, were historically attracted to prairie dog towns to feed, apparently because the constant cropping of the vegetation produces highly palatable and nutritious new growth.

Unfortunately, most “urban” prairie dog towns bear little resemblance to naturally functioning prairie habitats. Most colonies in the Front Range region, including the City of Longmont, occupy areas previously converted from prairie to cropland or subjected to heavy use by domestic livestock. For these reasons, most urban prairie dog colonies are in areas that are weedy or barren (photo at right).

When prairie dogs colonize abandoned cropland, the habitat is already lacking in native plants. While the casual observer may blame the weedy condition on the prairie dogs, the reality is that these areas would be weedy anyway, although with taller, unclipped species. The clipping of vegetation close to the ground is both the result of intensive herbivory (i.e., feeding on stems and leaves) and a behavior that enhances the ability of the prairie dogs to detect the presence of predators. However, although the prairie dogs did not cause the weedy vegetation in these situations, their presence can essentially preclude the naturally slow process of colonization by native grasses and forbs.

While prairie dogs often occur in previously degraded lands, they also can quickly convert an area of apparently healthy grassland into weedy or barren areas largely lacking native grasses and forbs. In these

situations, the prairie dogs do cause the weedy condition by removing more above-ground plant tissue than the roots are capable of replacing. This is often the result of reduced plant vigor prior to the presence of prairie dogs due to heavy and protracted grazing by livestock or the intentional seeding of non-native grasses to "improve" degraded rangeland. However, even areas of essentially native grassland may be incapable of withstanding the impacts of prairie dogs in situations such as typify the Front Range region, in which prairie dogs occur as dense populations confined to relatively small areas.

In summary, urban prairie dog towns are not microcosms of the prairie. Instead, they are almost always weedy, non-native remnants of previously degraded rangeland or abandoned cropland that are capable of supporting few other wildlife species. The fact that prairie dogs not only survive, but thrive, in these weedy or barren lands is a tribute to their resourcefulness.

Ecological Relationship to Other Wildlife

The black-tailed prairie dog is often referred to as a "keystone species," meaning that its presence profoundly influences other aspects of the ecosystem. However, the term "keystone species" does not necessarily imply a benefit for the ecosystem as a whole. Instead, it merely indicates that an area is much different in terms of the occurrence, abundance, and use by other species when prairie dogs are present than when they are not part of the wildlife community.

One common misconception about prairie dogs is that many species—often described as either 166 or 208— "depend" or "rely" on them for their own existence. This is incorrect (e.g., see Kotliar et al. 1999, Kotliar 2000). These large numbers of reportedly "associated" wildlife consist almost entirely (approximately 95 percent) of species that occur just as often, or more often, in other habitats, including grasslands where prairie dogs are absent. Examples include waterfowl and tree-dwelling songbirds observed flying over a prairie dog town during a species count. These species do not "depend" on prairie dogs, even in part, and most do not even benefit from the prairie dogs. They merely are able to use prairie dog towns as well as other habitat types or may pass through (or over) the colonies while moving between habitats that they actually use.

On the other hand, a few species are highly benefited by the presence of prairie dogs and essentially dependent on them. These include some species considered rare or declining, in part due to the decline in prairie dogs, and of special concern both regionally and nationally. Examples that occur in the Longmont area include the following:

- Three species have a strong affinity to, and partial dependence on, prairie dogs. These include a State-listed threatened species (the burrowing owl, which nests in abandoned prairie dog burrows) and two State-listed species of special concern (the ferruginous hawk, which favors prairie dogs, and the mountain plover, which requires nests and feeds in shortgrass prairie, including prairie dog towns).
- In the Front Range region, bald eagles are attracted to prairie dog towns to hunt, especially during winter when their preferred prey (fish and waterfowl) are less available. At a local level, this may represent a strong affinity or partial dependence.
- Five species tend to be more common in areas with prairie dogs than areas without but are not "dependent" on them. These include the swift fox (State-listed species of special concern), deer mouse, northern grasshopper mouse, horned lark, and golden eagle. For the three smaller species (deer mouse, grasshopper mouse, and horned lark), the slight preference for prairie dog towns may be due to lack of competition from species excluded by the presence of prairie dogs (i.e., other mice and ground-nesting birds). The swift fox and golden eagle probably are attracted by the prairie dogs as a prey species.

- Three other species are sometimes mentioned as benefiting from the presence of prairie dogs: the prairie rattlesnake, western meadowlark, and tiger salamander. However, no data have been reported in the scientific literature to support this speculation.

Essentially all other species of wildlife, including the vast majority of native rodents, ground-nesting songbirds, and reptiles found in prairie ecosystems, occur less commonly in prairie dog towns than in grasslands lacking prairie dogs. Therefore, the biodiversity of an area can actually decline when prairie dogs colonize. However, this point is somewhat misleading in a situation such as that of Longmont's, because most open lands without prairie dogs have been degraded by prior grazing, farming, or other surface disturbance. These areas already have a lowered biodiversity, and the addition of prairie dogs can therefore increase overall wildlife use, including that of the rare or special-concern species mentioned above.

Besides issues of biodiversity, the concentration of raptors around prairie dog towns—although perhaps representing a shift in the distribution of the raptors rather than an increase in their numbers—provides an interesting and popular opportunity for wildlife viewing and nature study. This is further increased by the fact that many of the species most often attracted to prairie dog towns are large, attractive, and uncommon species such as the bald eagle, golden eagle, and ferruginous hawk. Another large raptor, the rough-legged hawk—a migrant from the north that occurs here only in winter—is also attracted to prairie dog towns.

Disease

Sylvatic plague (bubonic plague in humans) was inadvertently introduced to North America from Asia during the settlement of the New World. The sylvatic plague bacterium is carried by the oriental rat flea (*Xenopsylla cheopis*), which has found a suitable host in the prairie dog. The fleas may in turn be transferred to dogs or cats that come in contact with an infected colony.

Transmittal to humans may occur through fleabites or by exposure to infected animals, including pets. However, the risk of human infection is low. According to the Colorado Department of Public Health and Environment, 20 cases of human bubonic plague were documented in Colorado from 2005 through 2017. Bubonic plague in humans is treatable with antibiotics and readily curable if diagnosed and treated early.

Issues Associated with Prairie Dogs

Issues related to the presence of prairie dogs include habitat-related issues, individual animal- related issues, and cost and other practical issues. These are outlined below.

Habitat-Related Issues

- The presence of prairie dogs in an area of previously degraded habitat (e.g., abandoned farmland) precludes rehabilitation to a more desirable condition because the prairie dogs would quickly consume any seeded plants.
- The presence of prairie dogs in an area of good-quality habitat can result in serious degradation of the vegetation if it is not dominated by plants able to withstand their intensive removal of foliage. This degradation generally involves rapid removal of all but the most resistant species, most of which are weedy species, and creation of barren areas that are quickly invaded by weeds.
- Changes in composition and structure of the vegetation can reduce the quality of the habitat for other wildlife species, including most other small mammals and ground-nesting songbirds. Species that are benefited, including some raptors and carnivores, are only attracted to relatively large colonies in relatively natural settings (as opposed to "urban" colonies).

- Weedy infestations on prairie dog colonies can be a source of seeds that then invade neighboring sites.

Issues Related to Individual Animals or Populations

- Yearlings tend to disperse away from the colony in late summer and fall, potentially resulting in their arrival at places where their presence is unwanted or inappropriate. Examples include airports, playgrounds, schoolyards, parks, athletic fields, agricultural fields, and lawns or other landscaping.
- Dispersal from a colony or, for colonies located near a roadway, daily movement patterns may create a safety hazard or public nuisance when they attempt to cross the road.
- Similar safety hazards can occur for prairie dog colonies near airport runways (e.g., the Vance Brand Airport, photo below).
- Even animals that do not disperse in search of new habitats may expand a colony outward, resulting in new burrows and animals on adjacent lands.
- Sylvatic plague outbreaks may pose a health risk to citizens who walk through or near the colony or whose dogs enter the colony, become infested by infected fleas, and then expose the owner to the fleas. Infected prairie dogs may also move onto adjacent lands, thus spreading the disease.

Cost and Other Practical Issues

Preventing dispersal or offsite expansion of a colony is essentially impossible. Movement barriers, including vinyl fences, can greatly reduce the amount of dispersal or expansion but are expensive to install and maintain. Costs are approximately $4 per linear foot for the fencing, not including installation and maintenance. Controlling prairie dogs by removal can also be costly, especially if it involves relocation to another site. Relocation costs generally range from $200 to $400 per animal, not including costs of the land. For example, relocation of 150 prairie dogs to a 5-acre enclosure adjacent to the Vance Brand Airport cost the City approximately $30,000 including fencing materials and ongoing maintenance. This is a total per-animal cost of more than $300. Costs can be reduced by using volunteer groups, but this may involve a longer timeframe to complete.

Controlling prairie dogs by removal for donation to the U.S. Fish and Wildlife Service black-footed ferret recovery program or to raptor rehabilitation programs can also be expensive, although generally less so than relocation. Additionally, this method does not require a receiving site. However, this method often meets with public opposition due to the potential for injury and stress to the prairie dogs.
The least expensive and fastest control method consists of exterminating prairie dogs in their burrows using a toxic gas. Aluminum phosphide, which is a restricted use pesticide registered by the Environmental Protection Agency, is the most commonly used chemical. However, it's use often meets with public opposition, especially if large colonies are involved. More recently, the use of pressurized exhaust containing primarily carbon monoxide has been utilized as a more humane burrow fumigant. Carbon monoxide cartridges, which resemble large "smoke bombs" can also be used.

Extermination and vacuum removal, and to a lesser extent trapping, represent a risk to non-target species such as cottontail rabbits and snakes. Of special concern is the potential for harm to the burrowing owl, which nests and roosts in abandoned prairie dog burrows and hunts for insects and small rodents in the surrounding habitat. This species is State-listed as threatened and protected by the Migratory Bird Treaty Act.

Regulatory Compliance

Controlling prairie dogs by removal and relocation requires a permit from Colorado Parks and Wildlife. The permit application must specify the trapping method and the maximum number to be relocated and

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identify and describe the receiving site. The application must also describe provisions for dealing with any prairie dogs that cannot be captured (e.g., extermination, vacuum removal). The number that can be moved depends on the size and condition of the receiving site, as evaluated by Colorado Parks and Wildlife. In most cases, some site preparation is needed before the relocation. At a minimum, this involves mowing to a suitably short height. The number of prairie dogs that can be relocated is typically in the range of 8 to 12 animals per acre. Long-term monitoring is also required by Colorado Parks and Wildlife. Prairie dogs cannot be moved to another county without the approval of the Board of County Commissioners of that county.

Prior to extermination or removal of prairie dogs from City land between mid-March and October, the City would be required to conduct a burrowing owl survey. If one or more burrowing owls is found, the City would have to either (1) delay the action until the end of the burrowing owl season or (2) avoid an area extending 150 feet from any burrow being used by a burrowing owl.

Habitat and Species Preservation and Management – City Lands

Notwithstanding any negative aspects associated with the presence of black-tailed prairie dogs in specific situations, two important facts remain: (1) it is a species of special importance to a large portion of the citizens of Longmont, and (2) it can attract and sustain use by some wildlife that might otherwise not occur, or at least not at the same abundance, in a given area. Included among the latter are species of special concern such as the bald eagle, ferruginous hawk, and burrowing owl.

Therefore, preservation of prairie dogs on some City lands is considered desirable and important. The City should undertake a periodic (biannual) inventory of the location, size (area and estimated population), and ecological attributes of prairie dog colonies on City-owned lands. Ecological attributes include shape, presence or proximity of trees for raptors, prevalent plant species and condition, proximity to major roads, proximity to areas of intensive human use (e.g., residential, commercial, industrial, and recreational facilities), and potential for controlling offsite dispersal. Based on information collected during the periodic inventory, the City should then classify each colony into the following management categories:

- *Preserve* – Avoid projects that would impact the colony, to the degree practicable. Allow the colony to continue to function as at present. If the colony dies out due to sylvatic plague, leave the burrows intact to allow for future natural colonization. Alternatively, use the empty burrows following a sylvatic plague die-off (after a waiting period of at least 1 year) as a release site for prairie dogs that must be removed from other City lands. In the intervening period, control weeds that may invade (e.g., by mowing or spraying with a chemical herbicide) and, where desirable vegetation is sparse, seed with an aggressive perennial grass to provide a temporary cover and improve conditions prior to recolonization or release of prairie dogs.
- *Actively Manage/Replace* – Same as Preserve, except that (a) barriers may be used to minimize offsite dispersal, (b) perch sites (poles) may be installed to attract raptors, and (c) hides (blinds) may be installed to aid hunting by carnivores. If the colony dies out due to sylvatic plague, retain the empty burrows for future natural recolonization or use them (after a wait of at least 1 year) for relocation of prairie dogs from other City lands. Some intervening weed control or grass seeding may be required.
- *Actively Manage/Exclude* -- Same as Actively Manage/Replace, except that if the colony dies out due to sylvatic plague, destroy the burrows by disking or chiseling ("plowing") and revegetate with perennial grasses (native or non-native, depending on the intended future use. If other prairie dog colonies exist nearby, the revegetated area may need to be protected by a barrier (vinyl fence or other) to help prevent unwanted recolonization. This category would apply to colonies in areas considered inappropriate for prairie dogs or where their presence conflicts with a higher priority use, but where the situation does not need short-term action.

- Remove – Applies to colonies in areas not considered appropriate for prairie dogs or where their presence conflicts with a higher priority use, and for which the need to remove the prairie dogs is more immediate than for Actively Manage/Remove. Types of removal are listed below.

- Relocate – Used when relocation to another site is a viable option. See Section X regarding regulatory compliance. Section X discusses the reason that relocations of prairie dogs—if done properly—are fundamentally different from relocations of other problem wildlife.

  Relocation from City land should occur during the period of June through October if practicable to avoid the fall/winter season (November through February) when relocations may be less successful due to cold weather and snow cover), and the spring birthing/nursing season (March through May). Prior to capture, all open burrows within the colony to be relocated should be dusted for fleas as a means of reducing the potential for transmission of sylvatic plague, in conformance with requirements of Colorado Parks and Wildlife. Additionally, individual prairie dogs should also be treated for prairie dogs using an insecticide spray prior to relocation.

  Relocation should not be used in situations involving the need to remove fewer than 60 prairie dogs from a single area. This provision reflects the lower survival associated with small relocations as well as the disproportionate administrative and fiscal burden for the City as well as Colorado Parks and Wildlife in relation to the ecological and societal benefit. The number of prairie dogs should be estimated using the formula for population estimates developed by the City Natural Resources department.

- Remove/Euthanize – When live relocation is not feasible or a site is not available, prairie dogs should be donated to the U.S. Fish and Wildlife Service black-footed ferret recovery program or an approved raptor rehabilitation program as a food source. The U.S. Fish and Wildlife Service has found that ferrets raised on prairie dogs for food fare better following release than those raised on other types of food.

  Note that captured animals are euthanized before being fed to the ferrets or to raptors. Euthanasia typically occurs prior to transportation for raptor rehabilitation, but live prairie dogs are accepted for ferret recovery as they are extensively monitored for plague. A permit from Colorado Parks and Wildlife is required for the transportation of live prairie dogs; if prairie dogs are euthanized on-site, a donation reporting form must be provided to Colorado Parks and Wildlife within 30 days of the donation. Most raptor rehabilitation centers prefer that prairie dogs are donated after having been frozen, as this will kill any fleas on the animal.

  Trapping for donation can occur during the fall and winter months as there are no concerns with post-release survival, but it is still not allowed during the spring birthing/nursing season.

  If this method is used, the City should retain the services of a professional or qualified volunteer organization to capture and transport the animals to the designated location. The City should also ensure that the removal is performed as humanely as possible, given the limitations of the method employed.

- Exterminate – Prairie dogs are euthanized in their burrows with the use of a chemical fumigant (aluminum phosphide) or asphyxiant (carbon dioxide). This option should be used only as a last resort or to exterminate prairie dogs that were not captured during an appropriate trapping period (typically no less than seven days).

  Any plan to exterminate prairie dogs on City land must first be approved by the City Manager after being provided with information on the size and location of the colony, the number of prairie dogs affected, the reasons for the proposed extermination, the other options considered, and the reason(s) the other options were deemed infeasible or impracticable. If extermination is used, the City should retain a professional prairie dog exterminator or use a qualified staff member who has spent at least 5 days assisting a professional.

  Extermination can occur year-round, as long as all label requirements are otherwise adhered to. This is the only management method that should be implemented during the spring birthing/nursing period.

  If extermination is approved, it will be permitted to occur between April 1 and June 1.

  If one or more burrowing owls is found, the permittee would have to either (1) delay the action until the end of the burrowing owl season or (2) avoid an area extending 150 feet from any burrow being used by a burrowing owl.

  Applicants shall be required to conduct surveys for burrowing owls prior to any permitted prairie dog management activities between March 15 and October 31. If one or more burrowing owls is found, the permittee would have to either (1) delay the action until the end of the burrowing owl season or (2) avoid an area extending 150 feet from any burrow being used by a burrowing owl.

The order of priority for removal of prairie dogs from City lands should be as follows:

- Preferred Option – Relocation, if the number to be removed is greater than 60 animals and a suitable release site has been identified, approved by Colorado Parks and Wildlife and City Council, and the public given adequate notice.
- Second Option – Removal for donation to the U.S. Fish and Wildlife Service black-footed ferret recovery program or raptor rehabilitation program OR extermination within the burrows. The choice among these two should be based on criteria such as urgency, cost, and the express need for euthanized animals for ferret recovery or raptor rehabilitation programs.

The City should notify the Colorado Department of Public Health and Environment (CDPHE) in the event of any prairie dog die-off on City land potentially associated with sylvatic plague and should cooperate in obtaining samples for epidemiological evaluation. If plague is confirmed in a prairie dog colony on City land, the City should cooperate with the Colorado Department of Public Health and Environment in implementing a program to dust the affected area for fleas to eliminate or control the outbreak and provide public notice in accordance with State guidelines.

Habitat and Species Preservation and Management – Private Lands

The prairie dog control ordinance approved in January 2019 requires that a permit be obtained before any prairie dog management activity is undertaken on private lands within the City. The stipulations of that ordinance will not be repeated in this Plan, but several recommendations for amendments include:

- Increase the minimum number of prairie dogs for a live relocation to 60 from the current 25. Scientific literature shows that relocations of fewer than 60 individuals result in high mortality rates.
- Population estimates must be corroborated by City Natural Resources staff, using their prairie dog population estimate formula.
- If a population of fewer than 25 prairie dogs requires removal, relocation to the US Fish and Wildlife black-footed ferret recovery program or raptor rehabilitation facility must be attempted prior to extermination. If extermination is proposed as the only means of prairie dog management, the permittee must have a compelling reason why donation is not possible.
- Additionally, the following are general recommendations pertaining to prairie dog management on private land:
    - To the extent practicable, prairie dog colonies larger than 5 acres in size on private parcels greater than 10 acres in size should be mapped and classified (by management category) as part the City's biannual prairie dog survey.
    - Where fumigants are used, the City shall strongly encourage the use of carbon monoxide, either as a cartridge or pressurized exhaust, and strongly discourage the use of aluminum phosphide.
    - City-owned lands are not available to accept relocated prairie dogs from privately owned lands.

E. Wildlife Management Issues

Definition and General Considerations

This section deals with wildlife species of which individuals or groups may represent a management issue or "problem" for the City. Examples include animals that represent a health or safety hazard to humans, cause significant property damage or loss on City-owned lands, or consume significant amounts of staff time and City budgets to address. In considering the management of wildlife problems, it is important to remember the following:

- Problems exist at the level of the individual animal, family group, or population; that is, no species is problem per se.
- Problems that occur on City lands or consume staff time and budgets are often the direct or indirect result of conditions or actions by citizens on private lands.
- City staff should not take responsibility for dealing with problem wildlife on private land, unless the problem is the direct result of an action taken by the City. However, the City should develop a brochure or a tab or one or more links on its official website to help citizens decide how best to avoid, minimize, or deal with problems related to wildlife.
- Most wildlife problems in Longmont are the result of species adapting to, and in many cases thriving in, urban or suburban environments. That is, the animals are attracted to the City's environments, as opposed to situations in which Longmont is expanding into wildlife habitats.
- Notwithstanding the previous bullet, some wildlife problems are the result of new developments into or next to wildlife habitat, but these are generally transitory until the individual animals or populations adjust to or relocate to avoid the human presence and changed environment.
- For some problem situations in which a policy of "live and let live" is not practicable, trapping for release at another location may appear more humane than the alternative of lethal control. However, the following factors generally militate otherwise:
- Trapping and removal of an animal typically creates a "vacuum" at the capture site, which in most cases is quickly filled by another animal of the same species. The rate at which the void is filled depends on the mobility and abundance of the species, the time of year relative to normal dispersal patterns, and whether some measures are implemented to prevent recolonization.

- Trapped animals may suffer or die during the relocation process due to stress or injury.
- Relocated animals often have a low survival rate at the release site due to territorial behaviors of resident animals at the release area; a high predation rate due to near-term lack of denning or hiding sites; disruption of feeding and other physiological behaviors; and, in some cases, disruption of family structures.
- Relocated animals often leave the release point, exposing them to higher predation rates, meteorological stress, mortality from vehicles while crossing roads, and stress due to fear.
- As part of their wanderings, relocated animals may enter properties that create a problem for another landowner, in some cases including the same or a different City department than the one that trapped the animal.
- Even if released animals remain in the relocation area, their doing so may be at the expense of other members of the same or another, ecologically similar species inhabiting that area.

For the reasons above, this Plan recommends that the City adopt the following policy:

- The City should not conduct trapping of any animal for the purpose of release at another site, except for (1) relocations of black-tailed prairie dogs as approved by Colorado Parks and Wildlife and (2) for other species, situations in which the relocation would be from City land to City land, consistent with Colorado Parks and Wildlife regulations or otherwise approved by Colorado Parks and Wildlife, and unlikely to interfere with the ecological balance of the release site or create a nuisance for an adjacent landowner. Where trapping cannot be avoided, the City should trap the animal humanely and euthanize it both humanely and promptly to avoid prolonged stress.

The reason for excluding prairie dogs from the general policy against relocating wildlife described above is related primarily to its colonial behavior, based on extended family groups called "coteries." While relocating an individual or small number of prairie dogs has the inherent problems discussed above for other wildlife (e.g., low survivorship and a tendency to disperse from the relocation site), relocation of prairie dog family groups into suitable and properly prepared habitat is generally quite successful.

Management Issues Involving Some Beavers

Ecological Synopsis

The beaver is a large aquatic rodent that occurs along streams, ditches, and ponds throughout the region. It feeds primarily on the sapwood and foliage of trees and shrubs and builds a den (lodge) using earth and sticks.

The hallmark behavior of beavers is the felling of trees by gnawing through the trunk and using portions of the felled trees to construct a dam. Smaller branches of trees and shrubs are also used for food, which may be eaten above ground or taken into the den for consumption then or later. The construction of a dam across a stream creates a pond, altering the aquatic habitat and stream hydrology. The combination of felling of trees, consumption of woody material, and changes in the stream system also changes the riparian habitat. Beaver dens may be located in the dam or in a separate mound of sticks called a lodge. The den is accessed from below the water line, making it safe from most predators. Beavers may build a lodge in a pond created other than by their activity— e.g., at Golden Ponds west of Hover Street.

Young beavers may disperse considerable distances in search of a new home, resulting in more dams in the general area. As beaver numbers in an area increase and available trees decrease, the habitat can become so highly modified that it is no longer suitable. Trees and willow shrubs may become so depleted that the area has insufficient food or structural materials for maintaining the dam or lodge. When this occurs, the beavers abandon that site and disperse to another suitable area. In time, the abandoned area usually (but

not always, and generally after a period of at least a few decades) recovers sufficiently to support beavers again.

Identified Problems
Two types of problems related to beavers may arise wherever they occur in urban/suburban areas:

- destruction of trees, and
- construction of dams in places that clog waterways or culverts and create the potential for water damage (e.g., basement flooding) of nearby structures.

At Golden Ponds and other City parks, beavers have caused significant damage to both native and planted trees, in some cases including conifers. The City has found that constructing a fenced cage around trunks to reduce the damage can be effective but requires considerable staff time to maintain.

The photo at left shows a typical "beaver cage" around a cottonwood tree. In some cases, beavers are able to move the cage sufficiently to access the trunk with their teeth through the wire mesh. Finer textured materials may prevent beavers from reaching the trunk but are generally made of materials through which the beavers can easily chew. The City's Parks and Forestry Division estimates an annual cost to Longmont taxpayers of $10,000 to $20,000 for damage prevention and tree replacement measures on City lands.

A less costly and maintenance-intensive approach that has also been utilized is painting the base of the tree trunks (3 to 4 feet) with a mixture of paint and sand. This makes the tree undesirable for beavers. This method will only be successful on mature trees, so saplings would still need to be caged.

No cost estimate has been made for staff and equipment time needed to remove blockages to storm sewers, culverts, or bridges from accumulation of woody debris associated with beaver activity. These blockages commonly occur during storm flows, which can lead to more flooding and damage than might otherwise occur for a given flow. Trash racks are often used to facilitate debris removal by keeping the material from entering a sewer or culvert, but these only ease maintenance and does little to prevent blockage when storm flows carry limbs and twigs of cottonwoods and willows. The ease with which the twigs of these trees break is an adaptation for reproduction. The broken twigs are carried downstream and deposited with sediments on the streambanks as the waters subside. Some of the twigs then take root, and some of these can grow to become new trees.

Regulatory Compliance
The beaver is designated by Colorado Parks and Wildlife as a furbearer and, as such, can be taken only during a specified season (fall-spring) and only with a small game license, unless they are causing damage to real property or creating a risk to public safety. In the latter case, beavers may be trapped without a license, but they may not be released at another site without obtaining a relocation permit from Colorado Parks and Wildlife. If not relocated under a permit, the trapped beavers must be euthanized. Use of a lethal trap is not permitted except under a furbearer license.

The beaver is the one species that the City will generally make an exception to its policy of not relocating trapping individuals. Beavers in the right location are considered to be "ecosystem engineers," in that their dams and the associated flooding create a novel environment that supports a suite of other plant and

animal species adapted to those conditions. Therefore, Colorado Parks and Wildlife would be inclined to issue a relocation permit to a location where they may wish to establish a new beaver population.

Management of Problem Beavers

In dealing with problems associated with beavers, the City should:

- Continue current policy of protecting planted or important native trees on City land where beaver damage has occurred or is likely, as part of a "live and let live" approach.
- Allow beavers to harvest any trees or shrubs that are not considered critical to the intended use of the City land.
- Leave dams built on City land or waterways adjacent to City land, except in the case of a dam that (a) is built at a culvert, bridge, or diversion structure, and/or (b) creates a risk of water damage to the adjacent land.
- If the beavers themselves are not causing a problem with excessing tree harvesting, but the risk of flooding is a concern, explore the possibility of using a flow control device installed in the beaver dam. These are often referred to as "beaver deceivers" or "castor masters." Such devices allow water to move through the dam via a large-diameter pipe attached to a cage that prevents the beavers from rebuilding the dam around it.
- When property loss, risk of flooding or water damage, and/or interference with the intended uses of City lands become unacceptable, initiate an effort to trap the beavers that are causing the problem. Notify Colorado Parks and Wildlife of the City's intent and inquire as to whether there are any known landowners or agencies that would accept relocated beavers. If so, obtain a relocation permit from Colorado Parks and Wildlife. If not, determine whether a small game license is required (i.e. has the beaver caused real property damage), and proceed with trapping.
- If possible, conduct the trapping during the normal open season for this species (fall-spring), which is timed in part to avoid the potential for creating orphan offspring when they are too young to survive on their own. Trapping may be performed by City staff or by a licensed trapper.
- If no relocation site is identified, euthanize all beavers trapped.
- Following removal of the problem animal(s), destroy the dam to prevent it from attracting other beavers.

Management Issues Involving Some Canada Geese

Ecological Synopsis

Historically, the Canada goose (photo below, taken at Golden Ponds) was a highly migratory species in the region, usually seen primarily during migration or on open waters in winter. In the 1960s, Colorado Parks and Wildlife undertook habitat modification (including placement of artificial nest structures) to induce geese to nest. The Canada goose has since become both a resident and a migratory species in the area and has gone from rather uncommon to abundant, widespread, and adapted to human environments that provide for their needs. Geese are most vulnerable to carnivores such as coyotes, which may take adults, and red foxes, raccoons, and striped skunks, which may take eggs or young.

Identified Problems

The primary problem with Canada geese in urban/suburban environments is that they often congregate on parks, golf courses, athletic fields, and other areas where their droppings can become an eyesore and interfere with human use and enjoyment of the site. They also can keep grasses clipped so close to the ground that damage results, including golf course greens. Because geese readily breed in proximity to areas of human use, the young hatched and raised in those areas tend to remain, creating a growing population and growing problem.

The City's Golf Services Department estimates that measures to control geese (through hazing, see below) cost the City nearly $6,000 per year. Even this cost is conservative, because much of the work is provided by volunteers.

Regulatory Compliance
The Canada goose is a game species in Colorado and is protected by the federal Migratory Bird Treaty Act. As a hunted waterfowl species, the taking of geese for sport requires state and federal licenses. Taking of geese except in conformance with state and federal hunting requirements and limitations is prohibited unless a license has been obtained from Colorado Parks and Wildlife.

Hazing (harassment of geese by dogs under the control of a person) to disrupt goose activities and encourage them to leave an area can be conducted with approval from Colorado Parks and Wildlife. This method is relatively effective, because the geese do not readily habituate to (become tolerant of) dogs, which resemble their primary predators (foxes and coyotes). Generally, hazing is conducted at variable times from day to day so that geese cannot simply avoid an area at the time when hazing occurs.

The Migratory Bird Treaty Act prohibits hazing during the goose breeding season. Therefore, use of hazing on golf courses, parks, or athletic fields must be suspended from April through July. This reduces the effectiveness of the technique, since it allows geese to raise young in an area where they may be a problem, only adding to the problem population through time.

Where hazing has not been effective in dealing with a problem, and if the problem is sufficiently severe, Colorado Parks and Wildlife may authorize the destruction of a nest. Under the Migratory Bird Treaty Act, this also requires a Depredation Permit from the U.S. Fish and Wildlife Service. One common technique, called oiling, consists of coating the eggs with vegetable oil, which prevents gaseous exchange across the shell. In the meantime, the geese continue to sit on the eggs. By the time the adults "realize" that the nest has failed, it often is too late in the season for them to nest again. In comparison, simple egg destruction is not as effective, because the sudden disappearance or destruction of the eggs may trigger laying of a new clutch.

Management of Problem Canada Geese
In dealing with problems created by concentrations of Canada geese, the City should:

- To the extent practicable, follow a "live and let live" approach when the consequences of not dealing with problem geese are minor.
- Continue and, as needed, expand the use of dogs to haze geese concentrations on golf courses, parks, athletic fields, or other areas of City land.
- Where deemed suitable in terms of safety, compliance with firearms ordinances, and compatibility with other land uses, the City may consider allowing hunting of Canada geese on City lands during the hunting season as a means of managing problem populations. This would require licenses from Colorado Parks and Wildlife and U.S. Fish and Wildlife Service.
- Consider a ban on feeding of Canada geese to reduce the severity of problem concentrations of geese at public parks or other City lands where they occur in proximity to human uses. This restriction would also apply on private lands.
- Continue and, as needed, expand the use of dogs to haze geese concentrations on golf courses, parks, athletic fields, or other areas of City land. Amend the Longmont municipal code to allow the use of dogs in hazing on all City-owned lands.
- Consider using pond management techniques (especially maintaining dense vegetation) to minimize the use of City ponds by geese.

Management Issues Involving Some Fox Squirrels

Ecological Synopsis

The fox squirrel is a relatively recent resident of the Front Range region, having arrived here only a few decades ago as an intentional release in Fort Collins. The rapid spread of fox squirrels throughout the area since then, combined with their natural movement westward along major river corridors on the Great Plains, suggests that they would have gotten here naturally within a relatively short period. Because the urban/suburban environment of the Front Range is similar to other parts of the U.S. where they occur naturally, fox squirrels are adapted to our local environment and have flourished. Although they also occur in more rural settings, especially along perennial streams such as the St. Vrain, fox squirrels are much less common "in the wild" than "in town."

The fox squirrel, like the red fox, is a creature of patchy woodland, preferring forest edges to forest interiors. Although squirrels do not venture significant distances into open habitats, they spend much of their time foraging on the ground as well as in the boughs of deciduous trees.

Identified Problems

The major issue with squirrels in Longmont is the penchant of some individuals or populations to feed on the sapwood of trees, especially elms but also including silver maples and cottonwoods. This results in complete "debarking" of twigs, stems, and portions of some larger branches. When a twig, stem, or branch is debarked around all or most of its circumference (called "girdling"), flow of fluids and nutrients ceases, and areas higher on the trunk or farther out on the limbs die.

The photo at left below shows a mature elm on which several large limbs have been killed by squirrel debarking. The City's Parks and Forestry Division estimates the annual cost of squirrel damage at $25,000 to $35,000. This estimate includes trimming or removal of dead or dying branches and, in extreme cases, the removal of an entire tree. Removal of dead or dying limbs is related to the overall health of the remaining part of the tree as well as for aesthetic reasons and to minimize the safety hazard of dead branches over streets, sidewalks, and buildings.

The estimate also includes staff time and materials used to trap squirrels in problem areas. However, it does not include the value of destroyed trees, which are essentially irreplaceable since it takes many years for even the largest nursery stock to attain mature stature. The estimate also does not include the societal cost of having less staff time and budget available for activities related to management of Longmont's urban forest.

The City's focused trapping of squirrels has proven somewhat successful when comparing trapped to untrapped areas. However, the effort required to address this problem detracts resources available for other activities related to management of Longmont's urban forest

An interesting aspect of this situation is that it is somewhat localized. Most squirrel populations, whether in Longmont or elsewhere, do not seem to cause this type of damage to such a large degree. The reason for the localized behavior in parts of Longmont is not known. It is possible that this reflects a learned behavior, passed from one generation to the next as the young are learning where and what to eat. It also is possible that this occurs only in areas where squirrel populations have attained abnormally high densities. Clearly, if the behavior were very widespread, no City with fox squirrels would have healthy elms or other vulnerable street trees, but this is not the case.

Another potential problem is that squirrels may den in City buildings, including attics, chimneys, and wall voids. Even if not a causing a distraction or disturbance, squirrels denning in buildings can cause damage to roofs, insulation, wires, and other fixtures.

Regulatory Compliance
The fox squirrel is a small game species in Colorado, and hunting is permitted during a specified season (fall-winter). Trapping of squirrels that are causing property damage may be trapped without obtaining a permit, but releasing the trapped animals to another location would require prior notification of Colorado Parks and Wildlife, to a site that is suitable for the species, with permission of the landowner or managing agency, and only within 10 miles of the capture site. Otherwise, the trapped animals must be euthanized. Section 4.5.1 describes the negative ecological aspects of relocating problem wildlife.

Another potential negative ramification of relocating trapped squirrels is that it could cause the extreme debarking in an area where it is not currently a problem, whether by introducing squirrels that engage in that behavior excessively or creating an artificially high population density.

Management of Problem Fox Squirrels
In an ongoing effort to protect street trees, which represent a valuable resource for the community, and to reduce the annual costs of trimming and tree removal, the City should implement the following:

- Where practicable on City land, such as for isolated "specimen" trees that squirrels cannot access from a nearby roof or tree, the City should attempt to prevent squirrel damage by placing a climbing barrier around the trunk of the tree. [Note: Squirrel repellents are available but need to be reapplied frequently, including after precipitation, and therefore are impracticable for the City.]
- In situations of squirrel damage to trees on City land that cannot be protected from squirrels by a climbing barrier, the City should pursue the trapping of squirrels. A small game license from Colorado Parks and Wildlife will be required if property damage caused by the problem animal(s) cannot be documented.
- In situations involving damage to trees on City easements or rights-of-way across private land, such as street trees, the City should cooperate with the individual landowner to explain the problem and request permission to trap squirrels on that land.
- If the individual landowner does not grant permission to trap squirrels on that property, the City should consider seeking permission from the owner of an adjacent or nearby property that is likely to be used by the same squirrels as the ones causing damage.
- If possible, trapping should be conducted during the normal open season for this species (fall-winter), which is timed in part to avoid the potential for creating orphan offspring when they are too young to survive on their own. Trapping may be performed by City staff or a licensed trapper.
- The City may also trap (or hire a professional to trap) squirrels that create a nuisance by denning in City buildings. After removing the animal, the City should locate the entry point of the squirrel and make modifications to prevent subsequent entry by another squirrel.
- The City should euthanize all squirrels captured, whether involving tree damage or denning in a City building and should not transport trapped squirrels to another location for release.
- Where deemed suitable in terms of safety, compliance with firearms ordinances, and compatibility with other land uses, the City may consider allowing hunting of squirrels on City lands during the hunting season as one method for managing problem populations.

As described previously, removing squirrels from an area creates a territorial "vacuum" that typically is quickly filled by squirrels from other areas. However, since the problem of tree damage is localized, it is possible that in-migrating squirrels will not feed on sapwood to the same extent as the removed squirrels.

Management Issues Involving Some Muskrats

Ecological Synopsis

The muskrat is an aquatic rodent that is closely related to New World mice. Muskrats may construct lodges of mud and plant debris (e.g., cattails and bulrushes) or burrow into the banks of streams and ponds. Entrances to the lodges or burrows start below the waterline to provide protection from predators. Unlike beavers, they do not build dams, nor do they damage trees, instead feeding on lush foliage.

Identified Problems

The only problem with muskrats identified on City lands as of the date of this Plan is the potential for damage to earthen dams at ponds, including water features at the Sunset Golf Course but potentially at other golf courses and parks. This damage can result when den burrows result in removal of earth material and allow water into the dam. This can cause the dam to weaken.

Regulatory Compliance

The muskrat is designated by Colorado Parks and Wildlife as a furbearer and, as such, can be taken only during a specified season (fall-winter) and only with a small game license. This restriction does not apply to muskrats that are causing damage to property or creating a safety hazard. In this situation, muskrats may be trapped without a license but must then be euthanized unless a relocation permit has been obtained from Colorado Parks and Wildlife. Trapping muskrats for release at another location is generally not desirable because of the potential that they would not stay there but disperse elsewhere, potentially causing problems for another site or landowner. Therefore, Colorado Parks and Wildlife is not expected to issue a relocation permit under most circumstances. Use of a lethal trap is prohibited except under a furbearer trapping permit.

Section X describes the ecological problems associated with relocating mobile species.

Management of Problem Muskrats

In dealing with problems associated with muskrats, the City should:

- To the extent practicable, follow a “live and let live” approach to muskrats.
- When a dam safety risk or other significant public hazard exists, trap the muskrat(s) causing the problem, obtaining a Colorado Parks and Wildlife license if necessary.
- If possible, conduct the trapping during the normal open season for this species (fall-winter), which is timed in part to avoid the potential for creating orphan offspring when they are too young to survive on their own. Trapping may be performed by City staff or by a licensed trapper.
- Euthanize all muskrats trapped. The City should not transport trapped muskrats to another location for release.

Management Issues Involving Some Raccoons and Striped Skunks

Ecological Synopsis

The raccoon and striped skunk are omnivorous predators, feeding on a wide range of plant foods as well as animal prey. Both species are commonly found along waterways but also are common in urban/suburban areas far from water. Their cleverness, ability to use a wide range of foods and denning sites and being active at night make them particularly well suited to human environments. Raccoons are active year-round, although spending much of the winter in their dens, while striped skunks hibernate.

Identified Problems
Because these species are able to use a wide range of foods and human environments, they can thrive in proximity to humans and become a nuisance. In most cases, this is because the human habitation that attracts the animals provides either a food source (including garbage and pet food) or denning site.

The main problem identified is that raccoons may den in City buildings, where they may cause damage to roofs, insulation, wires, or other fixtures. Plant and other materials used to construct nests in chimneys can create a significant fire hazard, and raccoons can enter buildings through open flues, causing substantial interior damage. Striped skunks are less likely to den in buildings, but they may den under porches or in crawl spaces, creating a nuisance from their odor and potentially damaging insulation, wires, and other fixtures.

Regulatory Compliance
The raccoon and striped skunk are designated by Colorado Parks and Wildlife as furbearers and, as such, can be taken only during a specified season (fall-winter) and only with a small game license. However, this restriction does not apply to raccoons or skunks that are causing property damage or creating a health and safety hazard such as by denning in a chimney or under a porch. Trapped raccoons, but not skunks, may be released at another location without a permit, provided that Colorado Parks and Wildlife has been notified in advance, the release site is suitable habitat, permission has been granted from the landowner or managing agency at the release site, and the relocation point would be no more than 10 miles from the capture point. Otherwise, relocation of raccoons and skunks would require a relocation permit.

Live-trapping raccoons or skunks for release at another location is not desirable because of the potential that they would not stay there but disperse elsewhere, potentially causing problems for another site or landowner. Therefore, Colorado Parks and Wildlife is not expected to permit relocation under most circumstances. Section 4.5.1 describes the ecological problems associated with relocating mobile species.

Management of Problem Raccoons and Striped Skunks
In dealing with problems associated with raccoons and striped skunks, the City should:

- To the extent practicable, follow a "live and let live" approach to raccoons and skunks that are not causing actual damage or creating a health or safety hazard.
- When unacceptable property loss or a health or safety hazard exists, trap the individual animal(s) causing the problem, obtaining a Colorado Parks and Wildlife license if necessary.
- If possible, conduct the trapping during the normal open season for these species (fall-winter), which is timed in part to avoid the potential for creating orphan offspring when they are too young to survive on their own. Trapping may be performed by City staff or by a licensed trapper.
- Euthanize all raccoons or skunks trapped. The City should not transport trapped individuals of these species to another location for release.
- After removing any raccoons or skunks that are denning in a City building, locate the entry point of the animal(s) make modifications to prevent subsequent entry by another raccoon or skunk.

Additionally, the City should consider creating an ordinance prohibiting the feeding of wildlife (except birds) and prohibiting the keeping of dog food or trash outdoors overnight, unless within a sealed container or secure enclosure (see Section X).

Management Issues Involving Some Red Foxes

Ecological Synopsis
The red fox, historically known as a furtive species due to its being hunted or trapped, is an example of how readily some species of wildlife can adapt to human habitats and human presence when not hunted.

This carnivore generally prefers patchy habitats that provide trees or dense shrubs for cover and open areas for hunting small prey. Fortunately for the fox, the types of habitats associated with human developments are ideal, especially when they provide prey (songbirds, rabbits, squirrels, house cats, small dogs) or supplemental food (trash or dog food left outdoors overnight). Red foxes are active primarily at night and spend the day in a den or burrow.

Identified Problems

The red fox is generally not a nuisance where it occurs and can be beneficial by feeding on rodents and other potential pests. The principal problem in Longmont arises because of the fox's penchant for digging in banks and other soft earth.

For example, one such apparently ideal denning location has been the Ninth Green at the Sunset Golf Course (photo at right). Unfortunately, it is not possible to simply ignore the burrow system and adopt a "live and let live" philosophy because of subsidence or collapse of the overlying earth and sod. Repair could continue indefinitely unless the situation is addressed, and of potentially greater concern is the interference with use and enjoyment of the course by citizens, guests, and other visitors. Moreover, remedying the problem by rebuilding the Ninth Green to make it unsuitable for fox denning would have three limitations:

- It might merely force the foxes to another undesirable location.
- It could reduce the quality of the golfing experience by eliminating an attractive, elevated green.
- The cost to the City would be substantial.

Trapping of red foxes that are causing property damage does not require a permit from Colorado Parks and Wildlife, but release at another location would. Additionally, as described in Section 4.5.1, it is likely that any relocated foxes would eventually be replaced by other foxes, and release of the trapped foxes at another location could create a nuisance for nearby landowners and for existing wildlife in the release area.

Regulatory Compliance

The red fox is a furbearer in Colorado and is regulated by Colorado Parks and Wildlife. Red foxes may be taken during a specified season (fall-winter) with a small game license. Trapping of problem animals can be conducted without a license and outside the open season if the animal is causing property damage. However, the transport of live-trapped animals to another location would require a permit from Colorado Parks and Wildlife. Considering the problems inherent in relocating mobile species such as the red fox (see Section 4.5.1), Colorado Parks and Wildlife may not grant requests for trapping and relocation of red foxes that have created a nuisance for the City.

Management of Problem Red Foxes

Based on the information summarized above, the City should implement the following policies regarding problem red foxes:

- To the extent practicable, the City should continue its current "live and let live" policy toward red foxes that inhabit or otherwise utilize City lands.
- If red foxes create a problem that causes unacceptable property damage, incurs unacceptable costs to taxpayers (including staff time), or interferes with the intended use of the land, the City may pursue an effort to capture and euthanize the problem animal(s). A small game license from

Colorado Parks and Wildlife will be required if property damage caused by the problem animal(s) cannot be documented.

- If possible, trapping should be conducted during the normal open season for this species (fall-winter), which is timed in part to avoid the potential for creating orphan offspring when they are too young to survive on their own. Trapping may be performed by City staff or by a licensed trapper.
- The City should NOT release any trapped foxes at another location but instead should euthanize all captured individuals.
- If trapping is conducted to remove one or more problem foxes, the City should evaluate methods to prevent recurrence of the problem.

Additionally, the City should consider creating an ordinance prohibiting the feeding of wildlife (except birds) and prohibiting the keeping of dog food or trash outdoors overnight, unless within a sealed container or secure enclosure (see Section X).

Management Issues Involving Some Small Birds and Small Mammals

Ecological Synopsis

Some species of wildlife, besides those discussed above, often find human structures ideal for nesting, denning, or roosting. These species commonly include non-native small birds such as the rock dove (domestic pigeon), European starling, and house sparrow; bats; and small rodents, including both non-native species (house mouse and Norway rat) and native species ("field mice").

Identified Problems

Bats nesting in the attic of a house are seldom a serious problem, and measures can be taken to prevent their returning in subsequent years by closing off their entry point. However, many people find the presence of bats unacceptable, for reasons of sanitation (their guano may accumulate), concern about rabid bats, or a simple dislike for them.

Mice or rats living in the walls of a house or concentrating in outbuildings can be both a nuisance and a potential health and safety hazard. These rodents may chew through electrical insulation, creating a fire hazard, and they may pose a risk of exposure to several disease transmitted either through fleas (i.e. sylvatic plague or tularemia) or through exposure to fecal matter (i.e hantavirus).

Birds that become problems are those that concentrate in an area where their nests and excrement are unsightly and pose a potential health hazard. In some situations, people may find the nests of native birds such as the barn swallow and cliff swallow to be a nuisance when built under the eaves of their house.

Regulatory Compliance

While Colorado Parks and Wildlife lists the native species above as nongame species, the three non-native birds that commonly become problems (rock dove, starling, and house sparrow) are not listed as nongame and therefore not given the same protection as native birds. Additionally, the Migratory Bird Treaty Act does not extend to these species, because they are not native to North America. Therefore, killing of these species and the destruction of nests of these species, even if the nests contain eggs or young, is not prohibited.

Additionally, Colorado Parks and Wildlife allows black-billed magpies, common crows, and a variety of small mammals (jackrabbits, ground squirrels, tree squirrels, rats, voles and mice except Preble's) to be captured or killed without a permit when creating a nuisance or causing property damage. As discussed in Section 4.1.1, lethal control of Preble's is permitted when occurring in or within 10 feet of any structure

regularly used by humans. Relocation of live-trapped individuals of these species is generally not desirable ecologically (see Section 4.5.1) and would require a relocation permit from Colorado Parks and Wildlife.

Management of Problem Small Birds and Small Mammals
The following measures are intended to provide guidance to the City in dealing with problems created by these groups of animals:

- Where practicable, the City should continue its current "live and let live" approach when the consequences of not dealing with a problem are minor.
- When problems arise that warrant immediate resolution to remedy a public health or safety issue (e.g., mice living in a regularly used building or nesting starlings despoiling a public area), the City has the authority to remove the offending animal(s). Removal may employ lethal traps, live traps, legally approved poisons, or other means that do not pose a risk to the public and are consistent with City ordinances.
- Following removal of problem animals or following the natural resolution of a situation that does not warrant the City's intervention, the City should investigate and implement measures to prevent or reduce the potential for recurrence of the problem (e.g., sealing identified entry points).
- To reduce the potential of attracting problem wildlife, feeding of wildlife on City land should be prohibited, including feeding of birds unless for educational purposes and in a situation that does not increase the risk of attracting nuisance species. [For example, spilled birdseed may attract native mice to the vicinity of a human-used structure.]

Management Issues Involving Some Turkey Vultures

Ecological Synopsis
The turkey vulture is a migratory, scavenging species that spends summers and breeds throughout the Front Range, southeast, and western portions of Colorado. They are often observed soaring high above the ground, gliding on thermals, and they can travel many miles in their search for food, which is almost exclusively carrion. They locate sources of food by means of an excellent sense of smell. Though they prefer fresh prey, their immune and digestive systems allowing them to feed on carcasses without contracting botulism, anthrax, cholera, or salmonella.

While often considered to be an undesirable species due to their feeding habitats, turkeys vultures serve an extremely important ecosystem service by hastening the removal of rotting carcasses. An absence of vultures can lead to an increase in the presence and proliferation of the aforementioned bacteria, which can cause severe illness in humans and wildlife.
While vultures prefer to nest in areas with minimal human disturbance, they are often observed roosting and foraging in human environments due to the presence of roadkill and garbage. They can roost in groups numbering a few dozen to over 100 individuals. Additionally, migrating flocks can number in the thousands.

Identified Problems
The principal concern with turkey vultures in the Longmont-area is related to the tendency for many individuals to roost in a single location. When a large roost establishes, the vultures' feces and vomit can accumulate rapidly, and when this occurs near human-occupied areas, it can cover the roofs of houses, vehicles, office buildings, and communication and electrical towers. The sheer quantity of the matter can be distressing to residents, and the feces are high in uric acid, which can lead to a strongly unpleasant ammonia odor. Although the likelihood of disease transmission between the vultures and humans is extremely low, such situations can also pose a health and safety risk to the public.

Additionally, vultures are also especially hazardous to aircraft due to their soaring behavior. If roosts are located hear airports, they pose a risk to low-flying aircraft.

Regulatory Compliance
The turkey vulture is a true migrant in Colorado, and it is protected under the Migratory Bird Treaty Act. It is not regulated as a game species by Colorado Parks and Wildlife. Hazing techniques are permitted, provided they do not result in the take of a bird or a nest. Therefore, such tactics would generally be discouraged while the birds are actively nesting, although, as previously mentioned, they are rarely a nuisance to humans while nesting.

Where hazing has not been effective in dealing with problem vultures, and if the problem is sufficiently severe, the US Fish and Wildlife Service may authorize the use of lethal control. Under the Migratory Bird Treaty Act, this requires a Depredation Permit that outlines specifically by what means and how many vultures can be taken. For turkey vultures, the US Department of Agriculture Animal and Plant Health Inspection Service - Wildlife Services often assists with and facilitates turkey vulture depredation.

Management of Problem Turkey Vultures

- Where practicable, the City should continue its current "live and let live" approach when the consequences of not dealing with problem turkey vultures are minor.
- Provide educational content through the City's website on ways that landowners can legally harass problem vultures on their own (lighting, noise, sprinklers, etc.). Additionally, provide direct assistance to landowners with significant and persistent problems, including the use of decoys, deterrents, and other methods that do not violate the Migratory Bird Treaty Act.

- If hazing efforts are not successful and a landowner continues to experience property damage or healthy and safety risks from vulture activity, the City should facilitate coordination with the US Department of Agriculture Animal and Plant Health Inspection Service - Wildlife Services for more extreme methods. This can include expanded use of decoys, use of pyrotechnics as a means of hazing, and lethal control if necessary. Wildlife Services will facilitate the issuance of a depredation permit if lethal control methods are utilized. Any plan to use lethal control must be approved by the City Manager after being provided with information on the number and location of the problem vultures, the other management options attempted/considered, and the reasons for the proposed lethal control.

V. Habitat and Wildlife Management Priorities

A. Methodology

Ecological criteria, important for prioritizing management of open space for wildlife and the acquisition of new Open Space (Section 6), were derived from public meetings and expert opinion. These include criteria describing habitat type, landscape configuration (size, shape, and adjacency), ecological condition, and "naturalness." Other criteria addressing economic and sociopolitical considerations were also included. Criteria were organized into "tiers" to aid in prioritizing management and acquisition of Open Space.

Tier I criteria are the coarsest, providing an area-wide overview of management and acquisition priorities. Most Tier I criteria can be quantified using GIS (geographic information system) data layers. Tier II and III criteria are used to refine an evaluation or prioritization. Most of these criteria require site-specific knowledge and may in some cases require additional field study to be quantified properly. Tier IV criteria assist in the evaluation of methods by which land can be preserved or acquired and focuses on alternatives to purchases of land in fee simple. These include conservation easements and various methods to create incentives for developers to incorporate habitat preservation or enhancement during design of their projects.

Some criteria were given weights to differentiate ecological value. Habitat type, for example, was weighted to show relative habitat value. Habitat weights were developed by referencing a statewide habitat evaluation completed by the Colorado Division of Wildlife (Table X) and by input of technical experts. The weighting factors relate directly to the relative number of species a given habitat type is able to support. Other criteria are assigned an "optimal value" or a qualitative statement that indicates the optimal condition(s) relative to wildlife.

Table X. Colorado Division of Wildlife Statewide Habitat Ranking for Types in Longmont

Habitat Type	*Number of Species*	*Threatened or Endangered Species*	*Species of Special Concern*
Riparian Lowland	302	5	8
Urban Areas	146	2	0
Agricultural Pastures with Trees	142	1	3
Lakes and Reservoirs	139	5	14
Marshes	130	5	5
Shortgrass Prairie	126	3	11
Tallgrass Prairie	89	1	1
Mixed Grass – Disturbed	78	1	1
Rivers and Streams	64	4	9
Sand Sage Prairie	54	1	2
Cropland	44	2	2

Commented [RH2]: This will need input from CPW or City staff to update.

The importance of riparian habitats indicated in Table X is also reflected in Appendix X (Species List) in that nearly two-thirds of the species listed are associated either solely or primarily with riparian and stream habitats. Good-quality segments of St. Vrain Creek and of Lefthand Creek illustrate the structural

complexity and presence of water that result in a disproportionately high density and diversity of wildlife in riparian habitats compared.

It should also be pointed out that the large number of species indicated in Table X and Appendix X as occurring in urban areas is somewhat misleading because it includes many water birds and songbirds attracted to urban ponds and mature trees, respectively, during migration seasons but not remaining as summer or winter residents. The tier structure and accompanying criteria used to guide management (and prioritize future Open Space acquisitions, see Section 6) are as follows:

- Tier I – Major habitat type, as discernible on satellite imagery used for this project (Maps X and X). Habitat type may be modified by one or more special wildlife values in specific situations.
- Tier II – A refinement based on ecological criteria. This tier is used to differentiate between grossly similar habitat areas under Tier I.
- Tier III – A refinement based on a consideration of other goals, land uses, economics, etc.
- Tier IV – Tools for preservation or acquisition of identified "target" areas.

Tier I (Broad Brush Prioritization)		
Component	***Characteristics and Optimal Value***	***Weight***
	HABITAT TYPE	
Riparian – Perennial Stream	Riparian lowland is Colorado Division of Wildlife's highest-rated habitat in terms of species richness and is also high in the number of threatened, endangered, or special concern species. Riparian habitats associated with a perennial stream also support aquatic species and have a more reliable source of moisture for vegetation and terrestrial wildlife. This combination represents a structurally complex (layered) habitat for both arboreal and ground-dwelling species and provides reliable water, lush forage, and shelter.	10
Riparian – Other	Riparian corridors with no or few trees and those along intermittent streams and ditches are able to support less diverse and abundant wildlife than woodlands along perennial streams. Nonetheless, the overall ecological value is high compared to other types present in the planning area.	9
Open Water Lakes/Ponds	Although rated only seventh by the Colorado Division of Wildlife in terms of richness, lakes and ponds are the highest in terms of special concern species and also high for threatened or endangered species. In general, larger and deeper lakes are capable of supporting more species than smaller, shallower ponds, especially in terms of diving ducks and the amount of shoreline available. However, small ponds can be beneficial in terms of shoreline length per acre of surface, and in providing habitat for smaller species incompatible with predatory game fish.	7
Wetlands (Marshes/Bogs)	The Colorado Division of Wildlife rates this category as eighth overall in terms of richness but high for threatened or endangered and special concern species. Because this type cannot be readily discerned using satellite imagery for the GIS-based spatial analysis, it is treated as a special wildlife value criterion that raises the rating of the basic habitat type when present (e.g., a lake with cattail margin versus a barren shore). Cattail marshes and wetland willow thickets are especially important for supporting a variety of birds that do not occur in other types and for breeding by a variety of amphibians (frogs and toads).	7
Agriculture – Pastureland	Pastures consist of perennial grasses (sometimes with alfalfa) grown for hay or grazed. The low plant diversity, periodic wholesale disturbance (mowing) or heavy use by livestock, and general lack of native plants reduces their value for wildlife. However, they provide some prey for raptors and carnivores, especially when in a relatively natural condition with trees for perching or nesting. Wildlife use can be optimized by delaying mowing until after the songbird nesting season (approx. July 15), mowing at a greater height (6 inches or greater), and leaving unmown margins at 25 to 50 feet wide along fences and ditches.	4

Urban – Park	These lands, including golf courses, are usually characterized by "generalist" species commonly associated with human habitats and activities. While not "wild," they often provide habitat linkages with open spaces, attract migrant songbirds, and provide opportunities for wildlife viewing. Ponds can also support aquatic and amphibious species. Wildlife use can be optimized by including some thickets and creating wetland margins along portions of pond shores.	4
Agriculture – Cropland	Row crops have low value for wildlife due to the plant monoculture and periodic intensive human activity coupled with alternating barren (fallow) conditions. Wildlife use can be optimized by maintaining unmown vegetation (e.g., tall grasses) in strips 25 to 50 feet wide along fences.	1
Urban – Non-park	Areas of mature landscaping, such as in older neighborhoods, attract a variety of migratory as well as resident small birds as well as some raptors and carnivores and ubiquitous "urban" species.	1
SPECIAL WILDLIFE VALUE		
Special Wildlife Value	The weighting criteria above focus on a "typical" habitat condition. Unusually good-quality or poor-quality conditions at a specific site can change the relative value accordingly. For example, an exceptionally diverse pasture with tall trees, water, and proximity to open space may have a higher value to wildlife than open water with poor water quality, no shoreline vegetation or shallow shoreline zone, and adjacent intensive development.	

Tier II (Ecologically Based Refinement)	
Component	***Characteristics and Optimal Value***
LANDSCAPE CONFIGURATION	
Edge vs. Interior	Habitat edges tend to attract species associated with habitat mosaics or those more tolerant of human disturbance. These habitat-generalist or disturbance- tolerant species include most of the wildlife commonly associated with human developments—e.g., squirrels, rabbits, magpies, robins, etc. Habitat interiors are generally required by habitat specialists or species intolerant of human disturbance, including most of the species undergoing major declines in response to land developments. Humans tend to create "patchy" environments, which some species favor but others cannot utilize. **Figure X** illustrates the effects of edge width on effective habitat for habitat interior species. Note that edge may consist of a transitional habitat not suitable for the habitat-interior specialist, a habitat zone that is suitable but not usable due to competition with habitat generalists adapted to the edge, or a zone that is suitable but not usable due to human disturbance in the adjacent area (e.g., a trail, sports complex, or residential/commercial development).
Habitat Patch Size	Large patches are more able to support large species and those with large home ranges (i.e., the area required to support them and their movements). Large patches also have less edge per given area, affecting the species the habitat can support (see above). For example, a 4-acre circular patch has a circumference (edge) of approximately 1,480 feet, while four 1-acre circular patches have a combined circumference of 2,960 feet, or twice as much. **Figure 2** illustrates the effects of patch size on effective habitat size for interior species or those intolerant of adjacent human disturbance.
Habitat Patch Shape	Patches that are more "equi-dimensional" (e.g., circular vs. oval, square vs. rectangular) and patches with smoother edges have less edge per given area, again affecting the species the habitat can support (see above). **Figure 3** illustrates the effects of patch shape on habitat size for interior species.
Contiguity vs. Fragmentation	Internally contiguous habitats function as a single unit, while fragmented habitats may not function together, depending on the ability of a species to move between the fragments. **Figures X and X** illustrate habitat fragmentation.
Patch Connectivity vs. Isolation	For mobile species, patches separated by small distances may function as a single unit. For less mobile or more secretive species, even small distances may be sufficient to preclude movement between patches. Habitat connectors can allow otherwise separated patches to function as a unit. See **Figures X and X**.

ECOLOGICAL QUALITY	
Condition	Habitats in good condition—i.e., good vegetation cover and few weeds—are more valuable for most wildlife than disturbed or degraded sites. For aquatic sites, this includes water quality as well as the type and quality of the physical environment (banks, substrate, and riparian vegetation).
Special Management Needs	Areas in poor condition generally have special management needs that may affect how they are managed and the potential they can reach. Examples include infestations of weeds, barren or unproductive soils resulting from compacting or stripping of topsoil, areas subject to erosion, and areas damaged by chemical pollutants.
Naturalness	Habitats that are more "natural" are those that are dominated by a higher percentage of native plants or, if non-native plants, that are left in a semi-natural condition (e.g., not mown). Native habitats are almost invariably more diverse, and in most cases, contain plant species of higher value to wildlife. However, appropriate non-native plants can also provide for most wildlife needs.
Structural Complexity	More "layers" or "strata" of vegetation support more types and numbers of wildlife. This is especially true when trees and tall shrubs are present to attract arboreal species (see **Figure 6**). For lower-height habitats, such as grasslands, complexity can be provided by the presence of prairie shrubs, rock outcrops, or water. For streams, complexity may include a combination of deep, quiet pools and shallow, fast-flowing riffles, and areas with fine substrate alternating with coarse substrate or coarse plant debris (e.g., boulders, cobbles, and logs). For lakes and ponds, complexity may include deep-water and shallow-water areas, exposed shorelines, quiet embayments, and both rooted and adjacent terrestrial vegetation.
Species Richness	Habitats consisting of numerous plant species tend to support more wildlife use (number of species and individuals) than areas with few plant species. Greater species richness not only equates (generally) with greater structural complexity (see **Figure X**), it provides a variety of food types (foliage, flowers, seeds, fleshy fruits) that are available throughout and beyond the growing season. In contrast, pastures of one or two species produce abundant foliar growth and seeds, but only of one or two types and during only a small part of the growing season.
POTENTIAL FOR PRESERVATION, ENHANCEMENT, OR RESTORATION	
Current Condition	Current condition of a habitat is the primary factor in determining whether preservation, enhancement, or restoration is needed. An exception to this generalization is that agricultural lands can often be more easily converted to native grasslands than can non-farmland. The reason is that revegetating an area of irrigated row crops or fallow small-grain field generally involves much less weed control than starting with a weedy, degraded rangeland or farmland that has been long abandoned.

Time and Cost to Achieve Desirable Results	This criterion reflects the realities of budgetary constraints facing almost any municipality, especially during a period when the emphasis is on acquiring new lands while they are available. However, some enhancement or restoration projects may require a long timeframe to complete; it may be appropriate to begin and continue the process at a reduced level rather than postponing it completely.
Existing and Future Onsite Land Uses	The intended long-term use of a property strongly influences its interim management.
Surrounding Land Uses	Surrounding land uses, both existing and planned, also strongly influence whether a property warrants preservation, enhancement, or restoration. Even the best habitat is of limited wildlife value if closely surrounded by intensive human use.
Proximity to Other Habitats of the Same or Better Quality	This criterion goes hand-in-hand with the previous two. A habitat that lies near an already good-quality habitat may warrant higher prioritization of preservation, enhancement, or restoration. The value of the combined areas is partly limited by the poorest part.

Tier III (Other Bases for Refinement)	
Component	***Characteristics and Optimal Value***
INTEGRATION OF WILDLIFE GOALS WITH OTHER GOALS OR USES	
Passive Recreational Trail	Soft-surface trails and slow-speed uses are usually compatible with wildlife if they have sufficient setback from areas of intensive wildlife use (e.g., riparian corridors, wetlands, stream/pond shores) and do not fragment the habitat. Buffers should range from 50 feet for wetlands or ponds to 150 feet or more for good-quality riparian habitat. Some habitats may be so sensitive or ecologically important that trails are not appropriate. Seasonal closures of trails, such as to protect a raptor or heron nest, may make a trail more compatible with sensitive wildlife use.
Moderate Undeveloped Recreation	Uses such as fishing and (in limited situations) hunting are also generally compatible with most wildlife uses, unless (a) the season of greatest human use corresponds with the season of critical wildlife use and/or (b) the human use could cause direct harm to the species or habitat of concern.
Intensive Undeveloped Recreation or Multi-modal Transportation	Off-road cycling, high-speed on-trail cycling, and equestrian use could create levels of human activity and disturbance not tolerated by a species or habitat of concern. These types of uses generally require a larger buffer width than the passive recreational trail described above. Seasonal closures may also be appropriate, especially if adequate buffers cannot be provided during the seasons of intensive/sensitive wildlife use or intensive human use.
Potential for Outdoor Education and Nature Study	Areas having this potential should be given a priority for preservation, enhancement, or restoration. The potential for outdoor education and nature study is related to type and combination of habitats, accessibility from roads and trails, and location. Generally, areas that meet other criteria for preservation or enhancement are better suited to these uses than areas that require restoration— except potentially over the long term.
Location within City or Counties	Focus group meetings did not indicate a strong preference within the community to ensure that all quadrants receive an equal proportion of various wildlife habitat types or qualities. Instead, the emphasis should be on optimizing existing or future City-owned lands for wildlife, regardless of location.
POLITICAL AND ECONOMIC CONSIDERATIONS	
Budget-related Concerns	As noted above, any city has a limited budget. Therefore, electing to undertake enhancement or restoration may take a back seat to acquisition while undeveloped lands remain available. In terms of management dollars, priority should be given to preserving existing good-quality areas within the system to ensure that the current qualities and values do not diminish while budget is spent primarily on other acquisitions.
Establishing Near-, Mid-, and Long-term Goals	As noted above, it may be appropriate for some areas to establish sequential management approaches to meet near-, mid-, and long-term goals. As an example, this could include the following: near-term – implement weed control and stabilize eroding slopes or banks; mid-term – begin selective plantings of species that require a long period to establish (e.g., trees), long-term – convert non-native areas to native areas and add different habitat types for diversity.

Critical Areas that May Require Special Funding	In some cases, management actions (especially restoration) or acquisition (Section 6) of specific areas may be so critical to the City's long-term visions and goals that special funding may need to be sought. This may include, for example, joint participation by multiple entities (e.g., Boulder County, Weld County, and adjacent communities), grants from the State, or special referenda.

Tier IV (Preservation or Acquisition Tools)	
Tool	***Characteristics and Optimal Value***
PURCHASE OPTIONS	
Fee Simple	City gains full title to land, but at a high price. Issues include acquisition of underlying mineral rights (future drilling for oil and gas, mining for sand and gravel) and water rights (available water broadens future land use options).
Conservation Easement	Less costly, because seller retains some development or usage rights, but much more "bang for the buck." Major issue is whether seller's retained rights are compatible with City's intended uses and degree of control over how the land is managed.
ALTERNATIVES TO PURCHASE FOR PRESERVATION OR ACQUISITION	
Land Swaps	The City may be able to exchange land it currently owns for higher quality wildlife habitat, usually in conjunction with an inducement such as higher approved development density, expedited review process, or money to cover the price differential.
Density Bonuses or Exchanges	The City could induce a developer to preserve, in its natural condition, a larger portion of a property being considered for development than otherwise required. The inducement could include a higher approved density on the subject parcel, a density exchange for another parcel owned by the developer, or some other consideration such as money. The density bonus could be increased further if high-priority habitats are involved (see Sections 5.X and 6.X) and/or if the habitats to be preserved are improved by habitat enhancement/restoration (weed control, revegetation of degraded areas).
Stricter Development Codes	The City could increase its current setback requirements from streams and wetlands and add setbacks for other high-priority habitats (ditches, ponds, mature trees, native grasslands, etc.). This would retain more of the wildlife value of habitats adjacent to areas being developed. The City could also require that preserved areas be managed to control weeds and restore degraded habitats.
	In combination with stricter requirements, the City could create incentives to developers to preserve larger areas of wildlife habitat (see Section 7).
Wildlife-Related Requirements of Annexation	The City could require that annexation proposals include an evaluation of wildlife uses and habitats on the subject parcel(s) and a plan (as a condition of annexation) for the preservation of high-priority wildlife habitats (see Sections 5.X and 6.X).
Joint Acquisitions (with county or other municipal governments)	Through multi-jurisdictional agreements, Longmont and its neighbors could jointly acquire and manage larger or more expensive areas than could be accomplished individually. These generally are limited to areas of common interest, such as areas that bound neighboring communities, but could also include areas more remote from one community but with some sort of usage preference.

Grants or Other Funding Sources	The City could pursue grants or other funding sources (e.g., from Colorado Division of Wildlife) for wildlife habitat preservation and enhancement. While the grants are generally of modest size and can be used only for specific purposes, any of these monies can be used to offset dollars that otherwise would have to come from the City's Open Space revenue stream.

B. Preliminary Classification of Management Zones

The tiered methodology described above was used to identify, at a preliminary level, areas of special importance that should continue to be managed primarily as wildlife habitat and areas where current management might be broadened to include habitat-related issues. For example, and not surprisingly, areas ranking highest as a result of application of the methodology outlined above were associated with perennial streams (St. Vrain, Lefthand, and Boulder Creeks) and large water bodies (Union Reservoir and Terry Lake).

The analysis also shows where adjacent Open Space properties managed as a system might benefit wildlife habitat greatly. For example, contiguous Open Space properties along the St. Vrain, managed for riparian health, function, and connectivity, would provide additional habitat benefits by managing across jurisdictional boundaries, as opposed to managing individual properties.

Management zones were designed to direct wildlife management based on ecological concepts and criteria. Zones often cut across jurisdictional boundaries, and in some cases, may suggest cooperative management. Some management zones also overlap with other zones, providing numerous avenues from which to approach management of open space resources for wildlife. Therefore, management approaches might be habitat-based—e.g., prairie or riparian habitat management—or structural, including the management of corridors. Management strategies are likely to entail combining approaches to underscore principles of ecosystem management and the ability to plan for multiple objectives.

Management zones should also be used during the land development review process. This would provide a consistent method for evaluating potential impacts to wildlife and identifying planning options to mitigate those impacts (see Section 7).

The management zones shown on Map X and described in the following subsections were derived using the methodology discussed in Section 5.X, the wildlife and habitat considerations discussed in Section 4, and the identification of major habitat types using satellite imagery (Map X). Figure X depicts some of the concepts incorporated into Tier II (i.e., involving landscape configuration).

Riparian (Habitat or Ecosystem) Management Zone

As described in Section 4, riparian vegetation is extremely important to wildlife in the planning area by providing habitat and movement corridors for numerous species. The Riparian Management Zone consists of a stream or ditch, adjacent riparian vegetation, and a buffer extending up to 300 feet beyond the outer edge of the riparian vegetation (including the outer edge of the canopy of trees).

Many species that use riparian habitats for nesting, denning, or daytime cover—including raptors, some songbirds, deer, and foxes—use adjacent habitats for hunting or foraging. For these species, as well as for species sensitive to human activity, development adjacent to the outer edge of the trees would reduce or eliminate much of the current habitat value.
Within the riparian habitat itself, species composition and habitat structure (or configuration) of the plant community are important management issues. Structural considerations within the riparian habitat include maintaining large patch sizes and minimizing the effects of fragmentation. This can be accomplished in part by ensuring that riparian patches retain optimal adjacency and that setbacks (buffers) are such that patches are not constrained by adjacent development or other uses.

Fragmentation is already apparent in several riparian systems within the planning area, particularly in urban areas. The riparian corridor on Lefthand Creek, for example, is often fragmented where it intersects bridges or roads. In these areas, riparian vegetation may be sparse or lacking, and the ability of wildlife to use these corridors may be impaired by culverts, bridge abutments, or a lack of connectivity between habitat patches.

The photo at left shows a reach of Lefthand Creek upstream from the bridge at Colorado Highway 119. Note the gap in riparian trees and shrubs, which reduces the quality of the corridor both as wildlife habitat and for wildlife movement. The reduced quality associated with the discontinuous riparian woodland is exacerbated by the nearby regional multi-use trail on the south side of the creek (left of creek in photo). Thus, the discontinuous woody canopy not only fragments the habitat for arboreal (tree-dwelling) species but reduces the hiding cover for wildlife moving along the stream. Restoration of fragmented riparian habitats is included in the Restoration Management Zone (Section 5.X).

Commented [KK3]: Need an updated photo from staff.

Corridor Management Zone

The Corridor Management Zone is currently defined by the St. Vrain, Boulder, and Lefthand Creek corridors, including major tributaries. The photo at right is a reach of Spring Gulch located south of Colorado Highway 119 and adjacent to the Sandstone Ranch sports field complex. Although riparian trees are only scattered along this reach, the habitat is lush, diverse, and capable of supporting a number of native species. Lower reaches of the creek may provide habitat for native nongame fishes. Spring Gulch also provides a potentially important habitat connection between Union Reservoir and the St. Vrain.

Functionally, a variety of configurations of woodland, shrubland, and grassland habitats not related to streams and ditches may be regarded as corridors where they support wildlife movement or serve as connectors between habitat patches. Examples may include golf courses, agricultural fields, railroad or powerline easements, and other undeveloped lands. In the planning area, however, most intact corridors are associated with riparian systems and thus technically included in the Riparian Management Zone. Some of the corridors in Longmont include areas of significant fragmentation. These are included in the Restoration Management Zone (Section 5.X).

Open Water and Aquatic Management Zone

The Open Water and Aquatic Management Zone includes all water bodies as defined by the City of Longmont GIS data layer. This layer shows all lakes, ponds, and water-filled gravel pits and ponds.

Prior to settlement, the planning area contained little open water or aquatic habitat, aside from the major creeks. The creation of irrigation reservoirs and ditches has provided significant additional habitat for aquatic species and, in many cases, for species associated with adjacent riparian or wetland habitat. From a practical standpoint, the management of open water entails the management of aquatic resources primarily for game fish and fish-eating water birds. However, future management of most lakes and ponds could specifically include creation of shallow wetland benches that provide nesting habitat for wetland songbirds and water birds as well as areas in which nongame fishes can breed and escape predation by game fish or other predators.

Planting cottonwoods or erecting nest/perch poles can also attract ospreys (left), bald eagles, and other raptors. Furthermore, the benefits of adjacent shallows, wetlands, and tree plantings can be optimized by restricting human use, including fishing, along those portions of the shore and placing signs to preclude watercraft from approach within 150 feet of the shore in those areas.

Water-filled gravel pits may become either good-quality or poor-quality aquatic habitat, depending on a number of factors. These include shoreline configuration and slope, presence or potential for establishment of rooted aquatic and adjacent upland vegetation, and water quality. The last factor is often limited by the flow- through rate of groundwater or surface water in the pits. Where practicable, gravel pits reclaimed as ponds should be designed such that flow-through is sufficient to maintain adequate aeration during summer heat as well as when covered with ice in winter.

Whether natural or resulting from gravel mining or agriculture, smaller ponds generally offer better potential than larger lakes for management to sustain native nongame fishes and amphibians (see Section 4). These species often cannot coexist with predatory game fish or the type of smooth, barren shoreline commonly found around relatively barren gravel pits or irrigation lakes with widely fluctuating water levels. The City should continue to work with Colorado Parks and Wildlife to identify sites appropriate for the introduction of native nongame fishes and continued or future use by amphibians such as the northern leopard frog. As noted previously, creation of shallow shoreline benches with emergent aquatic and wetland fringes around portions of ponds or lakes of any size can greatly improve the habitat for waterfowl, amphibians, and aquatic reptiles as well as native and non-native fishes.

Prairie, Mixed Grassland, or Semi-Natural Pasture Management Zone

Only minor patches of native grassland (none “pristine”) remain in planning area. Relicts of native grassland exist in only a few, rocky areas that were too steep for cattle or the plow (an example being at Sandstone Ranch). Small areas with components of shortgrass prairie and sand prairie exist along and above the bluffs at Sandstone Ranch, although most of this area was formerly stripped of soil during the historic rock quarrying. Most areas that were tallgrass prairie

prior to settlement have been converted to agriculture or put to some other human use, including mining for sand and gravel on floodplains where this habitat occurred. In general, grasslands in the planning area are mixed grasslands, containing more generalized or transitional species than either shortgrass or tallgrass per se, and usually with a significant (or dominant) component of non-native grasses.

Given the small size of the few, scattered patches of semi-natural grassland, they are too small to be of significant habitat value, even to relatively sedentary species such as reptiles and small rodents. While restoration of some areas currently in agriculture to shortgrass or tallgrass prairie may provide small patches for aesthetic or educational purposes, full-scale restoration is unlikely. Probably the greatest potential is for tallgrass prairie, which can be established relatively easily (at least at a rudimentary level) in areas of adequate moisture. The Sandstone Ranch stewardship plan includes possible restoration of tallgrass prairie in an area historically used for hay production (some of which now supports a prairie dog colony), and reclaimed sand-and-gravel mines also have this potential.

Several relatively large patches of semi-natural pasture (non-irrigated, but consisting primarily of non-native forage grasses) within the planning area may provide similar habitat benefits. Where practicable, these areas should be managed as large patches, rather than allowing fragmentation, while addressing issues of undesirable exotic species (including weeds and other invasive plants) and modifying haying to minimize wildlife impacts. For example, hay production could be modified by delaying the first cutting until after the songbird nesting season (typically July 15) and cutting no closer to the ground than 6 inches. No Open Space lands are currently used for grazing, but if such lands are acquired in the future, reduction in the intensity of grazing and changes in seasonal use can also hasten recovery.

While this management zone is mostly confined to a few locations of semi-natural pasture, conversion of croplands to non-irrigated pastures could provide similar habitat benefits, particularly if the resulting patches are large and relatively contiguous. This conversion would be relatively simple if the irrigation water were available for a period of a few years to help get the planted grasses established. Areas of existing irrigated cropland or semi-natural pasture could also be planted with a relatively diverse mix of native tallgrass or midgrass species. The native tallgrasses are often used as native hay and, due to the availability of moisture in areas where they occur, more easily established than dryland plantings of shortgrass species.

Certainly, the most difficult conversion of farmland to grassland would be to recreate areas of shortgrass prairie. Any candidate areas would probably consist of dryland crops (e.g., winter wheat). Due to the lack of irrigation water to supplement precipitation, the establishment of native shortgrasses would be a slow process involving several years and a significant effort at weed control. On a relatively small “demonstration” scale, however, it could have educational/research benefits.

St. Vrain Creek Corridor Management Zone

Regarded as an outstanding example of riparian lowland corridors in the Front Range region, the St. Vrain Creek corridor warrants particular management attention. The Colorado Natural Heritage Program has drawn a Potential Conservation Area boundary for St. Vrain Creek, coincident with this management zone. The St. Vrain Creek Potential Conservation Area is ranked by the Colorado Natural Heritage Program as having high biological significance.

The St. Vrain corridor within the planning area consists of two large segments. The western segment (west of Hover Street) has been less affected by in-stream or along-stream habitat modification and is of special concern because it supports populations of the native nongame fishes discussed in Section 4. The western segment also is the only area of Longmont in which Preble's meadow jumping mouse has been documented. Although the western segment is relatively free of in-stream habitat modifications, an old structure adjacent to Golden Ponds (photo at right) appears to benefit native fishes by precluding upstream movement by non-native (including predatory) species from downstream reaches (Randy Van Buren, Colorado Division of Wildlife, personal communication 2004).

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The eastern segment is more highly modified and vulnerable to periodic fluctuations in water quality related to the Longmont water treatment facility. While this segment supports some native fishes, its primary value is in the arboreal songbirds, raptors, white-tailed deer, wild turkey, and other terrestrial wildlife it supports.

The central portion of the St. Vrain corridor in Longmont is fragmented as the creek passes through urban and industrial areas of central Longmont. While this fragmented area still supports some riparian vegetation, notably absent is the type of habitat structure that exists in portions to the west (upstream) or east (downstream)—i.e., where cottonwood galleries are broad and a willow understory well established. Current development trends aside, significant areas of riparian fragmentation would be likely candidates for recommended restoration of riparian species and structural reconfiguration.

This habitat fragmentation where the St. Vrain passes through Longmont also affects aquatic species, which historically were able to move between upstream and downstream reaches and thus continuously recolonize areas from which they might be locally extirpated (i.e., no longer present) during periods of extremely high or low flow. However, it appears that attempts to reestablish the aquatic habitat linkage through this area might not be beneficial, since it would allow upstream or downstream movement of non-native predaceous fishes into areas where they currently are not prevalent. This could have a detrimental impact on the native fish community in currently relative natural reaches.

One issue of special concern in this management zone is ensuring that any future recreational uses, including a kayak park, not affect the physical habitat of stream segments supporting the native non-game fishes. This includes changes in seasonal flows, substrate, and relative extent of pools, riffles, and runs without consultation with Colorado Parks and Wildlife. Another use of the St. Vrain (and other stream) corridors that should be given careful consideration in the future is the construction of trails. In general, greenway trails should be located outside the riparian canopy plus an additional buffer of at least 150 feet, or more where possible.

Restoration Management Zone

Within the planning area, several locations are notable for their restoration potential. From an ecological perspective (and not taking into account costs and land use considerations), restoration of fragmented corridors and disturbed habitats would result in added benefit to wildlife and other Open Space amenities. Notable areas within the Restoration Management Zone include fragmented portions of the St. Vrain and Lefthand Creeks and riparian areas associated with Boulder Creek in the southeastern portion of the planning area. This restoration

should focus not only on restoring degraded aquatic habitats, but also on improving the contiguity of riparian woodlands, enhancing the shrub/grass understory in areas affected by livestock grazing, creating wetlands in off-channel ponds and sloughs, and improving (in quality and width) adjacent grassland or naturally managed pastureland as feeding habitat for mammals and birds nesting, resting, or moving through the riparian woodland.

Where feasible, restoration of these habitats should also extend upstream at least a short distance (150 to 300 feet) along tributary drainages that provide linked habitat and water quality benefits.

C. Priorities for Future Acquisition

The City's Open Space Master Plan (2018) also utilized a weighted criteria analysis to identify priority areas for acquisition. Wildlife and plant ecology was one of the variables considered in the analysis, but the overall intent was to identify properties that would provide recreational and community benefits as well. Nonetheless, the results of the analysis revealed a very similar pattern of priority acquisition areas; the St. Vrain Creek and Boulder Creek corridors represented some of the highest priority acquisition areas. Additionally, survey participants in the community were asked in what portions of the community they wanted to see more open space. The two most popular areas occur along St. Vrain Creek where it flows through the City. These results generally align with the results of the wildlife analysis and public input during the preparation of this Plan.

Approach

General priorities for future Open Space acquisitions were formulated based on input from citizens both online and at public meetings, expert opinion of the project team, and spatial analysis. Acquisition priorities can be distilled into the following general categories:

- corridors that connect otherwise isolated habitats, and lands contiguous with existing Open Space
- riparian areas, wetlands, and areas containing or near surface water resources
- areas conducive to species richness or diversity

The last bullet includes habitats known to support species of high interest or special concern and habitats that are currently under-represented or lacking from Open Space (e.g., native grasslands, high-quality semi-natural pastures, and areas having significant stands of trees).

These priorities were captured in the tiered evaluation processed described in Section 5. The tiered approach can be used to compare potential acquisitions to determine which has the highest overall value to wildlife. For example, an area containing a medium-sized patch of riparian habitat adjacent to existing Open Space might have a higher value than a large patch of cropland, isolated from existing Open Space and lacking corridors to link to other habitat. The prioritization process is perhaps most useful for determining where areas of wildlife value are located and comparing those areas against lands not currently in the Open Space system. This coarse-filter approach can be used to focus acquisition efforts where they may provide the best investment of limited funds and time while providing maximum benefit for area wildlife.

To locate high priority acquisition areas within the planning area, the priorities map (Map X) was compared against areas currently in the Open Space system (i.e., City and County open space,

parks. and municipal golf courses). High priority areas not in the Open Space system were regarded as priority acquisition areas. Because these priorities were based on Tier I criteria, knowledge of current or upcoming land development projects was not considered. This latter type of knowledge would be applied at the Tier II or III scale and might well remove an area or set of areas from consideration.

The results of this coarse filter prioritization identified areas along Boulder, St. Vrain, and Lefthand Creeks, described below.

Results

Boulder Creek

The largest priority area is located on Boulder Creek, near its confluence with St. Vrain Creek (south of the Boulder Creek Estates property in Weld County) (Map X, Area X). This area is regarded by Colorado Parks and Wildlife as an important foraging and roosting habitat for bald eagles and also provides high-quality habitat and a movement corridor for other species. This area has been mined for gravel over many years, and wildlife habitat (riparian vegetation and the aquatic regime) has been greatly modified during this period. As a priority acquisition area, this portion of the planning area might be an appropriate target for a large-scale restoration effort. Key restoration elements might include the reestablishment of hydrologic connectivity and the restoration of riparian and tallgrass prairie composition and structure. A detailed evaluation of this area would be useful, including the establishment of a baseline condition that documents long-term ecological patterns and ranges of variability. Getting in front of a restoration effort of this magnitude would provide ample opportunity for public education and involvement, while providing additional habitat (and possibly recreation opportunities) for numerous species, including the bald eagle and other species of high interest or special concern.

Tier II, III, and IV criteria (see Section 5) should be used to refine the prioritization process farther. This could include adding levels of economic and political reality to the process—for example, addressing site-scale aspects of specific areas—and identifying which properties warrant additional analysis or data gathering. It is likely that the land acquisition process will be driven by mechanisms outside the City's control, including the availability and price of land, location, size of properties, etc., but knowledge of these areas can help keep priorities at the forefront so that opportunities can be recognized should they arise.

St. Vrain Creek

Three principal priority areas occur on St. Vrain Creek (Map X, Areas X, Y, and Z). One is located immediately downstream from the confluence with Boulder Creek. This priority acquisition area should be regarded as part of the Boulder Creek priority area.

Another priority acquisition area on St. Vrain Creek is located near Airport Road. Currently, this portion of the western segment of the St. Vrain corridor is the only one not currently part the overall Open Space system. This part of the creek is considered an important foraging habitat and concentration area for the bald eagle. It also is located immediately east of occupied habitat for Preble's. As part of the western segment of the St. Vrain Creek corridor, this priority area is also a significant movement corridor for wildlife species.

Finally, the area located in general vicinity of the confluence of Lefthand and St. Vrain Creeks is characterized by relatively high total values, but only a narrow portion of St. Vrain Creek is currently part of the St. Vrain Creek Greenway system.

While these three areas are considered priority for acquisition along St. Vrain Creek, it should be noted that there is a strong desire within the community to preserve as much of this creek corridor as possible. As discussed in previous sections, St. Vrain Creek provides habitat for many valued wildlife species, including native fish that are especially well-adapted to its conditions. Additionally, the flood in 2013 decimated many areas within the floodplain, such that the City is undergoing a massive flood mitigation effort (the Resilient St. Vrain Project or RSVP) to strive to attenuate future flooding events. City acquisition and management of portions of the St. Vrain corridor, in concert with the RSVP, would not only minimize flooding risk to private properties, but also aim to preserve valuable wildlife habitat in perpetuity.

Lefthand Creek
A portion of Lefthand Creek located southwest of Longmont also ranks high in terms of wildlife value but is not currently in the Open Space system. It is also adjacent to current Open Space properties and is characterized by well-established riparian vegetation along much of the reach. This portion of Lefthand Creek retains corridor functionality (see Map X, Area X).

Large Parcels in Western Weld County
While not ranking as high as areas associated with the riparian habitats and corridors described above, lands in the northeastern portion of the planning area (predominantly Weld County) should also be regarded as potential priority acquisition areas given the predominance of large patch sizes that remain there. Most wildlife habitat in this area is agricultural cropland and therefore a lower priority overall. However, use of innovative management strategies could benefit numerous wildlife species that rely on large patches of relatively contiguous habitat. Managing for wildlife in this part of the planning area need not reduce agricultural production, but it might influence how production occurs over time. This could include changes in the seasonal rotation, level of use by livestock, and cropping methods to maximize habitat at suitable times (e.g., bird migration and nesting seasons).

These larger parcels should also be considered as possible relocation sites for projects in which prairie dogs need to be removed from City or private lands. Other Open Space (but not wildlife-related) considerations for these large parcels include educational opportunities involving grassland restoration and potential value for passive or active recreation, as community separators, and as sites for preserving the agricultural heritage of the area.

Strategies for Future Acquisition

As of the date of this Plan, the City has used a combination of purchase in fee and purchase of conservation easements when adding lands to the Open Space system. Some alternatives currently used by other cities in the region are summarized in the Tier IV matrix of Section 5.

VI. Recommendations for Best Management Practices, Code Changes, or Ordinances

Section 1.A lists local planning tools and documents that bear, directly or indirectly, on the acquisition or management of wildlife habitats. Additionally, the species information and management approaches described in Sections 3 through 6 include some descriptions of recommended new ordinances or policy changes that would improve or reinforce Longmont's wildlife resources. The following list briefly summarizes recommendations for general policies, additions or modifications to City ordinances or the Land Development Codes, and new strategic approaches related to the acquisition or management of wildlife habitat and management of problem wildlife or other species.

A. General Policies

Policies Regarding Problem Wildlife and Private Property

To reduce the burden on City staff and budgets of addressing problem wildlife in situations that involve private property, the City should:

- Develop, in cooperation with Colorado Parks and Wildlife, and distribute (by pamphlets, mass mailings, email postings, or other tools) information regarding the negative aspects, including costs to the City, health and safety risks to the public, and potential risks to wildlife of attracting wildlife to urban/suburban environments.
- Develop and distribute information on methods of reducing wildlife problems on private property, including not feeding wildlife and, if an animal chooses to den or nest on that property, having it removed promptly (see bullet below) and correcting the problem that attracted the animal after it has left or been removed (e.g., blocking access points for squirrels into attics or raccoons into chimneys).
- Develop and distribute information on the damage to native wildlife caused by free-roaming domestic animals, specifically house cats that prey on native birds and mammals or dogs in natural areas that are not designated as "off-leash" areas.
- Develop and distribute information regarding the City's role in responding to wildlife problems, versus the citizen's role. Specifically, the City should adopt a policy that City staff, including animal control and other personnel, will respond to requests from private parties only if (a) the situation exists on City-owned land, or (b) the situation represents a potential imminent health and safety risk. Private parties should contact professional pest control organizations or wildlife rehabilitation groups regarding problem wildlife on private property.

Policies Pertaining to City Lands

To help in achieving the wildlife and habitat goals described in this Plan, the City should:

- Adopt a policy for City lands that establishes a minimum setback of 150 feet and a preferred (where practicable) setback of 200 feet or greater for trails, roads, and other facilities within or along riparian corridors, including ditches that support riparian trees and shrubs. Exceptions may include crossing points of bridges and portions of soft-surface, pedestrian-only "nature trails" that may approach more closely in limited areas for wildlife viewing. Lighting shall be generally discouraged on trails near riparian areas

or other high-quality habitat areas. However, if there is an expressed community need for lighting, the City should install lighting that meets the community's needs while also being as "wildlife friendly" as is feasible given the trail location and project budget.

- Adopt a policy for City lands that existing trails or other conditions on City lands that do not conform to the recommended minimum setback above be considered for realignment in the future when other modifications are needed or when sufficient funds are available.
- When the Open Space emphasis shifts from acquisition to management, adopt a policy for City- owned or City-managed Open Space lands requiring that any degraded or primarily non-native areas be considered for restoration or enhancement. This should include both improving the condition of existing habitats and, where practicable, creating native habitat types that were historically present but currently lacking or under-represented in Longmont (e.g., native grasslands). A long-range plan should be developed to prioritize these activities using the methodology applied in Sections 5 and 6 of this Plan.
- As funds and staff resources allow, gather baseline data on wildlife presence and use throughout Longmont. This may include, but is not limited to, species inventories, presence/absence surveys, habitat suitability assessments, citizen science programs, pre- and post-project monitoring, etc. With such foundational data, the City will better understand wildlife and habitat conditions prior to impacts by a project or a natural disaster and will be able to use these conditions as a reference or baseline for restoration.
- As funds and staff resources allow, map and assess riparian corridors throughout the Longmont area to define "reaches" based on similar vegetative structure and composition (and thus wildlife habitat quality). These designations can be used to guide restoration projects or inform the approval of and requirements for variance requests.
- Where it is possible and likely to be beneficial, install bat boxes, bee boxes, raptor perches, and other wildlife-friendly structures on City-owned lands to attract desirable species, especially those that provide ecosystem services (i.e. pollination, managing mosquito or rodent populations). Check the condition of these structures annually, in order to document maintenance or necessary decommissioning.

Policies to Facilitate Natural Resources Support to Planning and Zoning

To provide natural resources expertise to the planning and zoning department, the City should:

- Natural Resources Staff Review – Involve Natural Resources staff in all planning development permit reviews and hearings, especially in the review of riparian setback variance applications. For all development applications, Natural Resources shall make a recommendation to the planning director as to whether a Species or Habitat Conservation Plan is required. When such a plan is found to be necessary, Natural Resources will also be responsible for the review of this document for thoroughness, accuracy, and suitability. Natural Resources will make a recommendation to the planning director as to whether the plan should be accepted or whether additional conservation measures should be required.
- Environmental Planner - Create a new staff position of Environmental Planner. This individual would be responsible for attending permit hearings, reviewing applications, and coordinating with Natural Resources staff to ensure field verifications of reported conditions are performed as needed.

- Mitigation Toolkit – Prepare a "toolkit" of mitigation strategies (specifically wildlife avoidance and habitat enhancement and restoration techniques) that can be incorporated into the Longmont Development Code Administrative Manual. This will provide developers with basic strategies that can be implemented to fulfill habitat and species conservation requirements. The existence of this toolkit will not absolve the developer of the requirement to retain a qualified individual to prepare the Species or Habitat Conservation Plan.

New or Expanded Ordinances Regarding Problem Wildlife

To aid further in achieving the wildlife and habitat goals of this Plan, the City should consider enacting the following ordinances, whether new or representing an expansion of an existing ordinance. *These recommended new ordinances are not intended to infringe on the rights of Longmont's citizens or to result in an intensive enforcement program by the City*. Instead, the ordinances should be accompanied by an educational campaign and would provide a basis for enforcement in the event of egregious and continuing violations that result in substantial harm to City property or create a nuisance for other residents.

Recommended ordinances are:

- Prohibition Against Feeding Wildlife – To minimize problems associated with habituation and concentration of some wildlife (e.g., the red fox, raccoon, and striped skunk) in urban/suburban habitats, the City should prohibit the feeding of all wildlife, whether on private or public land, except for bird feeders on private land.
- Prohibition Against Keeping Pet Food Outdoors Overnight – To minimize problems associated with habituation and concentration of some wildlife in urban/suburban habitats, the City should prohibit the keeping of pet food outdoors overnight. Like the ordinance prohibiting intentional feeding of wildlife, this ordinance is intended to reduce the attractiveness of urban/suburban environments to carnivores such as the red fox, raccoon, and striped skunk.
- Prohibition Against Keeping Garbage Outdoors Overnight – To minimize problems associated with habituation and concentration of some wildlife in urban/suburban habitats, the City should prohibit keeping garbage outdoors overnight, except beginning no earlier than 1 hour before sunrise on the day of trash collection. This prohibition would exempt garbage kept in wildlife- proof containers or fenced and roofed enclosures.

New or Expanded Land Development Code Components

As a means of extending important wildlife and habitat management goals to private lands, the City should consider incorporating the following components into the Land Development Code. These suggested additions or modifications to the existing code are not intended to unreasonably impede or delay development or infringe on private property rights. Instead, the recommended new measures would ensure that new developments adequately consider wildlife and habitat preservation or enhancement for the benefit of existing and new residents of Longmont. The measures are aimed at ensuring that Longmont's currently high quality of life is maintained while accommodating continued population and economic growth. Thus, the measures would change how future development within or adjacent to important wildlife habitats would be designed, but not their overall development density.

- Expanded Riparian Setback – Modify the existing language of the Code, which establishes a setback of 150 feet only from St. Vrain Creek, Boulder Creek, Dry Creek #2, Lefthand Creek, and Union Reservoir. All natural streams within the City should be protected by the full 150 foot buffer. Management of wetlands and manmade ditches will continue as currently codified.
- Redefine Riparian Definitions – Revise the current definition of "high water mark" and prepare a definition for "riparian vegetation" within the Land Development Code to clarify and create consistency as to what is considered "riparian" for setback purposes.
- Limitations on Riparian Fragmentation – For proposed developments with one or more new stream crossings, require that the crossing be designed in a manner that does not restrict wildlife movement along the stream corridor, does not interfere with movement of aquatic species, and is sited to avoid or minimize loss of high-quality riparian vegetation (e.g., mature trees and native shrub thickets). If multiple crossings are proposed (e.g., a road, bike path, and utilities), require that they be collocated to the extent practicable or, if collocation is not practicable, that the developer demonstrate that the multiple locations have been sited to minimize habitat fragmentation and loss.
- Optional Additional Riparian Setback – Establish a policy that would create incentives for developers to expand the riparian setback beyond the minimum. Incentives could include increased open space credits, density bonuses or exchanges, or other mechanisms.
- Optional Dedication of Riparian Setback – Establish a policy that would allow landowners/developers to dedicate all or a portion of the riparian setback to the City for maintenance and management purposes.
- Optional Riparian Restoration or Enhancement – Consider a policy that would create incentives for developers to enhance or restore degraded riparian habitat. Methods of enhancement or restoration to be considered could include, among others, removal of debris (e.g., concrete rubble), control of weeds, removal and replacement of Russian-olives with native trees, and planting of desirable native trees, shrubs, and grasses to improve habitat structure, contiguity, and connectivity, as well as screening from the proposed development.

  Riparian restoration programs on private lands should be conducted in a way to not impede storm flows and thus create a public safety hazard. This could be accomplished by (1) ensuring that new bridges or culverts have excess capacity or other measures to reduce the potential for blockage from vegetation; (2) planting species less prone to limb breakage than the prevalent cottonwoods, box-elders, and "crack willows"; and (3) emphasizing plantings of trees and shrubs along the tops of the banks rather than along the active channel. Special care should be taken in designing restoration of stream reaches immediately upstream from bridges or culverted road crossings.

- Creative Stormwater Management – Consider a policy that would require or, at a minimum, create incentives for developers to design stormwater management facilities that serve an ecological function such as wildlife habitat or water treatment. Examples include (1) conveying stormwater runoff in swales vegetated with wetland or moist upland plants instead of in piped storm sewers or concrete channels and (2) designing detention ponds to support unmanicured native plants, including woody species where appropriate, instead of manicured turfgrass. These measures may also constitute Best

Management Practices to assist the City in meeting pending non-point-source (stormwater) water quality standards.

- Wildlife or Habitat Mitigation Fee – Consider expanding the current requirement for a Species or Habitat Protection Plan by establishing a process by which a developer is required to pay a wildlife or habitat mitigation fee to the City for loss of important habitats or wildlife that cannot reasonably be avoided by the proposed development. The purpose of the fee would be to assist the City in acquiring new or maintaining existing habitats that represent the same type of wildlife use. Examples include native plant communities, wetlands, riparian corridors, and areas of mature trees (if desirable species).
- Variance Process for Reduced Riparian Setbacks – Applications for variances for reducing the 150-foot setback from the edge of a riparian area will continue to be reviewed on a case-by-case basis. However, preparation of a Habitat Conservation Plan should be a mandatory requirement and not, as is currently the case, a decision of the planning director.
    - Update Requirements for Species or Habitat Conservation Plans – Update the existing submittal requirements in the City code for Species and Habitat Conservation Plans. See suggested language in Appendix XX. These submittal requirements will be provided to the planning department for inclusion in the Longmont Development Code Administrative Manual.
    - Update the Habitat and Species Protection Standards – Existing language in the municipal code includes 12 habitat and species protection standards that apply to all development projects, unless otherwise waived by the planning director. These standards should be updated, especially for projects that apply for and are granted variances for reduced riparian setbacks. Suggested language for this update can be found in Appendix X, but several key elements are described below:
        - A property that is being redeveloped (as opposed to a new development) cannot increase the built footprint or amount of impermeable surfaces.
        - If landscaping or other vegetation is proposed within the 150-foot riparian setback, it must consist of native plant species.
        - Building height within and adjacent to the riparian setback shall be restricted to 20 feet.
        - Window glazing to minimize bird strikes shall be required within and adjacent to the riparian setback.
        - All utilities shall be sited underground where possible Aboveground utilities should incorporate all current and appropriate wildlife protections.
    - Approval of Riparian Setback Variances – City Council shall be responsible for approving or rejecting, by a 2/3 majority vote, all applications for riparian setback variances. Planning and zoning and natural resources staff members will make their recommendations to City Council.

New Requirements Related to Annexation or Subdivision Applications

In addition to measures related to specific land development applications (Section 7.3), the City should consider the following regarding annexations or subdivision applications.

- Notification of Open Space Superintendent – The City planning staff should notify the Open Space Superintendent of any applications for annexation or subdivision so that the Superintendent may inspect and evaluate the affected lands early in the application review.
- Wildlife Inventory and Management Plan – In conjunction with proposed annexation or subdivision, the City should require the applicant to submit a report, prepared by a qualified biologist, describing existing ecological resources and how loss of, or impacts to, those resources would be avoided, minimized, or offset. The report should specifically address important or high- priority habitats and wildlife (see Sections 5.2 and 6.1).
- Wildlife Habitat Dedications – In conjunction with proposed annexation or subdivision, the City should consider requiring, as a condition of approval, a dedication of specified acre-amounts of important, high-priority, or other identified habitats. If this recommendation is adopted, the City could devise a process or formula for calculating the acre-amounts of the required dedication. This could be based, for example, on the size of the parcel, the habitat types and wildlife uses present, and the anticipated land uses. The process or formula for calculating acre-amounts should be written to prevent an applicant from taking one or more actions to reduce the amount, type, and quality of ecological resources prior to or during the application review.

New Ordinances Regarding Lands Acquired and Held in Anticipation of Development
The City should consider a policy to require developers, land speculators, or other parties who purchase agricultural land or other open lands for future development to maintain the land in a manner that does not (1) result in infestations of noxious weeds or (2) allow prairie dogs to become established in areas where they did not previously occur, unless the developer, speculator, or other party is prepared to maintain the colony in perpetuity.

The purpose of this ordinance is to prevent conditions that create an ongoing or future management problem for the City. For example, weed infestations may complicate future management of portions of the property retained as open space and create a problem for adjacent landowners. Establishment of prairie dogs on lands from which they were previously excluded by active agriculture or control may create a problem for future development of the site or for adjacent properties onto they disperse. Additionally, the establishment of a colony that will subsequently be removed for development may cause other wildlife (e.g., coyotes, raptors) to alter their historic patterns of use, only to be adversely affected in the future when the new prey base is eliminated.

In requiring the control of weeds on these lands, the City should comply with the Colorado Noxious Weed Act and Boulder County noxious weed policies. However, the City's ordinance could go beyond the State and County requirements by helping to prevent the establishment of noxious weeds rather than dealing with the problem after it has been created. Examples could include (1) ongoing maintenance-level applications of herbicides or use of mowing to minimize weed reproduction and/or (2) the seeding and maintenance of a dryland cover crop (in areas of abandoned cropland) to minimize weed colonization.

Preventing prairie dog colonization of lands in which they were not present at the time of the change in ownership or use may require that the current owner or other responsible party (1) construct a perimeter barrier (e.g., vinyl fencing) to prevent movement onto the property or (2)

remove prairie dogs as an ongoing process rather than allowing establishment of a viable colony. In the latter case, prairie dog control should conform to the seasonal constraints and burrowing owl survey requirements specified in Section 4.4.X of this plan.

Policy Regarding Grants and Joint Acquisitions

The City should identify and consider, on an ongoing basis, opportunities such as State grants, joint purchases with other entities, or other funding mechanisms to assist in the purchase of lands containing important or high-priority wildlife and habitats (see Sections 5 and 6). The purpose of this policy is to allow the acquisition, for the benefit of the City and its citizens, more areas of such habitats than practicable solely with Open Space tax revenues.

APPENDIX LIST

A. PROPOSED CHANGES TO: Longmont Municipal Code, Title 15 – Land Development Code, Chapter 15.05 – Development Standards, 15.05.030 – Habitat and Species Protection, H. Species or Habitat Conservation Plans
B. PROPOSED CHANGES TO: Longmont Municipal Code, Title 15 – Land Development Code Chapter 15.05 – Development Standards, 15.05.030 – Habitat and Species Protection, G. Habitat and Species Protection Standards
A. Figures 1 through 6 (Landscape Characteristics)
B. Vertebrate Species Known or Likely to Occur in the Planning Area
C. Maps 1 through 6 (GIS Analyses Using Satellite Imagery)
D. City of Longmont Development Standards
E. Summaries of Public Meetings
F. Colorado Parks and Wildlife Information