

5 HABITAT AND WILDLIFE MANAGEMENT PRIORITIES

5.1 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 most coarse, 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 4) 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 4. Colorado Division of Wildlife Statewide Habitat Ranking for Types in Longmont

<i>Habitat Type</i>	<i>Number of Species</i>	<i>Threatened or Endangered Species</i>	<i>Species of Special Concern</i>
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

The importance of riparian habitats indicated in Table 4 is also reflected in Appendix B (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 (below left, upstream from the Colorado Highway 119 bridge) and of Lefthand Creek (below right, upstream from 95th Street bridge) 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 4 and Appendix B 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 3 and 4). 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

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City of Longmont, Department of Community Development, Parks and Open Space Division

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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	<p>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.</p> <p>Figure 1 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).</p>
Habitat Patch Size	<p>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).</p> <p>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.</p> <p>Figure 2 illustrates the effects of patch size on effective habitat size for interior species or those intolerant of adjacent human disturbance.</p>
Habitat Patch Shape	<p>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).</p> <p>Figure 3 illustrates the effects of patch shape on habitat size for interior species.</p>

<p>Contiguity vs. Fragmentation</p>	<p>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.</p> <p>Figures 4 and 5 illustrate habitat fragmentation.</p>
<p>Patch Connectivity vs. Isolation</p>	<p>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 4 and 5.</p>
<p>ECOLOGICAL QUALITY</p>	
<p>Condition</p>	<p>Habitats in good condition—i.e., good vegetation cover and few weeds—are more valuable for most wildlife than disturbed or degraded sites.</p> <p>For aquatic sites, this includes water quality as well as the type and quality of the physical environment (banks, substrate, and riparian vegetation).</p>
<p>Special Management Needs</p>	<p>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.</p>
<p>Naturalness</p>	<p>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.]</p>
<p>Structural Complexity</p>	<p>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.</p> <p>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).</p> <p>For lakes and ponds, complexity may include deep-water and shallow-water areas, exposed shorelines, quiet embayments, and both rooted and adjacent terrestrial vegetation.</p>
<p>Species Richness</p>	<p>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 6), 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.</p>

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 to 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).

<p>Conservation Easement</p>	<p>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.</p>
<p>ALTERNATIVES TO PURCHASE FOR PRESERVATION OR ACQUISITION</p>	
<p>Land Swaps</p>	<p>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.</p>
<p>Density Bonuses or Exchanges</p>	<p>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.</p> <p>The density bonus could be increased further if high-priority habitats are involved (see Sections 5.2 and 6.1) and/or if the habitats to be preserved are improved by habitat enhancement/restoration (weed control, revegetation of degraded areas).</p>
<p>Stricter Development Codes</p>	<p>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.</p>
	<p>In combination with stricter requirements, the City could create incentives to developers to preserve larger areas of wildlife habitat (see Section 7).</p>
<p>Wildlife-Related Requirements of Annexation</p>	<p>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 5.2 and 6.1).</p>
<p>Joint Acquisitions (with county or other municipal governments)</p>	<p>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.</p>
<p>Grants or Other Funding Sources</p>	<p>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.</p>

5.2 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 stream (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 5 and described in the following subsections were derived using the methodology discussed in Section 5.1, the wildlife and habitat considerations discussed in Section 4, and the identification of major habitat types using satellite imagery (Map 4). Figure 1 depicts some of the concepts incorporated into Tier II (i.e., involving landscape configuration).

5.2.1 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).

The importance of preserving adequate setbacks is illustrated by the photo at right, showing a portion of the Lefthand Creek corridor downstream from 95th Street. Many species that use the riparian habitat for nesting, denning, or daytime cover—including raptors, some songbirds, deer, and foxes—use the adjacent habitat 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 new 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 5.2.6).

5.2.2 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 Gulche 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 5.2.6).

5.2.3 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 (such as at the Pella Open Space, photo at right) 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 the Colorado Division of 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



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(left). 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.

5.2.4 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.

5.2.5 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).



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 photo at left, taken from the bluff overlooking the Sandstone Ranch district park, shows the width, continuity, and habitat complexity of this reach of the St. Vrain in eastern Longmont. The adjacency of ponds, pastures, and small areas of native grassland considerably increase the diversity

and abundance of wildlife that the riparian habitat would support if confined between poor-quality habitats or developed lands.

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 the Colorado Division of 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. For example, the regional trail shown at left

(located east of U.S. 287 and north of Colorado Highway 119) has resulted in loss of understory vegetation that contributed to habitat complexity and created a situation in which human activity along the trail may reduce or preclude use by some sensitive species. Affected species could include neotropical migrant songbirds, raptors, carnivores, and hoofed mammals, as well as water birds feeding in the creek or nesting/perching in the adjacent trees. In general, greenway trails should be located outside the riparian canopy plus an additional buffer of at least 150 feet, or more where possible.

5.2.6 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.