6.2011

Cache la Poudre River

Natural Areas Management Plan Update

City of Fort Collins Natural Areas Program

naturally yours

CACHE LA POUDRE RIVER NATURAL AREAS MANAGEMENT PLAN UPDATE

June 10, 2011

Natural Areas Included in this Plan:

Butterfly Woods
North Shields Ponds (includes former Sterling Natural Area)
McMurry
Salyer
River's Edge
Magpie Meander
Gustav Swanson
Udall
Springer
Williams
Kingfisher Point (includes former Nix Natural Area)
Riverbend Ponds
Cattail Chorus
Cottonwood Hollow
Prospect Ponds
Running Deer
Arapaho Bend

Memorandum of Adoption

The Cache la Poudre River Natural Areas Management Plan 2011 was administratively adopted by the Natural Resources Director on June 10, 2011.

6-10-11

John Stokes, Natural Resources Director — Date

City of Fort Collins Natural Areas Program

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The Cache la Poudre River holds an iconic status in the Fort Collins community. The river and its adjacent parks and natural areas are central to the community's identity, and a source of great pride. The river corridor provides opportunities for a range of activities, including family outings, nature observation, reflection, active recreation, aesthetic contemplation, biodiversity protection, and habitat conservation and restoration.

The City of Fort Collins Natural Areas Program (NAP) is responsible for the stewardship of 17 natural areas along 13 miles of the Poudre River totaling 1,380 acres. This *Cache la Poudre River Natural Areas Management Plan Update* details how these community assets will be carefully stewarded.

A. Vision for the Poudre River Natural Areas

- A Poudre River and natural areas that comprise a sustainable river ecosystem characterized by functional hydrology as well as healthy and diverse plant communities that support an abundance of native wildlife.
- Multiple opportunities for outdoor recreation that help make the river an inviting, fun place to explore and connect with nature are available.
- A well-informed citizenry that appreciates, respects, and understands the values of the river and associated natural areas.
- A series of partnerships and collaborations exist that enable this vision to be implemented beyond natural areas boundaries.

B. Scope of the Management Plan Update

This update of the *Poudre River Natural Areas Management Plan* identifies key conservation, recreation, and cultural goals for NAP lands and describes management strategies and actions to achieve them.

The scope of this plan update is limited to properties along the Poudre River that are owned and/or managed by the NAP. It is important to recognize that this plan update does *not* describe management for the following:

- Lands along the river managed by the City's Parks and Stormwater departments;
- Private lands along the Poudre River;
- Utility corridors along the Poudre River;
- River flows (quantity, duration, or timing).

The properties managed by the NAP along the Poudre River represent a portion of the lands within the river's corridor through Fort Collins. Likewise, the jurisdiction of the NAP is limited to management of terrestrial lands that extend to, but do not include, the river channel or the water in the channel. Consequently, while this management plan update acknowledges the importance of river flows and hydrology, management of the river channel or river flows is beyond the immediate scope of this document.

It is important to recognize that the long-term health and persistence of the river's keystone cottonwood forests cannot be assured if natural processes driven by flows, flooding, and river migration across the floodplain continue to decline. Historically these processes were much more dynamic. The NAP recognizes that seasonal flow patterns, sediment transport, opportunity for channel migration, and other natural processes that are currently limited in this urban reach of the river are critical factors to many of the ecological and conservation values identified in the planning process.

C. Relationship to Other Planning Documents

The river and lands along the Poudre River have been the focus of a variety of planning and management efforts through the years. These include:

Framework for Environmental Action (1992) – This plan identified action for the Poudre River corridor including development of a land acquisition program, natural areas plan, and mitigation manual.

City Land Use Code (1997) – This code established a variety of river protection regulations including land use districts and a development buffer zone, which extends 200-300 feet from both sides of the river in most areas with a smaller buffer in the downtown core.

Cache la Poudre River Natural Areas Management Plan (2001) – The previous management plan is the basis of this plan update. This update combines geographically contiguous sites into "planning units," as opposed to an individual site-by-site approach as in the original plan (see Chapter 6).

City Plan Fort Collin (2011) – The City's comprehensive *City Plan* was first completed in 1997, updated in 2004, and updated again on February 15, 2011 and entitled "City Plan Fort Collins." *City Plan Fort Collins* contains an array of principles and policies that underscore the

community's support for the Poudre River ecosystem and adjacent natural areas. The following are pertinent principles and polices:

Principle ENV 24: The City will support a healthy and resilient Cache la Poudre ecosystem, and protect, enhance and restore the ecological values of the River.

Policy ENV 24.1 – Support Ecological Resilience
Support a healthy river ecosystem that is resilient; i.e., a river ecosystem that has the capacity to persist and adapt over time in the face of natural and human-caused challenges. Protect or enhance opportunities for natural processes to drive ecosystem renewal.

Policy ENV 24.2 – Conserve Natural Features
Conserve and protect important natural areas and natural values within the Poudre River Corridor. This will include acquiring land for public natural areas and conservation easements to protect natural area values on privately-owned lands, establishing appropriate cooperative agreements with adjacent landowners, developing and applying development regulations and design standards, and promoting public education and outreach programs, and other techniques as appropriate.

Policy ENV 24.3 – Provide Natural Area Protection Buffers
Maintain natural area protection buffers along both banks of the Poudre River to protect natural features and scenic qualities, and to account for the natural instability of the River channel. The buffer should be a minimum of three hundred (300) feet wide, beginning at the outer limits of the river bank, or areas of riparian vegetation. One known exception to this general policy is the stretch of the river between North College Avenue and Lincoln Avenue, where a narrower minimum buffer distance is more appropriate due to the constraints of existing development and the area's proximity to downtown.

Policy ENV 24.4 – Restore and Enhance
Restore or enhance degraded or disturbed areas of the Poudre River Corridor to improve natural habitat conditions, biodiversity, and aesthetic and recreational values. Restoration and enhancement projects may be performed cooperatively with adjacent private landowners and volunteer community groups.

Policy ENV 24.5 – Coordinate to Provide Adequate Instream Flows
Work to quantify and provide adequate instream flows to maintain the ecological functionality, recreational, and scenic values of the Cache la Poudre River through Fort Collins.

Principle ENV 25: The City will provide enhanced recreation opportunities within the Poudre River Corridor, with an emphasis on scenic values, heritage education, and interpretation while avoiding or minimizing impacts to environmentally sensitive areas.

Policy ENV 25.1 – Minimize Impacts
Locate and design recreational features within the Poudre River Corridor in a way that avoids or minimizes impacts to natural areas, wildlife habitat, water quality, and other environmental values.

Policy ENV 25.3 – Extend the Poudre River Trail
Extend the Poudre River Trail system downstream to Harmony Road and then to Greeley through partnerships with Larimer County, Weld County, and other Northern Colorado interests. Location and design will account for and avoid or minimize impact to environmentally sensitive areas.

Policy ENV 25.4 – Develop Trail/Path Linkages
Develop additional trails or paths, as appropriate, to link the Poudre River Corridor to adjacent city neighborhoods and districts to provide public access within the Poudre River Corridor. These trail/path connections will be located and designed to avoid or minimize impacts to environmentally sensitive areas.

Principle ENV 26: The City will manage the Poudre River floodplain to minimize potentially hazardous conditions while promoting natural processes associated with flooding, erosion, and channel migration to occur over time as appropriate.

Policy ENV 26.3- Ensure Setbacks for Channel Instability and Improve Channel Migration
Apply buffer zones and consider vertical and lateral channel stability with new development and redevelopment to ensure adequate setbacks are provided to account for lateral migration of the River channel across the floodplain and vertical degradation. The resiliency of the Poudre River ecosystem is tied directly to the ability of the channel to migrate back and forth across the floodplain. Therefore, make efforts to protect the capacity of the channel to move laterally across the landscape and to seek opportunities to improve or restore the function of channel migration.

Policy ENV 26.4 – Development in the Floodplain
The Poudre River 100-year floodplain will be protected by implementing best management conservation techniques and floodplain regulations. Floodplain regulations shall promote public safety, protect the Poudre River corridor, and allow natural hydraulic and hydrologic processes to occur.

Principle ENV 27: Historic landmarks, cultural landscapes, and scenic and aesthetic qualities will be protected within the Poudre River Corridor.

Policy ENV 27.2 – Maintain and Enhance Visual Resources
Locate and design development within the Poudre River Corridor to best maintain or enhance views of the River, its natural setting, the protected corridor features, and the foothills and mountains.

Policy ENV 27.3 – Develop Landscape Guidelines
Develop guidelines for landscape treatment and streetscapes within the Poudre River Corridor that include the use of materials that are native to the Poudre River Corridor and will integrate developed areas within the natural context of the River corridor.

Policy ENV 27.4 – Restore and Enhance
Restore or enhance degraded or disturbed areas of the Poudre River Corridor to improve ecological conditions, aesthetics, and recreation access. Restoration and enhancement projects may be performed cooperatively with private landowners and volunteer community groups.

Principle ENV 28: The City will encourage learning and community awareness of the Poudre River's historic, cultural and natural heritage through education and interpretation.

Policy ENV 28.1 – Support Educational and Environmental Learning Opportunities
Support and provide historical, cultural, and environmental learning opportunities in the Poudre River Corridor. The Cache la Poudre River National Heritage Area was formed to provide for the interpretation of the unique and significant contributions of cultural and historic lands, waterways, and structures to our national heritage. Integrate education with interpretation, which may include interpretive trails and educational facilities as well as outdoor laboratories for lessons on wildlife habitat, gravel extraction and reclamation, floodplain management, rural heritage, farming, pollution prevention, and conservation/reconstruction of historic sites and structures.

Principle ENV 29: The City will collaborate with gravel mining interests to ensure that mining operations are conducted to meet community values and restore ecological function.

Policy ENV 29.1 – Gravel Mined Land Purchases
Evaluate areas along the Poudre River that have been mined for gravel for acquisition for public open lands purposes.

Policy ENV 29.2 – Reclaim Gravel Mined Areas
Collaborate with gravel mining interests to develop innovative approaches to gravel mine reclamation that will provide wildlife habitat, restoration of native landscapes, recreational opportunities, water storage, and other public values.

D. Planning Process: Conservation Action Planning

The Nature Conservancy's (TNC) Conservation Action Planning (CAP) methodology was adopted by the NAP planning team because of its proven effectiveness in identifying key conservation goals and its comprehensive management action framework. Likewise, the CAP process empowers a range of stakeholders to constructively discuss, interact, and consider alternative ways of acting to conserve natural systems. For the purpose of this management plan, the natural areas along the Poudre River form the natural system or conservation area covered by this planning approach.

The CAP process more specifically develops actions plans for conservation areas and their key features of biodiversity termed "conservation targets." Once conservation targets are identified, the following steps are made to identify the best approaches for success:

1. Define current condition and desired future conditions.
2. Identify the conditions or activities that are threatening or may threaten the species and systems of concern.
3. Develop strategies with partners to reduce threats in the conservation areas and restore viability and integrity to degraded species and systems of concern.
4. Develop the measures that will be used to (a) understand if the conservation strategies are moving toward effective conservation and (b) revise, improve, and share information on the efficacy of the different strategies.

It is the intent of the Natural Areas Program to use collaboration and partnerships to implement the best management practices that preserve key conservation targets. Targeted monitoring and adaptive management approaches will be implemented as management effectiveness is monitored and evaluated. In addition to utilizing CAP for conservation planning, this plan adapted the process to also identify key public values for visitor use and experiences such as recreation, environmental education, community involvement and other public values.

E. Public Outreach

The public was invited to share their thoughts about the management of the natural areas along the Poudre River through several venues. Throughout the planning process, monthly updates were presented at the City's Land Conservation and Stewardship Advisory Board's public meetings. In late summer of 2010, staff brought a general questionnaire to natural areas along the river and asked visitors to provide feedback. Participation was extensive with 127 people participating online and 118 on-site for a total of 245.

Results suggest that people enjoy the natural areas along the river as they are, and appreciate the natural values such as solitude, quiet, and recreational opportunities. There is a desire for more trail connections, smoother paved trails, less litter, more water in the river and expanded fishing opportunities. The public indicated access was sufficient, but elements of the Shields Street bridge, Linden Street bridge, and Lemay/Mulberry area could be improved. Improved river access for tubing and boating was frequently mentioned as was additional parking, better wayfinding, and expanded fishing opportunities. Additional public facilities such as picnic tables and benches were requested. Ratings of natural features such as river, forests and ponds were all high, with less emphasis given to recreational opportunities. Respondents are satisfied with educational media and suggested wildlife, history, plant life and water as topics for additional signage. Most felt usually safe at natural areas along the river and suggestions for improvement included removing transient campsites and more patrols. There was acceptance for the closure of trails for wildlife and plants, but less support for fewer trails when asked whether to have fewer improved trails or many "less maintained" trails. Many respondents felt that the natural areas along the river are properly taken care of and added they felt lucky to have the resource of the river and natural areas available to them.

The comments from the questionnaire were considered in the development of goals and strategies which were presented at an open house at Northside Aztlan Center on November 9, 2010. Twenty-five people attended the open house where additional feedback was solicited (comments included in Appendix A). An online "virtual" open house presented the same information and posed the same feedback questions. Seventeen people participated online.

In addition, Natural Areas Program staff made presentations to other city departments and relevant citizen advisory boards: Parks and Recreation staff and advisory board, Utilities staff, Advanced Planning staff, and Natural Resources advisory board.

A full written draft of this document was posted on the Natural Areas Program's website for public review in April and May, 2011 with an online comment form. The opportunity to comment was publicized and those who asked to be notified about future comment opportunities received an email. Comments were received from 13 people.

A copy of all the questionnaires/ comment forms and all comments received during the public outreach process may be found in Appendix A.

F. Sections of the Plan

The *Cache la Poudre River Management Plan Update* is divided into two parts. Part I (Chapters 1– 6) provides broad background, context, overarching management goals, objectives, and strategies for all river sites including a broad review of management since the first management plan was adopted in 2002 and the new management zoning system. Part II (Chapters 7-13) describes key issues, actions, and management zones for each planning unit or individual natural area.

CHAPTER 2

PHYSICAL SETTING OF THE POUDRE RIVER CORRIDOR

A. Physical Setting and Geographic Context
B. Regional Geology
C. Overview of Groundwater Hydrology
D. Changes in River Morphology

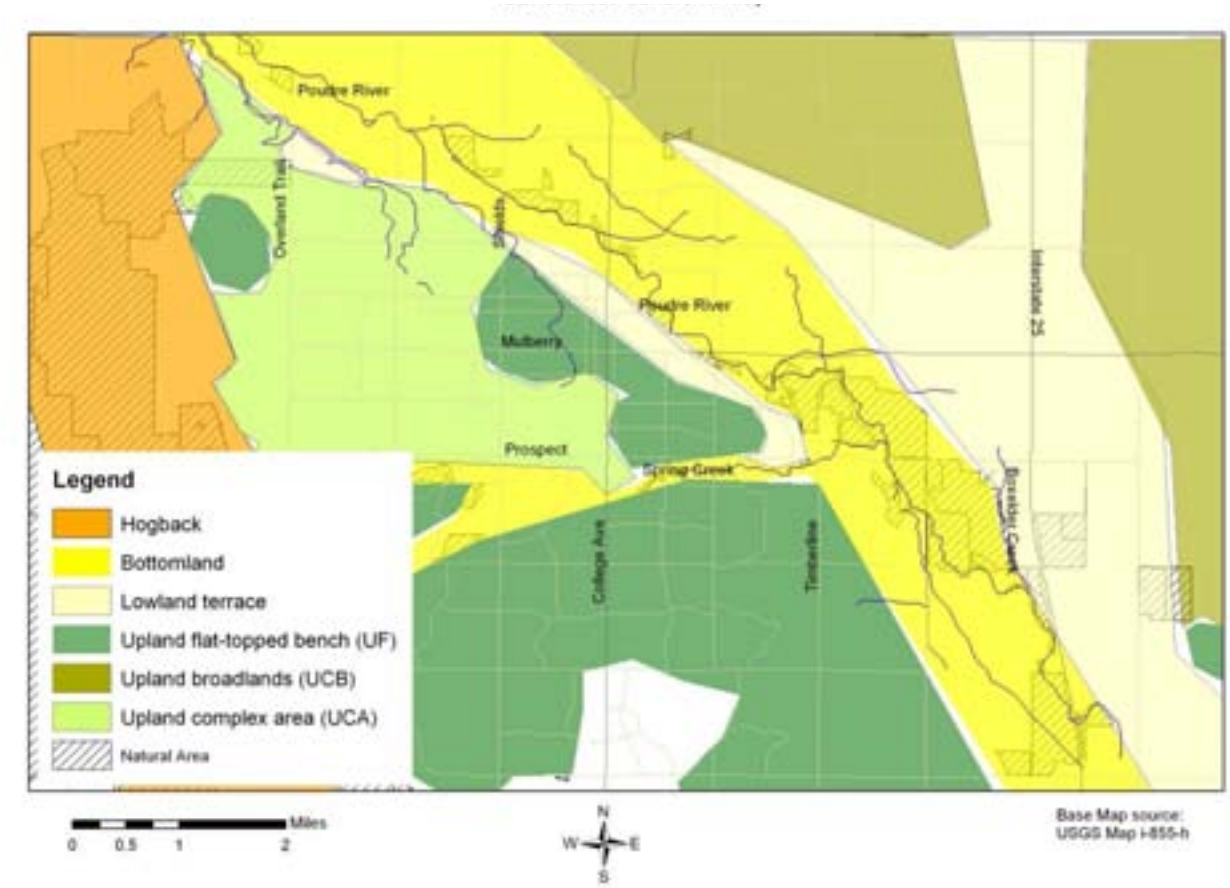
River corridors reflect a combination of influences including the natural physical setting, water flow patterns, and interrelationships between soil, plants, wildlife, and human activities. The Cache la Poudre River is no exception. This section provides a brief description of how the Poudre River corridor is evolving. This understanding forms the basis for natural area management, restoration, and conservation.

A. Physical Setting and Geographic Context

The Cache la Poudre River originates near the Continental Divide and flows north from Rocky Mountain National Park, then travels east through the Poudre Canyon, emerges from the foothills and flows through Fort Collins, and finally continues southeasterly until it meets the South Platte River about 5 miles east of Greeley. For the purposes of this management plan update, the Cache la Poudre River corridor consists of about 13 miles of the river channel through Fort Collins, adjacent riparian areas, and nearby uplands containing the City's Poudre River natural areas.

In Fort Collins, the Cache la Poudre River flows through lowland areas, which consist of broad bottomlands with localized topographic features that include abandoned channels and low terraces, approximately 1-mile wide. These terraces can be thought of as abandoned floodplains in contrast to benches which are located outside of the bottomlands and not created by floods. The landforms in Figure 2.1 suggest that physical controls affecting the river vary for each bank as well as upstream and downstream of the Spring Creek confluence east of Timberline Road. Therefore, although the natural area properties along the corridor all lie within the bottomlands, the influences of nearby landforms are different at individual sites.

Figure 2.1: General Landforms in Fort Collins

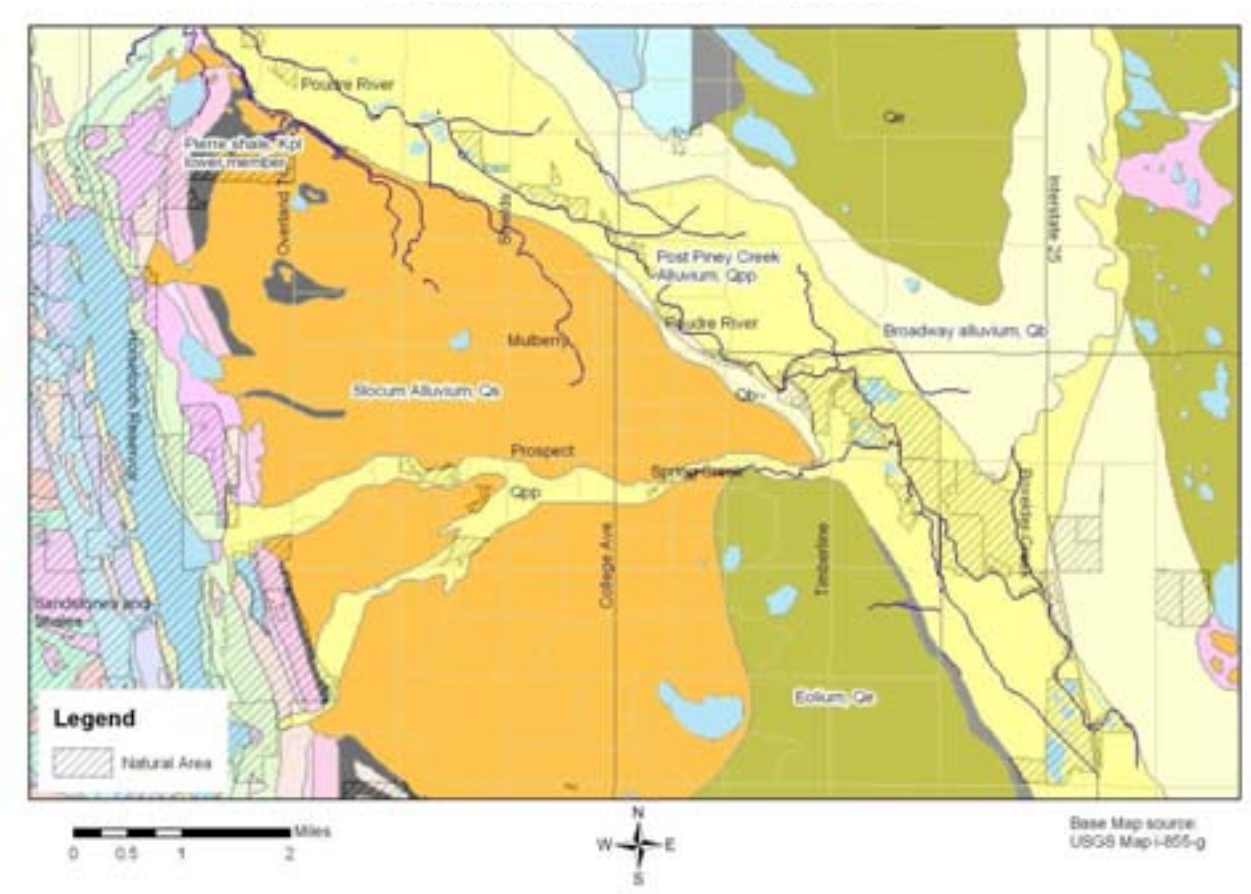


B. Regional Geology

Regional geology provides a foundation for the variations in soils, vegetation, and water movement through the landscape. Figure 2.2 shows the surface geology within the Poudre River corridor area, which consists primarily of sedimentary bedrock, alluvial deposits, and eolium (wind) deposits. Eolium deposits were laid down sometime within the last 10,000 years. Meanwhile, portions of the alluvial land surfaces have been, until recent times, reworked by river floods.

Bedrock beneath the Poudre River corridor consists primarily of the upper layer of *Pierre Shale*. In general, bedrock is encountered at relatively shallow depths of approximately 20-25 feet below ground surface. Bedrock is also exposed where the overburden has been eroded away, for example in the river bottom between Lincoln and Linden streets. A Pierre Shale outcrop band also exists parallel to the river just south of Spring Creek and extends to Interstate 25.

Figure 2.2: Surface Geology Map of the Poudre River Corridor

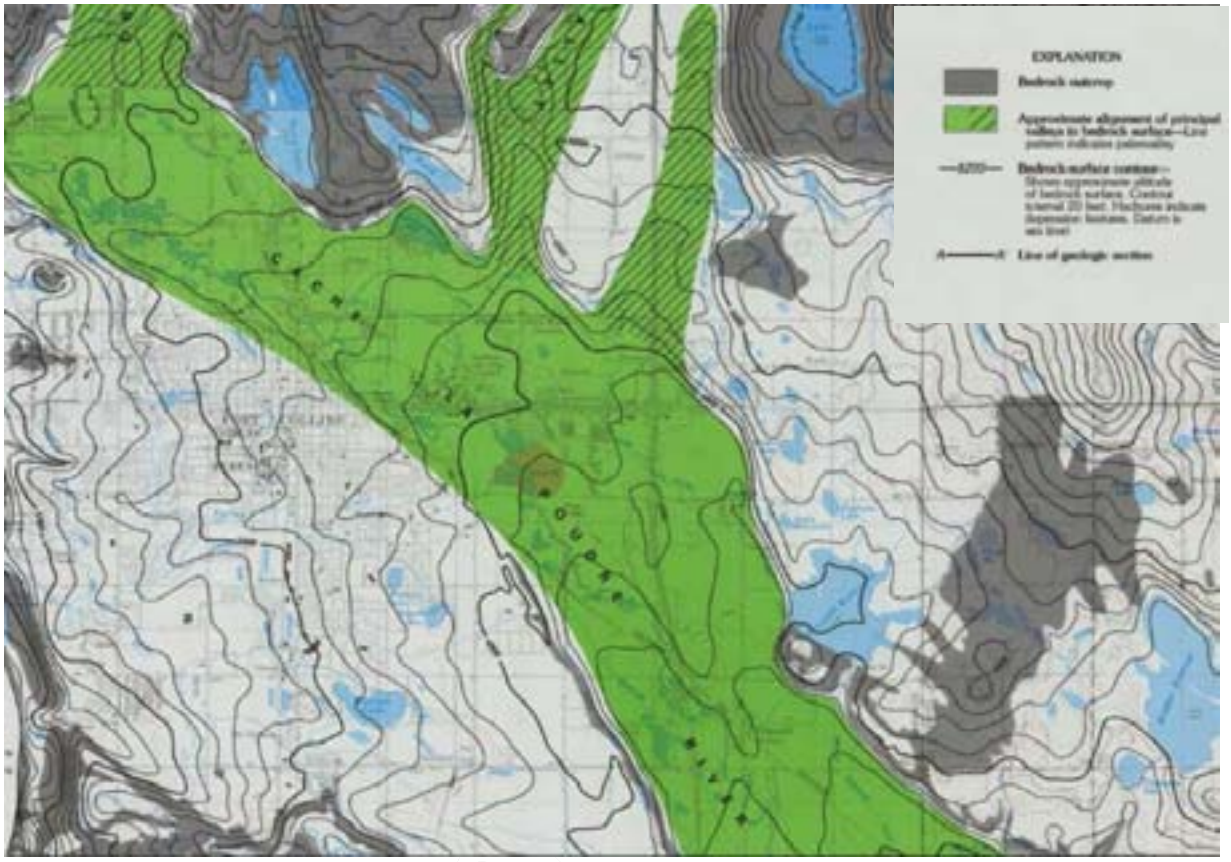


In most of the study area, the bedrock is overlain by *Post-Piney Creek Alluvium*, which consists of dark gray, sandy to gravelly alluvium with organic material.[1] Figure 2.3 shows the ancient river valleys present to the north; bedrock features and sediment deposits differ in these valleys and represent possible preferred flow paths for groundwater.

On the south side of the river, the geology of the uplands differs on either side of the confluence with Spring Creek. Upstream of the Spring Creek confluence surface deposits consist of *Slocum Alluvium* which are brown to white cobbles and large gravel deposits containing boulders. The *Slocum Alluvium* is reported to be as much as 90-120 feet thick. Downstream of the Spring Creek confluence, the uplands are mostly Eolium consisting of light brown to reddish brown to light grey windblown clay, silt, sand, and granules. As noted earlier, the eastern edge of the Eolium is bounded by a thin band of Pierre Shale bedrock outcrop.

[1] Key: Kp, Pierre Shale; Qpp, Post-Piney Creek Alluvium; Qb, Broadway Alluvium; Qs, Slocum Alluvium; Qe, Eolium.

Figure 2.3: Bedrock Map with Principle Valleys along the Poudre River Corridor



Source: Robson et al., 2000.

C. Overview of Groundwater Hydrology

Mountain snowmelt is the primary source of streamflow and groundwater recharge in Colorado's natural landscapes. In Fort Collins, groundwater occurs in an unconfined, porous aquifer system. In general, groundwater moves from upland areas of recharge to lower discharge areas by gravity. When a river is receiving groundwater discharge, it is a "gaining" stream; when a river is recharging the aquifer it is a "losing" stream. The Poudre River has both situations in different reaches of the river. The interchange between groundwater and surface water is dynamic and can vary within the river corridor depending on precipitation, seasonal uses of surface water, and location.

Typically, groundwater contours (representing water table levels) in shallow aquifers roughly parallel land surface contours; however, there can be significant variation in local flow paths depending on spatial and temporal variability. Key influences of groundwater movement include gradient (horizontal and vertical), hydraulic conductivity (permeability), and seasonal fluctuations. In Fort Collins, variations in the thickness, types, and extent of the unconsolidated deposits affect ground and surface water movement throughout the corridor. Human-made features such as berms, gravel ponds, and pumping wells can further alter local water movement.

Groundwater Characteristics along the Poudre River Corridor

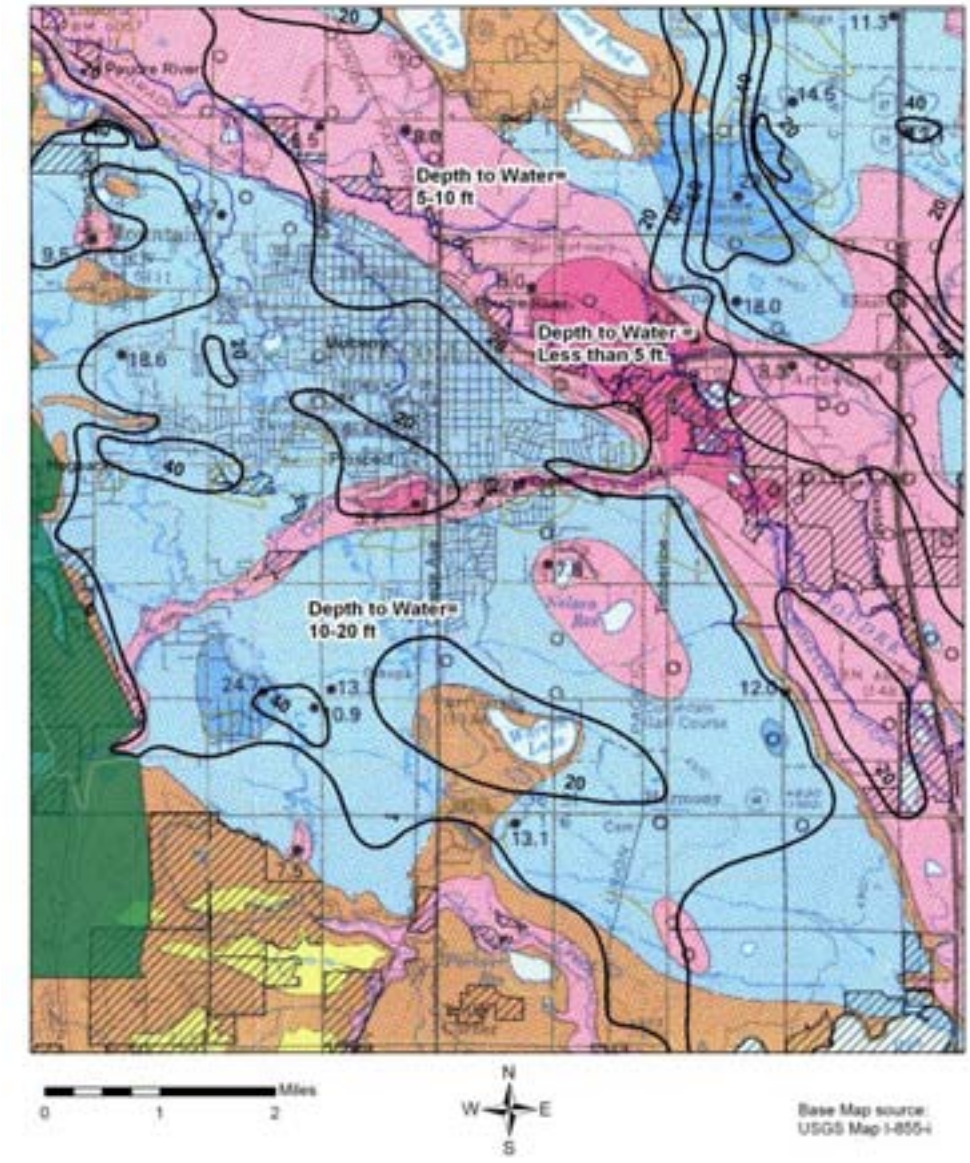
Within the Poudre River corridor, groundwater is found in the shallow, unconfined, alluvial aquifer. The aquifer consists of unconsolidated sand and gravel deposits overlying the shale bedrock. Groundwater is recharged by infiltrating precipitation, river flooding events, stream, pond, and canal leakage, and irrigation water infiltration. Recharge is generally highest in low slope areas and where the soils are highly permeable. Groundwater discharge occurs in many ways, including springs and seeps, seepage into stream beds and banks, evapotranspiration, and human use such as domestic wells. Groundwater discharge forms the base flow of the river (during periods of no snowmelt or storm runoff) in locations and times when the water table is high enough to intersect the bed of the channel.

The depth to groundwater within most of the corridor has been measured at about 5-10 feet below the ground surface, as shown on Figure 2.4. An area of shallow groundwater has been mapped near the confluence with Spring Creek and several of the City's natural areas lie within this area. Bedrock provides the lower boundary for the alluvial aquifer, and thus the saturated zone is relatively thin, about 20 feet or less. [2,3]

[2] This discussion is based primarily on groundwater information for Fort Collins collected as part of the US Geological Survey (USGS) Front Range Infrastructure Project, including geohydrologic mapping of the study area conducted by USGS in 2000, Front Range Infrastructure Project http://pubs.usgs.gov/ds/2006/193/ Also, refer to S. G. Robson, L. R. Arnold, and J. S. Heiny, *Geohydrology of the Shallow Aquifers in the Fort Collins-Loveland Area, Colorado*, Plates 1-5, Hydrologic Atlas HA 746B. In addition, several small site-specific groundwater contamination investigations were reviewed. A search of the existing water wells in the area (based on a 1-mile buffer around river) was also conducted at the State Engineer Office and identified over 1,700 wells. Well records helped identify potential well locations closest to a natural area to compare to the existing groundwater maps. Note: many of the wells no longer exist or the records had only partial information.

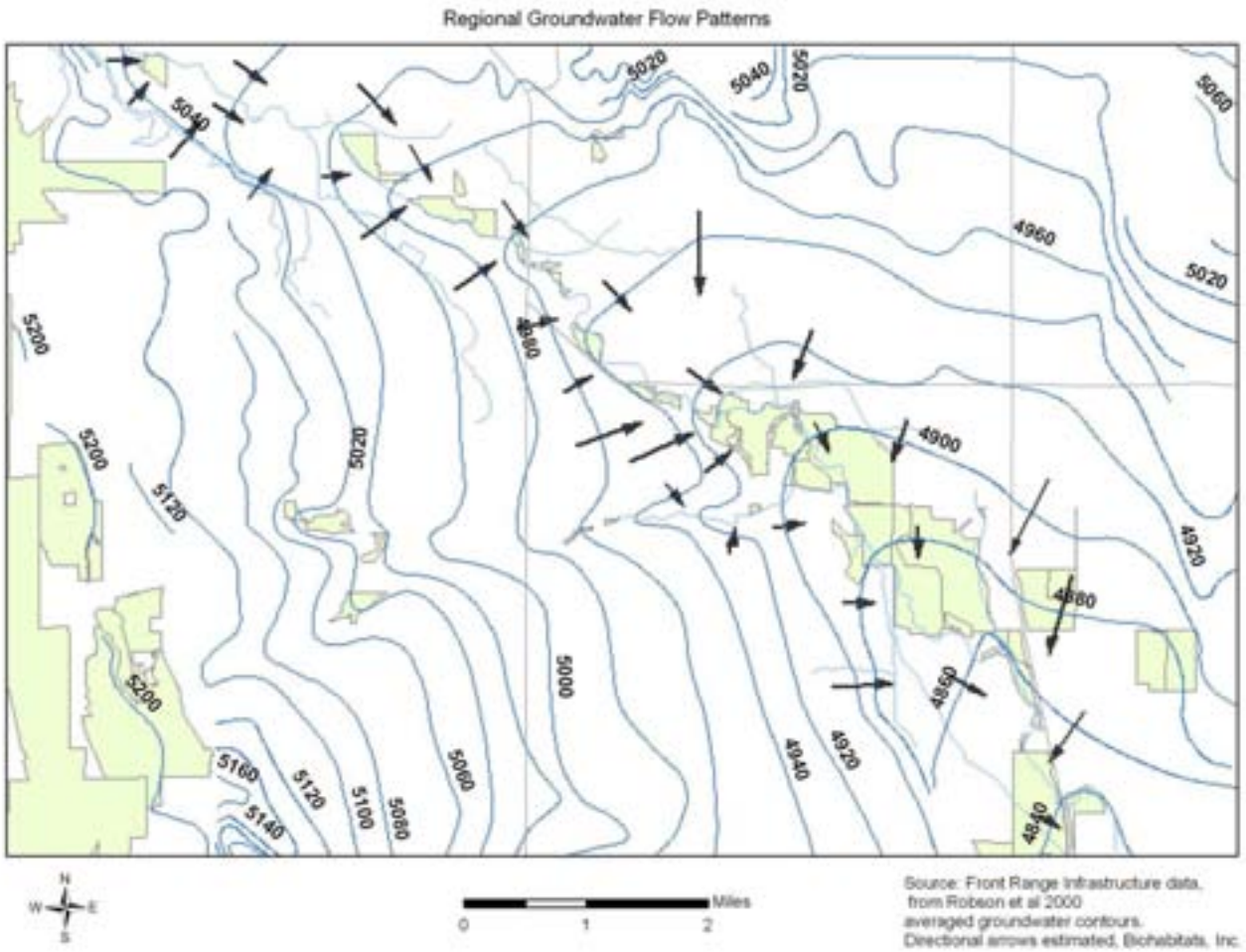
[3] In places, the water table aquifer extends into the upper portion of the shale, and groundwater in the bedrock is unconfined and has elevations similar to the alluvial aquifer. Robson, et al. 2000.

Figure 2.4: Map of Depth to Water Table for Poudre River Corridor.



As shown in Figure 2.5 groundwater flows perpendicular to groundwater contours. The direction of regional groundwater flow on the south side of the river is toward the northeast, and the direction of groundwater flow on the north side of the river is generally toward the southeast. In the northwestern part of the corridor, groundwater flow parallels the river on the north side of the river indicating that groundwater and surface water are interconnected. The nature of the interaction varies depending on stream stage and seasonal groundwater fluctuations, but this strong interaction means that, in places, local groundwater and surface water can be considered one resource.

Figure 2.5: Regional Groundwater Flow Patterns along the Poudre River Corridor



A conceptual model of hydrogeology as shown in Figure 2.6 illustrates the interrelationships between various physical, geologic, and hydrologic processes. Mountain snowmelt and runoff provide the main source of aquifer recharge; however, agricultural diversions and return flows have modified the river flows and natural groundwater recharge patterns. Recharge opportunities are greater to the north of the river where there is relatively low slope, permeable alluvium, paleochannels, and irrigation return flows. Outflows in the water table aquifer are from evapotranspiration and surface water discharge, as well as lesser amounts of vertical flow into the underlying shale aquifer.

The direction of regional groundwater flow in the area generally follows the ground surface topography, with groundwater flow paralleling the river in the northern reaches; however, local flows are influenced by water levels and local geologic features. There is a dynamic exchange of local groundwater and surface water that varies with location, season, level of the groundwater and stage of the river (base flow, flood flow, etc.). Because different geologic units have

different permeabilities changes in depositions can result in preferred groundwater flow paths through buried channels, layers, or at the interface between two geologic units.

Figure 2.6: Conceptual Model of Hydrogeology, generalized for the Fort Collins Reach

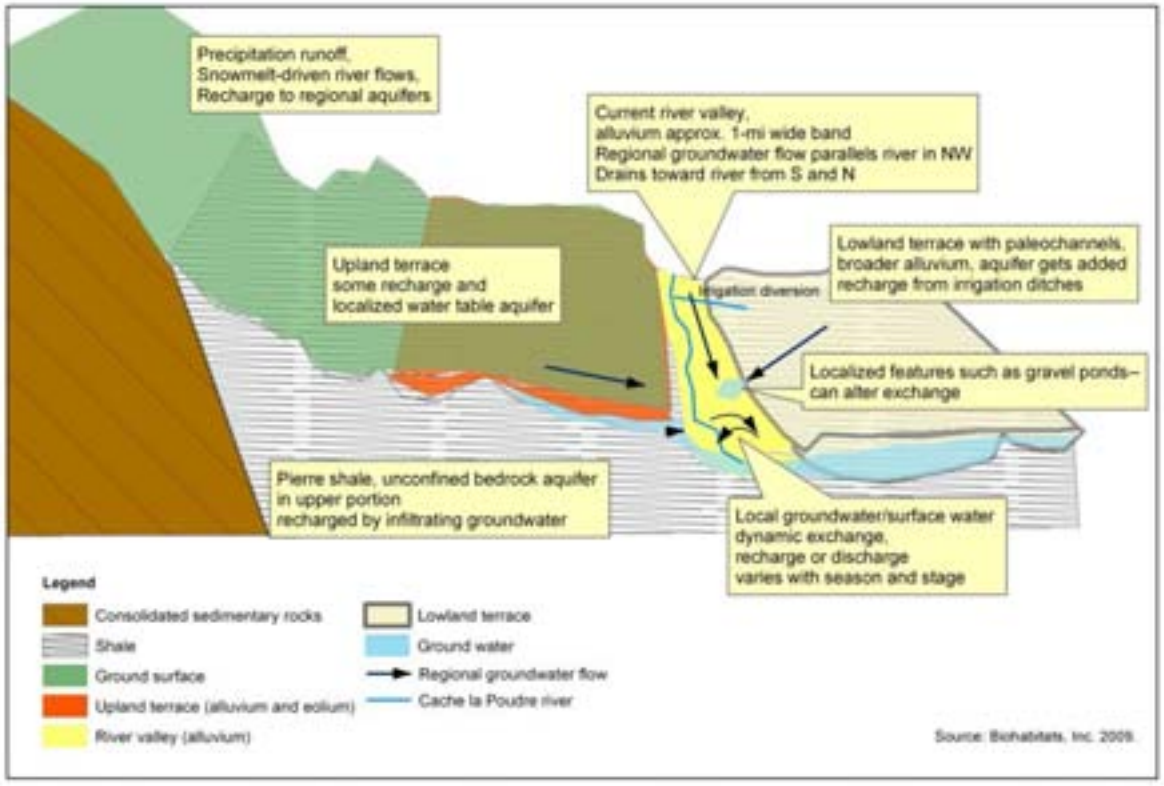
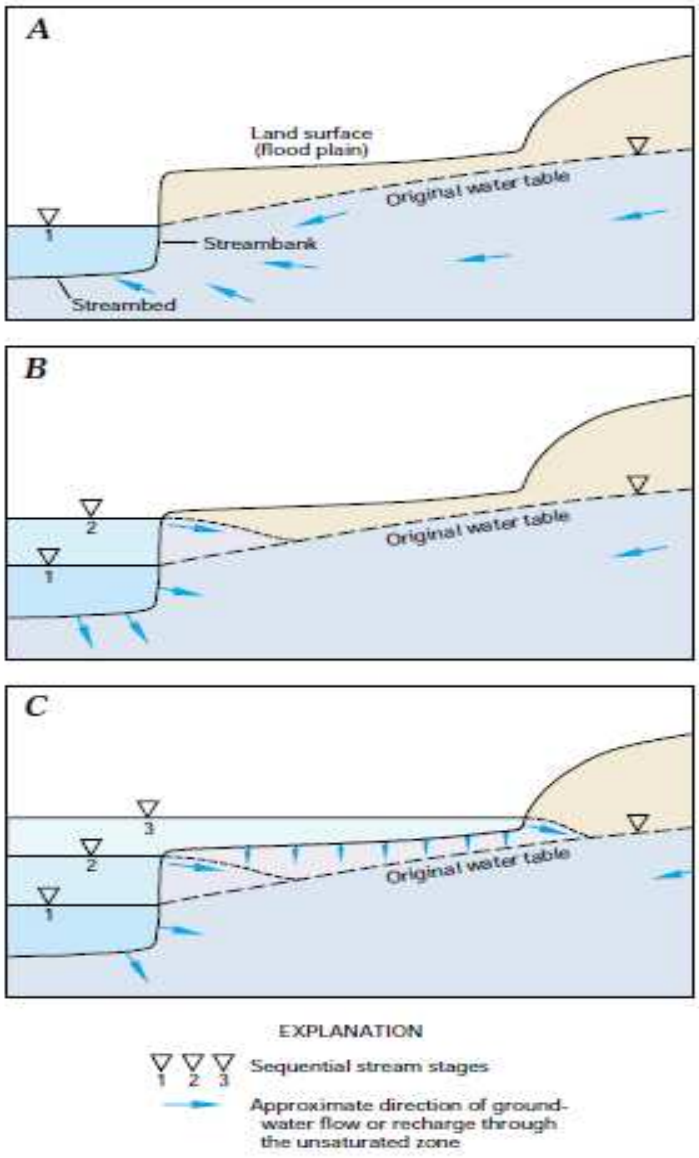


Figure 2.7 is a close up view of the surface water–groundwater interaction and illustrates how streambank recharge is critical to wetting soils in the riparian vegetation zone during higher flows in the river. When the river is at low stage as seen in Figure 2.7A, deep rooted plants are able to utilize water from the prevailing groundwater levels at low stage. Figure 2.7B indicates the beginning of recharge into the banks as the river rises. Figure 2.7C shows the floodplain completely saturated, allowing shallow rooted plants and soils to become wetted at flood stage.

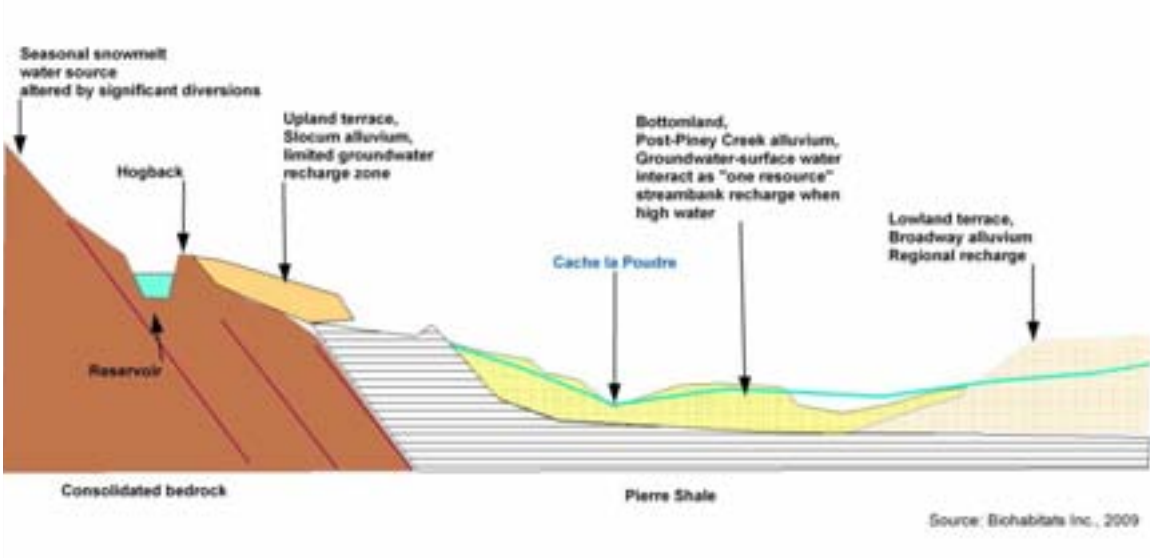
Figure 2.7: Surface Water–Groundwater Exchange along River Banks



Source: Ground Water and Surface Water- A Single Resource. Winter,et. al., 1998

The following cross-sectional views (Figures 2.8A–C) provide a picture of groundwater interactions along the river in Fort Collins, from upstream to downstream. Although representative example locations are shown for the north, central, and southern areas, there is actually a greater range of conditions as opposed to clear break points along the corridor.

Figure 2.8A: Cross-Sectional View of Northern Portion of Corridor (Near Butterfly Woods), looking upstream



As the above cross-section shows, the water table is higher on the south side of the river. The flows are parallel to the river on the north side where the groundwater-surface water interchange is strong (near Butterfly Woods). Human impacts from gravel mines and bank armoring is less common than further downstream, as shown in the cross section in Figure 2.8b.

Figure 2.8B: Cross-Sectional View of Central Portion of Corridor (vicinity of McMurry Natural Area), looking upstream

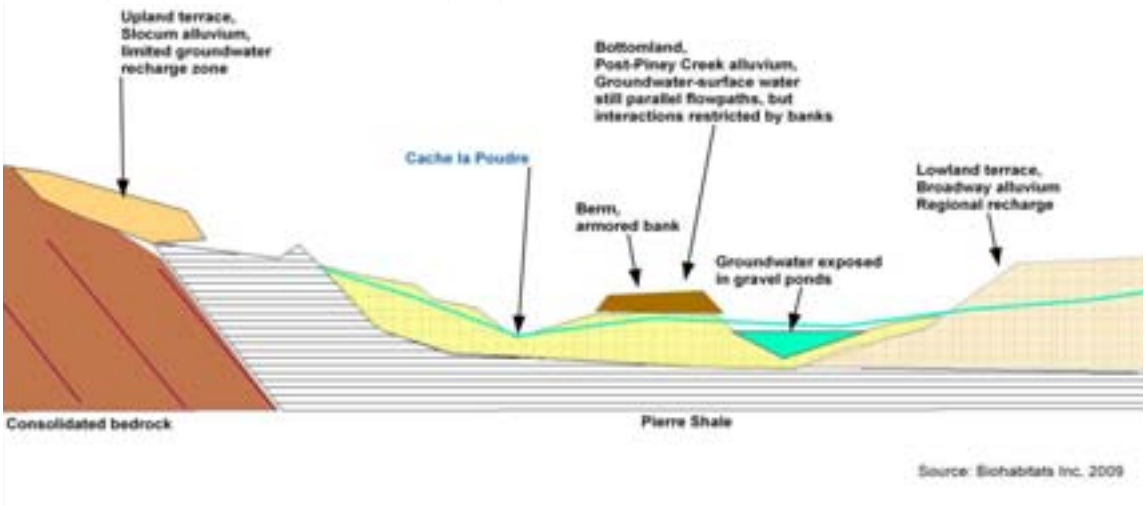
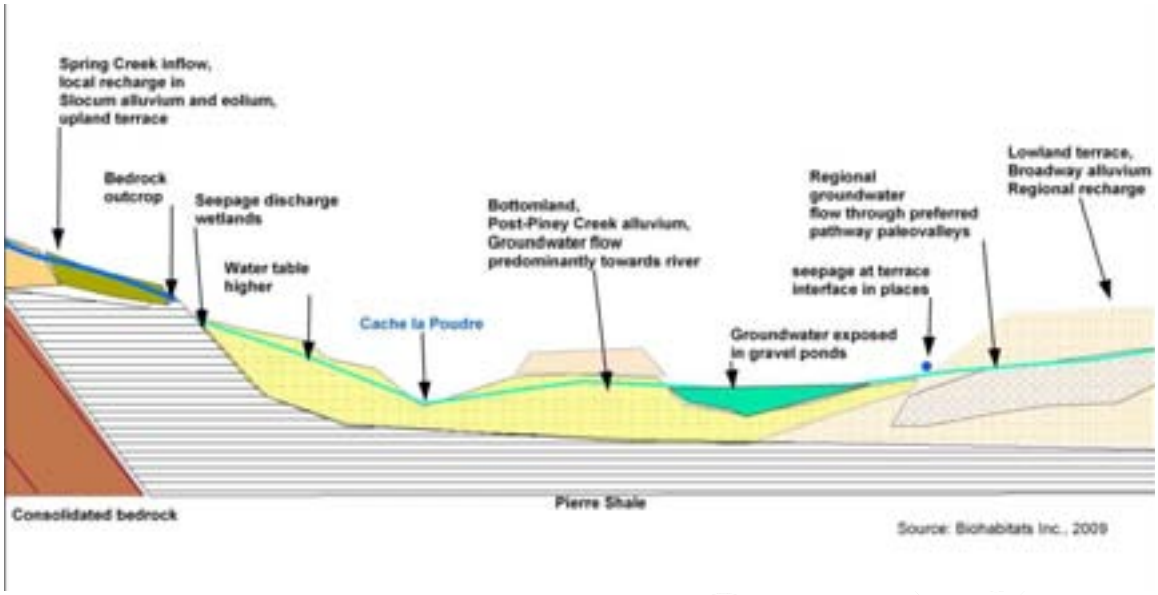


Figure 2.8C: Cross-Sectional View of Southern Portion of Corridor (Kingfisher Point to I-25), looking upstream.



The above cross section shows that in the southern portion of the City the groundwater table is nearer to the surface than upstream. The river becomes more of a receiving system with inflows from Spring Creek from the south and paleochannels (ancient buried channels) from the north. Seepage wetlands are found near bedrock outcrops and paleovalleys (ancient buried valley systems) on each side of the river in this section of the City.

D. Changes in River Morphology

With European settlement, the Poudre River corridor began to be modified by people. Water use, flow regulation, and river management changed the flow patterns and flooding regime of the river. River discharge was reduced significantly in comparison to historic flows. At the mouth of the Poudre Canyon, upstream of most of the diversions, total annual flows in modern times are about 300,000 acre feet, but by the time the river reaches the Lincoln Street gage; it is reduced to 100,000 acre feet. Agricultural diversions not only reduce annual flow but also significantly alter peak flows and day-to-day changes in water levels.

In addition to reduced flows, impacts to the river corridor from human use include armoring the stream banks with inter-locking rock (riprap) and concrete for erosion protection. These hardened banks severely limit the river's access to the adjacent riparian forests, backwater channels, oxbows, wetlands, and ponds. Channel straightening is another influence that results in restricting the river's natural migrations and diminishing transport of sediments, nutrients, and biological material necessary for food chain support. Lastly, gravel mining along the Poudre River has created hundreds of ponds adjacent to the river that, in most cases, expose the groundwater, increasing evapotranspiration and altering local groundwater flow patterns. These groundwater impacts likely reduce groundwater flowing into the river and alter the surface water–groundwater relationship.

The Poudre River through Fort Collins has a fairly natural meander pattern but this pattern is now locked in place by human-made levees and riprap bank protection. This is typical of rivers through urban areas where such measures have been taken to protect property and infrastructure. In addition, reduced flows from diversions have contributed to the inability of the river to access its floodplain through much of the reach except during very large storm events. This "hardening" of the river, along with reduced flows (annual peak discharge and base flow), has reduced the river to an unnatural fluvial system. This includes some of the processes that maintain a natural riparian corridor such as meander migration and annual flooding of low depositional surfaces.

While the river has lost many of its natural functions, the remnant meander pattern, along with the miniaturization of the channel (explained below), it does still provide some characteristics of a natural riverine system such as point bars, pools, and riffles. And although the riparian zone has been greatly reduced in many locations, the mature cottonwoods along the river banks provide woody debris and leaf material into the river, which is vital in the creating wildlife habitat.

There are two main tributaries to the Poudre River in the project reach: Spring Creek and Boxelder Creek. Both tributaries are stormwater-dominated systems. They contribute very little base flow to the river and contribute significant flows to the river only during very large storm events. Therefore, impacts to the river from these tributaries can be considered minimal.

The return of treated wastewater contributes a significant amount of flow back into the lower portion of the river during periods of major irrigation diversions. Water quality is affected but kept within standards set by the State of Colorado. Treated wastewater is warmer (because of household use) than river water, which affects aquatic biota and encourages warm water fisheries.

There are relatively few storm drain outfalls to the river through Fort Collins compared to similar urban corridors. One of the major outfall pipes to the river is at the Udall Natural Area– a recently constructed stormwater quality control feature. Stormwater is routed through a series of three ponds designed to remove waste and particulate matter and moderate high storm water flows such that the peak flows are reduced to more natural levels by the time they reach the river.

While there are many human-derived impacts to the river, the two major impacts are gravel mining and irrigation ditch diversion structures. In order to protect the gravel pits from flood waters, large earthen levees were constructed between the river and the pits. The levees confine larger storm flows to the channel which increases the potential for bed scour and bank erosion. The levees also hinder lateral migration of the river. In addition, the levees and pits decrease the vegetated buffer. Diversion structures divert a relatively large percentage of the river's baseflow and act as fish barriers, recreational hazards, bed material traps, and control both vertical and lateral movement of the river. The river would exhibit a more deepened or "downcut" cross section if there were no cross channel barriers at the diversions. Numerous bridges and bank protection structures throughout the planning reach also control lateral movement of the river.

The Poudre River through Fort Collins can be considered a transitional reach between the steep reach at the mouth of the canyon (0.5% slope) and the lowland reach east of I-25 (0.17% slope).

The average slope of the river through Fort Collins is about 0.3%. The sinuosity of the channel is relatively low (1.13, the ratio of stream length to valley length), but could still be considered average for a meandering riffle/pool river. The low sinuosity correlates with the above average slope. The average size of material in the streambed is cobble size (71 mm). It is interesting to compare these morphologic features with downstream locations. For example, in Windsor the river has a slope of 0.13%, a sinuosity of 1.6, and an average bed material size of 14 mm. This comparison helps illustrate that the Poudre River through Fort Collins is a transitional reach with a higher gradient, lower sinuosity, and larger bed material than downstream reaches. This transition reach may explain the higher occurrence of narrow leaf cottonwood at the upper end; while plains cottonwood is more common at the lower end (see Chapter 3 for more discussion of this).

One significant result of the river conditions described above is the long-term implications for cottonwood regeneration. The Poudre River through Fort Collins no longer has the processes to sustain natural cottonwood regeneration from seed on a regular basis. Cottonwood seeds require sunny, bare, moist surfaces protected from disturbance at the right time of year to grow. The fluvial system must have an active state of erosion and deposition to create favorable surfaces that are later abandoned (not reworked by either scour or deposition) to allow establishment and maturation of cottonwoods. Due to bank armoring, there is minimal meander migration taking place on the Poudre River through Fort Collins.

Narrowing (miniaturization) has been occurring on the Poudre River due to water withdrawals and associated depositional features (such as mid channel islands) have been observed to have new cottonwood growth. However, these depositional features are small and vegetation is susceptible to removal by subsequent storm discharges. This means the young cottonwoods growing on these depositional features may never make it to maturity. It is likely these features will experience a periodic cycle of formation, establishment, and removal, possibly resulting in the loss of one or several generations of cottonwoods.

Flood waters can benefit cottonwood regeneration by depositing materials that create the necessary environment for natural cottonwood propagation. Unfortunately there are few areas remaining along the Poudre River where floodwaters can access the floodplain and/or where it is wide enough to function naturally. As noted earlier, before settlement it is likely that the riparian vegetation was in more of a dynamic equilibrium, where the broad floodplain allowed at least a portion of the older woody species, including cottonwoods, to survive and propagate during flooding.

In summary, although individual properties along the corridor may appear to be in acceptable condition, the fluvial processes in the river are diminished, resulting in the river undergoing a miniaturization process. In the future without regenerative processes, a further decline in ecological conditions can be expected.

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CHAPTER 3

THE ECOLOGICAL SETTING

A. Riparian Forest
B. Floodplain Ponds
C. Floodplain Grasslands
D. Wildlife Corridor and Habitat

Introduction

Natural Area staff utilized The Nature Conservancy's Conservation Action Plan (CAP) planning process to help develop four conservation targets which describe the ecological setting in this chapter. The CAP process explains that…*a limited suite of species, communities and ecological systems are chosen to represent and encompass the full `array of biodiversity found in a project area."* "…*conservation targets are the basis for setting goals, carrying out management actions, and measuring conservation effectiveness. In theory, conservation of the focal targets will ensure the conservation of all native biodiversity within functional landscapes.*" The four conservation targets are riparian forest, floodplain ponds, floodplain grasslands, and wildlife corridor and habitat.

This chapter provides an introduction to the **key issues** and a baseline of the **current condition** and **threats** to each conservation target. A strong understanding of the targets helped develop of a set of **overarching goals** that are intended to guide management at a broad level. The next step in the planning process was to select specific elements (or indicators) of each conservation target to help define the health and viability of each target. This enabled a focused assessment of the current status and desired condition for each indicator. Specific **objectives** were developed, based on the desired condition for each indicator (such as the water quality of a pond). Each objective is followed by a list of short- and mid-term **strategies.** These lists enable the Natural Areas Program to take a "toolbox" approach towards meeting the objectives and goals. This integrated and multifaceted approach will increase the NAP's chances of success at ultimately supporting the long-term viability of each conservation target.

From the planning approach, several broad management concepts emerged:

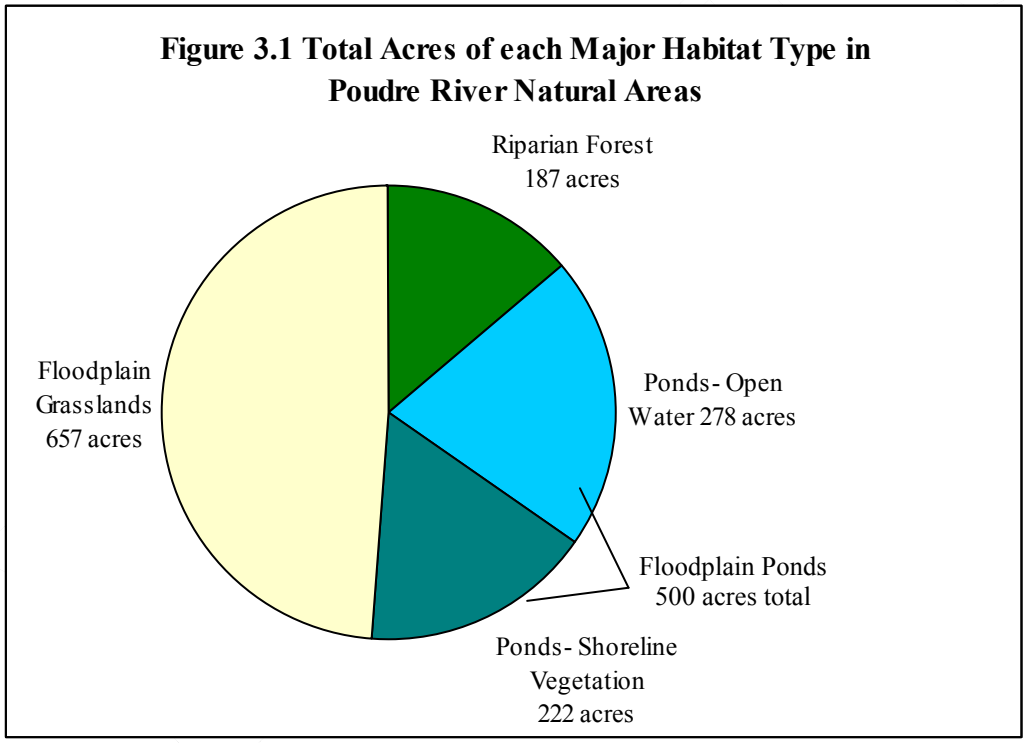
- Support ecosystem functions and processes at the local level;
- Focus on threats associated with non-native species;
- Anticipate natural ecological processes, such as flooding, that are historically part of the river corridor and include in management prescriptions and plans
- Enhance or conserve existing ecosystem complexity to help elevate systems resiliency;
- Set realistic goals in the urban context.

Based on these broad management themes and a landscape scale planning approach, the following strategies are useful in matching management actions with specific locations:

- Focus on locations that offer the best opportunity for actions based on factors including size, surrounding landscape setting or context, landform and geology, key ecological processes, recreational use, and other management considerations.
- Protect and maintain high quality, larger areas that are already in a good ecological condition by addressing small concerns before they become larger.
- Identify, prioritize, improve, and/or restore impaired and degraded lands.

Conservation targets A-C are habitat cover types and thus can be characterized spatially. Conservation target D. Wildlife Corridor and Habitat extends across all vegetation types. Figure 3.1 shows acreage of the riparian forest, the floodplain grasslands, and the ponds (separated into open pond water and vegetation).

Figure 3.1 Total Acres of each Major Habitat Type in Poudre River Natural Areas



Note: The total number of acres owned by the NAP on the Poudre River properties is 1,402. This pie chart does not include a few areas where property boundaries overlap with the river. Also, Magpie Meander Natural Area is omitted from the total.

A. Riparian Forest

1. Description

For the purposes of this plan the term "riparian forest" is used to refer to the ribbon of forest immediately adjacent to the Poudre River. These forests may also be referred to as "riverside cottonwood forests" because the native forest is characterized and dominated by three native cottonwood trees: plains, narrowleaf, and lanceleaf cottonwoods. The term "riparian" is used to refer to vegetation that grows along moving water. For the purposes of this management plan, cottonwoods and other the woody vegetation that occur around floodplain ponds are **not** considered part of "riparian forests," but rather part of the Floodplain Ponds conservation target.

Quick Profile of the Riparian Forest

Number of riparian forest acres in natural areas: 187 acres

Width and size: In the continuous narrow ribbon of forest along the river, most common width is 10–20 yards; several locations extend 80-100–80 yards.

Ecological values: Critical habitat for wildlife; provides mesic forest cover within the regional grassland ecosystem; ecological buffer services to river and water quality; interdependence with aquatic organisms; habitat for native riparian vegetation; provides native seed source for downstream reaches.

Community values: Iconic value to the community; very popular for recreation and refuge from the urban setting; wildlife observation; travel corridor.

Major threats: Lack of overbank flooding and recharge to alluvial groundwater; groundwater drawdown due to adjacent land use practices; poor ecosystem function leading to insufficient recruitment of plains cottonwoods; inability of river to migrate laterally; steep banks and lack of multiple terraces; significant competition from non-native trees; trampling to vegetation due to heavy recreation; fragmentation of habitat value in urban development; bridges; high use; social trails; off-trail trampling.

2. Overarching Goals for Riparian Forests

- Promote a diversity of forest ages and habitat structure while minimizing opportunities for establishment of non-native species through proactive forest management.
- Maintain, and where possible, restore wider, wetter riparian forests by lowering riverbanks to increase frequency and extent of overbank flooding.
- Support and participate in collaborative projects that protect or improve ecosystem processes essential to the viability and sustainability of the river's cottonwood forests. Examples of key ecosystem processes include overbank flooding, recharge and maintenance of alluvial groundwater levels, and sediment scour and deposition.

3. Background and Key Issues

The riparian forest is a long, narrow habitat which may appear small in size and simple in form, but the riparian forests of the urban Poudre River are probably one of the most complex and important habitats in the local landscape. Under natural (unaltered) conditions, a riparian corridor is a complex mosaic of moisture and disturbance patterns. Plants that form communities within

this complex mosaic survive on site where their basic requirements for establishment, growth, and reproduction are satisfied. Under natural or historic conditions riparian forests develop concentrated stands of young, medium or older "mature" forests resulting in a diversity of forest stand ages across the landscape.

These three photos taken on Poudre River natural areas show various forests ages and plant communities that contribute to make up the mosaic of the riparian forest.

Today's riparian forest tells a story that is both reflective of the past and indicative of a future that is likely to be very different from historical conditions. Past conditions are seen in the canopy of the riparian forest (the oldest and largest trees), which is still dominated by the cottonwood trees typical of a more pristine and functioning river system. Also, in many places these older forests extend up to 180 yards away from the river indicating that earlier conditions allowed the river to meander back and forth across the floodplain.

Plains cottonwood is recognized as the keystone species for riparian forests in eastern Colorado due to the large number of wildlife dependent on the cottonwood tree for habitat, and because the composition of cottonwood forests, i.e., density and shading, allows other riparian plants to grow. A **keystone species** is said to have a disproportionate effect on the ecosystem compared to its abundance. The removal of a keystone species initiates changes in ecosystem structure and often loss of diversity**.** Therefore, the health of the plains cottonwood population serves as a comprehensive indicator of the health of the riparian forest ecosystem.

A closer look at the riparian forest reveals a greatly impacted system and forecasts a future very different from its past. The younger native trees in the riparian forest are increasingly outcompeted by aggressive non-native trees. In particular, young plains cottonwoods and native shrubs are sparse to absent. These missing components can be attributed to altered topography associated with flood control efforts, river channelization, and urbanization of adjacent lands especially through the downtown area. River banks along much of the downtown stretch of the Poudre River are unnaturally steep and immovable because of bank armoring designed to prevent or minimize the flooding of nearby urban areas and stormwater infrastructure. The lack of a natural lateral migration of the river has manifested a riparian forest that is no longer connected to the high flows and flooding with which it historically evolved.

While all local habitats rely on water, river flows play a uniquely central role to the riparian forest which is entirely dependent on interactions with the river. The timing, quantity, and duration of river flows have a fundamental effect on all elements of the forest community and its

associated wildlife. The following sequence of events describes the domino effect and far-reaching influence that the river has on the riparian forest:

1. High flows scour and deposit sediment creating point bars or off-channel areas with the exact conditions required for germination of cottonwood seedlings (sunny bare surfaces with fine, nutrient poor sediment available at a specific time in the spring when the cottonwood seedlings are released).
2. High flows cut sediment away from the bank opposite the point bar (called the cut bank) causing changes to the river's course and redirecting subsequent high flows away from vulnerable cottonwood seedlings.
3. Dense stands of new cottonwoods establish and set down roots on the point bars and off-channel areas.
4. As the river meanders the banks develop a gradually sloping topography (or multiple "benches") allowing young forests to mature into a mid-succession forests. These forests often support thicker stands of fruit bearing shrubs, a diversity of smaller trees and sapling cottonwoods trees.
5. High spring flows fluctuate from year to year. In wetter years, the river overtops its bank flooding mature forests, saturating the root zone, and recharging alluvial groundwater. Both high spring flows and year-round base flows support groundwater levels providing year round sub-irrigation for the forest.
6. The river continues to move its course creating new habitat for cottonwoods and allowing other areas to mature into climax canopy forest lending to diversity of forest ages across the landscape dominated by keystone species, the cottonwood.

Flooding in the riparian forest at Lee Martinez Park (across from McMurry Natural Area) in the Spring of 2010.

Figure 3.2 The image on the left shows the sequence of events of river movement that leads to the development of new forests of point bars and older forests where the river once was. This image provides a good example of how the Poudre River once meandered back and forth.
http://pubs.usgs.gov/fs/fs-004-03/images/fig4.gif

Figure 3.3 The image on the right shows the Poudre River from College Ave through downtown as it travels under Linden and Lincoln. The river can not move back and forth due to multiple bridges, buildings, rip rap, and levees. In response to this confinement, the riparian forest has become narrow. On the right side one can see the old path of the river where a remnant oxbow, still populated with cottonwoods tells the story of the river's meandering past.

In today's Poudre River, the cascade of interactions, also known as "ecosystem processes and functions", are highly altered and no longer occur as they once did. Reduced flows coupled with the armoring of banks have created an urban Poudre river ecosystem that has poor or limited function. Additionally, it is anticipated that these natural functions will decrease given that river flows might be further reduced and future urban development could require additional stormwater infrastructure. As noted in Chapter 1, flow reductions from historical levels and bank armoring for the purpose of river stabilization are two foundational elements that are largely beyond the jurisdiction of the Natural Areas Program. This management plan recognizes the need to work in a collaborative manner with other agencies and stakeholders to try and reverse some of the impacts of land use and restore as much of the river function as feasible within the modern urban framework.

Future management of the riparian forests must consider methods to conserve the forests under altered hydrologic regimes and recognize that a return to a pre-settlement "native" condition is not possible. Therefore the goal is to maximize the resilience of the existing system and maintain existing habitat values. Strategies can be categorized in two ways:

1. Strategies that work towards maintaining the viability and long-term sustainability of existing cottonwood forests through inter-agency collaboration (specifically, by improving river flows and reconnecting the river to the floodplain).
2. Strategies that commit programmatic resources to long-term forest management. These objectives and strategies fall within the jurisdiction of the NAP and will focus on mitigating major threats associated with invasive trees and promoting diversity of native species, habitats, and structure.

Even though many factors lie beyond the NAP jurisdiction, there are many effective actions the program can take through species management and restoration efforts that will significantly influence the composition and health of the forest. These management actions will focus on:

- Promoting all species of cottonwoods;
- Taking aggressive actions against non-native trees;
- Working towards diversity of forest ages and structures; and
- Conducting restoration that improves interaction between river flows and the forest.

The Poudre River at Butterfly Woods Natural Area.

4. Current Condition

The data, discussion, and conclusions presented below are drawn from two field research projects conducted in the riparian forest in 2009. The Woody Vegetation Characterization Project (available upon request) followed accepted research methods where a randomly selected subset of the forest was studied to determine the composition and size class distribution for important trees and shrubs. In contrast, the Habitat Mapping Project (available upon request) was a census of the entire forest. The goal was to enhance our ability to describe the quality, distribution and self-sustaining capacity of habitats along the Poudre River.

In order to understand the current condition of the Poudre River it is helpful to consider how the riparian forests looked prior to the agricultural and urban development of the past 150 years. Two central themes or key characteristics help describe the earlier conditions on this reach of the Poudre River. These are:

1. **Variability:** As described above, the native Poudre River was highly sinuous bordered by a ribbon of riparian forest that became scarcer as it travelled east beyond Fort Collins. The forest itself was highly variable in age, topography and width. This variability was a direct result of the disturbance patterns driven by flooding.
2. **Transition Zone:** The urban Poudre River is situated at the nexus of a fast flowing, steep, cold montane river and a slow winding warm river of the eastern plains of Colorado. Consequently, the vegetation and wildlife community composition was representative of a transitional zone. For example, upper reaches of the river were nearly entirely dominated by narrowleaf cottonwood whereas downstream reaches were dominated by plains cottonwood. A similar shift occurred in shrubs and herbaceous plants communities which exhibited high diversity and compositional changes associated with both upper and lower reaches.

For the purposes of the ensuing discussion, the earlier pre-settlement conditions are referred to as the "native condition." Also, this discussion refers to a several tree species important in the evolving riparian forest. A more complete review of the life history traits, geographic range, and key concerns about each of these species is available in Appendix B.

Current condition: Forest Age and Composition

Due to extreme disturbance by floods, the forests along the Poudre River were historically a patchwork in the landscape consisting of multi-aged forest stands from seedlings to mature trees in excess of 100 years old. Today's forest is dominated by patches of late-seral mature forests, some mid-seral stands, and a few early-seral young emerging forests which consist of entirely different species than the native early-seral forests.

Mature riparian forests typically established more than 50 years ago. These forests are comprised of mature trees of plains cottonwood and crack willow trees which exhibit large girths and sprawling canopies. On the upper reaches of the river narrowleaf cottonwood is increasingly important, while lanceleaf cottonwood fills a significant portion of the canopy in the central sections (near Lemay Avenue and Timberline Road). The understory of these forests has a sparse shrub component (commonly wild rose and snowberry) which is not too dissimilar from the native condition. The herbaceous layer is dominated by smooth brome (a non-native pasture grass) which forms a dense thatch, spreads vegetatively via rhizomes, and prevents the establishment of native grasses and forbs. Smooth brome also occupies space that would otherwise be bare soil upon which cottonwood seedlings could become established following the next spring flood. There are many mature forests stands along the urban Poudre River.

Mid-seral riparian forests were established more recently (approximately 40–50 years ago) is located closer to the river channel, closer to alluvial groundwater, and is more likely to be connected to the river flows through overbank flooding. These forests have more structural diversity compared to mature forests with pronounced shrub and subcanopy components.

Boxelder (a native) and green ash (a local non-native, but regional native) are the most common trees in the subcanopy layer. The next most common trees in the subcanopy are peachleaf willow (a native), and plains and narrowleaf cottonwoods. The younger narrowleaf cottonwoods occur with greater frequency further upland from the river and are reproducing vegetatively. Green ash saplings are prolific in many of the mid-seral forest stands. Coyote willow is the dominant shrub along the river's edge with reed canary grass predominantly occupying the herbaceous layer in wet areas.

Yellow warbler in cottonwood

Early-seral forests may be defined as one that established recently (i.e., within the past 10 years). In the native Poudre River ecosystem an early-seral forest would have had little to no existing canopy or shade. Topographically these forests would have occupied areas close to or at baseline river water levels adjacent to riparian sedges, rushes, and forbs. Depending on the timing and physical characteristics of flow events, these early seral forests would have consisted of patches or perhaps entire beaches covered by a carpet of seedlings or saplings of predominantly plains cottonwoods and willows. This traditional early-seral forest is nearly absent from the entire urban stretch of the Poudre River. The set of physical circumstances required for natural regeneration is largely non-existent along the urban Poudre River. The closest and notable exception is found at the Environmental Learning Center (owned by Colorado State University) where an extensive riparian forest is situated on low-lying topography that was modified by high flow events over the past several decades. The only other locations along the river where plains cottonwood forests are regenerating are along the shorelines of gravel ponds and in historic meander channels.

A different type of young forest is evolving in the Poudre River forests. Instead of the single species stands of seedling plains cottonwoods, there are now Siberian elms successfully regenerating on long standing high and dry cobble bars. In fact, juvenile Siberian elms are establishing aggressively in many habitat niches when proximate to a parent tree. Under the shade of the mid-seral forests, there are high densities of green ash saplings. Green ash is native further down the wateshed and is now highly competitive within this region because as it has migrated upstream it is suited to similar conditions yet has the capacity to thrive in shade. Finally, narrowleaf cottonwood is reproducing vegetatively in sunny locations throughout the forests. Sapling boxelder and peachleaf willow were detected rarely (in contrast to the areas around the ponds) and Russian olives are ubiquitous but at low densities due to proactive management by the NAP. With this unique composition to the youngest generation of trees it is likely that future forest will look different.

Distribution across the Landscape

The spatial distribution of today's riparian forests displays some of the variability associated with the historic reference condition. Both narrow and very wide sections exist punctuated with stretches absent of forests. However, based on sampling it appears that current riparian forests

exhibit a narrower band than the pre-settlement condition. The high and dry topography and unnatural physical conditions will make it difficult for natural regeneration to occur at further distances from the river in the future. Possibly the best chance for plains cottonwood to regenerate is in the gentler sloping forests that are medium width (40–60 yards) and also any available back-channel areas.

Summary of Keystone Species Health: Plains and Narrowleaf Cottonwoods
The plains cottonwood population is not reproducing at the level needed to be self-sustaining. The few concentrated patches of young plains cottonwoods are located far from the rivers edge and became established due to random ideal conditions. Narrowleaf cottonwood is reproducing successfully and contributing significant numbers of individuals to all age classes. It is expected to be important in the future forest due to its ability to reproduce vegetatively. However, if climate warming trends continue, the geographic range of this species could shrink to higher elevations causing it to disappear from the transition zone.

The Future Forest
Based on the makeup of the smallest trees (see discussion of early seral forest), green ash, narrowleaf cottonwood, Siberian elm, and Russian olive (the latter two if left unmanaged), will probably become dominant in the future forest. It is unclear if the circumstances for boxelder and peachleaf willow establishment currently exists or whether optimal conditions will exist in the future. The static channel geometry of the urban segment of the Poudre River is having an adverse impact on native mid-seral forests due to lack of natural terrace development. These conditions are likely to cause an increase in the presence of trees adapted to still water or upland environments in the riparian zone. Additionally, encroachment by other non-native trees into this habitat will further decrease the competitive advantage of cottonwoods and lead to a major shift in forest composition.

5. Management Objectives and Strategies for the Riparian Forest

Objective for Ecosystem Processes: Increase the viability and sustainability of ecosystem processes essential to the river's cottonwood forests. Key ecosystem processes include overbank flooding, recharge and maintenance of alluvial groundwater levels, sediment scour and deposition, and the ability of the river to migrate laterally within the floodplain.

Strategies:

- Support and participate in scientifically driven collaborative projects that seek to quantify elements of the Poudre River ecosystem that are critical for maintaining or improving the health of the watershed (develop an "ecological vision" based on a scientifically based prediction of probable future ecological states).
- Participate in an interdepartmental Watershed Communications Team to share technical expertise, pool financial resources, and maximize project success.
- Collaborate with City departments and external organizations on projects that support the maintenance or improvement of ecosystem processes with a priority on processes that have the greatest impact on the riparian forest.
- Pursue a data-driven understanding of conditions and changes to the riparian forest in order to relate biological and physical conditions with ecosystem processes.

- Initiate, complete, and report on field research and share data externally.
- Monitor groundwater levels at targeted locations to develop baseline data in anticipation of future change. Possibly use water levels at unlined ponds as indicators of groundwater level to understand impacts of changing groundwater on conservation targets.

Objective for Cottonwood Forest Composition and Structure: Promote conditions that support the long-term sustainability of cottonwood forests along the river.

Strategies:

- Develop and implement restoration projects by lowering and regrading riverbanks to allow overbank flooding and creating shallow groundwater levels leading to enhance cottonwood recruitment and vitality.
- Use active forest management to promote cottonwood stands by removing Russian olive, Siberian elm, crack willow to reduce their population base and competitive edge with native plants.
- Consider using groundwater wells to help determine baseline and/or changing groundwater conditions in locations of interest (may be locations with greater threats or locations with desired conditions to mimic).
- Identify forested locations that have desirable age structure and species composition and that exhibit overall healthy condition. Collect data on physical characteristics (topographic, depth to groundwater) to use in restoration planning for other locations along the river.
- Encourage levy setbacks.
- Develop a demonstration project with the goal of mimicking plains cottonwood populations with lanceleaf cottonwood which has similar form and function yet has much greater ability to reproduce vegetatively. Pilot project should evaluate planting methods and multi-year survival rates.
- Select locations (including ponds adjacent to the river) for shrub plantings to increase habitat required by bird species dependent on riparian shrub communities.
- Increase cottonwood forest widths to at least 100-300 feet wide.

Objective for Invasive Species Composition and Dominance—Plants: Manage vegetation so that key non-native herbaceous, shrub, and tree species are sub-dominant and declining, and native species are increasing.

Strategies:

- Employ Integrated Pest Management (IPM) principles (mowing, weed spraying, grazing, and prescribed fire) to affect the conversion of vegetation composition to native species.
- Where possible, alter the underlying soil conditions to allow for better long-term viability of restoration projects.
- Encourage research projects and establish demonstration plots aimed at evaluating management tools for converting smooth brome and canary reed grass to native grass species in the riparian forest understory.
- Use early detection, rapid response principles to minimizing long-term costs associated with managing future noxious weed species.

- Mimic, to the extent possible and reasonable, a long-term disturbance regime to favor native herbaceous species.

Objective for Vegetation along Riverbanks: Maintain healthy vegetated river banks.

Strategies:

- Manage recreation and consider closures or trail relocations and restoration of heavily trampled areas along the riverbanks.
- Collaborate with Stormwater department to identify areas where restoration goals and flood control needs intersect or conflict. For example, work with Stormwater when underground infrastructure or levy construction could be modified to better meet natural areas goals.

Objective for Rare Species Habitat: Protect and enhance existing habitats for rare species.

Strategies:

- Identify opportunities to expand or restore unique habitats for rare species
- Update information on presence and condition of rare plant species such as American black currant and others identified by Colorado Natural Heritage Program (CNHP) with known or possible occurrences in the Fort Collins area.
- Include criteria for Preble's meadow jumping mouse habitat in restoration plans where possible. For example, create broad floodplain with gradual topography and dense native shrub cover along with dense ground cover of graminoids and forbs.
- Encourage internal, external or volunteer research to understand the habitat needs of certain rare insects (e.g., cross-line skipper, two-spotted skipper, moss's elfin, smoky eyed brown butterfly, and modest sphinx moth).
- Update information on presence and condition of rare species (smoky brown-eyed butterfly, Preble's meadow jumping mouse, black-necked stilt, Townsend's big-eared bat) as identified by CNHP with known or possible occurrences in the Fort Collins area. External research and/or volunteer support will be needed to accomplish this strategy.

Objective for Off-Channel Wetlands: Manage natural areas so some off-channel wetlands are present and of sufficient size and extent to support local wildlife and native aquatic plants.

Strategies:

- Identify best opportunities for wetland enhancement or creation to increase size, condition, and distribution of off-channel wetlands based on restoration planning information and non-native treatment areas.
- Consider special protection or management zoning for unique or high value wetlands such as groundwater seeps that support unique communities.
- Combine data from 2009 Habitat Mapping Project and 2010 Rapid Assessment into a single GIS layer of all off channel wetlands to have a comprehensive database for monitoring and management to efficiently implement the former two previous strategies.

B. Floodplain Ponds

1. Description

Floodplain ponds refer to the ponds in the Poudre River floodplain. The ponds support aquatic life and a fringe of wet-loving vegetation often consisting of many of the same plant species found in the riparian forests.

Quick Profile of the Floodplain Ponds

Number of ponds in natural areas along the Poudre River: 39

Total acres of open water: 278 acres

Total acres of associated vegetated fringe: 222 acres

Ecological values: Valuable and extensive source of water and wetlands in arid landscape; habitat for waterfowl; provides a food source for many nesting and migratory birds; provides habitat for aquatic mammals; amphibians; fish; best location of plains cottonwood recruitment in Poudre River corridor; supports many native riparian trees and shrubs.

Community values: Fishing; kayaking; canoeing; viewshed/scenery; easily accessible high-quality wildlife observation.

Major threats: Expansion of Russian olive; tamarisk; noxious forbs; Asian carp; bullfrogs; establishment of new invasive aquatics; algae blooms.

2. Overarching Goals for the Floodplain Ponds

- Maximize habitat value to native plants and wildlife.
- Implement habitat enhancement projects that create a diversity of wetland and terrestrial habitats that connect to adjacent riparian communities.
- Collaboratively manage pond fisheries with the Colorado Division of Wildlife (CDOW) to promote both native fish communities and sport fisheries.

3. Background and Key Issues

Floodplain ponds are an unusual conservation target as these ponds are artifacts of gravel mining that occurred throughout the past century. As a result, there are no natural ponds or reference conditions to form a basis for habitat construction or restoration. As these areas are part of the river's historic floodplain, management efforts will focus on integrating pond habitat into the adjacent riparian system. This is best achieved by improving connectivity between the river and ponds and creating a complex of wetland and upland habitats. In many cases, open water may be partially converted to emergent wetland or forested communities to provide wildlife habitat not widely available in the urban and arid (grassland) landscape. Wetland habitats offer a unique opportunity to replicate natural features associated with active river channels such as oxbows, backwater channels, and other wet habitats. These habitats are likely to benefit

Autumn colors at Riverbend Ponds Natural Area by Bob Willis

from a range of wildlife needs with particular benefits to birds, amphibians, and aquatic mammals.
Restoration and management of aquatic habitat focus on development of shallow water habitat, conservation of native fish, and an enhanced sport fishery. Ponds will be categorized based on ecological and physical attributes and managed in consultation with the Colorado Division of Wildlife. Achieving management goals for aquatic habitat and wildlife is dependent on identifying, understanding and minimizing the occurrence of specific aggressive non-natives (such as bullfrogs and Asian carp) that are known to compete directly with native fish and amphibians.

Restoration efforts at Artists Pond located in Cottonwood Hollow Natural Area have resulted in excellent aquatic habitat.

4. Current Condition

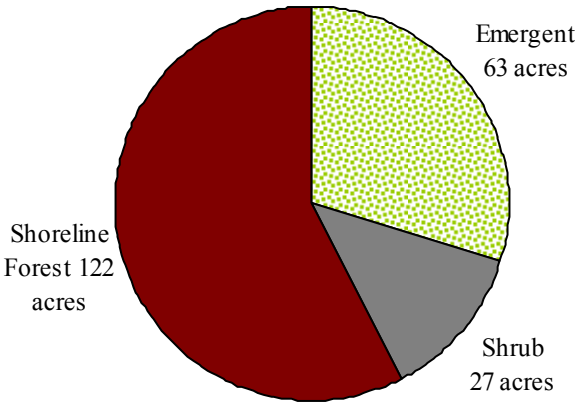
There are 39 floodplain ponds along the Poudre River with 278 acres of open water and 222 acres of shoreline vegetation. The ponds are generally shallow in depth and about half have some form of broad, shallow shoreline able to support littoral wetlands and the remaining have narrow shorelines that exhibit few if any wetland characteristics. The water levels in most ponds are closely tied to surrounding groundwater levels. A few of the ponds may have been lined (for augmentation purposes) so the pond water is not influenced by groundwater dynamics. Even though much remains unknown about the physical characteristics of the water in these ponds (depth, temperature, chemistry), it may be safe to conclude that the water quality is fair to good given that fewer than 10% of the ponds in the natural areas display obvious water quality problems manifested through algae blooms or fish kills.

A combination of restoration efforts and inherent capacity for aquatic environments to support plants and wildlife has allowed these human-made environments to develop into very valuable habitat for a diversity of wildlife. The aquatic environment supports both native and sport fish (stocked regularly by CDOW). All current information on the stocking history, fish species, size, and other information is in the Pond Table in Appendix C.

Depending on reclamation or management history of each pond, the shorelines provide variable levels of shallow water and wetland habitats which are essential for many wildlife guilds and are uncommon in this arid landscape. Data on wildlife population dynamics are limited, yet it can be assumed that many of these shallow water areas are highly productive habitats as evidenced by diversity of aquatic insects found in an around the emergent vegetation surrounding the ponds and by the presence of amphibians and small-sized water dependent mammals (mink, muskrat, and beaver) and shorebirds. For further discussion see current condition of section D of this chapter, and for complete species lists see Appendix D.

The 222 acres of shoreline vegetation are grouped into three cover types: emergent, shrub, or forest (forest refers to a narrow band of trees that establish along the shorelines). Figure 3.4 shows the total acres for each of the three cover types. While the forest appears to be the most dominant cover type, these areas frequently have a shrubby understory, so a prominent shrub layer exists on almost 147 acres.

Figure 3.4 Total Acres of Three Shoreline Vegetation Cover Types



The forests surrounding the ponds consist mostly of small trees when compared to the riparian forest. Studies revealed that these trees are primarily are young plains cottonwoods, Russian olives and peachleaf willows. Due to recent management efforts, Russian olive is rarely the dominant tree, but nevertheless it was detected in almost half of shorelines, underscoring its ability to quickly re-sprout and the importance of long-term management. Boxelder and narrowleaf cottonwoods are also occasionally growing around the ponds but are much less common around ponds when compared to the river.

The shrub-sized vegetation around the ponds is dominated by coyote willow followed by sapling peachleaf willow trees and sapling plains cottonwood trees. Of the 63 acres of emergent vegetation, over 90% are dominated by cattails. Bullrushes are the next most common wetland species sporadically found adjacent to cattails. Patches of shallower wetlands support sedges and rushes but this is rare.

This shoreline habitat around the ponds plays a unique role in supporting two components that are important but missing in the nearby riparian forests along the river: plains cottonwoods and shrubby understory. Plains cottonwoods are found at high densities and at all small size classes in all areas where pond shorelines are not vertical. A thick shrubby understory is ubiquitous around the ponds. While this shrub cover is dominated by the aggressive coyote willow, we can

Cattails dominate the edge of this pond.

The shoreline of this pond is dominated by saplings of plains cottonwoods and peachleaf willows.

assume that native riparian fruit-bearing shrubs could establish relatively easily in the shoreline habitat. These fruit-bearing shrubs were noted as missing by the breeding bird survey which is presented in Current Condition of the Wildlife Section (D.4.).

The NAP recognizes these ponds are invaluable as habitat and popular with visitors. The level of management understanding and focus currently does not meet the value of the resource. The strategies presented in the next section highlight a new commitment towards improving understanding of the physical and biological characteristics in order to focus and enhance management of the 39 ponds in the Poudre River natural areas.

5. Management Objectives and Strategies for Floodplain Ponds

Objective for Pond Management: Designate each of the 39 ponds to be managed primarily for native and sport fishes, or for shallow water habitat. Determine management priorities, restoration projects and stocking plans accordingly.

Strategies:

- Determine management goals for each pond by collecting information on physical and biological characteristics, stocking history, and recreational management goals.
- Develop a comprehensive database on the water status of ponds including information on liners and water rights, surface water connections, status of mining permits, and augmentation needs.
- Identify ponds to be managed specifically for native fish. Work with CDOW to develop management plans for the native fishery including the concept of refugia ponds for small fishes.
- Build shallow water habitat to support diverse populations of insect and other food sources required by specific native fish.
- Develop list of criteria for restoration projects on ponds.
- Consider dredging ponds if surveys indicate this would significantly improve success for meeting management goals. Use dredged material as topsoil in natural areas that lack soil organic matter and nutrition.

Objective for Water Quality: Sustain good water quality in pond ecosystem.

Strategies:

- Identify ponds with specific water quality concerns and potential concerns where direct and proactive management of water quality is a priority.
- Determine specific steps for improving water quality in ponds with known water quality problems. The goal is to improve and/or maintain ponds of concern so algae blooms and fish kills due to nutrient loading are rare. Consider developing a water monitoring project possibly with volunteers.
- Coordinate with adjacent property owners and water managers of the contributing drainage area to improve water quality and management practices within the subwatershed.
- For ponds with identified water quality concerns, determine if surface water manipulation (flow through, etc.) can alleviate or mitigate a certain condition.

Objective for Physical Architecture: Improve or create irregular shorelines and variations in water depths. Consider wetland island creation to provide habitat complexity.

Strategies:

- Inventory and assess pond dimensions and shoreline characteristics.
- Develop bathymetric and depth profiles of all ponds possibly with volunteers.

Objective for Vegetation Composition and Structure: Create a mosaic of aquatic, emergent, woody, and herbaceous plant communities within and near floodplain ponds and to the extent possible, create broad littoral zones.

Strategies:

- Select locations for shoreline restorations/improvement projects. Give priority to shoreline in the "Resource Protection" management zone. The goal is to extend the transition zones along the aquatic–terrestrial gradient to support a diversity of vegetation communities.
- Evaluate heavily trampled shorelines for seasonal closures, restoration or rezoning. At ponds where designated fishing is a priority, consider installation of designated or "hardened" fishing access points.
- Develop revegetation plans when removing Russian olives (or other non-natives) to replace structure and wildlife habitat and prevent erosion.
- Continue rare plant surveys in shoreline vegetation.
- Consider initiating rare plant surveys for aquatic species.

Objective for Invasive Aquatic Wildlife and Diseases: Work closely with CDOW and other partners to monitor all invasive aquatic wildlife.

Strategies:

- Keep bullfrogs out of existing bullfrog-free areas. Seek external support in identifying/confirming bullfrog-free ponds.
- Select targeted locations and implement pilot project to reduce bullfrog populations. Track staff time and population trends to assess on-going resource commitment and efficacy of strategies.
- Monitor for chytrid fungus.
- Encourage outside research on amphibian and removal methods.
- Implement a pilot project to manage against carp while managing for natives. Carp densities will be managed rather than aiming for complete removal.
- Create outreach around carp, bullfrogs and chytrid fungus.

Objective for Species Composition/Dominance—Birds: Maintain pond habitats for a range of bird communities including indicator and uncommon species. Observation of species of interest (rare, sensitive, representative, indicators) may trigger changes to management techniques or zoning.

Strategies:

- Monitor and maintain a record of raptor nest activity.
- Initiate winter waterfowl survey for the purpose of establishing baseline monitoring. Strongly consider making this a volunteer effort. Partner with existing data collection efforts such as the Christmas bird count.

C. Floodplain Grasslands

Western meadowlark

1. Description

Floodplain grasslands are defined as all the grasslands in natural areas along the Poudre River. While most of these grasslands are located within a 500-year floodplain, some are situated above the floodplain but are included in this conservation target because they exhibit higher productivity evident of wetter lowland conditions when compared to the surrounding arid landscape. Urban, agricultural, and industrial land uses have significantly altered former native prairie and today's grassland fragments are dominated by non-native grasses and noxious weeds.

Quick Profile of the Floodplain Grasslands

Acres of floodplain grasslands in natural areas along the Poudre River: 660 acres

Total acres under active restoration: 322 acres

Ecological values: Habitat for birds, insects, small mammals, and deer. Increases effective habitat size for wildlife in riparian forest (buffer concept).

Community values: Viewshed to the river; act as a buffer for the natural experience in the riparian forest; urban refuge; travel corridor; recreation (biking, walking); and wildlife observation.

Major threats: Drawdown of groundwater levels (due to adjacent mining activity); poor soil conditions and steep topography which results in restoration challenges and proliferation of non-native plants and weeds.

2. Overarching Goals for Floodplain Grasslands

- Manage for habitat diversity including grasses, forbs, and shrubs to maximize habitat potential for native wildlife within the urban context.
- Manage upland grasslands to provide ecotonal habitat for species within the forest, which increases species diversity and buffers the forests and the river habitats from urban influences.

3. Background and Key Issues

Floodplain grasslands provide unique opportunities in the urban environment for supporting native plants and wildlife of the short- and mid-grass prairies. In the past, these lands were used for gravel mining, urban infrastructure, industry and agriculture, all of which have significantly altered the soils and vegetation of the grasslands. The grassland habitat now exists as disconnected fragments surrounded by cityscape. Some of the grasslands have been restored to

increase the native plant diversity and several more have a high potential for restoration to native grasses if there is a consistent, long-term management commitment. Because of the proliferation of aggressive, non-native plants in the urban setting, and the high edge to interior ratio of each grassland fragment, the NAP has placed a high priority on vegetation management with the goal of maintaining a cover of 75% or greater of native vegetation.

Managing for a diversity of native plants on the floodplain grasslands will result in habitat that can support a variety of wildlife species including nesting, migratory, and wintering bird species, small mammals and deer. The capacity for these grasslands to support highly specialized wildlife is limited due to the small size, shape (high percentage of "edge"), connectivity to other grasslands, and high human presence. As a result, these grasslands are more likely to support generalist species, a high diversity of avian species during migration, and a relatively low diversity of nesting and breeding birds.

Floodplain grasslands act as an important distance buffer with regard to noise, night lighting, and other urban impacts on the natural areas. This buffering capacity improves the value of wildlife habitat in the river, riparian forests, and ponds. Additionally, by providing healthy grasslands between the built environment and the riparian corridor, visitors are given insight into the dichotomous nature of the river through the arid plains. Ongoing protection of the community's grasslands as well as deliberate planning of recreational amenities and regulations is needed to maintain or improve the many values of these important grasslands.

4. Current condition

Of the 660 acres of floodplain grasslands, 90% are dominated by grasses and forbs, and 10% are woody vegetation consisting of rabbitbrush and various trees. The trees are predominately cottonwoods, but also include Russian olives, Siberian elms, birches, junipers, pines and other (escaped) ornamental trees.

Historically much of the floodplain grasslands were farmed or mined for gravel. As a result, typical soils of these grasslands are thin and gravelly. Without active management these soils support early-seral, non-native plants. The most dominant plants in the grasslands in descending order of pervasiveness are:

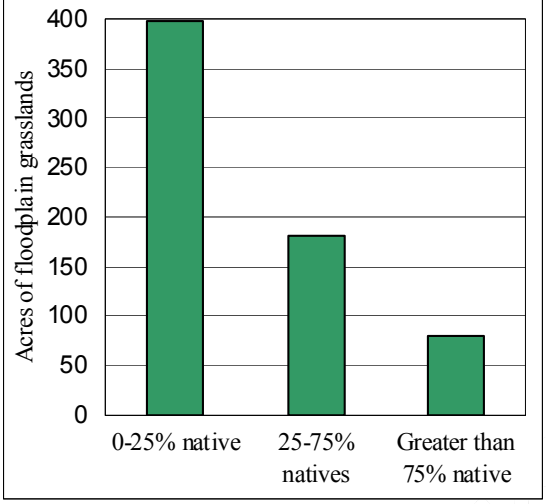
1. Smooth brome (non-native, agricultural origin)
2. Cheatgrass (non-native, C list noxious weed)
3. Kochia (non-native)
4. Cultivar ryes (non-native agricultural origin)
5. Western wheat and its hybrids (native, planted with success during restoration)
6. Crested wheat (non-native, agricultural origin)

Other very common plants include bindweed, Great Basin wildrye, and Jim Hill mustard as well a suite of non-native annual forbs.

The NAP goal for grasslands is to achieve and maintain more than 75% native plant cover. As most grasslands exhibit a high level of disturbance, the process of restoring these areas to native plants requires a long-term commitment and 10- to 15-year time horizon. The grassland restoration process typically involves 2 or 3 years of intensive weed treatment followed by soil

bed preparation and native grass planting. Once native grass seed has been planted, routine monitoring and an integrated approach aimed at increasing species and structural diversity is attempted while minimizing the reestablishment of weeds. Weed spraying, mowing, prescribed fire, and additional seeding are common tools used to mature the restored landscape.

Figure 3.5 Acres of floodplain grasslands based on % composition of native plants.



In the past decade the NAP has committed extensive resources to restoring grasslands. Figure 3.5 displays the distribution of floodplain grassland restoration status based on the composition of native plants. Over 300 acres are currently in active restoration at various stages of progression toward native communities has shown above. As many of these restoration efforts were initiated between 2003 and 2006, it is likely to be 2015 or 2020 before these first 300 acres can be considered "fully restored." Once the areas are "fully restored" based on species composition, mowing, prescribed burning or grazing will be necessary to maintain a healthy and vigorous grassland.

Blue grama (left) and Indian blanket flower (right) represent some of the desired native species that would contribute towards a more resilient and diverse restored grassland.

5. Management Objectives and Strategies for Floodplain Grasslands

Objective for Species Composition and Dominance—Plants:
Manage floodplain grasslands to promote the establishment and maintenance of so that native grasses and forbs are dominant and localized weed trends are decreasing. Patches of native trees and shrubs within the grasslands are desired.

Strategies:

- Regrade berms to create more natural topography as part of the restoration process.
- Continue vegetation management of grasslands already under restoration. This includes weed control and plantings.

- Mimic ecological disturbance processes to maintain healthy habitats by haying, grazing, and burning.
- Assess diversity and opportunities for improving diversity on multiple scales from microhabitats to landscapes throughout the planning and restoration process.
- Inventory and manage for rare plants.

Objective for Species Composition and Dominance—Grassland Bird Habitat: Manage floodplain grasslands to maximize habitat potential for grassland birds. Large intact areas of habitat should be managed to maximize structural diversity and support breeding, nesting, migratory and wintering birds.

Strategies:

- Prioritize large floodplain grassland protection areas to manage for nesting birds. Management actions include closing or discouraging social trails and possible Resource Protection designation.
- Adapt management as species of interest (rare, sensitive, or representative indicators) are observed.
- Plant shrub patches to increase structural diversity.
- Continue Poudre River breeding bird survey every 3-5 years (after baseline data has been established) to observe trends in grassland bird use.
- Adopt best management practices (as appropriate to the urban context) to reduce negative impacts on grasslands birds. These include:
    - Identify restoration units where the objective has changed from managing for plant communities to managing for wildlife. Stop mowing activities prior to mid-July to avoid disturbance of nests.
    - Adopt wildlife-friendly mowing patterns (from interior to exterior) to allow wildlife to escape from mowing activity, if necessary.
    - Leave unmowed strips along edges of grasslands to provide buffers.
    - Maintain grassland structure for wintering and migratory use.
- Consider management practices and locations where small changes can effectively increase patch size for some species (for example, two small patches become one large area through removal of a berm).

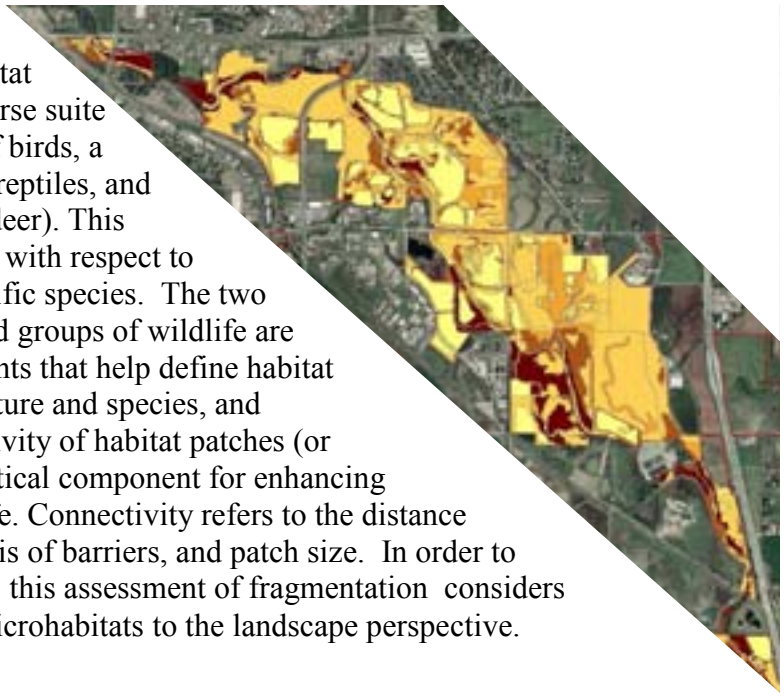
Objective for Upland Grassland Width: Establish grassland cover of 100-300 feet or greater (beyond the riparian forest on each side of the river) where feasible to provide a variety of benefits such as an ecotone for wildlife in the forest, water filtration, and improving the urban refuge experience for visitors.

Strategies:

- Consider locating trails on the outside of grassland buffers to enable grassland to act as an ecotone for wildlife habitat.
- Consider conversion of habitat types from open water to grasslands rather than to wetlands in water augmentation, grassland restoration, or mine reclamation projects.

D. Wildlife Corridor and Habitat

1. Description



The protected lands along the Poudre River are recognized as providing habitat and movement opportunities for a diverse suite of wildlife (including a wide variety of birds, a moderate diversity of amphibians and reptiles, and small to medium sized mammals and deer). This conservation target has been identified with respect to wildlife in general rather than for specific species. The two ecosystem features which benefit broad groups of wildlife are habitat health and connectivity**.** Elements that help define habitat health are diversity of vegetation structure and species, and dominance by native species. Connectivity of habitat patches (or vegetation communities) is another critical component for enhancing opportunities and utilization by wildlife. Connectivity refers to the distance between common habitat types, analysis of barriers, and patch size. In order to truly consider a broad suite of wildlife, this assessment of fragmentation considers multiple spatial scales ranging from microhabitats to the landscape perspective.

Quick Profile of the Wildlife Corridor and Habitat

Number of species observed in the corridor since 1974: 230 birds, 32 mammals, 5 amphibians, 8 reptiles, and 33 fishes.

Ecological Values: Critical source of food and cover for migratory and resident wildlife, connectivity between species groups and populations, supports genetic diversity.

Community Values: Uniquely high quality opportunities in urban setting for wildlife observation, education, research and photography.

Major Threats: Fragmentation, barriers (e.g., roads, fences, buildings), human activities and high density of trails, noise and light pollution, domestic pets (cats and dogs).

2. Overarching Goals for Wildlife Corridors and Habitat

- Maximize opportunities for wildlife to access and to move between plant communities or ecosystems. Collaborate with neighboring land owners and partner agencies to achieve this goal.
- Identify and remove or minimize barriers to wildlife movement within and between contiguous natural areas.
- Improve habitat quality within natural areas by indentifying and mitigating landscape features that fragment the habitat.

3. Background and Key Issues

Riparian and wetland habitats in the western U.S. comprise less than 2% of the landscape yet provide habitats for greater than 80% of wildlife species (McKinstry et al., 2001). The great numbers of wildlife species that depend on riparian areas use this niche for crucial habitat as well as for safe movement between home ranges, breeding locations, food sources or genetic populations. The Western Governors' Association (WGA) recently has launched the Wildlife Corridors Initiative (2008) aimed at understanding and developing recommendations for important wildlife corridors. The WGA recognizes riparian areas as important wildlife corridors and provides this definition:

> *Important Wildlife Corridors are crucial habitats that provide connectivity over different time scales (including seasonal or longer), among areas used by animal and plant species. Wildlife corridors can exist within unfragmented landscapes or join naturally or artificially fragmented habitats, and serve to maintain or increase essential genetic and demographic connection of populations (WGA Wildlife Corridors Initiative Report).*

Since its inception in 1992, the NAP has successfully protected a majority of the crucial riparian habitat and the wildlife corridor along the Fort Collins reach of the Poudre River within a pre-existing framework of urban development. The current and future goals for enhancing this important wildlife corridor are to reduce barriers to movement, maximize habitat quality and patch size, and decrease distances between patches. Collective management across agencies and property owners is also a necessary component of protecting this crucial habitat.

The WGA Wildlife Corridors Initiative states, "One of the most effective strategies to abate the threats posed by habitat fragmentation is to design our communities in a manner that protects crucial habitats and maintains the ecological permeability of the intervening landscape so that wildlife can move between those areas." By identifying and planning for the riparian area as an important wildlife corridor, the NAP seeks to carry out the goals at the municipal level, which is a critical component of regional success.

4. Current Condition

As noted elsewhere, the urban Poudre River lies within a transition zone from the mountains to plains. Therefore, like the plant communities and physical factors, wildlife that historically occurred in this area included a mix of species from both the mountain and plains as well as some that were found only in the narrow transition zone along the Front Range. The wildlife present today not only represents a portion of those present 200 years ago, but includes newly present species (or expanded populations of some species) living along the urban Poudre River. These include animals known to thrive in an urban environment such as red fox, expanded populations of wildlife (for example neotropical birds) due to the significant increase in still water and shoreline habitat in human-made ponds and reservoirs.

The NAP has collected anecdotal information and maintained species lists for wildlife identified along the Poudre River. However, with the exception of the recent breeding bird survey and amphibian surveys, few if any systematic studies have been conducted for other taxonomic groups that help inform the current condition of this target. A few localized studies on

amphibians, mice, bats, insects, and fish have provided the NAP with valuable information specific to individual properties. The following discussion provides brief descriptions for broad groups of wildlife followed by a more in-depth discussion of bird abundance, distribution and trends associated with habitat quality. Wildlife species lists are in Appendix D.

Terrestrial Mammals

Large predators such as mountain lion and black bear are rarely seen in this area, but on occasion are spotted moving along the corridor. Large ungulates such as white-tailed and mule deer are common (occasional sightings of solitary moose and elk have been reported). While deer appear to acclimate to urban noise, light, and human presence, they are still vulnerable and affected by large barriers such as tall fences, highways, roads, and "pinch points" where very little or no natural (undeveloped) corridor exists. For example, during high spring flood waters, deer were observed in a stressed condition along Mulberry Road as the entire narrow riparian corridor was flooded and not passable. Another example can be seen year-round west of Shields Street where a series of tall fences causes deer to get stuck, confused, and unable to move down stream.

Mid-sized predators regularly seen in the Poudre River corridor are red foxes and coyotes (coyotes are not seen in the urban areas of Planning Units B and C) and red foxes. Mink are less frequently sighted. In very rare instances otter are observed. Omnivores, such as raccoons and skunks thrive throughout urban areas and are common along the river. Herbivorous mid-sized mammals include muskrats and beaver. Muskrats are more abundant in extensive cattail marshes, but are occasionally seen along the Poudre River.

Mink at Cottonwood Hollow Natural Area by Dave Leatherman

Beaver are found throughout the system, and have a complex role in urban rivers. In natural, unaltered systems, beaver serve a critical (keystone) function by damning rivers which causes flooding and development of new wetlands and river channels. In the urban river however loose woody debris (trees fallen because of beaver) is dangerous to human safety during high waters. Consequently, municipal stormwater management requires the removal of beaver cut trees which limit opportunities for the animals to create homes and preferred slow water habitat. There is no direct management of the beavers, however, so they continue to inhabit the Poudre River corridor. The NAP is focused on the impact of beaver browsing on cottonwood trees whose populations are declining relative to non-native trees. Through the "Beaver Tree Project" the majority of the cottonwoods throughout the system have been coated with a sandy paint mix, which deters beavers away from cottonwoods and towards the non-native trees.

Some trapping of small mammals such as mice and voles has been conducted over the last 13 years to determine presence of the federally threatened Preble's meadow jumping mouse. However, no Preble's meadow jumping mice have yet to be trapped within the Fort Collins stretch of the Poudre River.

In general, density and abundance estimates for terrestrial mammals are lacking in the Poudre River Corridor. Movement of mammals along the river has not been well investigated although it can be assumed that movement patterns directly correlate with the connectivity and size of required habitat. In the case of more sensitive small mammals, this means denning or nesting habitat, proximity between covered areas (tall grass or woody vegetation), and water availability.

Aerial Mammals (Bats)

A summer survey of bats from 2001-2005 found the two most abundant species found on the Poudre River natural areas properties are the big brown and little brown bat. These species form colonies in human-made structures across their range. Bat researcher Thomas J. O'Shea states, "The high proportion of reproductive female big brown bats as well as varying numbers of female little brown bats found in the 2001-2005 samples reveals the importance of natural areas in Fort Collins as foraging and watering sites needed to maintain local bat populations. This importance was underscored by following radio-tagged big brown bats to nightly foraging areas in late May and June 2004. Most of the general locations we determined by telemetry encompassed natural areas along the Poudre River rather than other areas of the city. Natural areas likely provide increased availability of insect prey, drinking water, and possibly temporary night roosts compared to more urbanized areas."

O'Shea further states, "Two species that are consistently found in Fort Collins over the five years of this study roost primarily in trees and are largely migratory: hoary bats and silver-haired bats." (Neubaum and O'Shea, 2006). Evidence that hoary bats may be breeding locally was found at three Poudre River properties. The long-legged myotis, which usually resides in ponderosa pine forests, was also documented on natural areas along the river. This may indicate that this species uses the river to access its preferred habitat (Neubaum and O'Shea, 2006). The results of the survey suggest that the habitat of the Poudre River supports a variety of resident breeders and other species that use the area during their migratory journeys.

Amphibians and Reptiles

Amphibian diversity appears to include chorus frogs, bullfrogs, plains spadefoot, and Woodhouse's toad. Historic records of northern leopard frogs exist, but according to the Colorado Herptofaunal Atlas (Jackson, 2003) these may be locally extirpated. Bullfrogs were introduced to this area by human activity and are known vectors for chytrid fungus that can greatly impact amphibian populations. Bullfrogs are non-native, voracious predators eating a wide variety of plants and animals. They have a predatory impact on native amphibians and potentially on some bird species. The presence of bullfrogs was recorded in all planning units during the volunteer amphibian surveys and anecdotally by staff. The volunteer amphibian survey only recorded presence/absence and did not attempt to estimate abundance.

Watchful visitors can spot large snapping turtles crossing the trails.

The more common snake species associated with lowland habitat are bullsnakes and plains garter snakes. The western prairie rattlesnake, northern water snake, and racer are rarely observed. Snapping

and painted turtles are common and the ornate box turtle is rarely observed. During the breeding season from May to early July snapping turtles will move to terrestrial uplands to lay eggs. Nesting activity may peak after seasonal precipitation softens the soil. Mowing activities should be stopped or extremely limited during the nesting season as turtles are moving into areas where mechanical management is in place.

Fish

Fish diversity information for all floodplain ponds was provided by CDOW and detailed information is in Appendix C. Generally, many of the ponds are occupied with a variety of sport fish which are stocked by the CDOW.

The profile of fish species in the river has changed considerably since pre-European settlement. This transitional section of the Poudre River through Fort Collins was a "hot spot" of fish diversity in the region. Assemblages of fish present prior to European settlement included a mixture of species typical of plains streams, and those like greenback cutthroat trout typical of coldwater reaches upstream. Relics from the earlier glacial age that were once widespread (but were extirpated from plains reaches to the east as climates warmed) were also present in pre-settlement times. Many of the fishes that inhabited the transition zone require coarse gravel substrate, cool water, and woody debris in the channel.

Carp are non-native species that adversely impact other small fish by consuming resources, destroying habitat. Today, non-native trout and carp often make up substantial portions of the river's fish biomass. The most variety in fish species is found in native minnows and suckers able to withstand changed river conditions. Daily fluctuations in water levels throughout the summer months likely hinder the success of spawning and larvae survival of many fish. Warmer water temperatures negatively impact trout. Overall, fish biologists believe that native, coldwater fish currently inhabiting the river's transition zone in Fort Collins may be sustained in the future only in reaches farther upstream where there is adequate flow and cooler temperatures (City of Fort Collins, 2008).

Roseate skimmer at Cottonwood Hollow by Dave Leatherman

Insects

Populations of insects on Poudre River natural areas are not well documented. Butterfly Woods gained its namesake from two state-listed, rare butterflies: smoky eyed-brown and two-spotted skipper that were last observed on the site in 1995.

A regional study looking at the effect of fragmentation on insects included the habitat at Kingfisher Point (the only location in Fort Collins included in the study). Surprisingly, the researchers found the highest diversity of grasshoppers, including some unusual species, in Kingfisher Point compared to all other study locations across the Front Range. This study highlighted the value of local micro and macro habitat diversity for insects. These findings will be incorporated into the long-term goals for grassland restoration planning.

The condition of aquatic insects in the river is of interest to the NAP because aquatic insects provide a critically high proportion of the food base for terrestrial riparian wildlife. Aquatic insects are highly vulnerable to changes in the river's physical environment. Reduced flows and lack of movement of riverbed material has created an environment well-suited for filamentous algae more common to stillwater habitats. These algae can be prolific and choke out native flora by occupying growing space and reducing dissolved oxygen in the water. Similarly, many native aquatic insects and other microorganisms are not able to complete their life cycle in the modified environment because of poor habitat quality, rapid changes in water levels (associated with river and irrigation management), and reduced water quality associated with urban and agricultural inputs. Local experts suggest that only one-quarter of the number aquatic insects that once occupied the urban reach remain today because of the modified flow regime. Furthermore, the diversity of river fauna decreases continuously downstream through the urban river reach. As in most flow-altered aquatic ecosystems, the present assemblage of aquatic insects represents a limited group of highly adapted species resilient to erratic flows.

Birds

Bird observations have been recorded for all properties (see Appendix D). In 2009 and 2010 the NAP conducted a breeding bird survey on the Poudre River natural areas. The goals of this project were to: document and estimate breeding bird richness, abundance, distribution, and density; to develop a set of indicator species to be incorporated into this plan update to help guide the NAP in management decisions; and to identify hot spots, dead zones, impacts of urban development, and water and land management on bird use. The results were analyzed with respect to all species as well as with a focus on indicator species.

What is an indicator species?

Indicator species are those that would be expected to be present for a given habitat. In other words, if a certain habitat exists within the study area, the birds associated with that habitat should be present. If they are not, this is an indication that the habitat is not supporting birds commonly found in this habitat type, possibly because the habitat is missing critical elements, because patches are poorly connected, or because there are threats external to the habitat (for example, the presence of a well-used bike trail adjacent to the nesting habitat of a sensitive species could negatively affect the breeding success of that species).

For this study, the following indicator groups for a lowland riparian habitat were identified:
Canopy Species – yellow warbler, western wood-pewee, Bullock's oriole, house wren
Riparian shrub community – common yellowthroat, song sparrow, yellow-breasted chat, gray catbird, brown thrasher
Emergent wetlands – common yellowthroat, song sparrow, yellow-headed blackbird, American bittern, sora, Virginia rail
Grassland interface (scattered cottonwoods) – western meadowlark, Bullock's oriole, western kingbird, eastern kingbird, warbling vireo
Cavity nesters – northern flicker, house wren, black-capped chickadee, eastern screech owl

The following is a broad discussion summarizing key findings for each of the five indicator groups. The complete report of this study is available upon request at the NAP. The discussion of the canopy, cavity nesters, and shrub community indicator groups relate mostly to the riparian forest habitat. The discussion of the emergent wetland indicator group corresponds to the

available habitat called shoreline vegetation associated with the floodplain ponds. The grassland interface indicator group utilizes the floodplain grassland habitat.

Canopy Indicator Species: The species included in this group have the highest rate of occurrence out of all the indicator groups across the two study years. Even though it appears as if there is relatively little riparian habitat, the long narrow ribbon of habitat is mostly continuous (from the perspective of flying species), which appears to benefit the canopy dependent species. A depressed detection rate recorded in the downtown stretch is probably because the areas adjacent to this unit, located in downtown Fort Collins, have very little other natural vegetative cover.

As noted in the discussion of the riparian forest, there is a much stronger presence of canopy (older) forest than immature forests. Furthermore, the current canopy structure has been augmented by non-native crack willow, which in combination with the lack of scouring by overbank flooding, has led to the development of a largely homogenous canopy structure. Research also suggests that the historic structure of lowland riparian forests, which had more gaps in the canopy may have been even more beneficial to all canopy species. Intermittent gaps in canopy provided more space and foraging opportunities for birds that use an aerial hawking technique (Miller et al., 2003).

Western wood-pewee, a canopy indicator species, seen at Butterfly Woods Natural Area

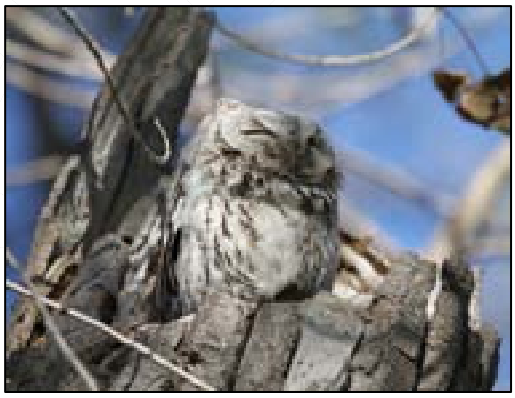
Riparian Shrub Indicator Species: Species that require or prefer a shrub component in the riparian forest setting and have a diet preference for fruit and berries were virtually absent from the study sites. Of the five expected indicator species, two were never detected (yellow-breasted chat and gray catbirds) while a third (brown thrasher) was heard only twice in two years and were assumed to be migrants. The shrub habitat on the river seems to be particularly weak in its ability to host any of the species in this indicator group. This finding is consistent with the conclusions about the scarcity of naturally regenerating early to mid-succession forests where thickets of fruit bearing shrub might be expected. Song sparrows were observed using coyote willow stands on islands or river banks. The shrubby vegetation types that are scarce along the river do occur at Dixon Reservoir (located in Pineridge Natural Area not along the Poudre River). Wild plum, chokecherry, immature peachleaf willow, and cottonwoods are thriving here and this habitat is clearly supporting yellow-breasted chats, gray catbirds, and brown thrashers. Dixon Reservoir could be used as a reference site for restoration efforts along the river.

Overall the detection rates of shrub-dependent birds are very depressed compared to the detection of canopy-dependent birds. However, a positive correlation was observed with shrub habitat surrounding ponds. Specifically staff has observed that common yellowthroats seem to prefer shrubby thickets around ponds and emergent wetlands. These shrub communities may also be attractive because of the cattail stands that occur along the edges of many ponds and larger patches in shallow wetlands.

Emergent Wetland Indicator Species: Three species of secretive marsh birds (sora, Virginia rail, American bittern) in this category were detected more easily by a call-playback protocol. Two of these species were detected along the study site, but the data may not be representative of their true distribution and abundance. Yellow-headed black birds were detected almost exclusively at Artist Point Pond at Cottonwood Hollow Natural Area. This may indicate a significant lack of suitable habitat for this species along the Poudre River. The conditions at Artist Point Pond host some of the highest bird diversity in the whole corridor. Replicating this habitat will help emergent wetland indicator species.

Grassland Interface Indicator Species: The grassland interface extends from the more mesic grasslands to the edge of the riparian woodlands and is characterized by scattered mature trees. Western meadowlark occurred most frequently in this category. This grassland species shows an ability to adapt to altered environments that have "healthy grass and thick litter cover" (Kingery, 1998). Eastern and western kingbirds were observed in areas with this habitat type. Bullock's orioles prefer mature cottonwoods, which are prevalent in this habitat type. Grassland restoration projects that replace monoculture non-native grasses with diverse native grass and forbs benefit grassland interface birds.

Cavity Nesters: This group is made up of primary and secondary cavity nesters. The primary nesters include the northern flicker, downy woodpecker, and black-capped chickadee. These species are critical in the production of cavities for nest sites. The high abundance of European starlings (non-native) along the Poudre River creates an impressive competitive pressure for native species that use and prefer cavities for nesting sites. The strategy and behavior of starlings also creates great competition for food. It is unknown if the available number of standing dead trees is unusually high or low compared to a pristine forest.



Eastern screech owl, a cavity nester indicator species, seen along the Poudre River at Lee Martinez Park

The breeding bird survey can be summarized as follows:

- A clear correlation exists between acres of available habitat type and densities of bird use.
- Higher detection rates of canopy-dependent birds may be in response to the older status of the riparian forest.
- Birds dependent on the shrub community type are depressed because of a scarcity of this habitat in the riparian forest, but they are utilizing the shoreline habitat around the many ponds.
- Emergent wetland quality appears to be stable but opportunities to expand wetland habitat abound.
- Cavity nesters are largely impacted by the competitive presence of non-native European starlings.

5. Management Objectives and Strategies for Wildlife Corridor and Habitat

Objective for Connectivity of Communities and Ecosystems: Maintain and improve habitats for a diverse assemblage of native wildlife. Protect large size patches and minimize distances between patches and reduce negative impacts from fragmentation and barriers from the built environment. Selected species from each conservation target will be utilized as indicator species and will represent multiple targets or desired habitat types and associated features.

Strategies:

- Analyze available mapping and wildlife data to assess the connectivity, quality, and usage of habitats in the river corridor. Focus on
    1. Size and connectivity of existing habitat patches,
    2. Known wildlife use and association with habitats,
    3. Identification of priority protection areas,
    4. Identification of locations of existing and future threats (barriers, fragmentation type, pinch points, locations with additional impacts).
- Consider local wildlife habitat needs or missing elements when developing restoration and revegation plans.
- Conserve additional wildlife habitat in the Poudre River corridor through conservation easements, targeted acquisitions, special incentive programs, and participation in the City's Development Review process to expand habitats and connect one habitat to the next.
- Continue to collaborate with City's Development Review Standards to help identify and maintain adequate wildlife buffer.
- Remove or mitigate barriers and collaborate where possible. Collaborate with adjacent landowners for mitigating wildlife barriers or using wildlife-friendly practices (such as smooth wire (versus barbed wire) or wood fencing, shielding porch lights). Possibly use student intern or volunteers to assess opportunities.
- Collaborate with other City departments to minimize or mitigate nighttime lighting where possible, practical, and safe.
- Identify research opportunities on wildlife topics for external (self funded) researcher or student. Examples include wildlife use of the corridor, urban recreation patterns and type of impacts/conflicts with wildlife, management recommendation for connectivity issues, and barrier mitigation strategies.
- Develop volunteer project to survey wildlife use.
- Adapt management as necessary when species of interest (rare, sensitive, representative, indicators) are observed.
- Monitor and maintain record of raptor nest activity.
- Consider use of volunteers to locate and monitor mid-size mammal dens.
- Consider select ponds in good condition to manage as reintroduction locations and breeding habitat for native species such as northern leopard frog.
- Collaborate with other City departments that own or manage Poudre River lands to work towards wildlife-compatible land management practices.
- Create a watch list of invasive and potentially invasive animals (e.g., New Zealand mud snail, zebra mussel) and educate staff and volunteers. Also train staff on species indicative of good water quality (in the river).

- Identify management opportunities specific to individual species of interest such as beaver, muskrat, and mink. For example, work with Stormwater Utility to install mitigation strategies that alleviate flooding problems associated with beaver dams that then enables beaver to persist in the watershed.

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CHAPTER 4

HUMAN DIMENSIONS:
BACKGROUND, GOALS, AND STRATEGIES

A. Visitor Experience
B. Recreation
C. Education and Outreach
D. Cultural Features
E. Collaborative Management
F. Poudre River - Community Values

This chapter identifies six human dimensions. Each dimension is defined, and has overarching goals, followed by an explanation of its existing conditions and key issues, and specific objectives and strategies to meet the goals.

A. Visitor Experience

1. Description

The Natural Areas Program is interested in continuing and enhancing the visitor experience. The visitor experience encompasses feeling safe and welcome, having fun, learning about the river, recreating, and connecting to nature. Natural area entrances, internal and external wayfinding, safety, signage, scenery and natural aesthetics, and a sense of proper stewardship are key components of the visitor experience.

Natural areas connect children with nature.

- **Entrances:** Entrances provide the first impression to visitors get when they visit a natural area whether on foot, bike, or car.
- **Wayfinding:** Navigating to a natural area from a connecting trail, sidewalk, or street is called external wayfinding. Internal wayfinding is navigating inside a natural area. Navigation markers may show visitors to points of interest or connections to other natural areas.
- **Stewardship:** Proper stewardship is the appropriate level of care of the public improvements and natural resources that is evident to the public. To provide a positive experience infrastructure such as parking lots, trails, fences, informational kiosks, restroom, trash cans, signage, and other public amenities must be well maintained. The

natural resources such as the vegetation, wildlife habitat, river channel, ponds, wetlands, uplands, and the natural aesthetics must be well maintained. These elements that are taken care of by the Natural Areas Program must be welcoming to visitors and discourage vandalism and littering.

- **Visitor Safety:** Visitors must be safe and feel safe from crime as well as be well informed about personal safety while recreating outdoors.

2. Overarching Goals for Visitor Experience

- Ensure that the river is an inviting, fun place for people to explore and connect with nature.
- Improve natural area entrances, external wayfinding and internal wayfinding to increase user-friendliness.
- Maintain a vigilant ranger presence and the level of service necessary to keep visitors safe and feeling safe.

3. Existing Conditions and Key Issues

Entrances: Natural area entrances are typically inviting and welcoming. Most entrances consist of a parking lot, site sign, restroom, fencing, and informational kiosks.

The chart below describes entrances to natural areas from streets and trails used by pedestrians, bikes, horses, and motor vehicles as well as connections to the Poudre River Trail. Natural areas are listed from west to east.

Figure 4.1 Access Points for Poudre River Natural Areas

Natural Area	Access Point	Access type
Butterfly Woods	Lyons Park	Parking
	Poudre River Trail	Pedestrian, bike, horse
Sterling*	North Shields Pond Natural Area	Pedestrian, bike, horse
North Shields Pond	Shields St parking lot	Parking
McMurry	Hemlock St. parking lot	Parking
	Poudre River Trail	Pedestrian, bike, horse
Magpie Meander	Soft Gold Park parking lot	Parking
	McMurry Natural Area	Pedestrian, bike, horse
Salyer	Hemlock St parking lot	Parking
	Poudre River Trail	Pedestrian, bike, horse
	Hickory St Trail	Pedestrian, bike, horse
River's Edge	Legacy Park parking lot	Parking
	Salyer Natural Area	Pedestrian, bike, horse
Gustav Swanson	Linden St parking lot	Parking
	Poudre River Trail	Pedestrian, bike, horse
Udall	None, not yet open to the public	
Springer	Poudre River Trail	Pedestrian, bike, horse
Williams	Poudre River Trail	Pedestrian, bike, horse
Nix**	Poudre River Trail	Pedestrian, bike, horse
Kingfisher Point	Timberline Rd. parking lot	Parking
	Poudre River Trail	Pedestrian, bike, horse
Cattail Chorus	Poudre River Trail, Spring Creek Trail	Pedestrian, bike, horse

Natural Area	Access Point	Access type
Riverbend Ponds	Cairns/Timberline parking lot	Parking
	Prospect parking lot	Parking
	Cherly parking lot	Parking
	Poudre River Trail/Prospect sidewalk	Pedestrian, bike, horse
	Cottonwood Hollow Natural Area underpass	Pedestrian, bike, horse
Cottonwood Hollow	Riverbend Ponds underpass	Pedestrian, bike, horse
	Running Deer parking lot	Parking
	Running Deer trail	Pedestrian, bike, horse
Running Deer	Prospect St parking lot	Parking
	Welcome Center parking lot	Parking
	Poudre Trail/ sidewalk	Pedestrian, bike, horse
Prospect Ponds	Sharp Point Dr. parking lot	Parking
	South parking lot	Parking; horse trailers
	Poudre River Trail	Pedestrian, bike, horse
Arapaho Bend	Horsetooth parking lot	Parking
	Strauss Cabin Rd parking lot	Parking
	Harmony Transportation Center	Parking

***Sterling Natural Area will be consolidated into North Shields Pond Natural Area (see Chapter 5).**
****Nix Natural Area will be consolidated into Kingfisher Point Natural Area (see Chapter 5).**

Wayfinding: Consistent visual branding of signage and other media supports wayfinding and reinforces the idea of the river as a continuous corridor, a valued community asset, and as a destination. Currently, consistent branding throughout the corridor is lacking due to multiple agency and private landowners, budgetary constraints, and lack of partnerships. There is a hodgepodge of signage from different agencies, directional signage is inconsistent and sometimes confusing, and there are few resources for wayfinding and corridor-wide information.

The current wayfinding aids that are physically present at each natural area are described below. The natural areas are listed from west to east.

Figure 4.2 Wayfinding Infrastructure for Poudre River Natural Areas

Natural Area	Street Signage	Trail or Sidewalk Signage	Internal Signage	Map On-Site
Butterfly Woods	None - no street access	Site sign, mini kiosks	None- paved trail is only access.	
Sterling*	None - no street access	Site sign, mini kiosks	Post at boundary with North Shields Pond	
North Shields Pond	Site sign on Shields	No sidewalk or trail connection.	Mini-kiosk at entrances; post at boundary with Sterling	
McMurry	Directional sign along College and along Hemlock; access is from Hemlock. Site sign at the parking lot.	No directional sign from Poudre Trail, mini kiosks at entry points.	Post at boundary with Salyer, post showing trail to Magpie Meander.	

Natural Area	Street Signage	Trail or Sidewalk Signage	Internal Signage	Map On-Site
Magpie Meander	None- access is from Soft Gold Park/ Hickory St.	Mini kiosks at entry points.	None- small site.	X
Salyer	Site sign along Hemlock Street	Site sign along Hickory Trail; mini kiosks at entry points.	Post at boundary with McMurry.	
River's Edge	Site sign along Woodlawn Drive	Mini kiosks at entry points.	None	
Gustav Swanson	Site sign along Linden Street at parking lot.	None	Mini kiosks at entry points.	
Udall	Site sign	None	None - not yet open.	
Springer	No street access	Site sign, mini kiosks at each boundary with paved trail	None - paved trail is only access.	
Williams	No street access, site sign faces Mulberry, too small to see from a passing vehicle.	Site sign, mini kiosk	None - paved trail and sidewalk are only access.	
Nix**	Site sign on Hoffman Mill Road; parking lot is for staff and office visitors only.	Mini kiosks at boundaries with paved trail, post at sidewalk to office; posts along Poudre River Trail.	None- paved trail is only access.	
Kingfisher Point	Site sign on Timberline.	Posts along Poudre River Trail.	Mini-kiosks at entry points.	
Cattail Chorus	No street access.	Site sign from Poudre River Trail, mini kiosk at entrances.	None- very small site.	
Riverbend Ponds	Site sign on Prospect and on Cherly, not on Timberline; directional signs on Prospect and on Mulberry.	Posts along Poudre River Trail.	Map provided on self-guided brochure, mini kiosks at entrances.	X
Cottonwood Hollow	Site sign on Prospect.	No	Mini kiosk at Running Deer border.	X
Running Deer	Site sign on Prospect; directional signs on Prospect.	Site sign can be seen from sidewalk.	Mini kiosk at entrances, map at trailhead kiosks.	X
Prospect Ponds	Site signs on kiosks.	Site signs can be seen from Poudre River Trails.	Mini kiosk at entrances; map at kiosks.	X
Arapaho Bend	Site signs on Horsetooth/ Strauss Cabin Rd and Harmony.	None nearby.	Mini kiosk at entrances.	X

***Sterling Natural Area will be consolidated into North Shields Pond Natural Area (see Chapter 5).**
****Nix Natural Area will be consolidated into Kingfisher Point Natural Area (see Chapter 5).**

Facilities Maintenance: The City's Parks Department maintains the Poudre River Trail through City natural areas; the Natural Areas Program maintains all other trails on the sites. Natural surface and crusher fines trails are maintained several times a year, which typically includes weed control, filling in holes, and removal of branches or trees that have fallen on the trail. Trail amenities such as footbridges, informational kiosks, and signage are inspected periodically for repair and replacement needs. Rangers assist Public Improvements staff in monitoring sites for necessary repairs and graffiti removal. City Code requires removal of all graffiti from property with 72 hours, but the City strives for within 24 hours.

Parking lots, trash cans, and vault toilets are serviced at least twice a week. Three parking lots have portable toilets that a contractor services once a week. These sites have floodplain restrictions that prohibit installation of a vault toilet given current parking lot locations.

Safety: The Natural Areas Ranger Program provides visitor and resource protection on natural areas, parks, and trails. Rangers maintain a high level of visibility within the Poudre River corridor, which promotes visitor enjoyment, outdoor safety, and resource protection. Rangers routinely communicate with Fort Collins Police Services and other law enforcement and emergency service agencies. Volunteer Ranger Assistants also provide a presence at times and locations where rangers cannot be present. Volunteers focus patrols in natural areas during high use periods, respond to visitor questions, and educate visitors who do not comply with area regulations. The Volunteer Ranger Assistant Program, which is still in its infancy, added 286 patrol hours along the Poudre River natural areas in 2010.

Citizens generally feel safe while recreating in natural areas including sites along the Poudre River. Residents routinely report feeling "always safe" or "usually safe" in natural areas within the city 86%–88% of the time (*Citizen Survey Report of Results*, 2008–2010). When compared to national and Front Range benchmarks, these personal safety ratings are above or much above the comparative averages. Similarly, residents report feeling "always safe" or "usually safe" 76%–80% of the time when using trails in Fort Collins (*Citizen Survey Report*, 2006–2010).

Crime statistics for parks, trails, and natural areas along the Poudre River support citizens' perception that these are safe areas. Statistics from 2004–2009 indicate that crimes against others such as assault or theft, number fewer than two dozen occurrences over a 5-year period. The predominant municipal violations for the same time period are dog off-leash violations, alcohol use, and transient camping.

4. Management Objectives and Strategies for Visitor Experience

Objective for Entrances: Create friendly and welcoming entrances to natural areas by providing infrastructure appropriate to the setting. Acquire lands and easements that support public access and improve trail and site connectivity.

Strategies:

- Improve access to the Poudre River Trail, and the Parks and Natural Areas along the Poudre River.
  - Identify locations for additional designated access points for natural areas and trails.

  - Acquire lands and easements that support public access and improve trail and site connectivity. Leverage program funds through partnerships, grant applications, donated easements, and other sources.
  - Expand trailhead parking opportunities in collaboration with the Transportation and Parks Departments, Larimer County, and others.
  - Collaborate with Parks Department, Larimer County Engineering and other stakeholders to address the Shields Street parking and river access issues.
- Maintain a high level of stewardship at natural area entrances.
  - Collaborate with City of Fort Collins Parks Department to enhance visitor experience and parking at Legacy Park and improve the natural aesthetics of the site.
  - Improve infrastructure at natural area entrances as appropriate, which may include parking lots, sidewalks, bike racks, vault toilets, dog bag dispensers, trash cans, horse hitching posts, etc.
- Place a high priority on improving the visual appeal of entrances of natural areas that serve as a gateway to Fort Collins. "Gateway sites" are natural areas with high public visibility because they are located at an entrance to the city or near prominent tourist destinations. Gateway sites need to be especially well cared for and inviting. These sites help visitors form an impression of Fort Collins and can be a source of identity and pride for citizens.
- Ensure that each natural area has:
  - Site sign with name of the site and the site's symbol
  - Mini-kiosks mark all legal entrances
  - Informational kiosk, if possible, with friendly educational messages and maps.
- Identify and create visual access or "river viewshed" points along the river from major streets, the paved trail, and other areas.

Objective for External Wayfinding: Provide wayfinding so that visitors easily find their way to the Poudre River Trail, and the Parks, Natural Areas and other destinations along the river from streets, neighborhoods, and the downtown area.

Strategies:

- Participate and/or lead an inter-departmental Poudre River Corridor Access Team to develop a comprehensive wayfinding plan for the Poudre River corridor.
- Provide appropriate street and trail signs at appropriate locations.
- Provide map elements on mini and informational kiosks, brochures, and other media to aide site-specific and corridor-wide wayfinding.

Objective for Internal Wayfinding: Provide on-trail and on-site wayfinding so that visitors can easily find their way along the trail, from site to site, and back out to streets, neighborhoods, and the downtown area.

Strategies

- Participate and/or lead an inter-departmental Poudre River Corridor Access Team to develop a comprehensive wayfinding plan for the Poudre River corridor.
- Designate a natural surface trail system within natural areas and between natural areas where appropriate. Close social trails.

- Mark destination points physically with signs and on maps and informational kiosks.
- Provide map elements on mini and informational kiosks, brochures and other media to aide site specific and corridor-wide wayfinding.
- Implement consistent branding and visual identity within natural areas.
- Guide recreationists to appropriate destinations.

Objective for Stewardship: Maintain natural areas so the appearance of the interior of the site is attractive to visitors; litter/trash is minimal and infrequent for most sites. Public improvements are maintained in good condition so that vandalism and structures in need of maintenance or repair are not evident or are addressed immediately.

Strategies:

- Ensure brochure racks are stocked 100% of the time.
- Re-design the trash cans to incorporate City and Natural Areas Program logos and colors, and investigate a reasonable solution to providing covered trash cans.
- Remove graffiti within 72 hours (preferably 24 hours) of report.
- Ensure that restrooms are clean, trash is removed, and parking lot litter is picked up at least twice a week.
- Maintain mowed/cleared vegetation along trails so that multiple modes of travel are unobstructed.
- Remove transient camps within one week of legal abandonment.
- Continue to support, expand, and commit additional resources to public volunteer stewardship efforts such as "Adopt-a-Natural Area."
- Participate or initiate community-wide river litter clean-up efforts.
- Conduct an annual inventory of stewardship needs at all natural areas.
- Ensure pet pick-up bag dispensers are available at sites where dog walking is permitted.
- Provide additional outreach about the importance of dog waste removal.

Objective for Visitor Safety: Maintain current level of visitor services to keep community ratings of safety in natural areas and along trails at the 2009 level or above as reported in the Annual Citizen Survey (86%). Maintain trails and focal recreation areas in a safe condition to minimize hazards to visitors.

Strategies:

- Consider public safety in all management decisions.
- Continue proactive ranger patrols through the river corridor to address acute issues of camping and use of alcohol/public intoxication.
- Continue to collaborate with Police Services on safety concerns.
- Continue to encourage Volunteer Ranger Assistant patrol within the river corridor natural areas.
- At areas with heightened safety concerns, reduce vegetative cover to allow for increased visibility while considering natural resource issues.
- Provide safe pedestrian access to the river and ponds in the interest of user safety and prevention of vegetation trampling.

- Collaborate with City Utilities and Parks Department, Larimer County, and adjacent landowners to increase outreach on river safety especially in spring during high water flows.
- Continue to monitor and repair trails and infrastructure to minimize hazards to visitors.

B. Recreation

1. Description

Recreation encompasses the variety of ways that the public chooses to interact with the natural areas along the Poudre River. Common activities include walking, running, bicycling, horseback riding, and fishing. For the purposes of this management plan, recreation is also intended to encompass additional activities not limited to picnicking, wildlife viewing, solitude, and boating. The Natural Areas Program also recognizes the importance of the Poudre River Trail as a travel corridor.

2. Overarching Goals for Recreation

- Provide a diversity of local and non-urban recreational opportunities while minimizing multi-user conflicts and preserving conservation values.
- Provide a variety of nature-based recreation opportunities on land and water.
- Improve a visitor's sense of solitude where possible.
- Provide access to visitors of all ages and abilities via paved and soft trails.
- Recognize that the Poudre River Trail is an important commuting corridor for bicyclists. Accommodate non-motorized commuting while providing a balance with recreational cycling.
- Provide recreation infrastructure that is modest, safe, and harmonious with the surroundings.

Carp fishing derbies engage the fishing public at Arapaho Bend Natural Area

3. Existing Conditions and Key Issues

Water features such as the river and adjacent floodplain ponds attract visitors to the River's natural areas. The Poudre River Trail is an additional source for recreation as well as an access route to the River's surrounding natural areas. The Natural Areas Program has collected information on the types of recreation and visitor uses in the Poudre River natural areas and in conjunction with the Parks Department collected data on the number of visitors near the river. Below is a summary of visitor numbers, trends, recreation uses reported by visitors in surveys, and the status of recreation amenities that support visitors in the natural areas.

Visitation Summaries

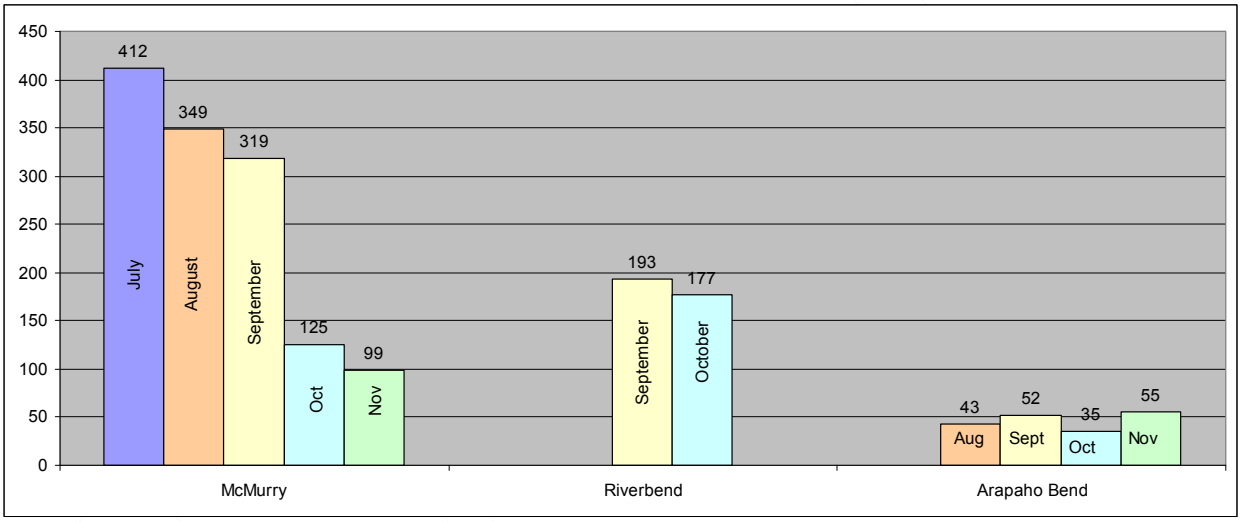
The Poudre River natural areas attract an estimate of 27% of the visits that occur at the City natural areas. McMurry and Salyer natural areas, adjacent to "Old Town," receive the 4th most

visits of all natural areas within the system. These areas receive especially heavy use in the summer.

Best estimates of daily use along the Poudre River Trail range from 300 to over 1,000 visits a day throughout the seasons with the obvious high peak occurring the summer months. In the spring and fall, surveys have found that the bike trail sees twice the volume of use/visitation as do the natural areas themselves. In the winter the bike trail continues to see about the same amount of volume as in spring and fall, but the natural areas have considerably less use. In general, year-round weekend use along the Poudre River Trail and associated natural areas is slightly higher than weekday use.

Visitation at three Poudre River natural areas was studied in 2008 and 2009. The average number of visitors per day during certain months at McMurry/Salyer, Riverbend Ponds and Arapaho Bend is shown in Figure 4.3.

Figure 4.3 Daily visitations for three Poudre River Natural Areas in 2009



The data show that McMurry/Salyer natural areas experience a higher volume of visits (400+ visits/per day) in the summer months compared to non-summer use. Riverbend Ponds tallies number around 200 visits per day in both September and October at a time when the downtown natural areas experience a significant drop in use. In contrast, Arapaho Bend has a significantly quieter feel to it with only 40-50 visits in a day. The graph shows a large amount of seasonal variability in the downtown natural areas and steady use at Arapaho Bend (City of Fort Collins, 2010). The high-use at McMurry/Salyer creates a challenge to balance recreation-related impacts and natural resource conservation.

Existing Visitor Amenities/ Infrastructure

The Natural Areas Program maintains over 15 miles of trails on natural areas within the Poudre River system. The Poudre River Bike Trail, which provides additional access to nearly half the natural areas, is maintained by the City's Parks Department. The following is a summary of some of the public improvements maintained by the Natural Areas Program on the Poudre River natural areas:

Figure 4.4 Public improvements within the Poudre River natural areas

Public Improvement	Amount
Natural Surface Trail	13.7 mi
Crusher Fines Trail	0.3 mi
Paved Trail (Asphalt or Concrete)	1.2 mi
Boardwalk	0.3 mi
Footbridge	3
Parking Lot	10
Vault Toilet	3
Site Sign	21
Interpretive, Regulatory, Informational Signs	130
Kiosk (Educational)	13
Mini Kiosk (Regulatory)	46
Bench	38
Picnic Table	5
Picnic Shelter	1
Fishing Pier	2
Boat Ramp	1
Emergency Call Box	3
Trash Can	14
Pet Pick-up Bag Dispenser	11

Types of Recreation Currently Offered

This existing infrastructure in the City of Fort Collins Natural Areas along the Poudre River provide access to variety of experiences including hiking/walking, dog-walking, off-trail exploration, biking, horseback riding, non-motorized boating, fishing, picnicking and handicap access. In providing recreational opportunities, the Natural Areas Program seeks to minimize impacts to conservation goals. The chart below summarizes current recreational experiences available at each natural area, listed from west to east.

Figure 4.5 Existing Recreation Activities

Natural Area	Hiking	Dogs	Off Trail	Biking	Horses	Boating	Fishing	Picnic Table	ADA Access
Butterfly Woods	X	X		X	X				X
Sterling*	X	X	X	X	X	X	X	X	
North Shields Pond	X	X	X	X	X	X	X	X	X
McMurry	X	X	X	X	X	X	X		
Magpie Meander	X	X					X		X
Salyer	X	X	X	X	X		X		X
River's Edge	X	X	X	X	X		X		
Gustav Swanson	X	X	X	X			X		X
Udall	Not yet open to the public.								
Springer	X	X		X	X				X
Williams	X	X		X	X		X		X
Nix**	X	X	X	X	X		X		X
Kingfisher Point	X	X		X	X	X	X		X

Natural Area	Hiking	Dogs	Off Trail	Biking	Horses	Boating	Fishing	Picnic Table	ADA Access
Cattail Chorus	X	X							X
Riverbend Ponds	X	X		X	X	X	X	X	X
Cottonwood Hollow	X								X
Prospect Ponds	X	X	X	X	X	X	X	X	X
Running Deer	X								X
Arapaho Bend	X	X	X	X	X	X	X		

***Sterling Natural Area will be consolidated into North Shields Pond Natural Area (see Chapter 5).**
****Nix Natural Area will be consolidated into Kingfisher Point Natural Area (see Chapter 5).**

Through various internal surveys, it is evident that walking and biking are the most common types of public recreation. This correlates to the high value the public rates the trails throughout the natural areas. Other common activities reported in visitor surveys include wildlife viewing, jogging, dog walking, and relaxing (several of these overlap with walking depending on the format of the survey). Less common activities reported are picnicking, fishing, boating/tubing, and horseback riding.

In general, the public enjoys the Poudre River natural areas as a natural refuge from urban life. Visitors overwhelmingly rate these experiences as either good or very good. As part of the planning process, staff examined survey data for areas where opportunities related to recreation could be improved. In general, ratings for river tubing, children playing, and fishing opportunities were activities the public believed could be improved. Similarly, picnic tables, trash cans, benches, and restrooms were the amenities that were most frequently listed as needing improvement when visitors were surveyed as part of public tours led in 2010. It is important to note that the reporting frequency of these types of "needs improvement" responses were infrequent, and occurred at the same rate as the response "like it how it is, can't think of any improvements."

Balancing often competing ecological and recreational goals can be particularly difficult at popular natural areas near downtown. The challenge is to provide access to a variety of user groups with different needs and associated impacts without causing excessively negative repercussions on the conservation targets outlined in Chapter 3. All strategies outlined in this section attempt to maintain and enhance recreation where possible while minimizing negative impacts to the site and the wildlife that use the site. Examples of this include designating specific areas for larger gatherings of people, limiting access into portions of sites that have significant ecological values, and maintaining a designated trail system. This is largely achieved through a new management and regulatory zoning system that designates a spectrum from high-use areas to closed areas and is outlined in Chapter 5.

4. Management Objectives and Strategies for Recreation

Objective for Spectrum of Experiences: Provide a variety of types of recreational opportunities as well as opportunities ranging from solitude to group (social) activities within the river corridor.

Strategies:

- Continue to work with the Colorado Division of Wildlife to enhance ponds for sport fishing throughout the corridor. Promote these areas to the public and look for opportunities to enhance the fishing experience by leveraging natural areas funds through "Fishing is Fun" grants and other possibilities.
- Continue to designate a natural surface trail system to provide a variety of experiences while minimizing social trails and impacts on conservation values.
- Minimize user conflicts along the Poudre River Trail through active ranger patrol, and appropriate trail etiquette signs.
- Continue to encourage nature-based, passive recreation opportunities within the Poudre River corridor, such as hiking and wildlife watching.
- Retain areas for visitors to experience solitude through management zoning.
- Designate focal recreation points and high use areas through management zoning.
- Participate in public/private effort to create a public gathering venue destination near the downtown/Old Town. At the same time, prohibit use of natural areas as a venue for large public events based on incompatibility with the Natural Area Program's mission and conservation goals.
- Identify and designate additional picnic areas and small group gathering areas where appropriate. Possible sites include Arapaho Bend, Salyer/Legacy, and Udall.
- Use educational materials to guide the public to recommended areas for specific recreational activities, solitude, or larger group gathering places.

Objective for Nature Interaction: Provide opportunities for the public to connect to nature with special emphasis toward children and teens.

Strategies:

- Provide off-trail opportunities for nature exploration throughout the river corridor. Promote these off-trail areas as recommended places for children to play.
- Support Fort Collins Museum's "Wild Zone" for children to experience nature by digging in the mud, building forts, and other unstructured outdoor play.
- Consider adding additional 'Wild Zones" throughout the river corridor.
- Provide educational programs and materials that promote the benefits of unstructured outdoor play for children. Provide educational programs and materials that create awareness and understanding of the natural world.
- Continue to support community efforts to connect children with nature by participating in the Children and Nature Connection- Northern Colorado group and similar efforts.

Objective for Connectivity: Support Park's effort to extend the Poudre Trail to I-25 to connect with Timnath's portion of the Poudre Trail, and provide additional access to the Poudre River Trail system throughout Fort Collins.

Strategies:

- Continue to support Parks Planning's effort to extend trail and make access improvements as resources permit.
- Continue to provide access through natural areas for trail extension and access points.

- Partner with Parks Department to acquire lands and easements that support the trail extension and additional access and improve trail and site connectivity (examples also listed in management unit sections are:
    - Connect the Poudre River Trail with the Foothills Trail by building a trail connection between Butterfly Woods and Reservoir Ridge,
    - Improve access to Gustav Swanson where the Poudre Trail crosses Linden Street,
    - Re-align Poudre River Trail on Springer Natural Area where the trail crosses Lemay Avenue,
    - Provide access from Wood Street to the Poudre River trail.

C. Education and Outreach

1. Description

The Natural Areas Program education efforts seek to increase public awareness, understanding and support for all natural areas through publications, technology, onsite signage, programming, events, and volunteer opportunities. These are designed to promote understanding of natural systems and foster each individual's realization of the importance and meaning natural places add to our lives. Along the river, education efforts focus on promoting the understanding local ecology and processes such as flooding and river morphology, species identification, hydrological cycles, and stewardship.

Public educational programs stimulate curiosity and promote awareness of the river and its ecosystem.

2. Overarching Goals for Education

- Increase public awareness, recognition, understanding and support for natural areas along the Poudre River.
- Ensure that the Fort Collins community continues to value the natural areas along the river for multiple reasons. Ensure that each of these values is communicated by many voices in the community.
- Effectively reach a diverse and significant portion of the community through a range of education and outreach strategies focused on the Poudre River and associated natural areas.
- Increase citizen's satisfaction with the media about the Poudre River natural areas.
- Use consistent branding to identify materials that the Natural Areas Program produces (as opposed to other entities that produce materials about the river) and clarify which properties along the river are owned/managed by the Natural Areas Program.
- Provide consistent messaging in education and outreach programs that focus on Poudre River-specific priorities.
- Provide a variety of meaningful volunteer opportunities in the natural areas along the Poudre River that connect citizens to nature.

- Promote the values that the Poudre River natural areas provide:
    - **Recreation**–The Poudre River, its natural areas, and trails provide places to hike, bike, dog walk, ride horses, bird watch, fish, swim, create art, write, and enjoy quiet time along a waterway.
    - **Education**–The Poudre River and its natural areas provide outdoor classrooms for students of every age to learn about water quality, river morphology, aquatic macro-invertebrates, riparian vegetation, etc. It is heavily used by the Poudre School District, Colorado State University and Front Range Community College.
    - **Scientific**–The river is used by scientists to conduct research.
    - **Economic**–Riverside properties are attractive to businesses and residents.
    - **Cultural**–The Poudre River natural areas contain traces of our past, provide a historical context, and are part of our community's identity.
    - **Ecological**–The river natural areas filter stormwater before it is returned to the channel, the vegetation filters pollutants from the air and is an important source of oxygen in an urban environment, contain floodwaters and prevent flooding of structures, and provide habitat for wildlife and native plants.
    - **Spiritual**– For some, the river provides a place of spiritual contemplation.
    - **Wellness**–Poudre River natural areas provides places for citizens to relax, be healthy and exercise.

3. Existing Conditions and Key Issues for Education

One indication that the public is interested in the natural areas along the river and are aware of their values is the amount and types of communication about the river within the community. Currently, a broad spectrum of the community can articulate the values of the river, but some values are communicated more often or better than others. For example when asked "What is important about the river and associated natural areas?" in public outreach for this plan, scientific value was not mentioned but the recreational values and ecological values were often cited.

The Natural Areas Program sponsors a range of education and outreach strategies which reach thousands of people directly and indirectly each year. For example:

- From September 2009 to September 2010, the website *www.fcgov.com/naturalareas* was accessed 45,500 times;
- In 2010, 140 people participated in Natural Areas program-sponsored volunteer projects along the river.

Demographics of program participants are not measured scientifically, so planning is based on observations of Natural Areas staff and volunteers. The demographics of education program participants do not match the demographics of the community which are: White 89%, Hispanic/Latino 8.8%, Black or African American 1%, American Indian/Alaska Native 0.6% Asian 2.5%, Hawaiian/Pacific Islander 0.1%, Some Other Race 3.6% (Trends, 2006).

Some visitor demographics are known from a formal survey of visitors to natural areas (including Poudre River sites) sponsored by the Natural Areas Program in 2006. It indicated that visitors are 47% female, 49% male (4% not responding), 73% lived within City of Fort Collins, 16% in other locations in Larimer County. Over half (56%) of respondents were 35 to 64 years old and 30% were between 18 and 34 years old. Only 6% of respondents were older than 65 and

3% were under 18. Sixty percent of all survey respondents had achieved an educational level of a Bachelor's degree or higher.

Satisfaction with media at all natural areas is measured by the 2006 survey question, "Was the information provided on maps, brochures, or signs at this site adequate for your visit today?" The results were 49% yes, 40% didn't use, 4% no. It is hard to tell whether the "didn't use" response is a positive response (such as the visitor had all the information they needed, thus didn't use anything new on this visit) or a negative response (such as the visitor didn't use media because they couldn't find it or it wasn't adequate). Also the question applied to all natural areas, not just sites along the river. This question will be revised accordingly in future surveys, scheduled for 2011 and 2016.

Site signs and media along the river natural areas are consistent within the entire natural areas system, but no river corridor-wide visual elements have been developed or incorporated. That will be a significant undertaking as outlined later in this plan.

Natural Areas Program staff and volunteers focus on Natural Area Program messages when communicating about natural areas along the river. The Program's current focus is welcoming visitors to natural areas, creating awareness about the diversity of high quality experiences at natural areas, and promoting the concept of long-term stewardship that involves citizen/visitors.

4. Management Objectives and Strategies for Education

Objective for Sharing Natural Area Information: The Natural Areas Program will share a range of values about the natural areas along the Poudre River. Community leaders and organizations will publically communicate the values of the river.

Strategies:

- Seek opportunities to highlight less obvious attributes of the river such as scientific, cultural, and economic characteristics.
- Continue to highlight what is special about natural areas in communications sponsored by the Natural Areas Program.
- Seek partnerships with community leaders and organizations to publically communicate the values of the river.

Objective for Reaching Significant and Diverse Portions of the Community: Provide a diversity of meaningful experiences for the community to facilitate their connection to nature. Outreach should reach a significant portion of the community (8%-10% annually) through direct and indirect education and outreach strategies. Strive to achieve audience demographics that reflect the demographics of Fort Collins and Larimer County.

Strategies:

- Utilize a variety of education and outreach strategies such as educational activities, tours, events, publications, media, etc. to promote the natural areas along the Poudre River and their values.

- Explore a collaborative effort with the Fort Collins Discovery Museum, The Farm at Lee Martinez, and other partners on a new annual river-focused event that promotes natural area values.
- Continue to participate in and consider expanding Colorado State University's annual *Picnic on the Poudre* focusing on the community near Magpie Meander Natural Area.
- Continue to diversify demographics of participants by working with community partners who have established relationships with under-represented groups.
- Recruit school field trip participants through the school program guide distributed annually to teachers.
- Seek ways to expand funding to provide bus transportation for students attending NAP-sponsored field trips to the Poudre River.
- Continue virtual geocache course as public interest warrants.

Objective for Public Satisfaction with Media: Increase the number of citizens that are satisfied with the variety of natural areas media above the 2006 level of 49% satisfied. Note: 40% did not use media, and 4% were unsatisfied (Corona, 2006).

Strategies:

- Continue to provide large map of entire natural area system including "zoom ins" of Poudre River corridor at kiosks.
- Consider developing a Poudre River brochure and/or a brochure about the Riverbend Ponds/Cottonwood Hollow /Running Deer/ELC complex.
- Provide a trail map on each natural area's web page.
- Maintain trailhead bulletin boards by updating postings seasonally or more often.
- Add interpretive features at selected natural areas. Monitor all interpretive features for deterioration or vandalism and replace if needed within 6 months of report of need.

Objective for Branding and Messaging: Natural Areas Program produced materials and communications will have consistent branding and messaging.

Strategies:

- Continue to follow established graphic identity guidelines and consistent messaging in all communications.
- Implement consistently-branded infrastructure:
    - Site sign with unique site symbol, City logo and program tagline.
    - Mini-kiosks marking all legal entrances
    - Informational kiosks, where appropriate, with educational messages and maps.
- Initiate and collaborate with partners to achieve consistent wayfinding throughout the river corridor from I-25 to Overland Trail as recommended in *City Plan Fort Collins*.

Objective for Volunteer Opportunities: Provide a diversity of meaningful volunteer opportunities such that volunteers fill vacant slots and assist the Natural Areas Program in accomplishing its mission. Strive to have all volunteer opportunities include an educational component.

Strategies:

- Continue successful recruiting methods such as annual volunteer orientation, electronic newsletter articles, listing at First Call 211, trailhead posters, news releases, etc.
- Continue successful volunteer programs such as Master Naturalist, Master Naturalist Assistant, Volunteer Ranger Assistant, Adopt-a-Natural Area, citizen science projects and make adjustments as needed.
- Increase volunteer opportunities as meaningful projects and volunteers are available.
- Continue producing volunteer newsletter quarterly.
- Continue outstanding volunteer appreciation, recognition and continuing education opportunities.
- Continue to support, expand, and commit additional resources to public volunteer stewardship efforts such as Adopt-a-Natural Area program and river clean-up events for natural areas along the Poudre River.
- Provide an educator to each volunteer project.

D. Cultural Features

1. Description

For the purposes of the Poudre River Natural Areas Management Plan, the term "Cultural Features" refers to historic and prehistoric human-made structures and artifacts found on, or in close proximity to, natural areas managed by NAP.

2. Overarching Goals for Cultural Features

- Identify and protect significant cultural features.
- Interpret cultural resources to increase visitors' understanding of the history and prehistory of the Poudre River corridor and to show how human activities have influenced natural history and land management.
- Recognize that cultural resource protection is not the primary mission of the NAP but at times can significantly influence site management, recreation, restoration efforts, and education direction.
- Seek partnerships and grants to conserve and help interpret cultural features.

The sugar beet flume at Kingfisher Point Natural Area reminds visitors of our collective history.

3. Existing Conditions and Key Issues of Cultural Features

The value and distribution of cultural features on natural areas along the Poudre River are currently poorly understood by NAP staff. Only obvious cultural resources have been identified (such as the beet flume at Kingfisher Point Natural Area, the Nix Farm, and the remains of Strauss Cabin near Arapaho Bend Natural Area). Natural Areas Program has not been able to devote much time or resources to researching the history of cultural features along the river.

NAP planners will anticipate and minimize potential impacts that management strategies may have on cultural resources. At the same time, they need to understand how the presence of cultural resources may impact how the land is managed to meet NAP goals.

Currently, few cultural resources on natural areas along the Poudre River are interpreted. Information on the Fort Collins Museum's *Trails of Northern Colorado* website (http://www.fcmdsc.org/trails/tour2/tour2.html) and an on-site interpretive sign provide some information on the Gustav Swanson Natural Area. The role of providing information about the history and prehistory of the Poudre River falls primarily to the Fort Collins Museum. The City of Fort Collins Advance Planning Department is responsible for ensuring that significant historical buildings are protected along the Poudre and elsewhere within the City Limits.

In addition, a portion of the Poudre River corridor covered in this management plan is contained within the boundaries of the Cache la Poudre River National Heritage Area (administered by the National Park Service), which was established by Congress in 2006 to provide for the interpretation of waterways and associated water delivery systems of the Poudre River. Thus far, a general brochure has been produced and interpretive and identification signs installed at various locations along the 45-mile stretch of the river from Gateway Natural Area in the Poudre Canyon to Greeley.

4. Management Objectives and Strategies for Cultural Features

Objective for Identifying Significant Cultural Features: Compile an inventory of cultural features that may be present on, or immediately adjacent to, natural areas managed by NAP.

Strategies:

- Seek collaborative opportunities with the Fort Collins Museum, Colorado State University, and others to compile and summarize information about significant cultural features of the Poudre River corridor and associated natural areas.
- Support community efforts to collect additional cultural information.
- Explore grant and partner opportunities to inventory and identify cultural features and locations within natural areas along the Poudre River.

Objective for Protecting Significant Cultural Features: Monitor and implement methods to reduce human impacts to significant cultural features.

Strategies:

- Document decisions regarding the significance of cultural features and the need to protect them.
- Include monitoring of significant cultural features in routine ranger patrol; this would include inspections for graffiti.
- Immediately remove/paint over graffiti on significant cultural features. The City goal is to accomplish within 72 hours, striving for within 24 hours.
- Install fencing and signage for structures that are prone to vandalism and enforce "No Access" restrictions.

Objective for Interpreting Significant Cultural Features: Ensure that significant cultural features are interpreted on natural areas through on-site signage and that visitors are aware of information available elsewhere (e.g., Fort Collins Museum).

Strategies:

- Seek guidance from the City's Risk Manager and Historic Preservationist regarding providing access to significant cultural structures.
- Explore collaborative opportunities to create interpretive features and to invest in adaptive reuse of historical structures.
- Design appropriate interpretive signs, with priority on highly visible features, such as the beet flume.
- Encourage the Fort Collins Museum to have information about the Poudre River historic and prehistoric resources conveniently available to the public (e.g., on-line resource; creation of a cultural display at the new Fort Collins Museum) and help publicize the availability of these resources.

Objective for the Role of Cultural Resource Protection in NAP: Determine how protection of each significant cultural feature will influence site management, recreation, restoration efforts, and education direction. Significant cultural resources at natural areas along the Poudre River should be identified, protected, and interpreted. Visitors to the river's natural areas should have the opportunity to understand the history and prehistory of the area through interpretation of cultural resources including physical artifacts, historical structures, and oral history.

Strategies:

- Evaluate the condition and relative value of cultural features on natural areas in collaboration with Historic Preservation and archaeology specialists.
- Seek guidance of the City's Risk Manager regarding any potential safety concerns for the public and best ways to mitigate dangers for visitors.
- Design interpretive features that explain how human activities have influenced natural history and land management.
- Explore grant and partner opportunities to protect cultural resources within natural areas along the Poudre River.

E. Collaborative Management

1. Description

Partnerships enable the Natural Areas Program vision to be implemented within and beyond the boundaries of the river's natural areas. Larimer County, City of Fort Collins Utilities and Park Departments, gravel mining companies, Colorado Division of Wildlife, Colorado Environmental Learning Center, and the Fort Collins Museum are just a few of our collaborators. More recent efforts working with the downtown business community and UniverCity Connections represent the potential to better integrate the river and its natural areas into the fabric of downtown.

This site sign recognizes collaborative efforts between City departments at Udall Natural Area.

2. Overarching Goals for Collaborative Management

- Seek partnerships that enable the Natural Areas Program's vision to be implemented within and beyond the boundaries of the river natural areas.
- Collaborate with partner agencies and adjacent landowners to help achieve management objectives.

3. Existing Conditions and Key Issues for Collaborative Management

Currently, our collaborative management efforts along the Poudre River include development of the Fort Collins Museum, participation in UniverCity Connections, and collaborating on projects and plans with the City's Parks Department. A variety of goals, from improving access and water quality to land acquisitions, have been achieved over the years with partnerships.

The NAP has identified existing as well as new potential partners to collaborate with in order to achieve some of the specific objectives outlined in various parts of this plan. These opportunities are already listed under the appropriate goals; however a few re-occurring themes are listed below under "Strategies for Collaborative Management."

4. Management Strategies for Collaborative Management

Strategies:

- Perform and ask for cross-boundary management.
- Participate in inter-departmental and cross-agency teams.
- Actively participate in new City-wide Watershed Team.
- Work closely with Colorado Division of Wildlife on fish management in ponds.
- Work with neighbors on wildlife movement barriers, access points, and other relevant issues.

- Collaborate with the City's Parks, Stormwater, and Transportation Departments as well as Larimer County on development of a comprehensive wayfinding plan, additional trail head parking lots, visitor amenities, trail extensions, trail connections, and recreational safety.
- Encourage and facilitate scientific research and volunteer projects that help meet goals outlined in this Poudre River Natural Areas Management Plan Update.

F. The Poudre River as a Community Asset

1. Description

The Poudre River is a source of great community pride and a tremendous asset to the community. The Poudre River's trails, natural areas, and parks are enjoyed by hundreds of thousands of visitors each year. Hiking, biking, nature observation, swimming, picnicking and fishing are just a few of the activities undertaken in natural areas. In addition to these recreation activities, the river is valued for the water it supplies the citizens and agricultural community, its biological diversity, its scenery, and its proximity to downtown. Citizens also are aware that the river faces many threats, in particular additional water withdrawals. Given the iconic status of the river to the community, the community has planned extensively for the river's future. The first *City Plan* in 1997 articulated the community's interest in managing and protecting the river's aesthetic and ecological values. The recent update to City Plan, *Plan Fort Collins, 2011*, strengthened the section on the Poudre River and envisions a river that is resilient to change, biologically diverse, and a great place for residents to recreate.

The Poudre River: our community icon and collective resource.

2. Overarching Goals for the Poudre River as a Community Asset

- Continue to recognize the iconic significance of the Poudre River to the Fort Collins community.
- Work to support a resilient Poudre River ecosystem.
- Help promote and achieve the community's wellness needs by providing a nearby retreat from modern, urban life.

3. Existing Conditions and Key Issues for the Poudre River as a Community Asset

The Poudre River Corridor is consistently highlighted in City planning documents because of its special significance to the entire Fort Collins community. The Poudre River corridor bisects the northern third of the City, from LaPorte in the northwest to Timnath in the southeast, a distance of approximately 13 miles. The width of the corridor varies from less than ¼ of a mile to 1½

miles, depending on the natural features and existing land uses. The City *Structure Plan* map contains a special overlay designating this area as the Poudre River Corridor. The Poudre River Trail is a major recreation amenity for the City, it also serves as a travel corridor for bicycle commuting. The river and its natural areas support the community's wellness needs providing nearby retreat from the stresses of urban life and are popular places to exercise and recreate.

Because river flows are the primary driver of ecosystem function, the development of additional water rights, which would divert more water out of the river, is currently the key issue for the future health of the Poudre River. Several water supply and storage projects are currently in the planning or permitting stages and while the specific impacts of each of these projects on the urban reach of the Poudre River remain unclear at this time, ecologists agree that the impacts of significantly reduced peak spring flows will further limit ecological functions, deplete adjacent groundwater reserves and cause associated stresses on riparian vegetation.

4. Management Strategies for the Poudre River as a Community Asset

- Participate in planning processes for future water storage projects that bring stakeholders together to find solutions to water supply while preserving the river's ecological integrity.
- Advocate for science-driven management of river flows that sustain ecosystem functions and conservation values identified in this management plan. Collaborate with City and non-City stakeholders to explore creative ways to promote in-stream flows.
- Support City policies that help conserve important ecological goals identified in this management plan such as City's Development Review Standards, Floodplain Regulations, or Land Use Code.
- Provide a diversity of appropriate recreational experiences emphasizing opportunities for visitors to relax, exercise, and enjoy the outdoor experience.
- Create welcoming, safe, and friendly natural areas where citizens and visitors can feel a sense of personal ownership of the natural areas.
- Collaborate with partners to create educational and learning materials that contribute to citizens' awareness of important cultural aspects of the river and its human history.
- Create a visual identity for the river's natural areas and associated public lands through consistent graphic design, wayfinding, informational kiosks and other visual media.

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CHAPTER 5

MANAGEMENT ZONING AND SITE RENAMING

A. Natural Areas Management Zoning System
B. Site Renaming

A. Natural Areas Management Zoning System

A new system of management zoning was developed to more effectively manage natural resource protection and human use within natural areas along the Poudre River. Prior to this plan, natural areas were zoned in their entirety as urban (least restrictive to visitor use, off-trail use permitted), restorative (closed areas for ecological restoration), or sensitive (on-trail use only). This system did not allow for flexibility to zone different areas within a single natural area, which becomes a limitation when trying to meet a range of recreational desires. The new system consists of five zones (0 to 4) ranging from areas closed to public use to "focal areas" prescribed for intensive public use. A modifier is added to the zoning designation to describe whether on-trail only or off-trail use will be permitted:

Trail Modifiers (Regulatory Zoning):

A – On-trail only
B – Off-trail use allowed
C – Closed, no trails available (Zone 1)

Management Zoning:

Zone 0 – Closed Natural Area – The entire natural area is not open for public access. The natural area is either not intended for public use or is not yet open due to lack of public facilities (e.g., trails, parking lots, etc.) which require construction prior to opening.

Zone 1 – Closed Zones: Portions of a natural area are not open due to one or more reasons specified below. In closed zones, trails and other public facilities either do not exist or are intended for maintenance purposes only. All Zone 1 – Closed Zones are modified as "C – no trails available." Reasons for closures may include:

- Areas closed for **conservation** or wildlife refuge.
- Areas where **no formal access** is provided.
- Areas closed due to **public safety** issues.
- Areas under **long-term restoration** (typically 10 years or more).
- Areas closed due to the presence of **cultural artifacts.**
- Closed to public because they are **leased lands.**

Zone 2 – Resource Protection Zones: Portions of a natural area where conservation and resource protection are the highest priorities. Visitor access is generally limited to on-trail or trailside activities. Public improvements are limited or nonexistent. Temporary or seasonal closures may be enacted for resource protection, restoration, or other reasons.

Zone 3 – Natural Experience Zones: Portions of a natural area that are intended to provide visitors with a place to connect with nature and enjoy site appropriate recreation. Off-trail use generally is allowed and public facilities may exist, though, not to the scale or frequency of a focal area. Temporary or seasonal closures may be enacted for resource protection, restoration, or other reasons.

Zone 4 – Focal Recreation Zones: Portions of a natural area that provide intense and directed recreation. These are developed areas intended to provide defined recreation or access to recreation. Focal areas generally include parking lots, picnic areas, boating or fishing access points, designated rock climbing areas, etc. Temporary or seasonal closures may be enacted for resource protection, restoration, or other reasons.

The maps in Figures 5.1 and 5.2 show the management and regulatory zoning for all Poudre River natural areas. In Chapters 7-13, a more detailed view of zoning for each natural area can be seen.

Figure 5.1 Map of Management Zoning

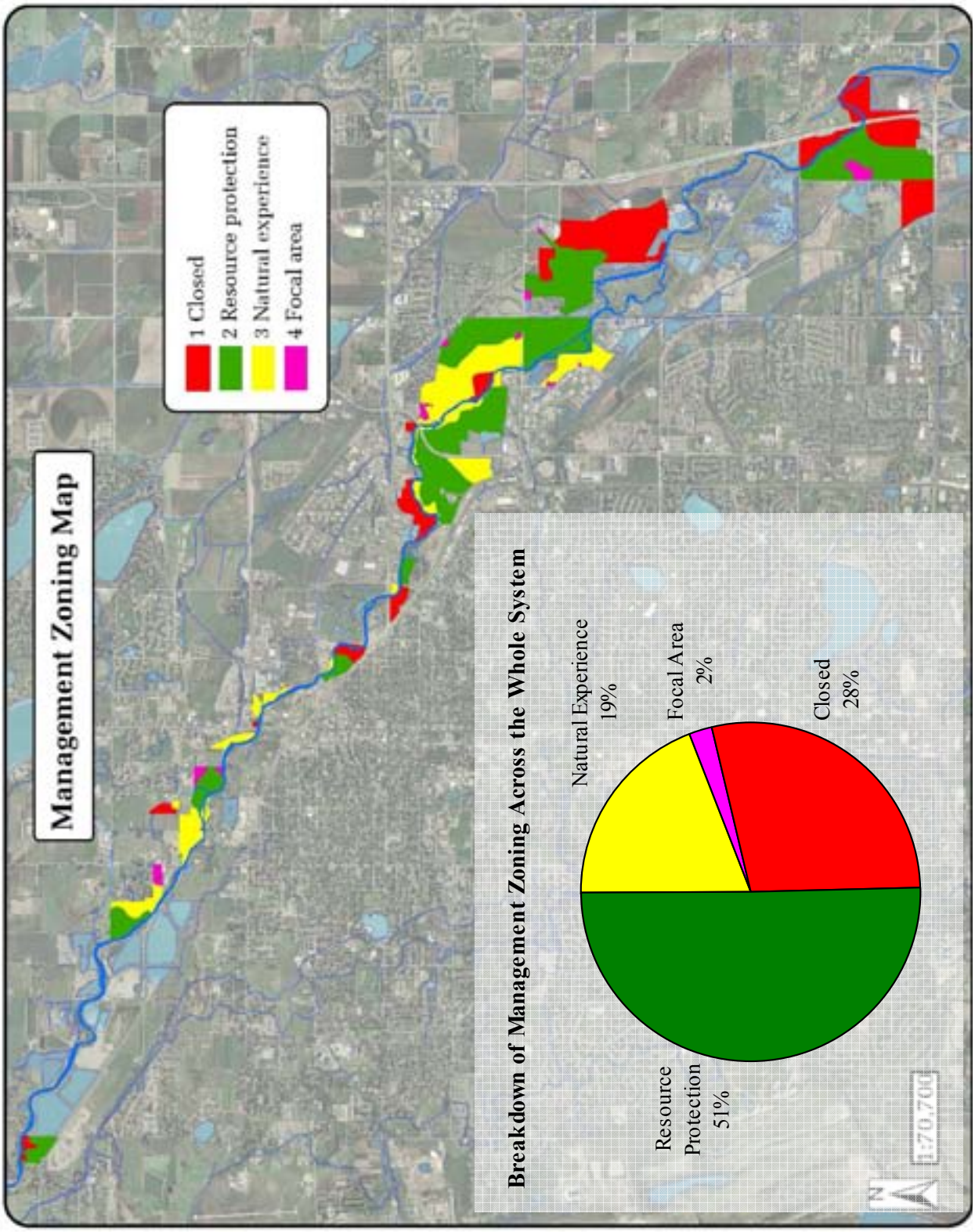
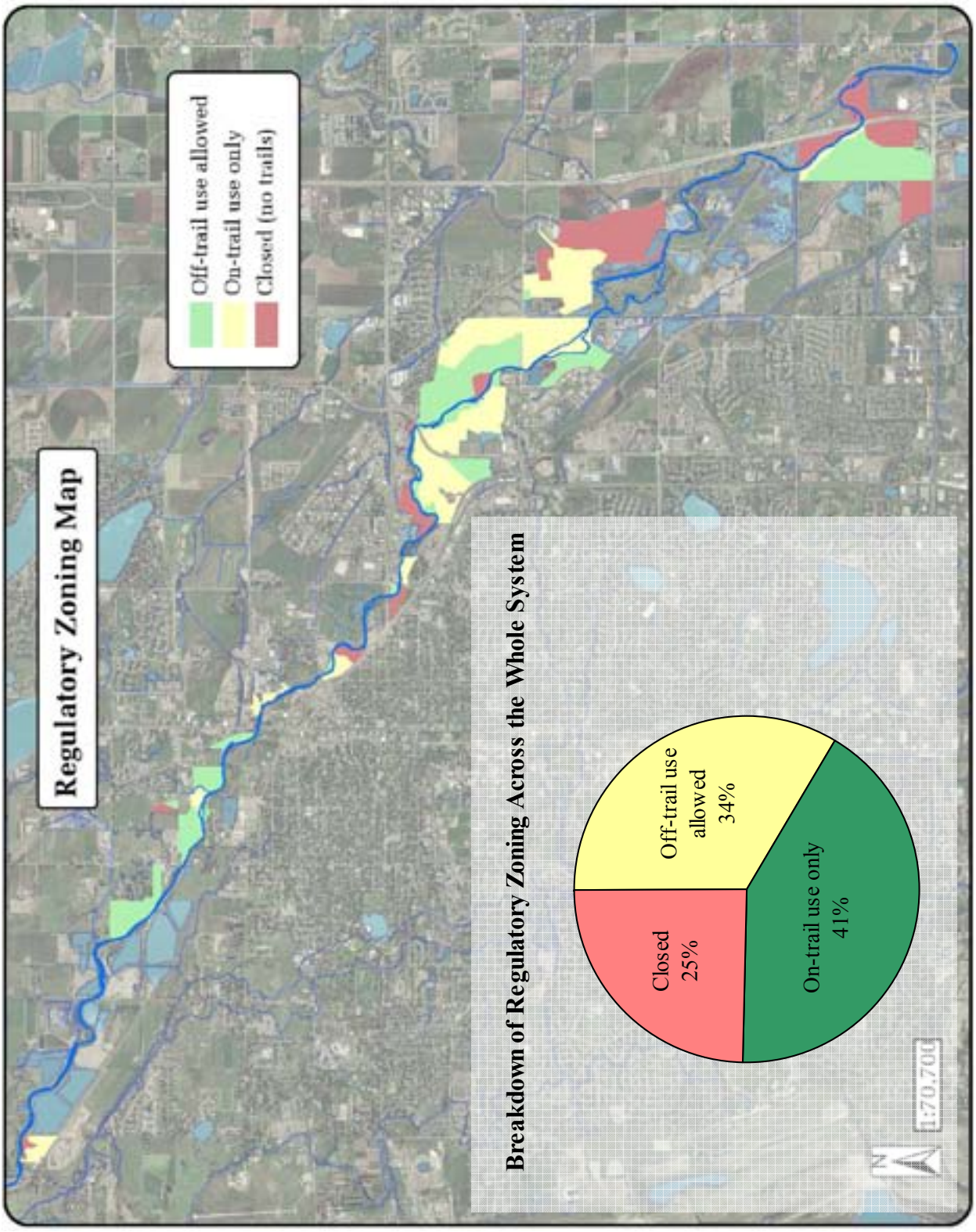


Figure 5.2 Map of Regulatory Zoning

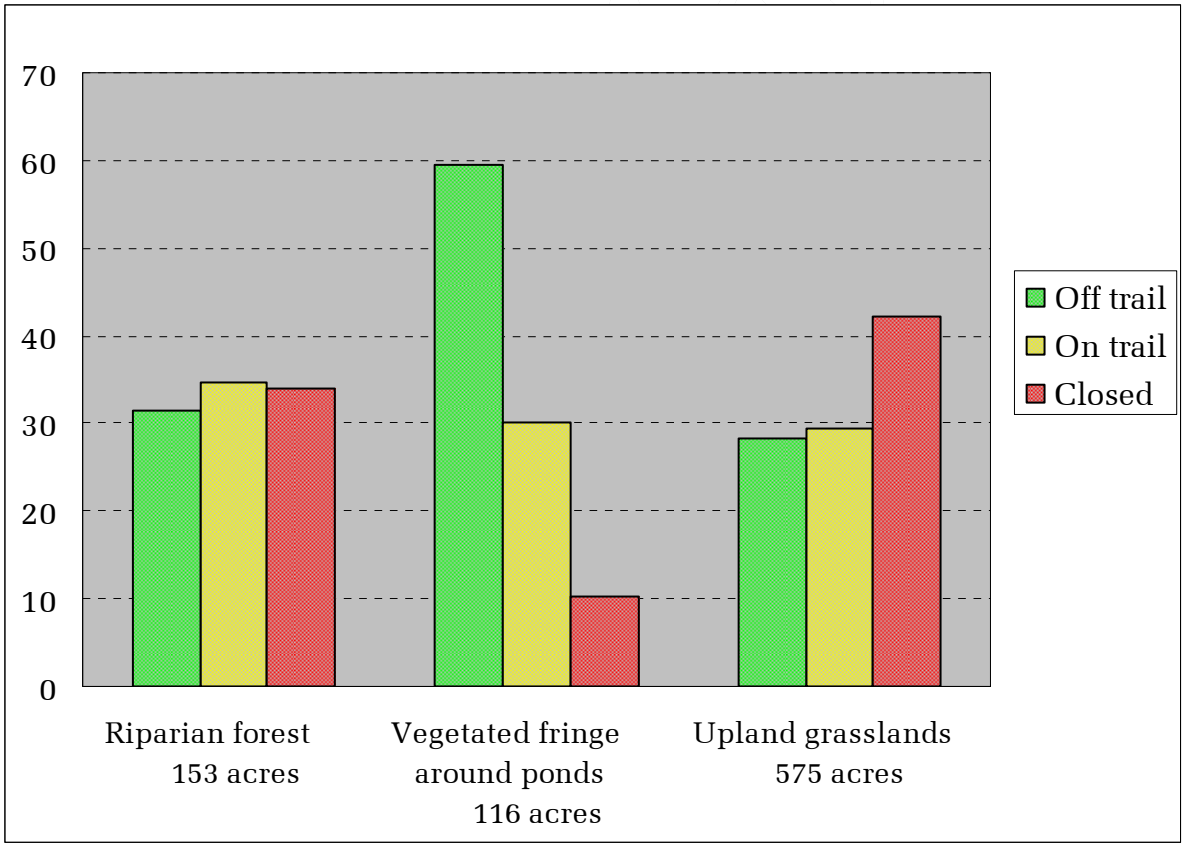


All natural areas within the scope of this management plan update were examined for existing conditions, key issues and concerns, and specific site management.

There are a few notable outcomes when comparing on and off-trail use within each ecological conservation target (Figure 5.3). First, ample off-trail opportunities around the ponds are available and provide access to fishing. Similarly, almost three-quarters of the ponds within the natural area system are open for non-motorized boating (including canoeing and kayaking). Access to the river is equally split between off-trail use permitted, on-trail access only, and no trails for the purpose of habitat protection. It should be noted that in some areas providing infrastructure for improved visitor access at the river's edge is difficult due to damage caused by seasonal flooding.

In general, most of the Poudre River corridor has about half of the area zoned for resource protection with the exception of the downtown area. This is a reflection of feedback from the public who valued the protection of habitat and ecological resources, but expressed that recreation was especially important in the downtown corridor. Further downriver there are more areas zoned closed for wildlife protection or grassland restoration as these larger sites are more conducive to habitat protection and larger-scale restoration.

Figure 5.3 Regulatory Zoning by Ecological Conservation Target



B. Site Renaming

This 2011 update to the Cache la Poudre River Natural Areas Management Plan proposes to again combine some sites using major physical barriers like the Poudre River and major roadways to differentiate sites and minimize site boundaries within contiguous properties. Names of properties donated to the City such as Williams, Springer, McMurry, and Salyer must retain their original names. The result is 17 (versus previously 19) natural areas in the Poudre River corridor from Overland Trail south to Harmony Road that are managed by the City of Fort Collins Natural Areas Program.

From the user's perspective there will be little noticeable change. From an administrative perspective the boundary changes and subsequent renaming will reduce the need for additional signs, will make maps easier and more uniform to read, and make management of the sites easier. The boundary changes and renaming occur in the natural areas listed below and displayed in the subsequent maps.

Figure 5.4 Boundary/Name Changes

2009 Name	Description	New 2011 Name
Sterling Natural Area	Entire property west of North Shields Pond Natural Area	Entire site changed to North Shields Ponds Natural Area
Nix Natural Area	Entire site (does not include Nix Farm – Natural Areas Program Office and Maintenance Facility)	Incorporated into Kingfisher Point Natural Area
Kingfisher Point Natural Area	Portion east of Timberline Road	Incorporated into Cattail Chorus Natural Area
Riverbend Ponds Natural Area	Portion of site west of Timberline Road	Incorporated into Kingfisher Point Natural Area
Riverbend Ponds Natural Area	Portions southwest of the Poudre River	Incorporated into Cattail Chorus Natural Area
Cottonwood Hollow Natural Area	Portion of site west of the west side channel of the Poudre River	Incorporated into Prospect Ponds Natural Area

Figure 5.5 Site Renaming for Sterling and North Shields Ponds

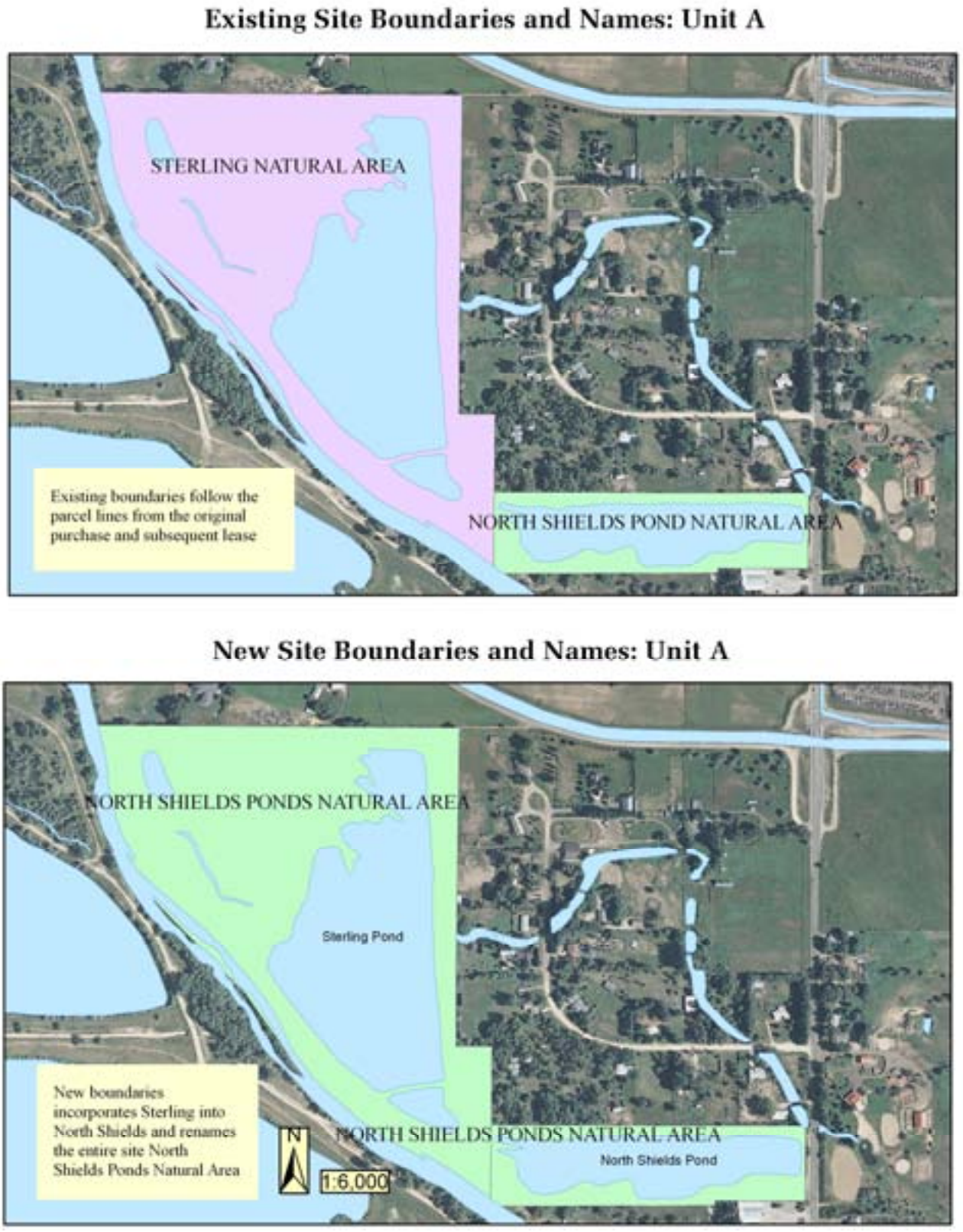


Figure 5.6 Site Renaming and Boundary Changes for Nix, Kingfisher Point, Cattail Chorus and Rivebend Ponds

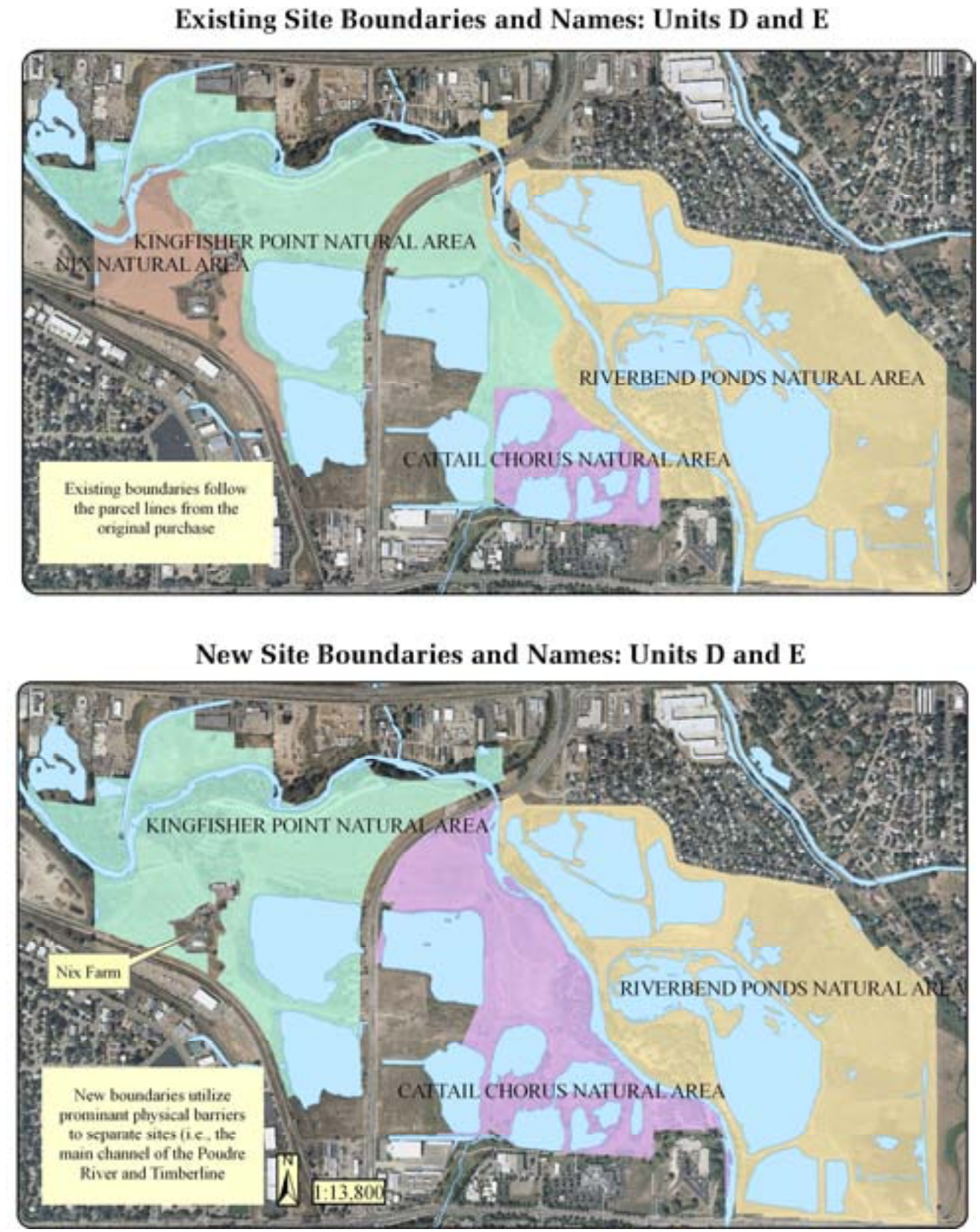
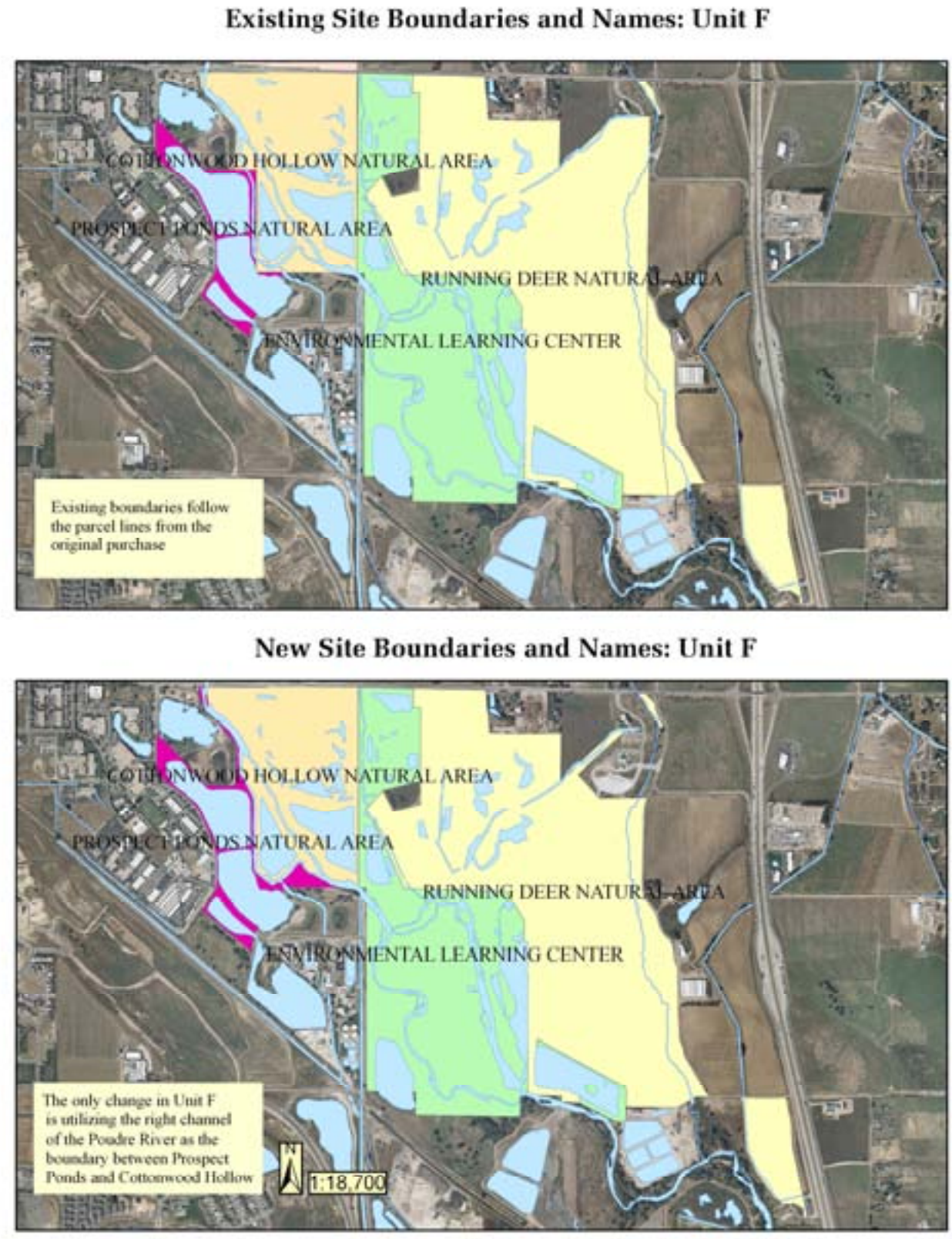


Figure 5.7 Site Renaming and Boundary Changes for Cottonwood Hollow and Prospect Ponds



CHAPTER 6

SUMMARY OF MANAGEMENT ACCOMPLISHMENTS

A. Land Conservation
B. Resource Management and Stewardship
C. Recreation and Public Improvements
D. Education and Public Outreach
E. Visitor Services

The Natural Areas Program has accomplished many management objectives on natural areas along the Poudre River since 1998.

A. Land Conservation

The 2002 *Cache la Poudre River Natural Areas Management Plan* presented site-specific plans for 17 natural areas on 891.5 acres. Since then, the names of some natural areas have changed, some acreage has been added, and new sites have been acquired. Recently combined/renamed natural areas are explained in Chapter 5. Since 1997, 510.6 acres have been acquired by the Natural Areas Program along the Poudre River—a 57% increase in acreage. Appendix E contains a more detailed account of the acquisition history of each site.

Figure 6.1: Poudre River Land Conservation Acres since 1997

Natural Area Name	Notes	Current Acreage	Acreage Gained Since 1997
Butterfly Woods	Formerly Site #96P1 in '97 plan	24.1	
North Shields Ponds	Added "Sterling" property, leased from Poudre School District	53.8	+43.8
Magpie Meander	Formerly Hickory Park Natural Area	7.2	
McMurry	Formerly McMurry Park, managed by Larimer County	43.9	+43.9
Salyer		24.0	
River's Edge	Formerly Legacy Park Natural Area	9.5	+3.0
Gustav Swanson		10.4	+0.2
Udall	Jointly owned/managed with Utilities	26.2	
Springer	Jointly owned/managed with Utilities	20.7	
Williams		1.4	
Kingfisher Point	Includes former Bignall and Nix properties	146.9	+90.4

Natural Area Name	Notes	Current Acreage	Acreage Gained Since 1997
Cattail Chorus		104.7	
Riverbend Ponds		218.4	
Cottonwood Hollow		88.0	+2.4
Running Deer		279.4	+279.4
Prospect Ponds	Partially owned/managed with Utilities	46.5	+7.3
Arapaho Bend		297.0	+40.2
Sum		**1,402.1**	**+510.6**

B. Resource Management and Stewardship

When the first management plan was adopted in 2002, it identified four general objectives for the management of natural resources along the Poudre River corridor:

1. Preserve and protect the native habitat and rare species;
2. Control the invasion and spread of undesirable non-native plants and state-listed weeds;
3. Enhance storm drainage facilities; and
4. Manage human/ecosystem conflicts through habitat manipulation, and plant and animal population management techniques.

The following is a summary of actions taken by the Natural Areas Program to achieve these objectives:

"1. Preserve and protect the native habitat and rare species of the sites."

Cottonwood Conservation: In 2003 the Natural Areas Program initiated a new management tool to encourage beaver predation on non-native crack willow instead of the native cottonwood trees. Beginning in 2003 a paint/sand mixture has been applied to the base of all cottonwoods on natural area sites along the river. This has proven to be an effective tool to mitigate damage to cottonwoods while increasing the damage to a non-native species.

Ecological Restoration: Prescribed fire for restoration purposes was first used in 2003. Approximately 40 acres were burned in two phases at Kingfisher Point to initiate the conversion from kochia to native grass on a lime substrate (a relict of sugar beet processing). Similarly, 25 acres of the Nix Natural Area were converted from smooth brome to a native grass mix through mechanical and chemical treatments. Subsequent projects included pond shoreline conversions in 2005 and 2006 that created shallow sloped banks and emergent wetland shorelines at McMurry and Riverbend Ponds. Restoration efforts at Salyer focused on widening the riparian forest through cottonwood and shrub plantings. The NAP permitted a gravel mine on a portion of what is now called Running Deer and leased the mining rights to LaFarge. Since the NAP owned the mine it had the opportunity to control the design and implementation of the restoration of the gravel mine at Running Deer. Rather then the traditional open water, "bathtub" style of restoration, the restoration of this portion of Running Deer was designed as a seasonally inundated wetland with a river connection functioning much like a backwater channel.

Rare Plant Surveys: With significant assistance from volunteers, the Natural Areas Program has documented three species of rare (populations tracked by Colorado Natural Heritage Program) plants along Poudre River sites. They include: prairie gentian (*Eustoma exaltatum* ssp. *russellianum*); tufted loosestrife (*Lysimachia thyrsiflora*); and American black currant (*Ribes americanum*). NAP maintains data on the status and location of these populations in a GIS database so that any proposed management actions first consider the protection of these populations and in some instances specifically promote the health of these populations.

Breeding Bird Surveys: In 2009 and 2010 staff initiated the first comprehensive survey aimed at assessing the species composition of breeding birds along the Poudre River. Breeding birds are an observable indicator and surrogate for habitat quality. These surveys documented that species representative of lowland riparian forests and associated habitats are occurring on natural areas properties. These data and findings serve as a baseline condition and reference upon which to evaluate future management actions.

"2. Control invasion and spread of undesirable non-native plants and state-listed weeds."

Noxious Weeds: The Natural Areas Program under State and County legal requirement has managed noxious weed species along the Poudre River corridor since 1998. A focused and dedicated effort has resulted in a significant decrease in the geographic spread and abundance of state-listed noxious weeds in the natural areas. Much of the program's efforts have focused on Canada thistle, leafy spurge, and salt cedar. Although these species still persist, an integrated pest management approach has dramatically decreased the prevalence of Canada thistle and leafy spurge. Similarly, salt cedar and purple loosestrife are carefully watched and immediately eradicated when detected along the Poudre River.

Invasive Tree Removal: The Natural Areas Program has put forth an intensive effort to reduce the presence of non-native trees along the river corridor. Since 1998, the program has collaborated with the City's Forestry Department to remove Russian olives and Siberian elms. In 2002, the Natural Areas Program began a coordinated effort to remove Russian olives from the entire corridor with significant work completed at Riverbend Ponds, North Shields Pond, Sterling, Cottonwood Hollow, and Running Deer natural areas. Natural Areas staff has a goal to complete an initial removal of all Russian olives from the natural areas along the river by 2012.

Photo-Monitoring: In 2005, photographs were taken at GPS-recorded locations to track changes in vegetation over time. Randomly-selected photo-points at 160 locations are now in use. Photos are re-taken every two years. Photos are then compared with previous years' photos; in 2009, 20% of the points have shown improvement.

"3. Enhance storm drainage facilities."

Udall Natural Area: The Natural Areas Program has a long-standing cooperative relationship with the City's Stormwater Utility. In 2002, the two City agencies cooperated on the planning and construction of the Oak Street Outfall project at Udall Natural Area. The project is a constructed three-pond natural system designed to treat stormwater prior to its runoff into the Poudre River. The net result is a functional stormwater treatment "facility" that serves as uplands

and wetlands for a variety of wildlife. Additional restoration and public improvements are anticipated in 2011 with the site opening to the public shortly thereafter.

Riverbend Ponds Flood Improvements: In 2005 and 2006, the City's Natural Areas Program, Stormwater Utility, and Engineering partnered on protecting local neighborhoods from future flood events through the construction of stabilized riverbanks and spillway areas at Riverbend Ponds. The Natural Areas Program was able to design and implement a series of upland and wetland restoration projects to enhance the habitat at Riverbend Ponds.

"4. Manage human/ecosystem conflicts through habitat manipulation, and plant and animal population management techniques."

Habitat Manipulation: In 2008, the NAP began a regular, intensive mowing protocol at Gustav Swanson Natural Area to increase sight-line visibility and discourage illegal camping and alcohol use. Ranger observations indicate that these measures have proved largely successful as the number of municipal violations in the area has decreased.

West Nile Virus: The Natural Areas Program assists in the yearly funding of the City-wide mosquito control program. A City contractor uses larvacides to control mosquito populations prior to emergence of the winged stage of the life cycle.

C. Recreation and Public Improvements

Four objectives that address recreation and public improvements were identified in the 2002 *Cache la Poudre River Natural Areas Management Plan:*

1. Provide opportunities for safe, accessible, and enjoyable public use of the sites, while minimizing disturbance to sensitive wildlife and plant communities;
2. Enhance user experience and enjoyment;
3. Provide recreational trails; and
4. Manage human/ecosystem conflicts through design of public use areas.

The following is a summary of actions taken by the Natural Areas Program to achieve these objectives:

"1. Provide opportunities for safe, accessible, and enjoyable public use of the sites, while minimizing disturbance to sensitive wildlife and plant communities. And 2. Enhance user experience and enjoyment."

Site Identification: Since 1998, the Natural Areas Program has installed various signage to assist users in identifying a site as a natural area. Site signs were re-designed with more prominent and colorful lettering, and included a unique symbol of an animal or plant to represent each site. Boundary markers were installed where necessary. Mini-kiosks were installed at all trail entrances to inform users of specific site regulations to reduce user conflicts. Ten large educational kiosks were constructed at major entrances to more popular sites, such as Riverbend Ponds and Arapaho Bend. These kiosks included brochure holders and educational information

on wildlife's use of the site. Signage, and in some cases fencing, were installed to inform users of sensitive wildlife or plant habitat areas.

Site Clean-Up: Since 1998, major clean-up has occurred on most sites along the Poudre River. Abandoned furniture, campers, refrigerators, old sheds, and even an old house have been removed from sites. More isolated sites, such as Arapaho Bend, are sometimes used as dumpsites and seem to be magnet for old couches at the end of the school year. In 2010, 11 couches were retrieved from City natural areas. Crews and volunteers participate in litter clean-up efforts. Crew's empty trash cans twice a week from spring to summer and once a week during the winter months. Graffiti is removed within 72 hours of notification of vandalism on a site. The Poudre River carries quite a bit of trash and debris during high flow events, which is deposited in riparian areas along the Poudre River. Adopt-a-Natural Area volunteers provide some assistance in removing litter and trash that lines the river. The major annual Poudre River Clean-Up ran until 2002 and involved staff from Parks, Utilities, and the NAP working with hundreds of volunteers. It was discontinued after several years because there was a limited amount of trash to clean-up, but a return to the former Poudre River Clean-Up, or some other major effort, may be warranted.

Site Safety: The Ranger Program began in 1997 with two rangers. Today, seven rangers patrol the 43 natural areas managed by the NAP, including the 17 sites (post renaming) along the Poudre River. Ranger duties include visitor assistance, crime investigation, resource protection, and routine patrol. The Poudre River Trail is patrolled on a daily basis with particular attention given to transient camping. In 2009, the Volunteer Ranger Assistant Program was created, which has provided additional patrols. In 2010, the rangers participated in *Homeward 2020,* the 10-year plan to end homelessness in Fort Collins. Rangers led volunteer groups through the Poudre River corridor to census and interview homeless people and create a photographic inventory. The rangers will continue to participate in this collaborative community project in 2011.

Parking Lot Additions and Improvements: Since 1998, new parking lots were built on Running Deer and Arapaho Bend. Improvements were made to six existing parking lots: North Shields Ponds, Gustav Swanson, Kingfisher Point, and the three lots at Riverbend Ponds. Other improvements included the addition of vault toilets at three lots, enlarging some lots, refurbishing the landscaping, replacing or installing fencing, adding bike racks, and/or adding concrete handicapped spaces. At Riverbend Ponds, the Cherly Street entrance parking lot was moved to reduce the impact to a rare plant–the prairie gentian.

Fishing: The NAP currently manages 21 gravel mining - remnant ponds along the Poudre River that support sport fisheries. The Colorado Division of Wildlife periodically inventories and stocks fish in many of these ponds. Primarily non-native fish species are stocked (e.g., bass, bluegill, crappie, perch). Accessible fishing piers have been built at North Shields Pond and Riverbend Ponds. Both piers were refurbished in 2009. The NAP conducted a Carp Fishing Derby in 2010 and plans to continue this fun event in future years.

Boating: Only non-motorized boats are permitted on City natural areas in order to preserve the quiet of the site for other visitors and to limit disturbance to wildlife. Boating is not a high use activity in natural areas including those along the Poudre River. Belly boats for fishing are more

common than canoes or small row boats. The ponds on the natural areas along the Poudre River are small and fisherman generally fish from along the shoreline. McMurry Natural Area receives some use by kayakers in training; thus, in 2005, the NAP constructed a boat launch area to limit disturbance of the bank to a specific location.

Ice Skating: Ice skating is generally not permitted on natural areas because of the potential for wildlife disturbance, limited ice conditions, and concern for visitor safety. However, due to historic use and request from user groups, ice skating (including ice hockey) is allowed on the south side of Merganser Pond at Prospect Ponds. NAP Crews demarcate an area once ice is at least 5 inches thick and post the site with "skate at your own risk" signs. The ice is not groomed or monitored.

Picnicking: Because City parks that are located along the Poudre River provide ample shelters and picnic tables, installing picnic structures on natural areas has not been a high priority for the NAP. However, early in 2010, a picnic shelter was completed at the North Shields Pond. Other natural areas with picnic tables include Sterling, Riverbend Ponds (south side of river), Prospect Ponds, and Arapaho Bend (at Harmony Transfer Station).

Benches: From 1998-2007, the NAP constructed benches made out of lumber (recycled material or wood) of various designs. In 2007, the Program changed to a simple stone bench so that the structures would be more sustainable (e.g., less maintenance, longer lasting, and more resistant to graffiti). Benches made from lumber are replaced with stone benches as they deteriorate. Also in 2007, the NAP adopted a Memorial Bench Policy. The NAP would accept donated benches inscribed with nature-oriented quotes, icons, and the loved ones name and date (usually year of death). Memorial benches were installed at seven natural areas along the Poudre River. The memorial bench program generated mixed reactions with regard to appropriateness of the benches in our natural areas and was discontinued in 2010; however, the stone benches remain the standard. In total, 40 benches are located in natural areas covered in the *Poudre River Natural Areas Management Plan Update,* providing places for reflection and contemplation, and resting along the trail.

"3. Provide recreational trails."

Poudre River Trail: The City's Parks and Recreation Department builds and maintains the hard surface Poudre River Trail. Since 1998, 1.75 miles have been added to the trail and another 4.67 miles have been improved by replacing asphalt trail with concrete. The new trail section from Lyons Park to Taft Hill Road includes a major pedestrian bridge across the Poudre River, designed to avoid impacting sensitive habitat on Butterfly Woods Natural Area. During replacement of the asphalt trail with concrete from Nix Natural Area to Timberline Road, the trail was moved farther back from the river to help provide a larger buffer for riverine and riparian wildlife.

Prospect Road Sidewalk: In 2006, when Prospect Road was widened, a trail underpass was constructed, which allowed access from the new Running Deer parking lot on the south side of Prospect to Riverbend Ponds on the north side of Prospect. The associated sidewalk extends from the Poudre River to Summitview Drive. The underpass also provides safe access under the busy Prospect Road for wildlife, particularly at night. Reports of animals killed on Prospect Road

were much more frequent prior to building the underpass. Safe passage for wildlife was one of the key management actions for this area in the previous *Poudre River Natural Areas Management Plan.*

Soft Surface Trails: Since 1998, six new natural areas have been opened along the Poudre River and over 4.1 miles of new natural or gravel surface trails have been created. More than 500 acres of natural areas distributed along the entire corridor were added. The soft surface trails generally on the interior of natural areas are popular with visitors for hiking, dog walking, and wildlife viewing, but some horseback riding does occur, particularly at McMurry and Arapaho Bend natural areas because of their proximity to boarding stables. Bikers and joggers tend to use the paved trail system more than the soft surface internal trails. Dogs, bikes, and horses are welcome at all sites except Cottonwood Hollow and Running Deer due to their proximity to CSU's Environmental Learning Center where these activities are not permitted.

"4. Manage human/ecosystem conflicts through design of public use areas."

Fencing: In 1998, the Natural Areas Program adopted the buck-and-rail style of wood fencing to replace barbed wire fencing. Buck-and-rail is more wildlife friendly (e.g., minimal leg tangling or broken wings that can occur with wire fencing). In 2003, the buck-and-rail style was replaced by a single rail fence style in an attempt to make the fence less obtrusive on the landscape. In some cases, western rail fencing (Park's signature fencing) has been used to protect sensitive natural areas habitat (e.g., rare plants) on natural areas that occurs adjacent to a park or the paved bike trail. The NAP has modified fencing within the floodway at several sites to lessen the chance of posts or rails dislodging in a flood event and adding to debris piles.

D. Education and Public Outreach

The 2002 *Cache La Poudre River Natural Areas Management Plan* included an objective to "educate the public about the values and benefits of preserving the various habitats along the river and the associated wildlife communities, as well as the historical use of the sites by native peoples and early settlers." Many of the education materials listed in the 2002 plan were Natural Areas Program-wide outreach and have since been updated, incorporated into other materials, or discontinued. Specifically, the video "*The Cache La Poudre River, An Integral Part of Our Lives*", the *Nature Next Door* brochure, and *Nature Next Door* video have all been discontinued. Educational program statistics are not reported on a site-by-site basis, so information on Poudre River-specific programming is limited.

Public Outreach: Since 2002, the range of educational programs and activities has been expanded. Activities, programs and events are led by Master Naturalist volunteers and staff, and all are free of charge.

Public tours of the Poudre River have been offered since 2008. As part of those tours, participants filled out survey forms that helped inform this management plan update. Public educational opportunities are published annually in *Tracks & Trails*, the Natural Areas Program's guide to activities and programming. Special events included the Carp Fishing Derby in 2010 which was very successful and accomplished its dual purpose of outreach and invasive

species control. *Picnic on the Poudre* is a collaborative event at Magpie Meander Natural Area, held since 2008, targeting a typically underserved community.

Requests from the community for custom programs are accommodated, wellness hikes for City employees, and field trips for school children are regularly provided. School field trips feature several activities that meet state standards and compliment classroom studies. Many school field trips to the Poudre River are in partnership with Utilities WaterSHED Program and target fourth and fifth graders. The Natural Areas Program focuses on birding, habitat, and river morphology and WaterSHED focuses on river shape and speed. Kindergarten–second grad field trips have also become popular and are often taught at Poudre River natural areas. Evaluations are now consistently used to gather feedback from all program participants with the goal of continual improvement.

Interpretive Features: Interpretive features have been added at ten Poudre River natural areas over the past 12 years including nine large educational kiosks containing interpretive signs and brochures. Signs have been replaced as needed. Topics include fishing ethics, river's meander process, and local wildlife. Additionally, the Natural Areas Program has been working since 2010 on creating a visitors' center and natural areas-focused exhibits in the new Fort Collins Museum. The river will be a focus of the "Biodiversity Wall" exhibit and natural processes will be included in interpretation of the 1997 Spring Creek flood exhibit.

Partnerships: The Natural Areas Program participates in community efforts focused on the river such as the UniverCity Connections River Team (since 2009) and the National Heritage Corridor education efforts since 2010.

Graphic Identity: In 2007, a set of graphic identity standards were adopted to create a coordinated identity for all printed media, informational signs and kiosks, and educational materials from the Natural Areas Program. Gradually, all communications from the Natural Areas Program have been updated and all new products follow the standards.

Technology: Since 2002, the Natural Areas Program has kept pace with the trends of emerging technology. The website, www.fcgov.com/naturalareas has been overhauled and hosts a wide array of information for each natural area including updates on trail conditions, access to management plans and natural area policies, an interactive tool to identify best locations for certain types of recreation, and other user-based applications. City-wide social media accounts for Facebook and Twitter are emerging and occasionally are used by the Natural Areas Program. In 2009, a monthly natural areas electronic newsletter was initiated and is distributed to more than 700 subscribers. *GeoCache la Poudre* is a virtual geocache course, sponsored by the Natural Areas Program to provide a positive alternative to traditional geocaching which is prohibited. The course was active in 2009 and 2010 with plans to continue in 2011 and beyond if community interest is sustained.

Volunteer Involvement: Volunteer management was not highlighted in the 2002 *Cache La Poudre Natural Areas Management Plan* but has become a major focus for the Natural Areas Program in the past decade. Volunteers make it possible to accomplish many of the Natural Area Program's goals and they serve as important ambassadors for the NAP in the community. Citizen

volunteers make important contributions to the river and associated natural areas through their efforts each year and effectively leverage the Natural Areas Program's funding. Volunteer opportunities range from long-term jobs such as Volunteer Ranger Assistants (who monitor trails and answer visitor questions) and Master Naturalists (who lead educational programs about the ecology of the Poudre River) to short-term jobs such as stewardship projects or citizen science efforts. Volunteer service has grown each year, in 2010, 419 volunteers were actively involved, contributing 11,452 hours to the Natural Areas Program.

E. Visitor Services

Rangers work in partnership with natural area visitors and trail users by encouraging responsible use and informing visitors about the regulations necessary to protect their safety and ensure resource protection. With rapidly growing use of the Poudre River corridor, maintaining and improving the quality of recreation experiences is challenging. In 1997, the City started a ranger program with the intent to patrol during the heaviest usage periods. Since that time the program has grown from a staff of two to seven. Patrol activities have increased to 7 days a week, sunrise to sunset. Over the years, rangers have established a visible presence on the trail system and compliance with regulations has dramatically increased.

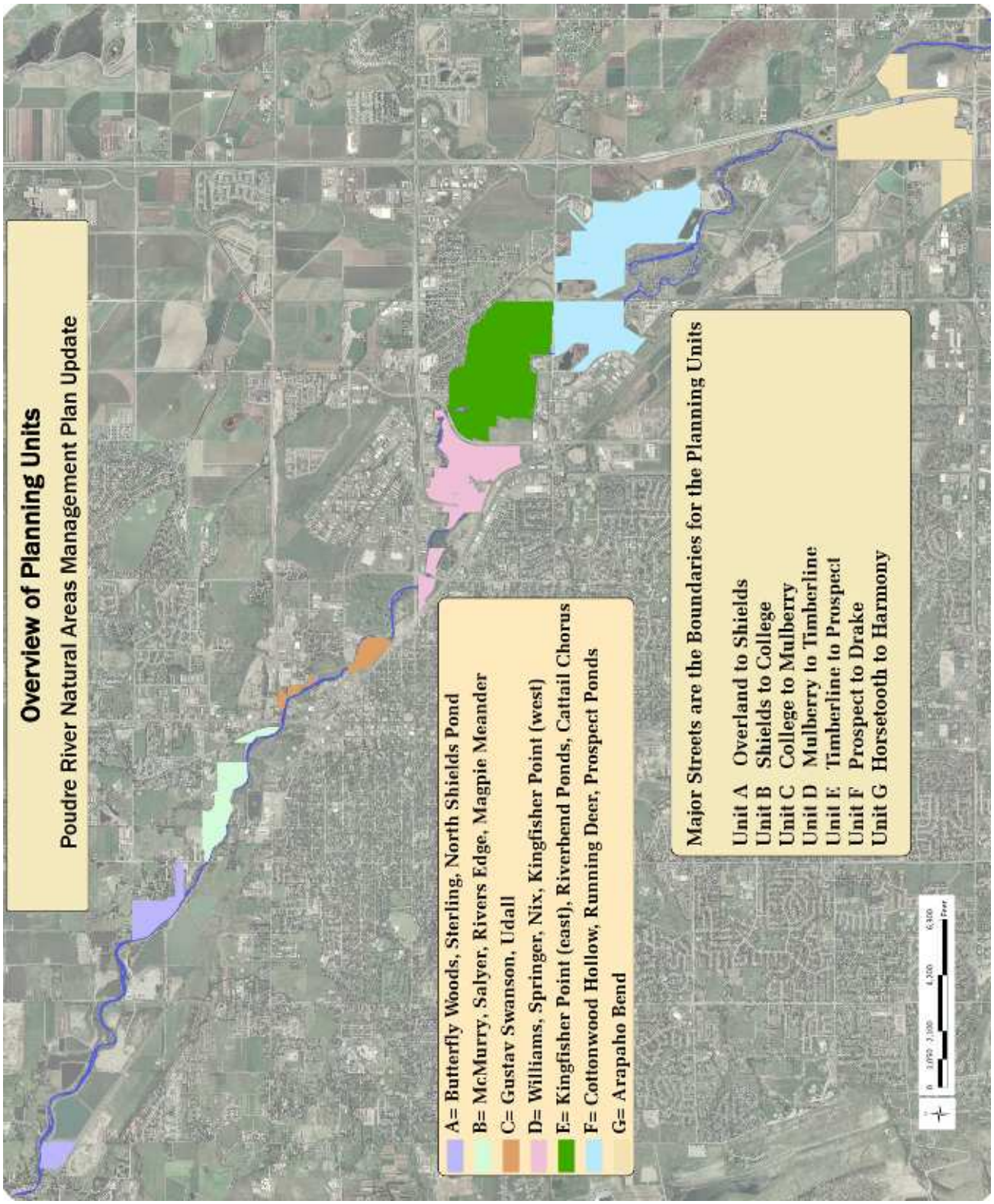
The number of visitors has also increased and rangers have responded to recreation trends and conflicting uses along the corridor such as tubing, fishing, illegal alcohol use, and illegal camping. In 2006, the rangers were identified as key enforcement 'service providers' for the downtown and Poudre Corridor in the City's Budgeting for Outcomes process which is designed to align the services delivered by City of Fort Collins with the services that are most important to the community. Further emphasis was placed on rangers pro-actively targeting trouble areas where illegal activities are known to occur. A slight revision in the rangers' commission has further allowed them to service the corridor by increasing patrol areas to include those accessible from or immediately adjacent to natural areas. Rangers actively work with businesses and police to manage downtown events that impact natural resource protection and public safety.

PART 2: THE PLANNING UNITS

The ecological conservation targets and the human dimensions generally apply to all natural areas along the Poudre River; however, some differences exist between sites and different stretches of the river. When threats to the ecological conditions were examined, a trend appeared that typically followed geographic clusters of natural areas. Major roads divided these clusters, which further supported the consideration of natural areas as groups or "planning units" rather than taking a site-by-site approach. Sites within each planning unit exhibit similar ecological characteristics and human dimensions. This planning unit-based approach provides a framework to understand and prescribe management actions within seven planning units rather than the now 17 (post renaming) individual natural areas. The following table shows how the planning units were developed using major streets as boundaries and provides the list of natural areas included in each of the planning units.

Planning Unit	Location	Natural Areas Located in each Unit
A	Overland Trail to Shields St.	Butterfly Woods, North Shields Ponds
B	Shields St. to College Ave.	Magpie Meander, McMurry, Salyer, River's Edge
C	College Ave. to Mulberry St.	Gustav Swanson, Udall
D	Mulberry St. to Timberline Rd.	Springer, Williams, Kingfisher Point
E	Timberline Rd. to Prospect Rd	Riverbend Ponds, Cattail Chorus
F	Prospect Rd. to Drake Rd.	Running Deer, Cottonwood Hollow, Prospect Ponds
G	Drake Rd. to Harmony Rd.	Arapaho Bend

The next chapters of this plan (7-13) are devoted to individual treatment of each of the seven planning units. Each chapter describes existing conditions and key issues, details the unit's management zoning, and lists specific management actions for the planning unit. Actions are organized by program areas: Public Improvements and Maintenance (PI), Education and Outreach (ED), Program and Land Management (PM), Restoration and Resource Management (RM), and Visitor Services/ Rangers (VS).


Overview of Planning Units
Poudre River Natural Areas Management Plan Update
A= Butterfly Woods, Sterling, North Shields Pond
B= McMurry, Salyer, Rivers Edge, Magpie Meander
C= Gustav Swanson, Udall
D= Williams, Springer, Nix, Kingfisher Point (west)
E= Kingfisher Point (east), Riverbend Ponds, Cattail Chorus
F= Cottonwood Hollow, Running Deer, Prospect Ponds
G= Arapaho Bend
Major Streets are the Boundaries for the Planning Units
Unit A Overland to Shields
Unit B Shields to College
Unit C College to Mulberry
Unit D Mulberry to Timberline
Unit E Timberline to Prospect
Unit F Prospect to Drake
Unit G Horsetooth to Harmony

CHAPTER 7

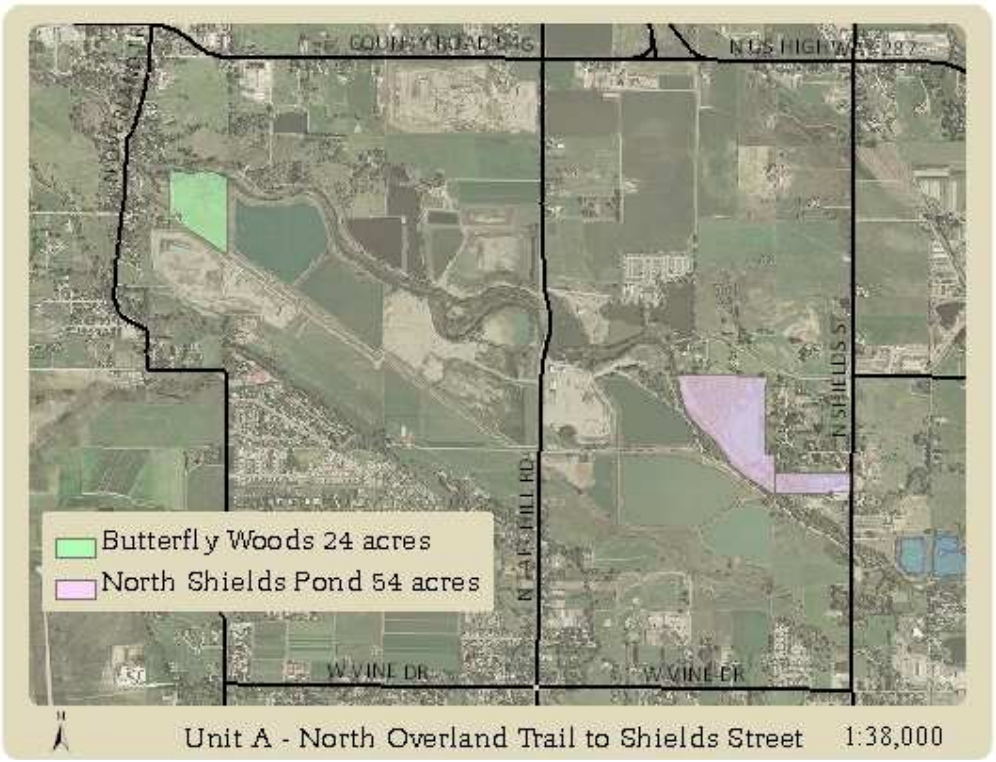
PLANNING UNIT A: BUTTERFLY WOODS AND NORTH SHIELDS PONDS NATURAL AREAS

A. Unit A Management Goals

The primary management goal for Planning Unit A is to conserve and enhance the riparian forests at Butterfly Woods and the west side of North Shields Ponds (formerly called "Sterling Natural Area") and to maintain and enhance the fishing experience at North Shields Ponds. Key issues for the planning unit include restoring groundwater levels at Butterfly Woods which have been lowered due to adjacent gravel mining. Restoration of this water supply is critical to the survival of the remaining cottonwood forests at Butterfly Woods.

The long-term vision for the area includes working collaboratively with adjacent gravel mine owners (south side of Poudre River) and LaFarge North America, Inc. ("LaFarge") on the restoration of gravel mines for the purpose of creating wildlife habitat and improving the natural experience for users along the Poudre River Trail (south side of river).

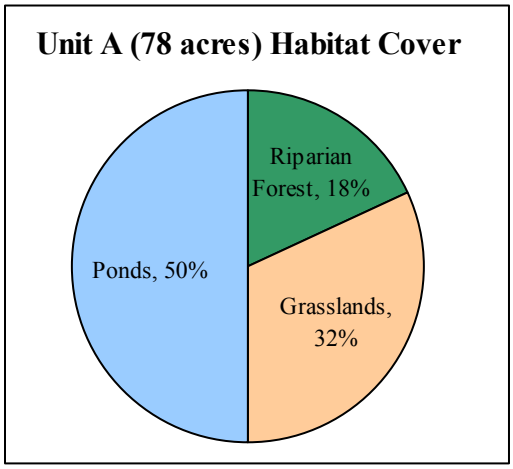
Figure 7.1 Orientation Map



B. Planning Unit A–Site Descriptions

Planning Unit A includes two natural areas located in a semi-rural setting characterized by current and recent gravel mining within the floodplain of the Poudre River. It is within the geographic area of Planning Unit A that the Larimer and Weld Canal draws its water from the Poudre River. This draw represents the most significant diversion structure on the Poudre River (in terms of water volume withdrawn from the river) in proximity to the City of Fort Collins and its downstream natural areas. The withdrawal of flows at this point significantly modifies the ecological conditions for all natural areas located downstream.

Figure 7.2



Planning Unit A, which includes Butterfly Woods and North Shields Ponds (which now includes the former Sterling Natural Area), encompasses 78 acres comprised of 18% riparian forest, 32% floodplain grasslands, and 50% floodplain ponds and associated shoreline vegetation.

Butterfly Woods Natural Area is the most northwestern and upstream City natural area covered by the Poudre River Natural Areas Management Plan. It is located just east of Overland Trail and occupies 24 acres of riverfront on the south bank. Historically the area was used as a small fruit farm which was supported by two adjudicated water rights that are still attached to the property. An abandoned railroad right-of-way (tracks are removed) runs along the southern border of the site and currently serves as the trail bed for the Poudre River Trail.

Ecologically, the site is characterized by a mature cottonwood forest, made up of more than 1,600 trees that extend more than 200 yards from the riverbank. Butterfly Woods is home to one of the few, large acreages of cottonwood forests that has not been impacted by the development of trails. The natural area is so named because two rare butterflies (smoky eyed brown and two-spotted skipper) were identified on the site by Dr. Paul Opler at Colorado State University in 1995. The current status of the butterflies is unknown.

A silver-spangled fritillary warming in the sun by Debbie Russell (not one of the rare butterflies).

Collaborative management with Lafarge on shoreline restoration of existing ponds and restoration planning for gravel mines currently in operation is an important planning goal for this unit. The most significant ongoing management concern is groundwater pumping for ongoing gravel mining adjacent (just to the south) to Butterfly Woods Natural Area. This lowering of the local groundwater may be the primary cause of cottonwood mortality at the site. In 2010 NAP staff recorded 22% of 1,600 trees were dead, a trend that began approximately four years earlier.

North Shields Ponds Natural Area is located on the west side of Shields Street and occupies 53.8 acres. This includes the 43.8 acres formerly called Sterling which has a 100-year lease from the Poudre School District and is managed and maintained by the Natural Areas Program. The legacy of gravel mining is evident by the two gravel ponds and unusually steep riverbanks created to prevent floodwater exchange between the ponds and the river. Aerial photos suggest the ponds came into existence between 1956 and 1969. Previously, the site was open grass with standing trees. By 1969, housing developments north of the eastern pond appeared. West of the eastern pond, an old diversion structure stood where the Josh Ames Irrigation Ditch flowed through the property. The ditch is reported to have been partially filled around 1980. Similarly, area residents report that a spring existed at the west edge of the eastern pond with peak flows two to four feet wide. Presumably, when gravel operations resumed on adjacent property around 1990 the spring was filled with gravel.

Trophy carp pulled out of North Shields Pond

Ecologically, the area supports a narrow band of cottonwood forest, non-native grasslands, and some emergent wetland habitat created by the naturalization of the eastern pond. The northwest corner of the western pond (Sterling Pond) supports a young but vigorous cottonwood forest that was created when the gravel pond was partially filled by the mining company post mining in the mid 1080s. In 2010, the forest was cleared of all invasive Russian olive trees. North Shields Ponds supports significant wildlife use and movement. The two ponds and associated diversity of shallow water habitats support a variety of birds, small mammals, and amphibians. Sterling Pond is unique as it is one of few ponds in the natural areas system that remains free of carp, a non-native fish that destroys habitat and consumes resources important for other aquatic wildlife. As larger wildlife (deer for example) move down the Poudre River corridor this reach (from Overland Trail to Shields Street) provides the last semi-rural habitat before wildlife are challenged by multiple physical barriers and the urban core of downtown Fort Collins.

C. Management Zoning and Visitor Use

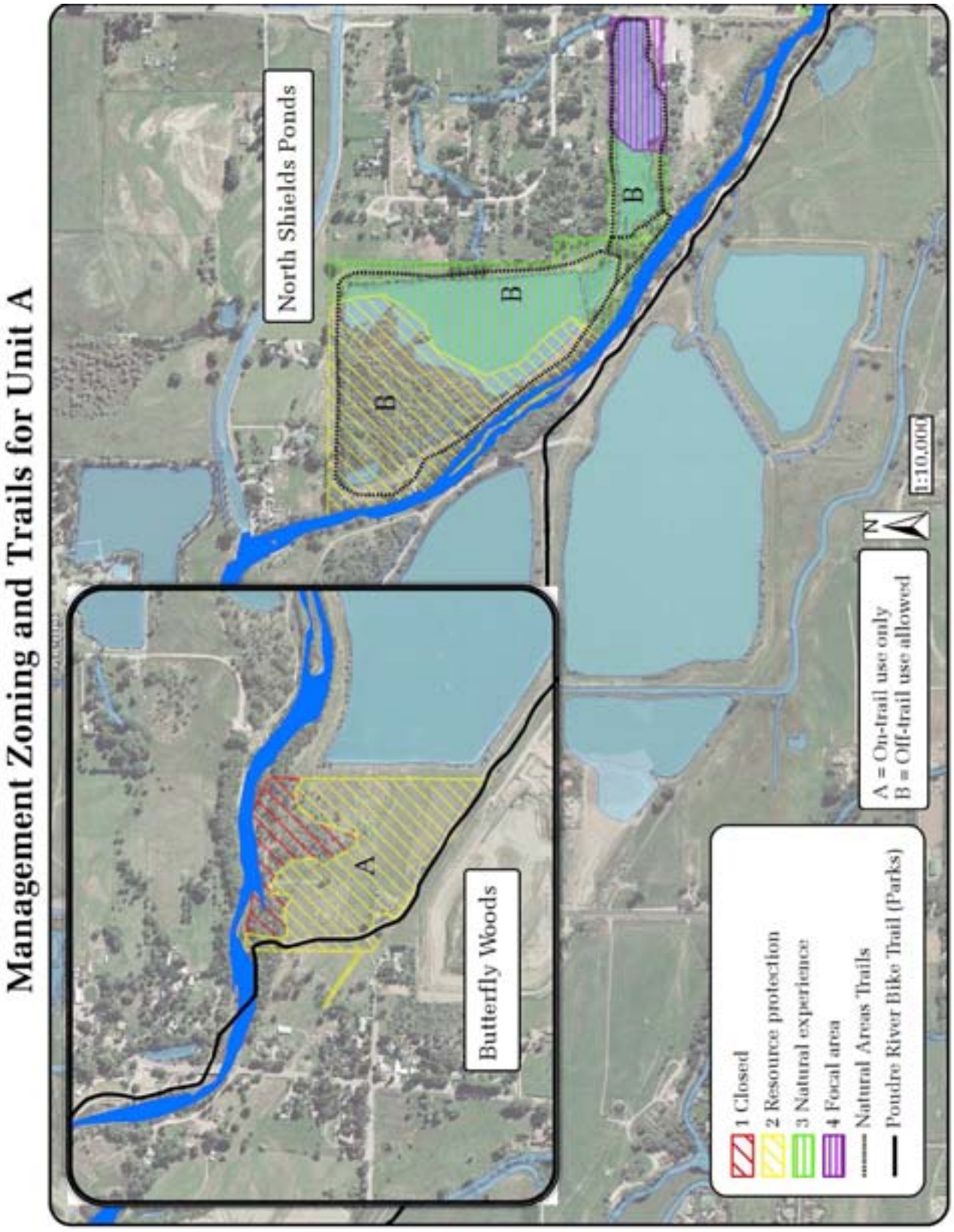
Butterfly Woods Zoning

As with a majority of the river corridor, the paved bike trail along this reach is a tremendous community asset. The bridge at Butterfly Woods may be one of the best locations for visitors to view and reflect on the Poudre River and its ecosystem. The cottonwood forests have management zoning Closed (1) which acknowledges the importance of the riparian forest and its importance to wildlife use. Consistent with that theme, the rest of the natural area is zoned as a Resource Protection (2) area with designated on-trail use.

North Shields Ponds Zoning

All areas of North Shields Ponds are good places for watching wildlife. The western pond offers greater solitude for visitors in contrast to the eastern pond, which is a popular and productive fishing location and excellent place for children to explore nature. For these reasons, the natural area is zoned to reflect a gradient of uses and experiences. Adjacent to Shields Street, the entrance, parking area, picnic shelter, and fishing pier are designated as a high-use or Focal Area (4). As visitors venture further west into the site, they have a more natural and quiet experience with fewer public amenities and higher resource protection. The east shoreline of Sterling Pond is zoned as a Natural Experience (3) area with permitted off-trail use to encourage a variety of fishing experiences for the angler. The riverbank and cottonwood forest on the west edge of Sterling Pond are zoned as Resource Protection (2), yet still designated as off-trail use allowed. If it becomes evident that social trails are developing or shoreline vegetation is being trampled, this could easily become an on-trail only area as the Resource Protection designation implies. Temporary closures to parts of the trail in this area may be necessary during a planned ecological restoration project scheduled for the riverbank between the river and Sterling Pond.

Figure 7.3 Zoning and Trail Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, * Time frame is in years

Site	Who	Time*	Management Actions
Butterfly Woods	RM	1	Work with Lafarge to restore groundwater to pre-mining levels and prevent further mortality of cottonwood trees at Butterfly Woods.
	RM	6 -10	Initiate a new butterfly survey to determine whether increasing the number of butterfly larval host plants is appropriate.
	VS	1	Make additional enforcement efforts to close visitor access within the cottonwood forest.
North Shields Ponds (west/Sterling site)	RM	6-10	Expand riparian forest width, and enhance bird habitat through restoration in the area between the riverbank and the shoreline of Sterling Pond.
	PI/RM	2-5	Redirect natural surface trail through the back/west end of NSP to join the (Sterling side) west trail. West trail will loop around pond and stay on the outside of the cottonwood forest. PI/RM will work to restore abandoned trails.
	PI/RM	6-10	Create hardened fishing access points to help encourage fishing opportunities while reducing impacts associated with trampled vegetation, etc. Attempt restoration plantings around access points to focus use.
	PI	6-10	Work with neighbors to promote the use of fence materials that are wildlife friendly (particularly north and east side of Sterling side).
	VS/PI	On-going	Maintain access closure to Lafarge bridge as bridge in on private land and there is no formal access agreement. In the future, NAP should consider gaining an agreement for public access and building enhancements to support a variety of trail users if City acquires/manages land on south side of the river.
North Shields Ponds (east side)	PI/ED	2-5	Add kiosk near entrance with interpretive sign and possibly a map; update and increase fishing ethics signs as needed.
	PI	1	Add fishing line recycling depository at fishing pier.
	PI	1	Work with CDOW to replace large bass size limit sign with smaller, newer sign.
	PI	6-10	Consider creating a pier/boardwalk along east edge of pond for increased fishing access and to help with visitor access and safety (may not be possible due to floodplain restrictions).
	PI	1	Remove remaining asphalt trail sections on north side of North Shields Pond.
	PI	1	Consider adding parking blocks to parking lot; continue to maintain lot and associated picnic area; vault toilet cannot be installed due to floodplain restrictions.
	RM	6-10	Collaborate with County Search & Rescue and Lafarge on creating a secure yet wildlife friendly fence.
Off-site	PM	2-5	Work cooperatively with Larimer County, Parks, and other collaborators to develop formal parking for river and trail access along Shields Street.
	RM	1-10+	Work collaboratively with Lafarge and the Tri-Districts on restoration efforts to enhance wildlife habitat once mining operations are completed.
	PM	1-10	Collaborate with Parks to improve trail connectivity at Taft Hill Road crossing where the trail is currently on the street.

CHAPTER 8

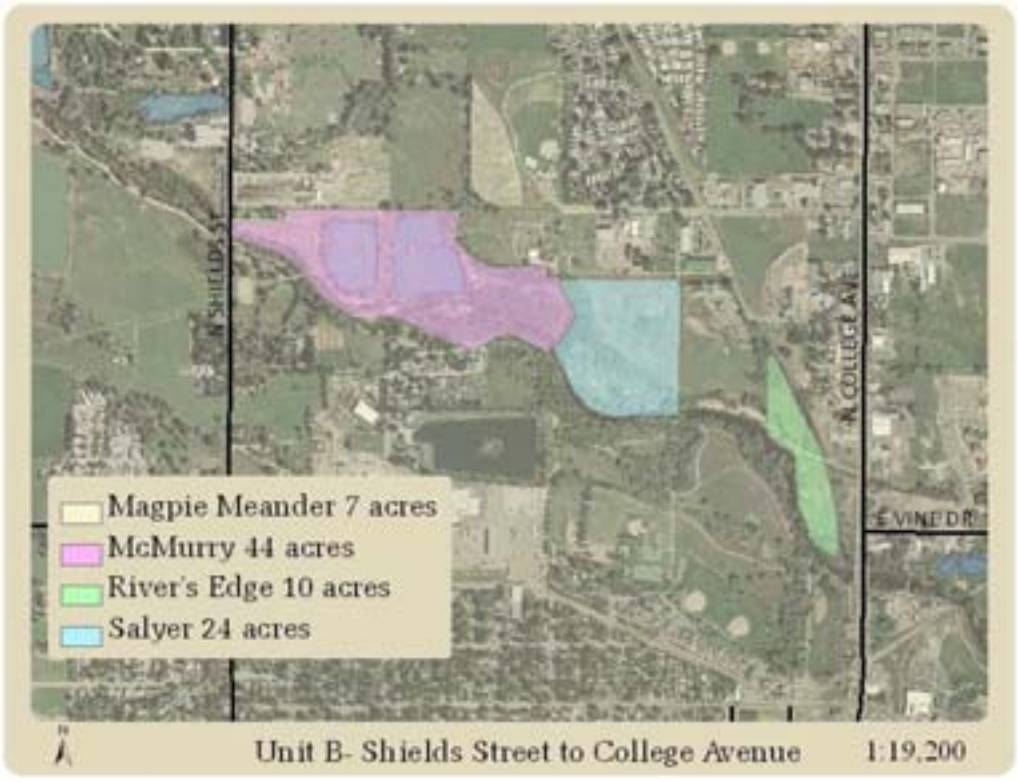
PLANNING UNIT B: MAGPIE MEANDER, MCMURRY, SALYER, AND RIVER'S EDGE NATURAL AREAS

A. Unit B Management Goals

The challenge of maintaining a balance between intense visitor use and conservation of existing ecological values is especially acute in Unit B. Collaborative, inter-departmental planning and creative visitor management are required to conserve ecological values with increasing visitation and subsequent recreation pressure, which in part will be due to the opening of the new Fort Collins Museum of Discovery, and North College Avenue redevelopment plans.

It is the NAP's desire to create directional and wayfinding signage along the river corridor and especially in Planning Unit B, in cooperation with multiple agencies and City departments. The intent is to raise awareness of the public lands and recreational opportunities along the Poudre River and ensure that the public can easily find and access these areas.

Figure 8.1 Orientation Map

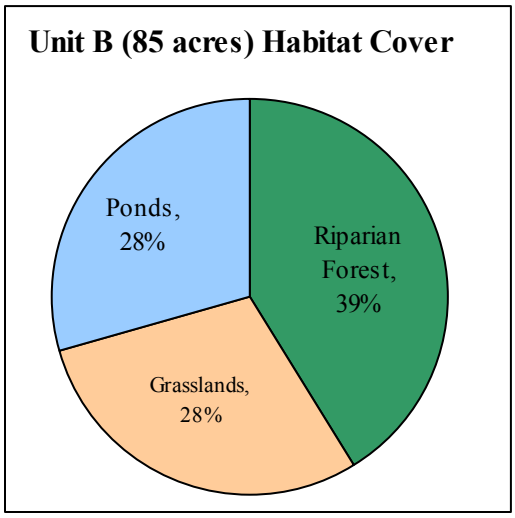


B. Planning Unit B – Site Descriptions

The Poudre River begins its course through Fort Collins' urban center as it enters Planning Unit B. The features of urbanization such as the increased density of roads, buildings, street lighting, and intensive recreational uses have a cumulative impact of fragmenting habitat and modifying wildlife use and behavior.

A range of ecological conditions and habitats exist across this planning unit as characterized by the system's riverbanks and adjacent riparian forests. As the river crosses Shields Street and enters the upper section of McMurry Natural Area, it is confined by steep armored banks that transitions to a wider, shallower, more sinuous channel as it approaches Salyer Natural Area. In this transition area, higher spring runoff can overtop much of the north bank and temporarily flood the adjacent riparian forests. As a result, the central sections of McMurry and Salyer support wider, more extensive and structurally diverse patches of riparian forest in Fort Collins. As the river exits the planning unit through River's Edge Natural Area, the banks steepen and the river once again takes on a more channelized character.

Figure 8.2



Magpie Meander is an "off-river" natural area set on a historic river meander where a high groundwater table supports a forested wetland, stream, and small pond in the southeast corner. Half of the old river oxbow is owned by the City and included in this natural area. The pond hosts an unusually high number of bullfrogs, an invasive species that adversely impacts the health of native amphibian populations.

The four natural areas in planning Unit B (Magpie Meander, McMurry, Salyer, and River's Edge) encompass 85 acres comprised of 39% riparian forest, 28% upland grasslands and 28% is covered by three man-made ponds and associated shoreline vegetation.

Magpie Meander, once known as Hickory Natural Area, is a 7.2-acre urban natural area on the west side of the 17.4-acre Soft Gold Park (formerly known as Hickory Park). The Dry Creek Diversion Channel abuts this natural area and is part of Soft Gold Park. In 2007, a trail easement was acquired across private lands linking Magpie Meander and McMurry natural areas.

McMurry Natural Area is a 43.9-acre site that provides riverfront access on the north and portions of the south banks of the Poudre River. Two floodplain (gravel-mined) ponds dominate the property with McMurry Pond lying just east of Sunfish Pond. Management of the eastern half of the property was transferred from Larimer County to the City's Natural Areas Program in 2004. A popular access location to the natural area and to the Poudre River Trail occurs on North Shields Street. Safety issues are a concern due to the high number of visitors illegally parking along the shoulder of North Shields Street and then walking along the roadway. This is especially acute in the summer. Vehicular traffic and speeds are quite high on this street and there is limited sight distance due to the bridge that takes traffic over the river. Larimer County plans to replace the bridge in 2013–2014. The Natural Areas Program, the Parks Department, and other City departments intend to address these issues when this occurs.

Floodplain ponds within McMurry have benefitted from shoreline restoration that softened steep banks and created emergent wetland habitat between the ponds and uplands. Grassland restoration attempts in this unit have not been successful due to poor soil conditions and drought. Despite this, these early-succession grasslands combined with adjacent wetlands, riparian forests, and ponds create a habitat mosaic that is of relatively high quality given its urban location and high visitation rates.

Blue-eyed darner by Dave Leatherman

Salyer Natural Area is a 24-acre urban natural area named for Dr. and Mrs. Everett Salyer who donated the property in 1985. The site was farmed for many years and was a horse pasture until 1995. The abandoned Josh Ames Ditch runs through the site and still provides a source of water for the vegetation that lines the ditch. Salyer is bordered by Legacy Park on the east and Lee Martinez Park directly across the river to the south. Access to Salyer from the Poudre River Trail is via two bridges that cross the river at the eastern and western edge of the property. The complex of City-owned natural areas and parks, the Poudre River Trail, and the river itself combine to form an important destination for local area residents as well as visitors to Fort Collins.

Within the last 10 years Salyer has undergone significant restoration efforts that have sought to widen the width of the cottonwood forest from the centerline of the river and convert abandoned farm fields from pasture to native grasses.

River's Edge Natural Area is a 9.5-acre urban natural area located on the north bank of the river to the east of Lee Martinez Park extending past Woodlawn Drive to the north, and bounded to the east at the Union Pacific railroad tracks just west of North College Avenue. Formal access to the site is via a loop trail on the parcel north of Woodlawn Drive that reconnects with Legacy Park. Larimer #2 Canal diversion inhibits formal public access to the south parcel of River's Edge. Despite this, some desire has been expressed to locate a trail and bridge from the new Fort Collins Museum across the Poudre River through River's Edge to Legacy Park and adjacent natural areas. As thousands of visitors are expected to visit the new museum, managers are expecting increased visitation pressure on River's Edge and the other natural areas within this planning unit.

Ecologically, River's Edge has been transformed over the past 10 years from a retail site with a parking lot to a diverse native grassland adjacent to a thin band of forest along the river. While the restoration is incomplete, the site is exhibiting strong progress.

C. Management Zoning and Visitor Use

The complex of natural areas and city parks in Unit B is critical to the City's identity, downtown character, and livability. The natural areas in Planning Unit B are the most heavily visited in the river corridor. Visitors routinely participate in a wide range of activities from solitude and nature reflection to socializing with large groups of friends and playing in the water. Walking with family, friends and dogs, fishing, floating the river, kayaking the ponds, picnicking, and nature

exploration are all popular activities. Planning Unit B is also an excellent setting for teaching environmental education and bringing children into the natural environment.

The complex management issues within this planning unit include excessive trash, trampling of the riverbank vegetation, social trails, and insufficient and illegal parking on Shields Street. A majority of these challenges are partly due to the popularity of tubing and swimming in the river, which can contribute to more than 500 visits to the natural areas per day in the summer months. The intense recreation use including the increased popularity of tubing and swimming in combination with the frequent municipal code violations of illegal camping and possession of alcohol in this Unit have warranted an increased level of patrol by Natural Areas rangers. Despite significant progress made through heightened education and enforcement, the constant pressure of first-time visitors to the area call for a sustained effort by rangers and Fort Collins police. Wayfinding challenges are especially evident in this Unit. As indicated in Chapter 4, a branding and signage project for all Poudre River natural areas will be undertaken in conjunction with other land-owning agencies and interests along the Poudre River. From a management perspective, a close collaboration with the City's Parks Department, Museum and other partners will be critical to continue accommodating heavy visitor use, providing safe recreation opportunities, and conserving important habitat.

Most of this planning unit is zoned as a Natural Experience (3), off-trail area because of the strong desire for people to get to the river. However, best management practices warrant careful monitoring of the number and development of river access points being created along the north riverbank (see photo). Creating a number of high-use Focal Areas (4) will help accommodate many users and direct pedestrian traffic to designated river access points. It may become necessary to close some of the informal access points to conserve the grass and shrub habitat along the river.

Informal river access points created by users

Magpie Meander Zoning

Magpie Meander is zoned into three areas with a closed area for conservation/wildlife refuge (existing fenced area), a Focal Area (4) at the pier and kiosk locations, and a Natural Experience (3) area around the pond and trail. Its location next to a park with a picnic shelter, bathrooms, and playground, provides great opportunity to attract children and families to engage in nature interaction at Magpie Meander.

McMurry Zoning

The riparian forest at McMurry is zoned as a Resource Protection (2) zone because of its high conservation value and is consequently an on-trail only area. Designating high-use trails through this riparian area and closing the social trails will maintain its conservation value. Any new unofficial social trails that develop through forested areas will be quickly closed and be enforced.

The trail along the north river bank crosses a stream (see photo) and has become devoid of vegetation through the years due to heavy visitor use. A more sustainable trail option is proposed

to move the trail away from the shoreline to go through the riparian forest and create a proper stream crossing. This would be achieved in conjunction with an effort to revegetate the bare ground in the area of the existing trail. As this is a popular trail location, a significant commitment on behalf of the user to respect the closure will be necessary.

Impacts to shoreline vegetation due to heavy trail use

The Focal Areas (4) at McMurry are a designated "beach" on the north bank of the river where many people congregate in the summer and the parking lot. As with most Focal Areas (4) some enhancements or minor improvements will be considered to enhance the visitor experience and protect adjacent habitat

Salyer Zoning

A Focal Area (4) is zoned on the north shore of the river where groups and families tend to congregate. In the summer, near the bridge at Legacy Park, groups carry in picnic tables and chairs and spend the afternoon picnicking (see photo below). To make this area more attractive and sustainable for families and large-group use, the NAP envisions working with the Parks Department to add amenities such as picnic shelters and bathrooms. However, floodplain regulations may make this a challenging endeavor.

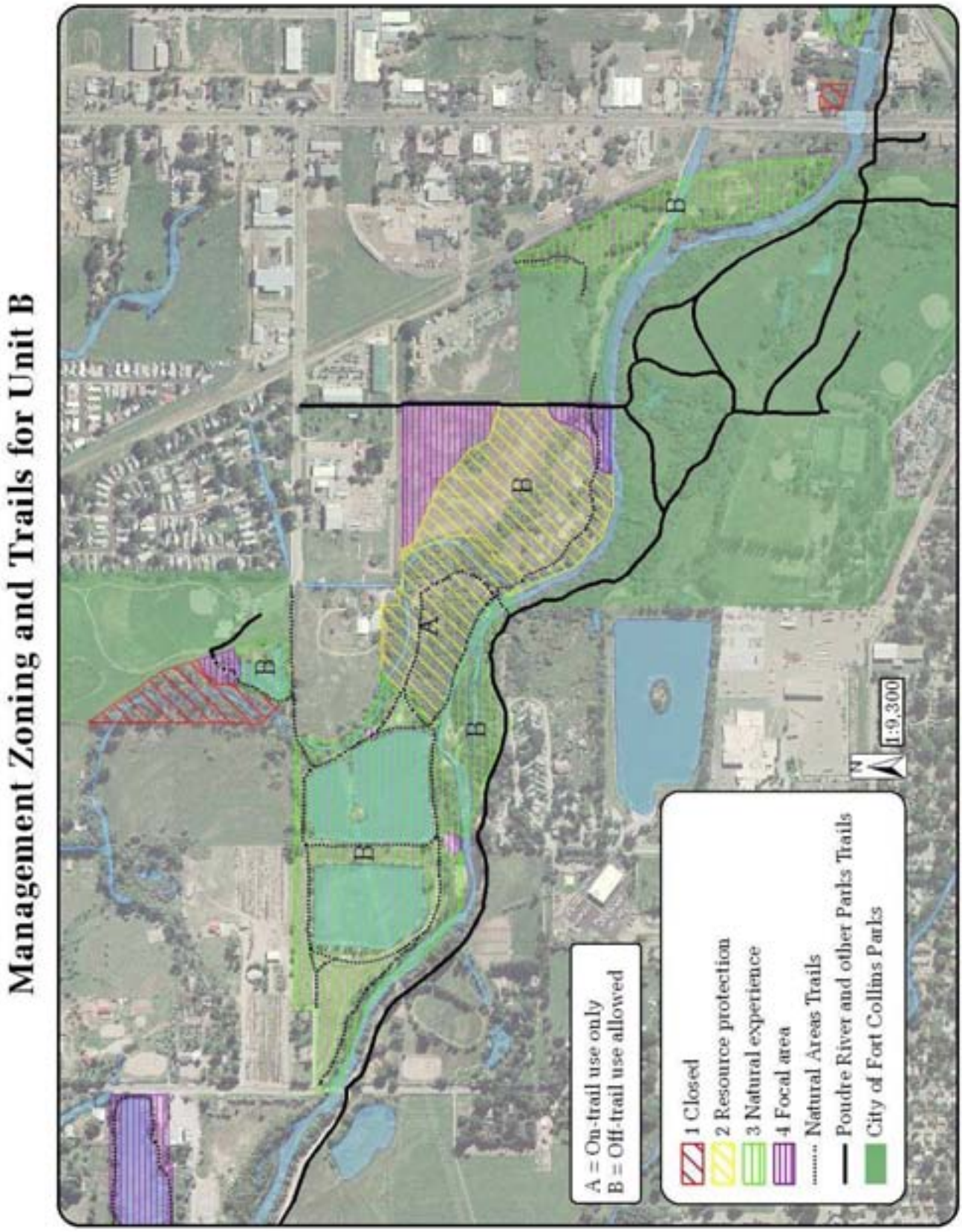
As part of the vision for this unit, the NAP will work with the Parks Department to develop a site plan to provide convenient river access while safeguarding and improving the ecological integrity of the area. For this reason the northeast corner of Salyer is also zoned as a Focal Area (4) in the hope that this area may provide consolidated parking for the natural areas and Legacy Park, and provide access to the Poudre River Trail. If this vision is not implemented, the area will continue to be managed as a Resource Protection (2) area.

Popular picnicking and water play area at Salyer Natural Area

River's Edge Zoning

Formal access into River's Edge is currently limited to the north side of Woodlawn Drive. There is a little visitor use by those seeking a quiet spot along this busy, in-town stretch of river and currently there is not a significant problem with illegal camping. With the new Fort Collins Museum and the redevelopment plans for North College Avenue, a formal pedestrian access may be provided. In anticipation of this, River's Edge is zoned as a Natural Experience (3) zone with off-trail use allowed, complimenting the Museum's Wild Zone, which will encourage nature exploration.

Figure 8.3 Zoning and Trails Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, *Time frame is in years.

Site	Who	Time*	Management Action
Magpie Meander	RM	1	Initiate bullfrog control pilot project
	ED	2-5	Explore demonstration bilingual interpretation
	ED/PI	2-5	Develop wayfinding signs between McMurry and Magpie Meander
McMurry	RM	2-5	Expand existing restoration efforts to naturalize pond shorelines.
	RM	2-5	Work to enhance fishing opportunities at the ponds in-conjunction with restoration projects. May include designating fishing areas to discourage trampling restored wetland banks.
	PM	2-5	Collaborate with Larimer County and Parks on the design and reconstruction of the Shields Street bridge to include pedestrian river access and river crossing, a trailhead parking lot, and other amenities consistent with visitor needs (also see Planning Unit A, North Shields Ponds management actions list, Chapter 7).
	PI	1	Add fishing line recycling depository.
	PI/ED	2-5	Install a kiosk with interpretive sign at parking lot.
	ED	2-5	Designate the beach on site and on maps as focal point high-use area.
McMurry/Salyer	PI/RM	2-5	Develop a designated trail system to improve and/or re-route trails that are not sustainable under current high use (may include closure/rehabilitation of existing social trails and revegetation).
	ED/PI/ VS	2-5	Develop and install directional signage to natural areas from the paved Poudre River Trail.
	VS/PI	2-5	Develop designated river access plan including safe areas for water-based recreation including tubing, playing, nature art, swinging, splashing, etc.
	VS/ED/ PI	2-5	Improve way-finding signs to assist visitors in navigating between Salyer and McMurry and Magpie Meander.
Salyer	All	2-5	Work collaboratively with the Parks Department to develop a comprehensive sustainable plan to consolidate parking, provide improved river access, identify and designate additional picnic and group gathering areas in both Salyer and Legacy Park.
	RM	1-10	Continue to explore riverbank restoration opportunities along portions of Salyer.
	PI/ED	2-5	Install kiosk with interpretive materials at one of the entrances.
River's Edge	ED/PM/ VS	2-5	Improve external wayfinding and pedestrian access from North College Avenue to River's Edge in collaboration with redevelopment expected to occur within 5 years.
	PM/ED/ VS	2-5	Work with Museum and Parks to accommodate increased visitation by museum visitors.

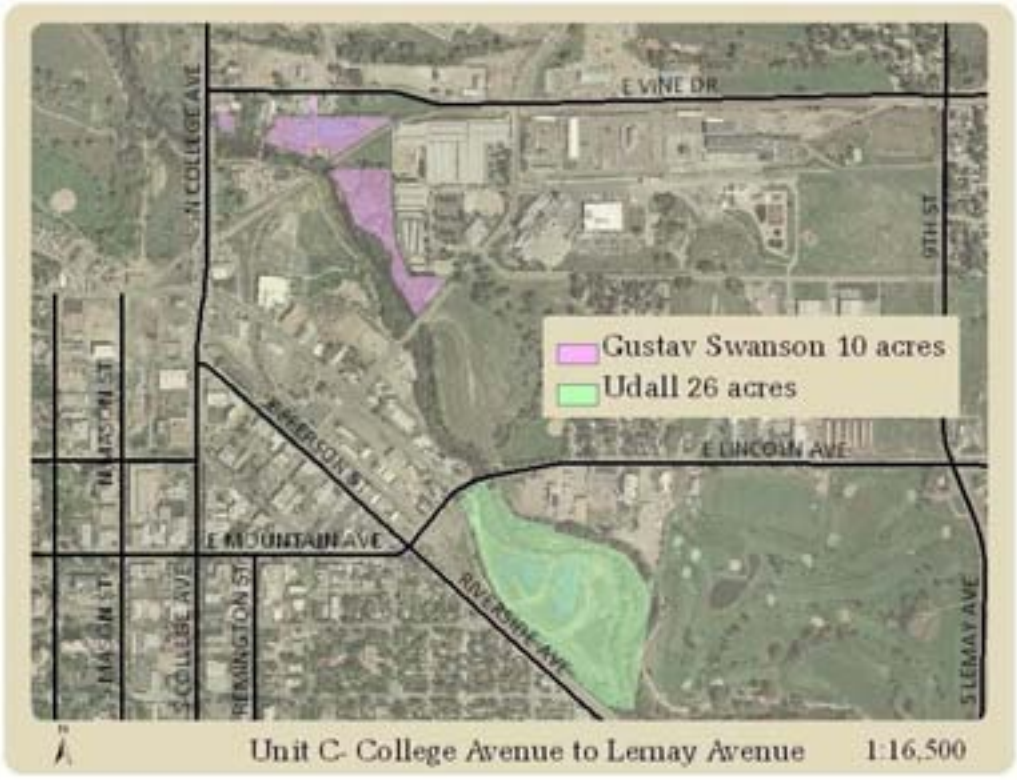
CHAPTER 9

PLANNING UNIT C: GUSTAV SWANSON AND UDALL NATURAL AREAS

A. Primary Management Goals

Management goals for Unit C are to increase opportunities for downtown visitors to enjoy safe and easily accessible natural areas, to protect and enhance high quality bird habitat, and to prevent further barriers to wildlife movement along the Poudre River. Collaboration and partnerships between City departments and other stakeholders will be critical in order to achieve the management goals for this planning unit because a multitude of external factors influence the function and quality of habitat and visitor experiences in these natural areas.

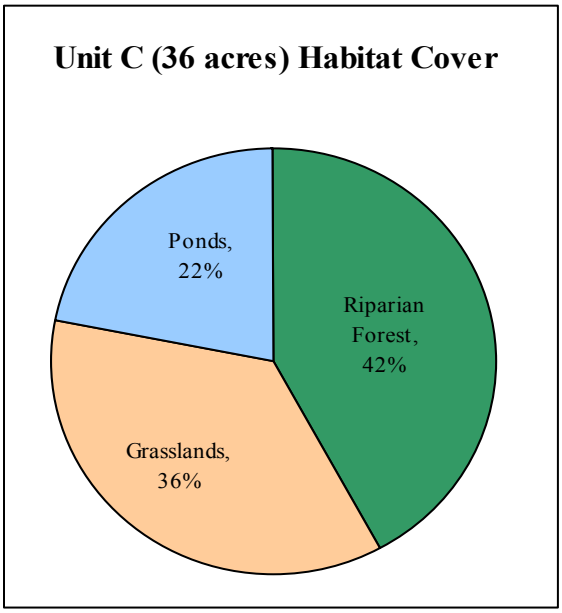
Figure 9.1 Orientation Map



B. Planning Unit C – Site Descriptions

Planning Unit C consists of two natural areas located one-quarter of a mile from each other: Gustav Swanson and Udall natural areas. These sites are north and east of downtown Fort Collins and surrounded by considerable urban development. Consequently, the river and its floodplain is highly altered and influenced by structures including bridges, railroads, and industrial complexes. Likewise, associated riparian forest habitat and wildlife movement reflect the most acute confinement on the river's 12-mile journey through Fort Collins. The riparian forest within most of this reach is limited to a narrow band along the river and regeneration of many native species is minimal. Channelization of the river is extreme between College and Lincoln avenues. Downstream of Lincoln Avenue, the riverbanks are somewhat less confined, allowing limited overbank flooding and development of riparian vegetation at Udall and downstream. This limited habitat, along with significant light and noise pollution and multiple major physical barriers, pose significant challenges for many types of wildlife attempting to live in or move through this river segment.

Figure 9.2



Despite limited property ownership in this reach of the river, the Natural Areas Program is exploring opportunities to partner with other City departments and outside stakeholders to : enhance the downtown economy and culture; provide better access points to the river; provide a location for special events; assist future redevelopment;, help meet stormwater and other urban infrastructure needs; and improve public safety.

The two natural areas in Planning Unit C encompass 36 acres comprised of 42% riparian forest, 36% upland grasslands, and 22% is covered by man-made ponds and associated shoreline vegetation.

Gustav Swanson Natural Area is a 10-acre urban natural area named for Gustav A. Swanson and dedicated on July 31, 1988. Dr. Swanson was a professor of Wildlife Biology at Colorado State University and devoted his life to encouraging people to learn about wildlife and to take action to conserve it. In 1984 Dr. Swanson suffered from an illness that confined him to a wheelchair and he passed away in 1995. Gustav Swanson's trails are wheelchair accessible.

Gustav Swanson Natural Area has a history of recreational use dating back to 1887 when a private company purchased the site along with land to the south and opened it as a public "park and pleasure grounds." They cleared underbrush and installed platforms, a bandstand, seats, and outbuildings. Later the site was used as an archery range, a water treatment plant, and a City dump. The site was identified as a wildlife habitat area in the *Poudre River Trust Land Use Policy Plan for the Downtown River Corridor* (1986). In 1988, a natural area (then called a "nature area") was established on the site as a cooperative project between the City and several community groups (Audubon Society, Colorado Native Plant Society, Poudre River Trust, and

adjacent property owners). Site improvements included an asphalt trail and parking lot, interpretive signs, realignment of a ditch to a more natural configuration, and native plantings.

A small isolated portion of Gustav Swanson (0.4 acres further west along College Avenue) was obtained by the City during land transactions associated with the State of Colorado's reconstruction of the College Avenue Gateway Bridge over the Poudre River. The John G. Coy Ditch runs through the site and through two small on-site ponds. The site surrounds a parcel owned by the Colorado Wyoming Gas Company and is divided by the Burlington Northern Railroad right-of-way.

Willows are planted as part of the Superfund Site restoration in 2005.

Portions of Gustav Swanson Natural Area and the City of Fort Collins Northside Aztlan Community Center to the south were designated a Superfund Site in 2004 by the Environmental Protection Agency (EPA). Historical uses of properties adjacent to these sites included a coal gasification plant, a gas station, a land fill and a petroleum distribution facility. Per an order from EPA, focused removal actions reduced exposure and migration of NAPL (non-aqueous phase liquid) contaminants to the public and river waters. As part of the superfund cleanup, significant site reclamation occurred. Restoration of the riverbed and extensive revegetation with native plants along both banks of the affected river reach was completed to improve overall habitat quality.

Gustav Swanson Natural Area lies one block west of New Belgium Brewery, the City's top tourist destination. Natural Areas Program staff recognizes that Gustav Swanson Natural Area is highly visible to thousands of tourists and residents each year. Management in the next 10 years will strive to welcome newcomers and entice visitors to explore other City natural areas.

Udall Natural Area rests on 26 acres south of Lincoln Avenue and east of Riverside Avenue. The site was named in honor of the late Rob and Dorothy Udall, long-term advocates of the river's natural resources. In 2002 this site was acquired to help protect lands along the river and as a constructed treatment area for stormwater runoff. The site is jointly owned and managed by the Natural Areas Program and the City Stormwater Utility.

There is limited upland buffer between the river and urban development within this reach; however, the ponds at Udall offer an important respite for wildlife. The series of three ponds at Udall were constructed by the Stormwater Utility to improve the quality of stormwater coming from the Old Town Basin before it enters the Poudre River. Debris and pollutants are removed from the water as it flows from one pond to another. The third pond in particular, supports high quality wetland vegetation and a diverse population of wetland birds. The Natural Areas Program

helped fund the Udall Stormwater project by contributing staff and resources to revegetate the wetlands, as well as three-quarters of the purchase price of this natural area.

Wetland planting in third (east) pond at Udall in 2004.

Located in the downtown area, Udall will likely have a high number of visitors when the site opens. Public improvements are scheduled to be constructed in 2011 with an anticipated opening in 2011 or 2012. As future downtown redevelopment occurs along Lincoln Avenue, Willow Street, and Riverside Avenue, Udall Natural Area will likely become a destination for walking, a place for downtown workers to eat an outdoor lunch, or for casual wildlife observation. Udall is an ideal location to educate the public about the treatment of stormwater runoff in a natural setting. That education effort is proposed as part of this management plan and would be in partnership with the City's Stormwater Utility.

C. Management Zoning and Visitor Use

The proximity of Gustav Swanson and Udall to the downtown area makes these natural areas ideal places to enhance visitor access to the river especially as the river becomes a destination and a central theme for ongoing and future redevelopment of the area. Few visitors use this area partly because Udall is not open to the public and river access is limited and not attractive. There are steep banks encrusted with rubble and construction debris. In anticipation of future development in the area, the NAP is collaborating with City planning departments to restore riverbanks, maximize river buffers, and provide additional opportunities for river access both physically and visually. Sidewalks at the entrances to Gustav Swanson and Udall would improve visitor access to these natural areas.

Gustav Swanson Zoning

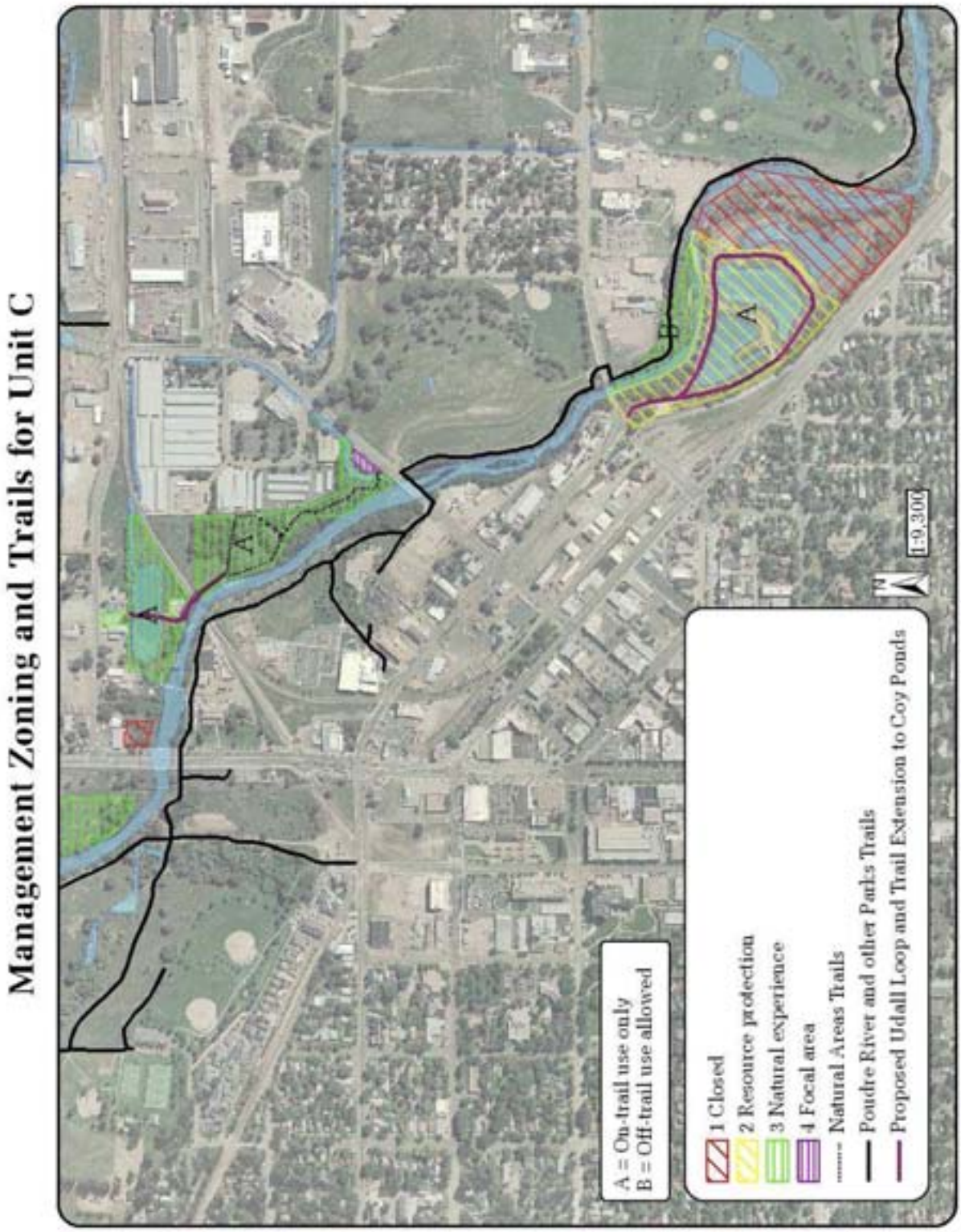
Gustav Swanson is one of the few areas zoned as Natural Experience (3) that designates on-trail use status. This enables the rangers to rigorously enforce illegal camping and improve the real and perceived safety issues in this area. Vegetation management includes frequent mowing to enhance safety and visibility. To provide access in the downtown river corridor area a spur trail north through Gustav Swanson to Vine Street will be constructed.

Udall Zoning

Udall is scheduled to open to the public in 2011 or 2012. At that time, a pedestrian-only loop trail will lead visitors into the site and around the middle ponds. In collaboration with the City's Stormwater Utility interpretive signs and materials will highlight the stormwater filtration function of the ponds and wetlands. As the ponds are not suitable for recreational uses (due to obvious water quality issues), the site is designated an on-trail only site. This designation also

reinforces the area zoned Closed (1) for habitat conservation along the river. Just downstream from Lincoln Avenue, a small portion of Udall on the north and east side of the river is zoned as an off-trail Natural Experience (3) area to provide access to the river from the Poudre River Trail. As part of a proposed restoration project along the steep river bank on the southwest side of the river, a river overlook area, serving as a picnic lunch spot for downtown workers and visitors, will be created.

Figure 9.3 Zoning and Trails Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, *Time frame is in years.

Site	Who	Time*	Management Action
Gustav Swanson	PI	1	Complete parking lot and landscaping improvements at Gustav Swanson consistent with this area being highly visible and a primary entryway to the City.
	PI	1	Replace portable toilet with a vault toilet pending a floodplain permit.
	PM	As needed	Work with Advanced Planning on redevelopment efforts to improve pedestrian access to Gustav Swanson.
	PM	2-5	Work collaboratively with Parks Department to improve connectivity between the Poudre River Trail and this natural area where it crosses Linden Street.
	PI	2-5	Consider developing a designated trail connection from Coy Ponds to Vine Street.
	RM	Ongoing	Maintain the vegetation in a mowed state to improve visibility, discourage illegal camping, and increase safety.
	VS	Ongoing	Continue a high level of ranger patrol to discourage illegal camping and public drinking.
	PI/VS	1	Provide designated river access points for tubing and other water-based recreation near Linden Street and the parking lot.
	ED	2-5	Replace and update all interpretive signs on trails. Consider adding a kiosk at the parking lot.
Udall	RM	2-5	Restore and naturalize right riverbank of the Poudre between the Lincoln Street bridge and the west Udall pond to: increase riparian forest width, enhance in-channel wetlands, remove concrete riprap and replace with stable, buried, natural stone riprap.
	RM	6-10	Remove old automobiles, rubble, and other non-natural materials from the riverbank to improve environmental quality.
	PI	2-5	Construct a river overlook structure to serve as a picnic spot and observation deck in conjunction with the bank restoration effort.
	PI	1	Design and construct a pedestrian-only loop trail, utilizing the existing gravel roads for the trail.
	ED	2-5	Collaborate with the Stormwater Utility to create and install interpretive signs to explain how street runoff water is treated on-site.
	All	2-5	When public improvements are complete open Udall in collaboration with Utilities.
	PM	As needed	Work with City's Advanced Planning Department on redevelopment efforts to improve pedestrian access to Udall.

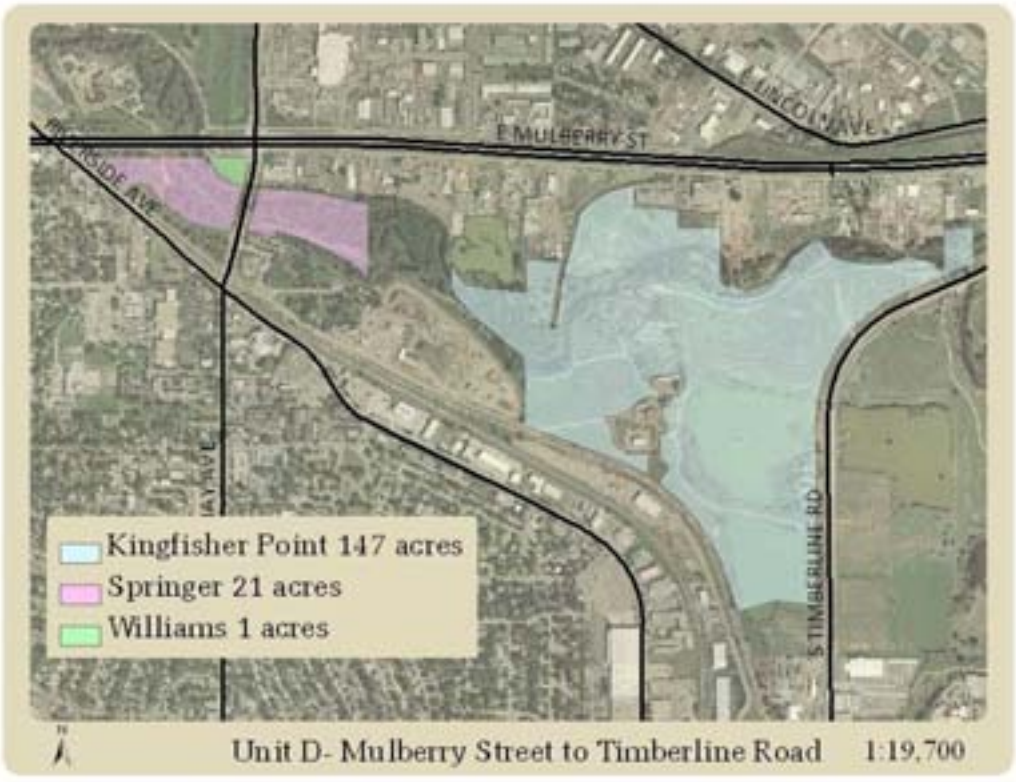
CHAPTER 10

PLANNING UNIT D: SPRINGER, WILLIAMS, AND KINGFISHER POINT NATURAL AREAS

A. Unit D Management Goals

Goals for planning Unit D are to continue to improve the health of the riparian forest, enhance native grassland restoration, and protect American black currant populations. The rural character of this unit is important to preserve as it provides a quieter, more reflective stretch of the Poudre River for visitors. Interpretation of cultural features, providing additional parking and access to the river and the Poudre River Trail are important visitor use objectives for this planning unit.

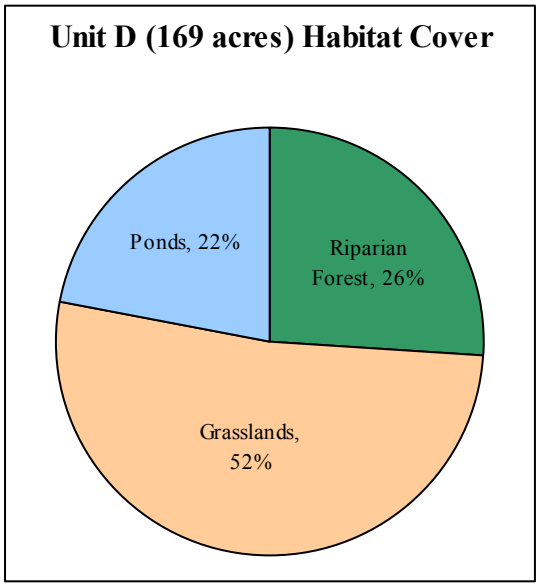
Figure 10.1 Orientation Map



B. Planning Unit D – Site Descriptions

Planning Unit D is situated immediately downstream of downtown Fort Collins. With decreasing urban pressures the acreage of natural areas is higher and the protected river buffer is comparable to that in Planning Unit B. The natural areas in Planning Unit D bear the legacy of gravel mining and urban pressures along with a history of sugar beet processing waste disposal.

Figure 10.2



The three natural areas in Planning Unit D (Springer, Williams, and Kingfisher Point [the area west of Timberline including the former Nix Natural Area]), encompass 169 acres composed of 26% riparian forest, 52% upland grasslands, and 22% by two man-made ponds and associated shoreline vegetation.

At the upstream end of planning Unit D, a fluvial terrace (a natural landform) limits the extent of the floodplain on the south side of the river while land use and development limits natural floodplain processes on the north bank. Nevertheless, throughout this river reach there are pockets of wider riparian forest due to graduated bank topography and considerably less bank armoring than the highly urbanized reaches upstream. These pockets allow the riparian forest to be more closely connected to river flows. There are higher frequencies of overbank flooding and shallower groundwater levels in these sections. Consequently in Unit D, successful regeneration of native species is intermixed with the most competitive non-native trees. A special feature in the floodplain of Unit D just downstream of Springer is a spring-fed off-channel wetland located at the base of a terrace.

The physical and geologic context in this unit means the riparian forest here has the greatest potential to change–for better or for worse. A reduction in natural processes and lack of non-native tree removal could result in a drastic narrowing of the forest, loss of native species, and decrease in structural diversity. Active management, protection of existing riverine processes, and proactive control of non-natives could result in a reach of the river with high quality riparian forests that contain the full spectrum of native plant species and structural diversity necessary to support a broad spectrum of habitat niches.

Springer Natural Area is jointly managed by the Natural Areas Program and City of Fort Collins Stormwater Utility. This 20.7-acre natural area was donated by Springer-Fisher, Inc. in 1990 and named for Harold Fisher's mother. The property is notable for the presence of a population of American black currant which is an imperiled plant species in Colorado. Springer Natural Area also provides nesting and migratory habitat for a variety of songbirds and secluded river habitat for waterfowl and wading birds.

The site contains a major storm sewer outfall from the Old Town Stormwater Basin and, in addition to simply conveying stormwater flows, acts to detain and remove nutrients and particulate matter from the water prior to its release into the river. The Platte River Power Authority holds a right-of-way easement to maintain power lines and clear vegetation from underneath the lines. This right to clear vegetation is especially problematic to NAP's effort to protect and promote the American black currant population.

American black currant

In 2013 the Colorado Department of Transportation (CDOT) plans to install a new bridge over the Poudre River on Mulberry. The City's Parks Planning Department is working with CDOT to relocate the Mulberry pedestrian bridge to just south of Lemay Avenue, which would allow for a major trail realignment to make the trail much more user friendly.

Williams Natural Area is a 1.4-acre urban natural area located at the southwest corner of Mulberry Street and Lemay Avenue. The site was donated to the City by Jack Williams in 1990. The large billboard that appears to be on the natural area is located on a small parcel of privately-owned land retained by the Harold Fisher estate.

Wildlife use of the site is limited due to its size, location at the intersection of two four-lane streets, and its open non-native grassland habitat. The site is important for the Poudre River Trail, scenic views, and it provides a buffer to Springer Natural Area which has high wildlife habitat value.

Kingfisher Point Natural Area is one of the larger natural areas along the Poudre River within the developed area of Fort Collins. At 146.9 acres, this site encompasses the former Bignall property, the former Nix Natural Area, former Kingfisher Point Natural Area west of Timberline Road, and a former parcel of Riverbend Ponds Natural Area located on the north side of the river just west of Timberline Road. As discussed in Chapter 5, the natural areas in this vicinity were reorganized and renamed based on geography instead of acquisition boundaries.

Kingfisher Point is named for the belted kingfisher, which is commonly seen along the river.

Much of Kingfisher Point was used for gravel mining and by sugar beet industry in the early 20th century. Beginning in the 1930s, this area was used as a disposal area for lime sludge, a byproduct of sugar beet processing. As a result, much of the area has lime "soil" deposits ranging from six to eleven feet in depth and becomes problematic in restoration efforts. Two ditches, the Arthur and Emigh Lateral, run through the site (of which the City owns 25 and 13 water shares, respectively).

The historic Nix farmhouse was remodeled in 2002 and now serves as the main office of the Natural Areas Program.

The former Nix Natural Area portion of Kingfisher Point is an historic farmstead at the east end of Hoffman Mill Road. At the time of acquisition three structures stood on the property: two houses and a barn (all historically significant). In 2002, the interior of the main house was converted to office space while maintaining its historic character and now serves as the Natural Areas Program's main office. Also in 2002, a new maintenance facility was constructed just south of the farmhouse and serves as a shop and houses the facility maintenance operations. In 2007, the exterior of the historic barn was restored and major structural improvements were made to stabilize and straighten the structure. At the same time, a three-sided loafing shed was added adjacent to the barn to house the program's farm equipment. Grants from the Colorado Historical Society helped to fund improvements to both the barn and the small farmhouse, which is currently used for office storage. The Nix offices are home to more than 20 full-time employees and dozens of seasonal staff and volunteers. The offices and facilities at Nix operate every day (at some level) except Thanksgiving and Christmas.

Adjacent to the Nix offices on the north side of the Poudre Trail is 6.1-acre portion of the site, formerly known as "Bignall," which sits high above the river. When it was purchased the site contained an old home in poor condition which had been leased by a local naturalist as office space for a few years in the 1990s and later used as a police dog training facility by the Fort Collins Police Department. In 2002, the home and outbuildings were removed and the site was restored.

The grasslands at Kingfisher Point are undergoing successful restoration from pastures of non-native grasses and weeds to the native perennials visible today. Restoration has been challenging due to the soil lime deposits. Nevertheless, the efforts are succeeding as native grasses have become dominant.

Weed-free hay grown from restored lime-deposit fields

From the landscape perspective the two floodplain ponds at Kingfisher Point (west of Timberline Road) represent the beginning of a large complex of wetlands and open water (from this planning unit and downstream) of high value to resident and migrating waterfowl and other waterbirds.

One vision for this unit includes a trail connection from the south side of the river and the Poudre River Trail to the north side of Kingfisher Point and future protected lands (north of the river between the river and Mulberry Street). If this vision is achieved it is likely to evolve after the life of this management plan (10 years).

C. Management Zoning and Visitor Use

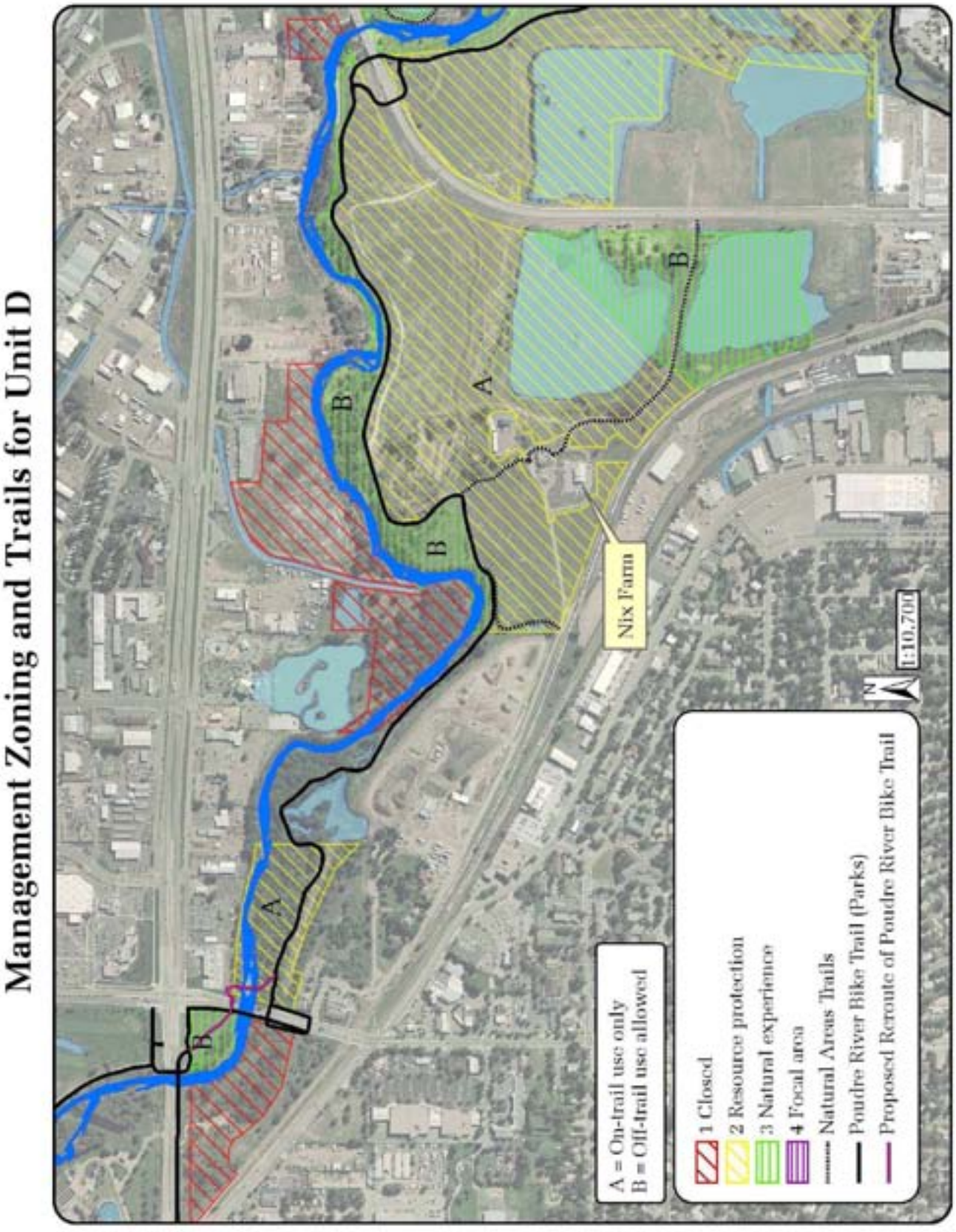
The Poudre River Trail from Mulberry Street borders Williams Natural Area and winds through Springer Natural Area east of Lemay Avenue, travels past seep wetlands on private land, and then opens to Kingfisher Point. The majority of visitors in Unit D remain on the paved trail; some wander through the riparian forest, visit the sugar beet flume, or fish from the banks of the Poudre River.

The area of Springer Natural Area located west of Lemay Avenue does not have public access and is zoned as Closed (1) for conservation of American black currant populations. The trail connection over the Lemay Avenue bridge is confusing and uncomfortable for some users because of the narrow sidewalk located immediately adjacent to the busy street. The City's Parks Planning Department is working to realign the trail with a future pedestrian crossing through Springer on the east side of Lemay Avenue, which will make the trail in this area much more user friendly. This area of Springer will be zoned as Resource Protection (2) and require users to remain on-trail. This zoning designation is also intended to assist the Natural Areas rangers with enforcement of illegal camping which is historically a problem in the area.

The cottonwood forest area at Kingfisher Point is interwoven with several social trails that are used by visitors to access the river. Zoning for this area will be designated as an off-trail Natural Experience (3) zone to allow this use to continue. The grasslands located south of the bike trail will be designated as an on-trail Resource Protection (2) zone to ensure the success of on-going grassland restorations. Portions of the shorelines on the two ponds at Kingfisher Point will remain an off-trail Natural Experience (3) zone to facilitate continued fishing access (see map). In contrast, the areas north of the river are zoned Closed (1) because of the existing lack of access.

Cyclists along the Poudre River Trail at Kingfisher Point

Figure 10.3 Zoning and Trails Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, *Time frame is in years.

Site	Who	Time*	Management Action
Springer	PM	2-5	Collaborate with Park Planning Department on the trail and bridge realignment near Lemay Avenue, which will assist with trail connectivity and take users off of the busy street sidewalk.
	ED	2-5	When Parks completes the trail re-route and new bridge, explore using these as opportunities for education about natural processes of river ecosystems.
	RM	2-5	Collaborate with Parks Planning Department on the restoration efforts following installation of new pedestrian bridge.
	PI	1	Work with Parks on improving Poudre River Trail wayfinding at Lemay.
	RM	Ongoing	Collaborate with Platte River Power Authority on management of vegetation under power line right-of-way in the rare plant habitat.
	RM	Vol.	Treat the weedy areas west of Lemay and clean up trash.
	ED	2-5	Update "Tale of Two Berries" interpretive sign.
Kingfisher Point	PI	2-5	Add trail wayfinding signage on the Poudre River Trail and at the Nix office building to help visitors find the Kingfisher Point parking lot off Timberline Road.
	EDU/PI	2-5	Design and install an interpretive sign at sugar beat flume along the Poudre River Trail.
	PI	1	Investigate the possibility of creating a formal parking lot for Poudre River Trail access along the west side of Timberline Road, just south of the bridge.
	PI	2-5	If a parking lot is possible near Timberline bridge, locate visitor amenities at new parking lot including a vault toilet and possibly a bike air pump.
	PI	1	Add fishing line recycling depository.
	PI/VS	1	Improve the stewardship of sugar beet flume cultural feature through graffiti removal, regulatory signage, and enforcement attention.
	PI	1	Investigate adaptive reuse of the beet flume bridge as a pedestrian bridge.
	PI	1	Clean up west bank of southwest pond and expand fishing access.
	RM	2-5	Promote native herbaceous plants between the river and the Poudre River Trail and investigate options for smooth brome control.
	RM	Ongoing	Continue grassland restoration on lime soils both north and south of river.

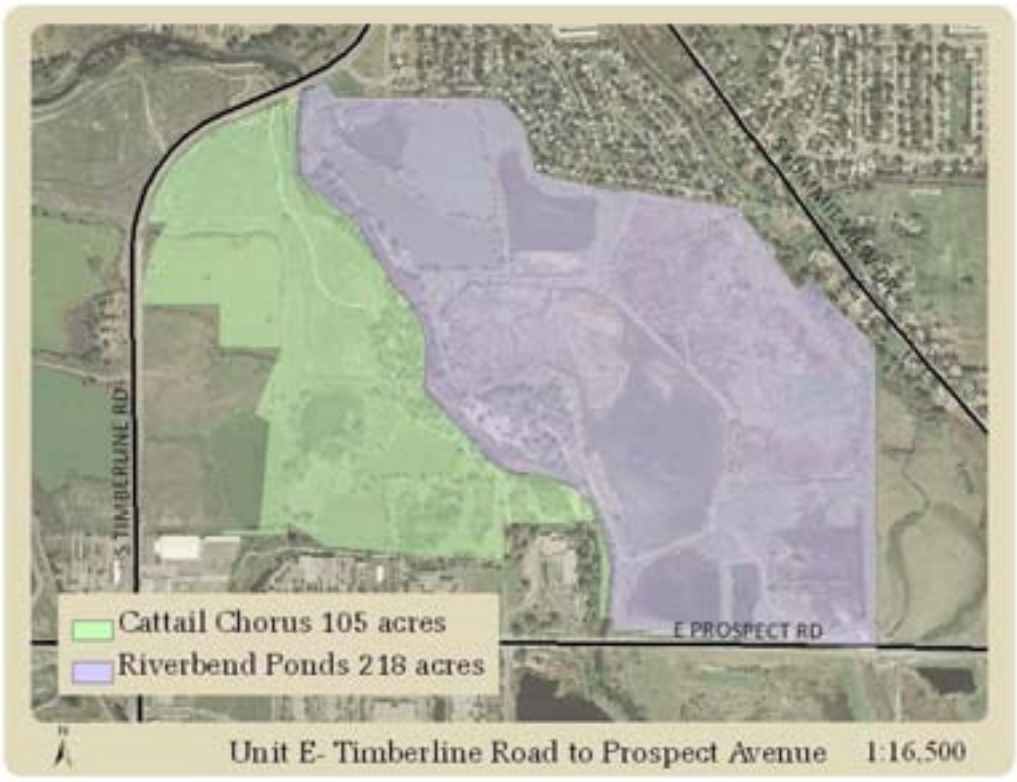
CHAPTER 11

PLANNING UNIT E: RIVERBEND PONDS AND CATTAIL CHORUS NATURAL AREAS

A. Unit E Management Goals

Management goals for Unit E focus on continuing to providing ample fishing opportunities at Riverbend Ponds, conserving cottonwood forests, and restoring grasslands at Cattail Chorus. Improved visitor access, parking, and directional signage to the Poudre River Trail from the north parking lot at Riverbend Ponds are planned for this unit.

Figure 11.1 Orientation Map

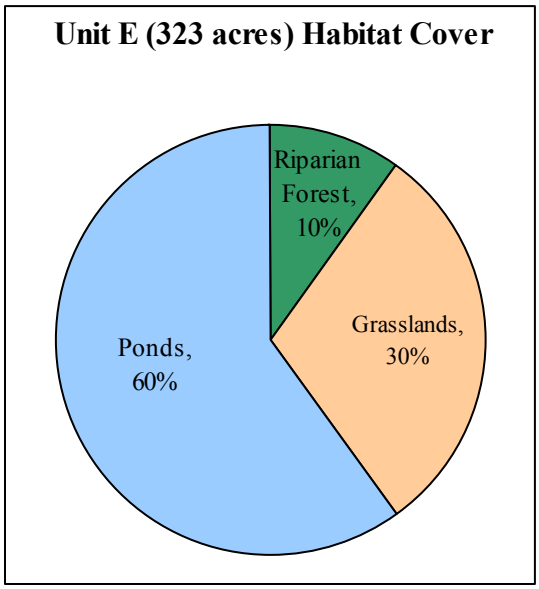


B. Planning Unit E – Site Descriptions

Riverbend Ponds and Cattail Chorus are the two natural areas that comprise Planning Unit E. The sites are divided by the Poudre River; together, the two sites encompass 323 acres composed of 10% riparian forest, 30% grasslands, and 60% floodplain ponds and associated shoreline vegetation.

Planning Unit E is located at the upstream end of a large section of broad undeveloped floodplain. The Poudre River corridor through this unit has experienced little development other than gravel mining and recreational improvements. As seen in Units B and D, the river banks are confined (through bank protection and hardening) in the upper and lowermost reaches (visible from the bridges at Timberline Road and Prospect Road, respectively). The middle section is less confined and lends itself to more natural processes including natural and gradual bank topography, relatively extensive overbank flooding, and a greater possibility for sediment transport. The riparian forest reflects these physical parameters in that it is a narrow forest on the ends of the reach and broader and more diverse in the central portion.

Figure 11.2



Riverbend Ponds, situated on the north side of the river, has five large ponds, several of which have undergone successful shoreline restoration that has improved the quality of the wetlands. On the south side of the river at Cattail Chorus lies open fields, two large ponds, a mature cottonwood forest, and six small ponds. Spring Creek drains into the Poudre River via the ponds at Cattail Chorus. This large, contiguous matrix of diverse habitat types supports a wealth of resident and migratory birds. There is strong potential for native amphibians to thrive here; however, data is lacking. In contrast to the expansive grasslands in the western section of Cattail Chorus, the grasslands throughout Riverbend Ponds are generally limited to narrow berms separating the ponds. Most of the uplands are covered with non-native grasses and pose a significant restoration challenge because of shallow soils, steep slopes, and a poor native seed bank.

Riverbend Ponds is a 218.4-acre natural area that offers a diversity of visitor experiences with its' diverse habitats and ample access. It is bounded by private lands on the north and east, the Poudre River on the west and Prospect Road on the south. Three parking lots provide access to Riverbend Ponds Natural Area. The site is also accessible via the Poudre River Trail by crossing the Timberline Bridge and along East Prospect Road.

The seven ponds on the site were created during gravel mining from the early 1950s to the mid-1970s. The *Strategy for Gravel Lands Along the Poudre Rive*r (Anderson & Company, 1998) identifies the eastern portion of the large pond (known during mining as Prospect North Pit) is an excellent example of "mined valley reclamation". This reclamation hydrologically links the

gravels mines together to create a unified landscape with varied hydrologic conditions and corresponding diversity of plant and wildlife habitat. This site is a popular fishing area and is stocked by the Colorado Division of Wildlife with warmwater sport fishes such as largemouth bass, crappie, and channel catfish. Birders also enjoy Riverbend Ponds–over 200 species of birds have been recorded on this site over the last 25 years. Riverbend Ponds has flat trails with several loop options and varied habitat which appeal to many hikers and dog-walkers as return visitors. Riverbend has undergone intensive removal of Russian olive which has dramatically improved the habitat quality for native wildlife. This work and other restoration efforts offer unique opportunities to affect positive ecological change due to this large, contiguous swath of the river corridor under ownership of the Natural Areas Program. This natural area includes the river's edge floodplain ponds and surrounding uplands making it easier to plan and affect positive change in contrast to the patchwork of land ownership that prevails through other planning units (especially through the downtown corridor).

Great blue heron, often seen in the Poudre River and ponds, by Theo Bauder

Lastly, Riverbend Ponds may be considered a case study in collaborative management success for a number of reasons. Foremost is the 2006 "L-path" project, which was a complex, joint effort between multiple City departments wherein funding was combined to meet diverse goals including shoreline restoration (Natural Areas Program), flood prevention for the adjacent neighborhood (Stormwater), and floodplain control to minimize flood-caused damage to East Prospect Road (Transportation).

Cattail Chorus at 104.7 acres extends from Timberline Road south of the Poudre River to the Spring Creek Trail. The original Cattail Chorus site was acquired in 1997 with the help of a grant from Great Outdoors Colorado (GOCO). NAP staff has identified the former portion of Kingfisher Point (located east of Timberline Road) as an area that warranted consolidation into Cattail Chorus based on habitat contiguity and shared property lines (see Figure 11.1). In addition, the former portion of Riverbend Ponds south of the Poudre River has been added to Cattail Chorus. The site is accessible via the Poudre River Trail on the east side and from the Spring Creek Trail on the south and southeast sides. The site is frequented by employees of neighboring businesses during the lunch hour.

The site contains diverse habitats for a variety of songbirds, waterfowl, and wading birds throughout the year. A unique winter night roost for great blue herons exists on the edge of one of the small ponds near the confluence of the Poudre River and Spring Creek. The original property of Cattail Chorus hosts "naturalized" gravel ponds and cottonwood forests that support abundant wildlife. The new section of Cattail Chorus (formerly Kingfisher Point) is represented

by portions of two un-reclaimed gravel ponds and two grassland fields with underlying lime deposits that are being restored.

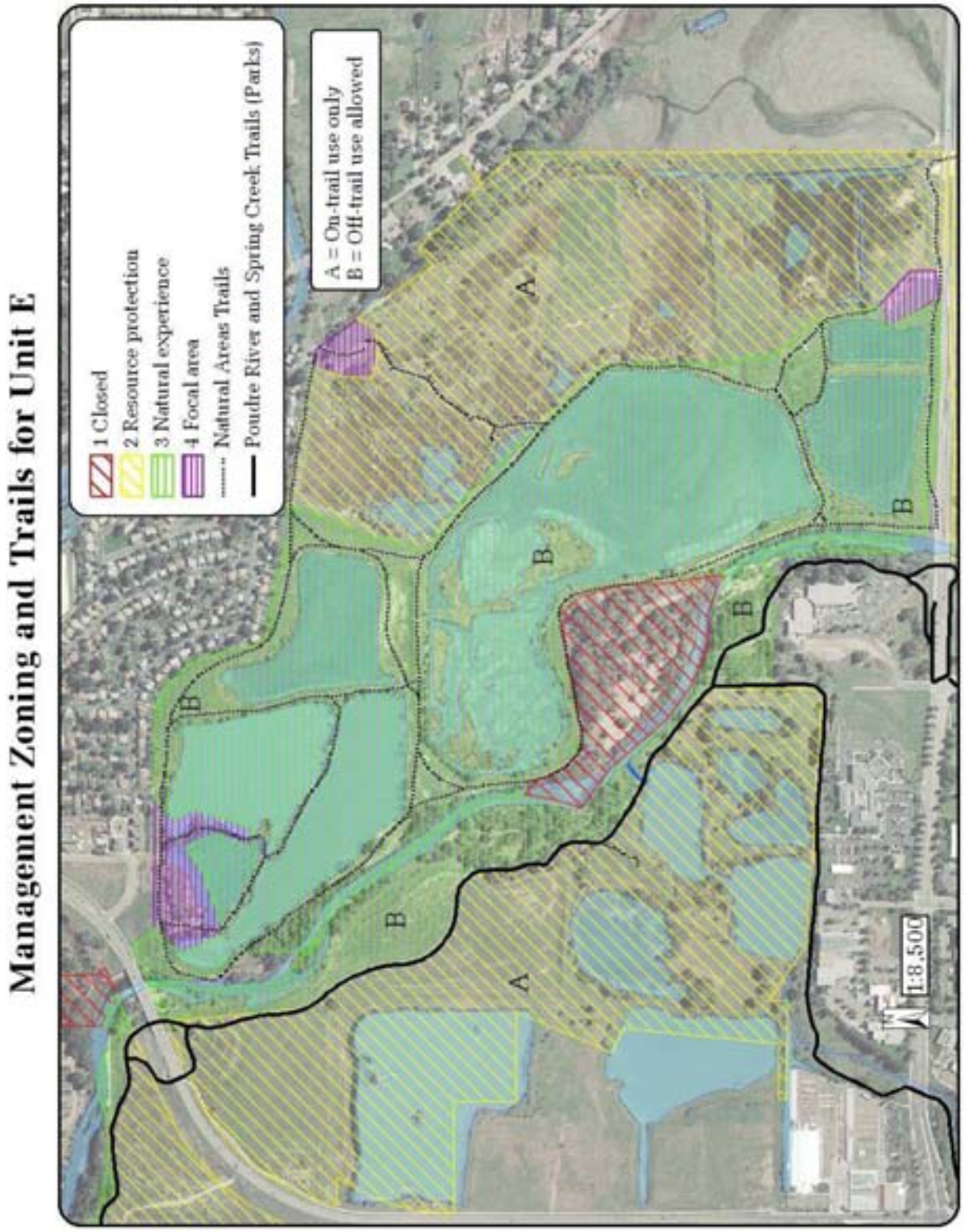
C. Management Zoning and Visitor Use

Fishing, wildlife observation, nature play for children, dog walking, and exercising are all common activities at Riverbend Ponds fostered by an infrastructure that includes level trails, narrow winding paths, a boardwalk, foot bridges, benches, a fishing pier, and a self-guided nature walk. A short walk into the property allows the visitor to enjoy a quiet reflective experience with ample opportunities for wildlife observation. Riverbend Ponds has less than 200 visits per day, which is much quieter than downtown sites in Unit B, but still well visited. The sites within the planning unit also attract a great diversity of wildlife and rare species.

To maintain the balance between public use and wildlife/habitat conservation, this site is designated with a full spectrum of zoning. Zoning around all ponds at Riverbend Ponds is designated as off-trail, Natural Experience (3) areas to support a focus on fishing at this site. The wetland area on the east side of Riverbend Ponds is designated as an on-trail Resource Protection (2) zone to serve as a wildlife refuge area. Similarly, a small, relatively undisturbed cottonwood forest area along the river is zoned Closed (1) for wildlife refuge and conservation and is the only section within the planning unit that is a new closure. Three Focal Areas (4) are designated at parking lot trailheads with wayfinding and access improvements to the Poudre River Trail planned for the north lot off Timberline Road.

Visitor use on the southwest side of the river through Cattail Chorus is centered on the paved Poudre River and Spring Creek trails used by commuters and recreationists alike. The Spring Creek Trail joins the Poudre River Trail near the southeast corner of Cattail Chorus. Areas west of the Poudre River Trail including the ponds and pond shorelines are designated as on-trail Resource Protection (2) zones to promote wildlife conservation and use on the ponds and in the interests of providing a buffer to the heron rookery. Likewise, this designation will discourage visitor travel over areas where grassland restoration is on-going. The small spur trail off the Poudre River Trail to a lookout point on Cattail Chorus recently has been used as the beginnings of a shortcut through the natural area. As this area is zoned for Resource Protection (2), Ranger staff will monitor the situation and consider closing (and enforcing the closure) if the use continues. Finally, the trail going southeast along the river is zoned for off-trail Natural Experience (3) use such that the public may access the river for fishing and other river enjoyment.

Figure 11.3 Zoning and Trails Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, *Time frame is in years.

Site	Who	Time*	Management Actions
All	RM	6-10	Solicit amphibian research for all sites in unit.
Cattail Chorus	ED	6-10	Update interpretive sign at Cattail Chorus.
	PI	1	Pursue working with the adjacent office complexes to provide at least a dozen existing parking spaces to be available to the public to provide better access to the trail and natural areas.
	ED	2-5	If successful with the additional parking, add these to Natural Areas Map.
	PI	1	Collaborate with the Museum and the City's Historic Preservation staff to document the cultural features from the sugar beet processing lime waste disposal in the area.
	PI/VS	1	Close northwest pond along Timberline Road to fishing.
	RM	1	Conduct a bullfrog control pilot project at Cattail Chorus in the interest of conserving native amphibians and natural pond vegetation.
	RM	1	Consider carp control strategies for some of the ponds at Cattail Chorus.
Riverbend Ponds	ED	2-5	Continue to include interpretive signs about trash being dangerous to wildlife and fishing ethics.
	ED	2-5	Update self-guided tour.
	PI	1	Extend the trail near north parking lot at Riverbend Ponds to sidewalk and add signage to help visitors find the Poudre River Trail.
	PI	1	Add fishing line recycling depositories.
	PI	2-5	Add pavement for better ADA access at north parking lot from vault toilet to kiosk and possibly to the fishing pier.
	PI/RM	2-5	Evaluate fishing access to ponds where current pressure is extremely high.
	RM	2-5	Install shrub and tree plantings in areas along river where Siberian elms were removed.
	RM	On-going	Continue aggressive vegetation management to ensure the success of restoration efforts made in 2006 and discourage the reinvasion of non-native grasses to the area.
	RM	2-5	Consider enhancing the naturalization process of the southernmost ponds adjacent to Prospect Road.
	RM	2-5	Evaluate forested point bars and assess forest composition for selective thinning to promote multi-aged, structurally diverse forests.

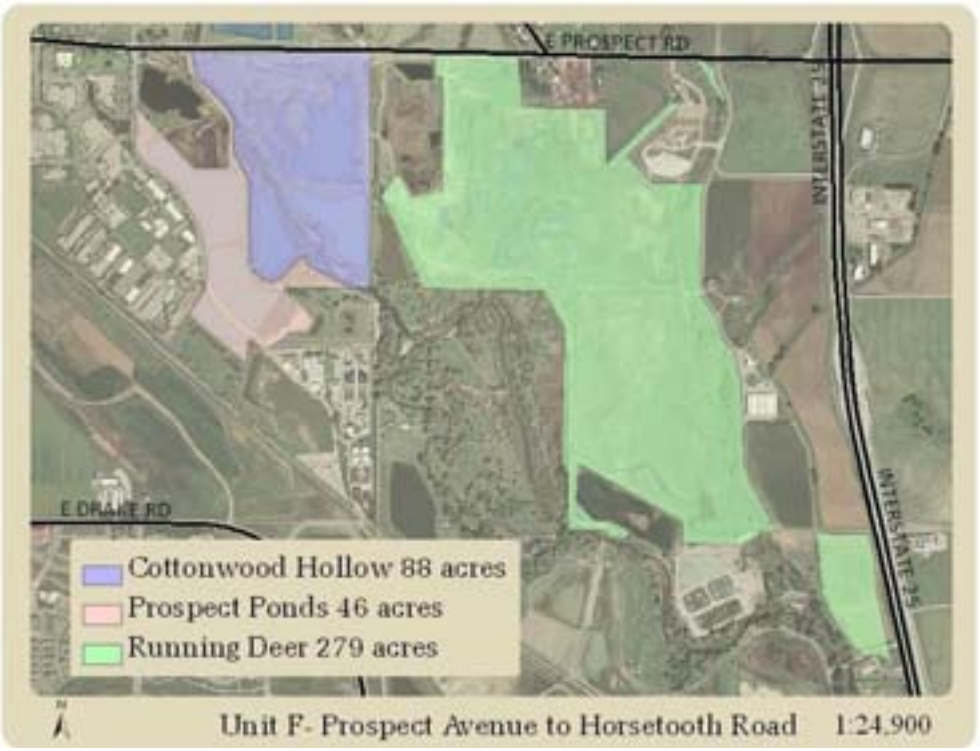
CHAPTER 12

PLANNING UNIT F: PROSPECT PONDS, COTTONWOOD HOLLOW, AND RUNNING DEER

A. Unit F Management Goals

Unit F represents the resilience of nature. The three sites in Unit F were farms and feedlots and all were mined for gravel and yet nature is prevailing and with lots of help from restoration efforts this area now has some of the most intact habitat within the urban setting of Fort Collins. Management efforts will continue to focus on maintaining quality wildlife habitat, restoring vast areas covered with non-native vegetation and on the reestablishment of natural ecological processes. Visitor and ecological management success will depend on long term commitments to collaborative planning and implementation efforts with other agencies and City departments. CSU's Environmental Learning Center and the Natural Areas Program share many overlapping goals including opportunities to strengthen partnerships centered on natural resource conservation and environmental education. The Colorado Welcome Center on the east side of Unit F includes an interstate highway rest area and the strong potential to showcase the Natural Areas Program and the Poudre River natural areas to visitors.

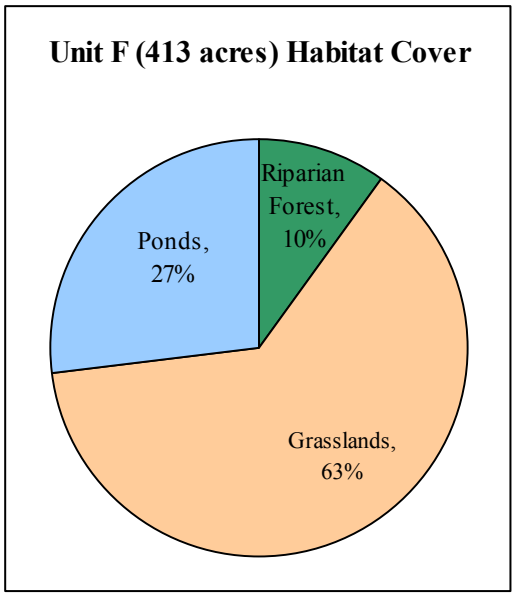
Figure 12.1Orientation Map



B. Planning Unit F – Site Descriptions

Planning Unit F includes three natural areas south of Prospect Road, all formerly mined for gravel. They add to the relatively large and contiguous matrix of diverse habitat types of natural areas north of East Prospect Road in Units D and E.

Figure 12.2



The three natural areas (Prospect Ponds, Cottonwood Hollow, and Running Deer) in Unit F total 413 acres and consist of 10% riparian forests, 63% upland grasslands, and 27% ponds and associated shoreline wetlands. The ten man-made ponds located in Unit F provide a combination of open water and shoreline wetlands that support a diverse assemblage of avian species including osprey, bald eagle, American bittern, marsh wren, yellow-headed blackbird, sora, pied-billed grebe, double-crested cormorant, American white pelican, black-crowned night-heron, Virginia rail, and common yellowthroat.

Overall, Unit F is an area with great potential to further improve wildlife habitat through additional restoration. Extensive restoration work at Running Deer will include Russian olive removal, regrading of steep berms and conversion of non-native grasslands to native cover. Opportunities also exist to help to enhance wildlife habitat in the adjacent 212 acres of the Environmental Learning Center (ELC) owned and managed by Colorado State University. While most of this large property lies to the south of the natural areas, one section of the ELC extends north to Prospect Road, dividing Cottonwood Hollow and Running Deer. The ELC has one of the largest patches of riparian forest including young cottonwoods, which are missing from much of the rest of the Poudre River Corridor. However, non-native plants, including Russian olives, are also persistent throughout the ELC and are currently receiving little management attention.

With the exception of Prospect Ponds, visitor opportunities are limited to only hiking and on-trail use only in Unit F. These regulations help conserve large habitat patches and will ultimately improve this habitat and opportunities for wildlife observation. A well designed trail system in Unit F and across the ELC is an important focus of this plan update. The proximity to I-25, Prospect Road and the State Welcome Center makes this unit a valuable gateway for the City.

Prospect Ponds Natural Area is a 46.5 acre site located on the western edge of Planning Unit F. The site is jointly owned and managed by the Natural Areas Program and City of Fort Collins Water Reclamation Utility. The site includes the original 35.1 acres of Prospect Ponds Natural Area (owned by Water Reclamation) and additional acreage of riverbank and riparian area west and south of the Poudre River, which formerly was part of Cottonwood Hollow Natural Area. The majority of the site is in the Poudre River floodway.

Prospect Ponds Natural Area includes three gravel-mined ponds. The two largest ponds are used extensively for fishing. The northernmost pond Merganser Pond receives a high nitrogen effluent

from the adjacent cattle feedlot to the north. Both of these ponds have periodic algal blooms and winter fish kills. Skunk Pond, to the south of the entrance road leading to the south parking lot receives low fishing use. Shoreline wetland vegetation is generally lacking on the ponds but could be improved through restoration efforts. The Poudre River, which borders the eastern edge of this natural area, is channelized and contains water diversion structures.

The paved Poudre River Trail runs along the west and south sides of Merganser and Catfish ponds. A natural surface trail exists on the north and east sides of these two ponds, completing the access around both ponds. Two parking lots serve Prospect Ponds and the Poudre River Trail. The paved north lot along Sharp Point Drive is maintained by the Parks Department and the gravel south lot at the end of Sharp Point Drive (adjacent to the Drake Water Reclamation Facility) is maintained by the NAP. Adjacent to the south parking lot are the Water Reclamation Utility's demonstration wastewater treatment wetlands constructed in 1995 to study the feasibility of using wetlands for denitrification and removal of metals.

Osprey platforms have had successful nesting pairs in both Units E and F.

Cottonwood Hollow Natural Area is an 88-acre site located directly across the Poudre River from Prospect Ponds. About 75% of the site consisted of cottonwood forest from at least 1937 through 1950 as indicated by aerial photos. The site was farmed in the early 1950s and was used as a feedlot beginning the 1960s until it was gravel mined in the early 1990s. Anheuser-Busch and Boxelder Sanitation District have wastewater lines near the ditch on the east side of Cottonwood Hollow.

Today, Cottonwood Hollow consists primarily of three gravel ponds. The northern pond was restored in the mid-1990s through a cooperative effort of the U.S. Fish and Wildlife Service, City of Fort Collins, Colorado State University, and Western Mobile, resulting in a pond with extensive wetland and shoreline vegetation. Wildlife and habitat management within and near the ponds is and will continue to be a management priority. Fishing is not allowed at Cottonwood Hollow; however, excellent wildlife viewing opportunities are found along the trail system. The National Association for Interpretation awarded the interpretive and education features at Cottonwood Hollow Natural Area first place in the Wayside Exhibits category at their 2001 national conference.

Access to the site is from the east via the Running Deer parking lot by way of either the paved sidewalk trail along Prospect Road or the natural surface trail through a portion of the ELC. Cottonwood Hollow is connected to Riverbend Ponds Natural Area via the Prospect Road Trail/Sidewalk underpass which goes under Prospect Road and which also provides a safe wildlife crossing particularly at night and the Poudre River Trail.

Running Deer Natural Area is located within the Boxelder Creek watershed and the creek itself runs along the eastern edge of the property. Running Deer was purchased in four parcels between1998–2007 and totals 279.4 acres. The property immediately adjacent to the Colorado Welcome Center has the potential to serve as one of the City's gateways to the Poudre River and its natural areas. Nearby, Hageman Earth Cycle leases 16 acres of Running Deer for their yard waste recycling and landscape materials retail sales facility. Most of Running Deer has been gravel mined and a portion of the site was part of the City's Resource Recovery Farm and used for sludge waste deposition on agricultural fields. The southeastern section of Running Deer was recently mined for gravel and is the site of a cooperative restoration project between NAP and the gravel mining company Lafarge North America, Inc.

Legacy Land Trust holds a conservation easement on 69 acres of Running Deer Natural Area. This portion of the site received Poudre-Big Thompson Legacy GOCO funding for land acquisition. The conservation easement allows restoration, natural surface trail construction, and signage.

Russian olive removal in progress at Running Deer Natural Area

The network of smaller ponds and associated wet soils on Running Deer has made the site ideal for Russian olive establishment. NAP has been actively removing Russian olives from the site for several years. Non-native vegetation is also prevalent in the uplands. Restoration is very challenging due to high levels of site disturbance from past land activities, thin soils, poor native seed bank, and steep slopes.

C. Management Zoning and Visitor Use

There is easy access to Prospect Ponds and the Poudre River Trail from the two parking lots. It is a popular site for fishing and lunchtime walkers from the many businesses to west of the natural area that line the south side of Prospect Road. This site is an off-trail Natural Experience (3) zone allowing for focused fishing to continue. For the lunchtime use, a Focal Area (4) zone is designated for a small area between the two central ponds that include plans to replace and enhance the picnic area. Liberty Commons Elementary School located nearby to Prospect Ponds is particularly well situated for teachers and students to use the area as for nature study.

Fire tower platform to refurbish for trail-spur destination lookout point at Running Deer

The natural areas located across the river on the east side will be managed to conserve large habitat patches, improve habitat and provide opportunities for wildlife observation. With this

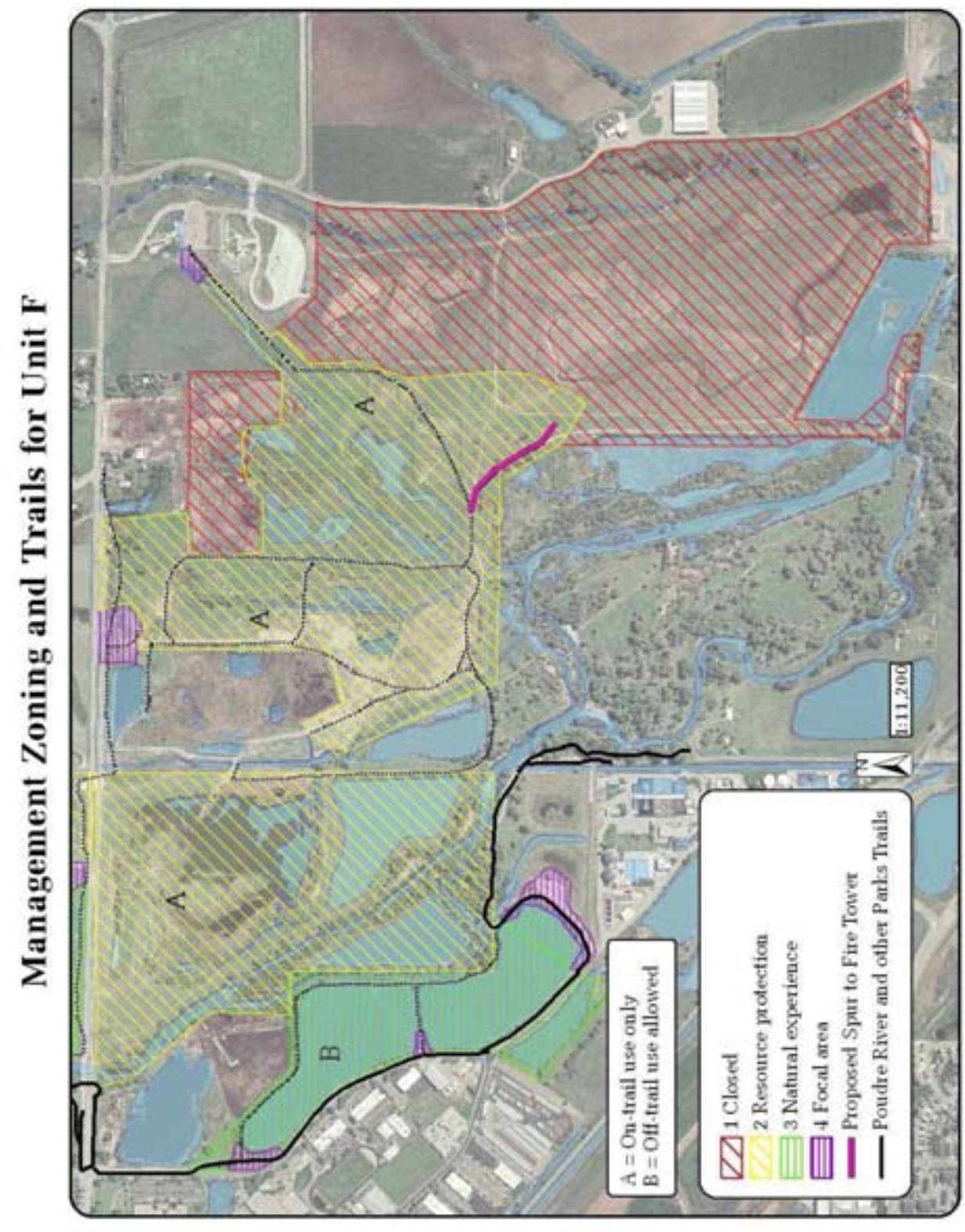
conservation objective in mind, Cottonwood Hollow and Running Deer natural areas, along with CSU's Environmental Learning Center are not open to fishing, biking, dog walking or equestrians. The exception is the paved pedestrian path that parallels Prospect Road. The Poudre River Trail and Riverbend Ponds just north of Prospect Road are open to all these uses. This limited use designation creates a balance with intensely used natural areas along the Poudre River.

All of Cottonwood Hollow and approximately half of Running Deer are zoned as Resource Protection (2) areas with on-trail status. There is an extensive trail network and several old roads from previous gravel mining operations. As the restorations progress at Running Deer, trails and roads will be consolidated and realigned to be compatible with resource conservation goals and provide a rewarding visitor experience. One exciting opportunity is to refurbish a historic fire tower platform and locate it at a destination point overlooking the Poudre River and a large grassland restoration area in the southeast corner of Running Deer. This restoration area is zoned as Closed (1) to conserve this area as a wildlife refuge. The area is also within the one-half mile buffer zone for a bald eagle nest just off the property. A loop trail is closed seasonally to protect the ospreys nesting on Running Deer. The other Closed (1) area at Running Deer is for lands leased to Hageman's Earth Cycle.

Kiosk at Colorado Visitor Center entrance to be enhanced

There are two Focal Areas (4); one around the parking lot and the other at the trail head at the Colorado Welcome Center. This latter entrance has been identified as an opportunity to welcome highway travelers and Colorado visitors to the Fort Collins network of natural areas. The hope is to encourage a stay or return visit to Fort Collins to explore the city and its natural areas. Several management actions will help improve the trailhead, kiosks, and layout of the rest stop.

Figure 12.3 Zoning and Trails Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, *Time frame is in years.

Site	Who	Time*	Management Actions
Cottonwood Hollow	ED	1	Update map on kiosk sign.
	PI/VS	1	Close social trails to protect wildlife resources; on-trail only site.
	VS	On-going	Continue to enforce no fishing to protect wildlife use.
	RM	6-10	Continue to manage all ponds for native fish consistent with water quality limitations and consider carp removal.
Prospect Ponds	ED	2-5	Work with neighboring Liberty Commons Elementary School to connect children to nature at Prospect Ponds.
	ED	2-5	Explore outreach and education opportunities with neighboring industries and employees that use the site for their lunch breaks.
	PI	1	Add fishing line recycling depository.
	PI	1	Assess the need for more hardened access for fishing such as a pier, dock, and steps.
	PI	1	Assess trail and pond access of northern and middle ponds as higher-use areas which could encourage children from neighboring school to use these areas.
	PI	1	Replace and maintain the picnic tables between the two main ponds.
	PI	1	Improve the condition at the south parking lot to make it more welcoming.
	PI/VS	On-going	Continue to work with the Pond Hockey Club to ensure adherence to established agreements related to ice skating on the southwest end of Merganser Pond.
Running Deer	ED	2-5	Pursue a relationship with Welcome Center staff and volunteers to provide yearly training about the Natural Areas Program.
	ED	2-5	Design permanent panels for the Welcome Center and Running Deer kiosks. Topic could include river ecology, gravel mining and restoration of gravel ponds.
	LM	1-10	Work collaboratively with Colorado State University as development plans progress for the Resource Recovery Farm area to ensure access is maintained to Running Deer.
	RM	1-10	Collaborate with City Utilities and the ELC to maintain a braided river channel, river movement, and cottonwood regeneration.
	RM	2-5	Continue restoring grasslands and wetlands on the gravel mined area including a potential volunteer work project to plant cottonwoods and willows along the unnamed stream (in collaboration with Lafarge).
	RM	6-10	Consider restoration projects along Boxelder Creek (in conjunction with the Boxelder Sanitation District and City Stormwater Utility).

Site	Who	Time*	Management Actions
Running Deer	RM	6-10	Close and revegetate roads as they become unnecessary (check access easements to sewer lines and manholes).
	RM	2-5	Remove Russian olives and Siberian elms. Use prescribed burns to restore vegetation. Re-grade with heavy machinery to soften the steep shoreline slopes and possibly create wetlands.
	RM	1-10	Consider the prairie gentian plant and native amphibian habitat needs during restoration planning.
	RM	2-5	Consider a one-time carp fishing derby.
	RM	1	Look into removing all wire fencing.around the mining permit area.
	PI	1	Consolidate trails by closing the nonessential connector trails.
	PI/ED	2-5	Work with NAP education staff, the ELC, and rangers to develop internal wayfinding signage.
	PI	2-5	Refurbish and relocate ELC's fire tower platform as a wildlife viewing structure and build associated trail spur.
	RM	1	Remove the wildlife viewing bunker built by ELC volunteers and its associated spur trail due to non-use and its inappropriate location.
	PI	2-5	Create a more welcoming entrance from the Colorado Visitor Center by improving the trail, kiosk, signage, and landscaping (in coordination with ELC).
	PM	On-going	Continue to have a presence on Boxelder Storm Water Authority Task Force.
	PM	1	Formalize working relationship with ELC through an Inter-governmental Agreement with CSU to address issues including: 1) the City donating the non-adjacent land on east side of Welcome Center parking lot that has the ELC's interpretive loop trail to the ELC; 2) City takes over management of the ELC land north and east of the Poudre River's east fork (trails, signs, vegetation, ranger patrol).
	VS	On-going	Coordinate with Colorado State Patrol to heighten enforcement at the rest stop parking area in the interest of keeping the area safe and welcoming.

CHAPTER 13

PLANNING UNIT G: ARAPAHO BEND NATURAL AREA

A. Unit G Management Goals

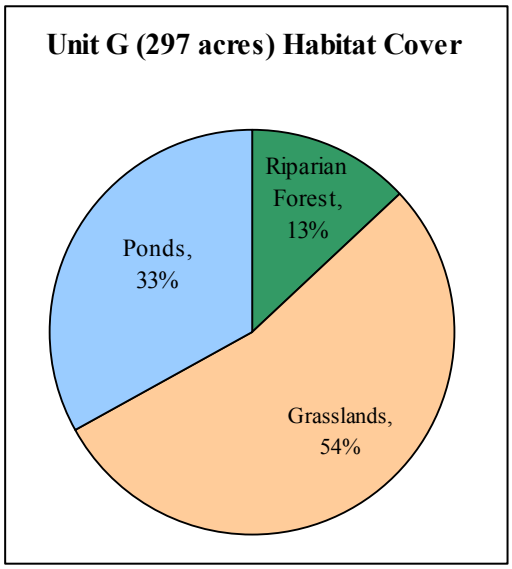
The management goals for Unit G are to maintain or improve current ecological conditions through riparian and upland restoration, to focus visitor use, and to improve public amenities by developing a designated trail system and centralizing and improving parking access. Participation in collaborative projects, such as the extension of the Poudre River Bike Trail through Arapaho Bend will be an important focus for Unit G.

Figure 13.1 Orientation Map to Unit G

B. Planning Unit G – Site Description

Planning Unit G is the easternmost planning unit and the last Poudre River natural area before the river leaves the Fort Collins area. Arapaho Bend is the only natural area in Planning Unit G, and is 297 acres located north of Harmony Road, extending from west of Strauss Cabin Road to east of Interstate 25. The site is comprised of 13% riparian forest, 54% upland grasslands, and 33% is covered by man-made ponds and associated shoreline vegetation.

Figure 13.2



Unit G is similar to Units E and F in that it is relatively large and provides a diverse matrix of uplands, ponds, wetlands, and riparian forest. While there is a relatively low density of urban development surrounding the property, adjacent gravel mining and being adjacent to I-25, Harmony Road, and the Transit Center add stresses on the habitat and the visitor experience. The Poudre River crosses I-25 at Arapaho Bend and the effect the interstate has on wildlife movement through this passage is not well understood. Also not well understood is the affect continuous and high noise levels may have on wildlife in this natural area.

The establishment of riparian habitats along western rivers and the vegetation composition within those habitats are a direct result of lack of confinement of the river channel. Arapaho Bend is the only planning unit in the urban reach where the Poudre River has some ability to move laterally and has relatively little armoring directly in the river channel. Natural processes such as overbank flooding, river scour, and sediment deposition can play a larger role in determining forest composition than in more restricted reaches. Naturally-occurring wetland seeps are also found in this reach and support a habitat type entirely unique to the Poudre River natural areas arid region.

Arapaho Bend is the largest City natural area within the Poudre River corridor at 297 acres. The 88 acres of ponds west of I-25 provide excellent fishing access and shoreline habitat. The site is valuable not only for its natural resources and recreation opportunities, but also as a scenic entryway into the City of Fort Collins. Because of its visibility from both I-25 and Harmony Road, this natural area site was highly valued for billboard advertising. At one time there were eight billboards on the property; however, by 2005 all billboards had been removed as required by the purchase agreement.

Arapaho Bend has three parking lots: the north lot at the east end of Horsetooth Road at the entrance to Larimer County's Strauss Cabin Open Space (site closed; arson fire destroyed cabin in 1999); a middle lot nearly halfway between Horsetooth Road and Harmony Road; and the third lot at the City of Fort Collins Harmony Transportation Transfer Station. Closing the north lot and expanding the middle lot is proposed in this management plan.

A significant change is coming for visitors to Arapaho Bend when the Poudre River Bike Trail is extended through the natural area and eventually links up with the towns of Timnath and

Windsor and the City of Greeley. The construction of this regional trail segment is likely 5-10 years away, but planning is underway with City Parks Department, Timnath, private landowners, and Larimer County.

Future opportunities may exist for additional conservation efforts as adjacent gravel mining operations are completed and the sites are reclaimed. Finally, additional collaboration may occur with upstream landowners on management issues with the Strauss Cabin (owned by Larimer County), privately owned lands to the north and west , and the Archery Range (managed by the Parks Department).

C. Management Zoning

Arapaho Bend supports many recreation opportunities including: fishing, canoeing and kayaking, horseback riding, wildlife watching, hiking and running. Current visitor use is low in comparison to other natural areas, but the habitat is highly fragmented because of the unplanned network of social trails. The Natural Areas Program's goal is to minimize fragmentation by designing a clearly marked trail system and a future centralized parking lot.

Two of the Closed (1) areas at Arapaho Bend are intended to be wildlife refuges and conservation zones and are located east of the river and east of I-25. The area zoned as Closed (1) west of Strauss Cabin Road has no trails. The hay field in the southeast part of Arapaho Bend (just west of I-25) is closed because it is currently leased for hay production.

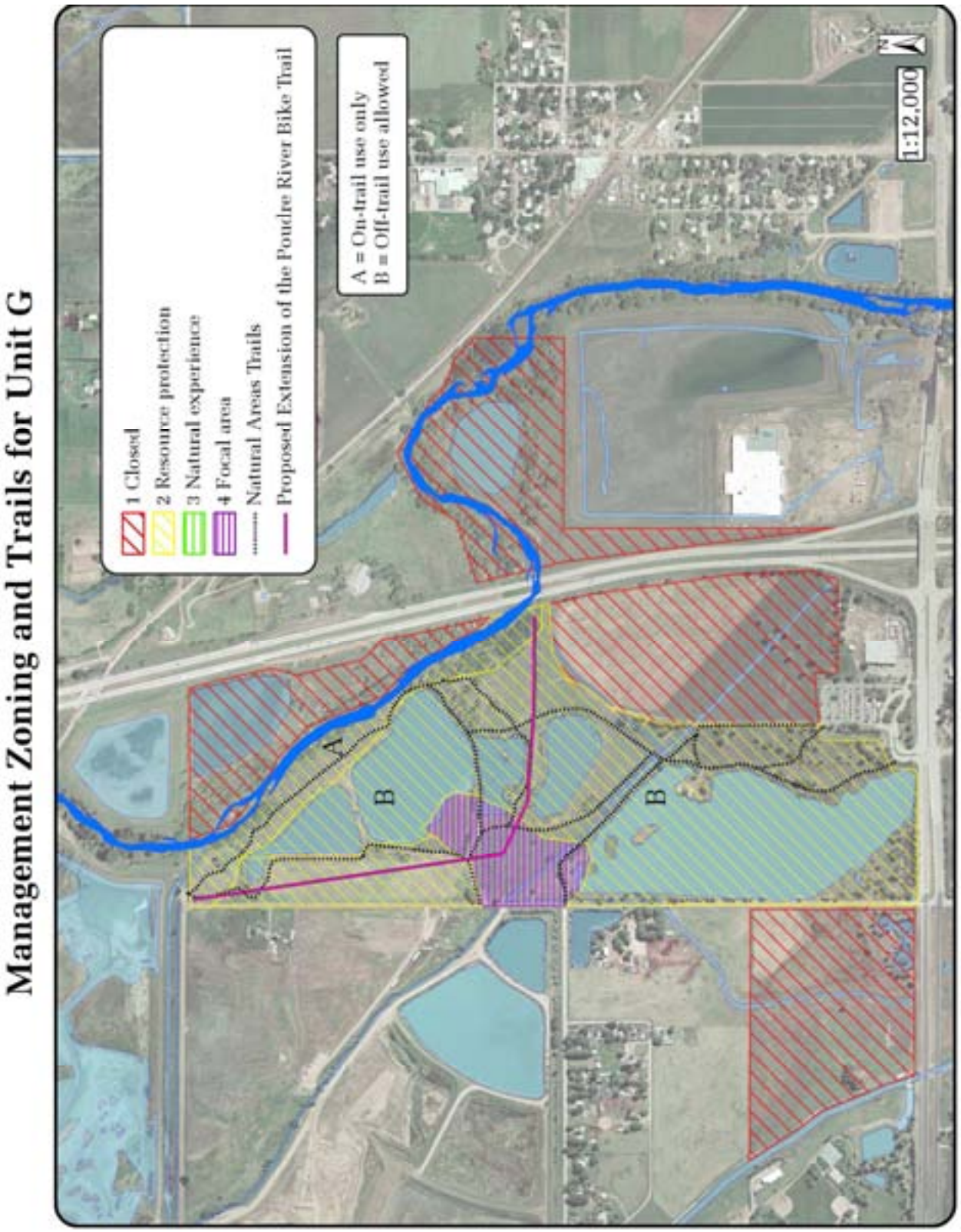
Aside from one large Focal Area (4), the rest of Arapaho Bend is zoned as a Resource Protection (2) area. Most of this Resource Protection area is zoned off-trail to accommodate fishing access. The area along the Poudre River is zoned as on-trail only to protect riparian resources along the river.

Raccoon resting in cottonwood tree

The two parking lots along Strauss Cabin Road will be consolidated to the one Focal Area (4) at the middle parking lot location. This new lot will include several visitor amenities in anticipation of the high volume of visitors expected when the regional section of the Poudre River Trail comes through Arapaho Bend. Amenities at the expanded parking lot will include horse trailer parking, vault toilets, and possibly a boat ramp and picnic areas.

As noted above, the City's Parks Department will be extending the Poudre River Trail through Arapaho Bend to connect with the trail from Greeley. The NAP recommends that the trail be aligned around the west side of the ponds (see Figure 13.3) to route the trail toward the (future) centralized parking lot and to avoid disturbance within the cottonwood forest. As the parking lot, Focal Area (4), and the Regional Bike Trail is developed, the unnecessary natural surface trails will be rerouted or closed to reduce habitat fragmentation.

Figure 13.3 Zoning and Trails Map



D. Management Actions

Key: ED=Education, PI= Public Improvements, PM=Program Management, RM=Resource Management, VS=Visitor Services, *Time frame is in years.

Site	Who	Time*	Management Actions
Arapaho Bend	PI	2-5	Close the north parking lot.
	PI	2-5	Expand and improve the middle parking lot. Include visitor amenities at or near the expanded parking lot: vault toilet, picnic area, boat ramps/launch areas, and horse trailer parking.
	PI	6-10	Direct regional Poudre River Trail away from riparian area and route between the ponds.
	PI	1	Install fishing line depository.
	PI	1	Add double-sided entrance sign along Harmony Road to help showcase this natural area at a City of Fort Collins gateway.
	PI	2-5	Close unnecessary roads and trails and designate appropriate roads and trails.
	VS	1	Work with City DOT on speed signage and with Police on speed enforcement on Strauss Cabin Road.
	PM/RM	6-10	Collaborate with the City's Parks Planning Department on construction of the Poudre River Trail underpass at I-25. Work to find ways to make the underpass friendly to wildlife movement.
	RM	6-10	Continue and expand upon restoration efforts along pond shorelines started in 2005.
	RM		Continue measures to control carp in ponds.
	EDU	2-5	Update interpretive features.
	EDU	Ongoing	Continue fishing ethics focus at Arapaho Bend for interpretive signs.
	PM/EDU	2-5	Consider designating a nature play area at Arapaho Bend.

References for Part 2

Anderson & Company, *Strategy for Gravel Lands along the Poudre Rive*r: An advisory Report to the City of Fort Collins, Colorado. February 1998.

APPENDICIES

Contents:

Appendix A-1: On-Site Public Feedback Form

Poudre River Public Feedback Form

Please help the City of Fort Collins Natural Areas Program manage lands along the river by providing your thoughts.

Optional- Please tell us about yourself:
I am: ___ male ___ female

Age: ___ under 18 ___19-29 ___30-50 ___51-70 ___ over 71

1. What do you **like** about the Poudre River and associated trails and natural areas?

2. What do you think **could be improved** ?

3. What is **important to you** about the Poudre River and the natural areas along it?

4. **How and where** could the **access** be improved to the Poudre River trail, to the natural areas and the river?

5. **Please rate these:**	**Circle one:**	**How** and **where** could this be improved?
Finding your way **to** the Poudre River	Easy Medium Difficult	
Finding your way **along** the Poudre River	Easy Medium Difficult	
Getting **into/ out of the river** for tubing, kayaking, canoeing	Easy Medium Difficult	
Parking for river access	Easy Medium Difficult	

6. Please rate your experience and share ideas for improvement on these:

	Circle one:	**How** and **where** could this be improved?
Hiking/ walking/ jogging	Poor fair good very good	
Biking	Poor fair good very good	
Fishing	Poor fair good very good	
Kayaking/canoeing/tubing	Poor fair good very good	
Children playing	Poor fair good very good	
Picnicking/ relaxing	Poor fair good very good	
Wildlife watching	Poor fair good very good	
Quiet reflection	Poor fair good very good	

Amenities- picnic tables, steps, trash cans, fences etc.	Poor fair good very good	

7. Please rate the **level of importance** of these features. Please rate <u>each feature</u>, 1-5.
   Most important 5 4 3 2 1 Least important

___ Cottonwood forests
___ Ponds
___ Grasslands
___ Recreation opportunities
___ The river as a wildlife corridor
___ The river itself

8. How satisfied are you with the information provided on **maps, brochures, and signs** at natural areas along the Poudre River? Circle one.

Very satisfied Somewhat satisfied Neutral Don't use Somewhat dissatisfied Very dissatisfied

9. What **topics** would you like to see on educational/ interpretive signs along the river?

10. Please rate how **safe you feel** along the Poudre River. Circle one.

Not very safe Somewhat safe Usually safe Always safe

If you feel unsafe, what could the City do to make you feel safer?

11. Could you **accept the closure and restoration** of some areas to benefit native plants and wildlife?

12. In order to have **better maintained** natural surface trails and better wildlife habitat, would you be willing to have **fewer** trails?

13. Does this area seem **well taken care of**? If not, what could be done to improve it?

Please share any other comments below.

If you would like to be contacted about future opportunities to comment (such as open houses), please share your email or mailing address here:

Appendix A-2: On-line Public Feedback Form

Poudre River Management Plan Update Public Feedback Form

Please help the City of Fort Collins Natural Areas Program manage the 19 natural areas along the river by providing your thoughts. This survey does not apply to lands owned/managed by others or the river itself which are beyond the Natural Areas Program's jurisdiction. There are 20 questions in this survey, all are optional.

1. Optional- tell us about yourself, are you:

- ☐ Male
- ☐ Female

2. Optional- tell us about yourself, how old are you?

- ☐ Under 18 years
- ☐ 19-29
- ☐ 30-50
- ☐ 51-70
- ☐ Over 71

3. What do you LIKE about the Poudre River and associated trails and natural areas?
Type your answer in the text box below.

4. What do you think COULD BE IMPROVED about the Poudre River, associated trails and natural areas?
Type your answer in the text box below.

5. What is IMPORTANT TO YOU about the Poudre River and the natural areas along it?
Type your answer in the text box below.

6. HOW and WHERE could the ACCESS be improved to the Poudre River trail, to the natural areas and the river? Type your answer in the text box below.

7. Please rate these:

	Easy	Medium	Difficult
Finding your way TO the Poudre River	☐	☐	☐
Finding your way ALONG the Poudre River	☐	☐	☐
Getting INTO/ OUT of the river for tubing, kayaking or canoeing	☐	☐	☐
PARKING for river access	☐	☐	

8. HOW and WHERE could finding your way, getting into/out of the river and parking be IMPROVED?
Type your answer in the text box below.

9. Please rate your experience:

	Poor	Fair	Good	Very Good
Walking/ Hiking/ Running	☐	☐	☐	☐
Biking	☐	☐	☐	☐
Fishing	☐	☐	☐	☐
Tubing, kayaking or canoeing	☐	☐	☐	☐
Children playing	☐	☐	☐	☐
Picnicking/ Relaxing	☐	☐	☐	☐
Wildlife watching	☐	☐	☐	☐
Quiet reflection	☐	☐	☐	☐
Amenities- picnic tables, steps, trash cans, fences, etc.	☐	☐	☐	

10. HOW and WHERE could recreation (such as hiking, biking, fishing, tubing, boating, children playing, picnicking, wildlife watching and quiet reflection) be IMPROVED?
Type your answer in the text box below.

11. HOW and WHERE could amenities (such as picnic tables, steps, trash cans, fences, etc) be IMPROVED?
Type your answer in the text box below.

12. Please rate the LEVEL of IMPORTANCE of these features. Please rate each feature 1-5

	5 - Most Important	4	3	2	1- Least Important
Cottonwood Forests	☐	☐	☐	☐	☐
Ponds	☐	☐	☐	☐	☐
Grasslands	☐	☐	☐	☐	☐
Recreation Opportunities	☐	☐	☐	☐	☐
The river as a wildlife corridor	☐	☐	☐	☐	☐
The river itself	☐	☐	☐	☐	

13. How satisfied are you with the information provided on MAPS, BROCHURES, and SIGNS at natural areas along the Poudre River?

Very satisfied	Somewhat satisfied	Neutral	Don't Use	Somewhat dissatisfied	Very dissatisfied
☐	☐	☐	☐	☐	

14. What TOPICS would you like to see on educational/ interpretive signs along the river?
Type your answer in the text box below.

15. Please rate how SAFE YOU FEEL along the Poudre River:

	Not very safe	Somewhat safe	Usually safe	Always safe
Safety	☐	☐	☐	

15. If you feel unsafe, what could the City do to make you feel safer along the Poudre River?
Type your answer in the text box below.

16. Could you accept the CLOSURE AND RESTORATION of some areas to benefit native plants and wildlife?
Type your answer in the text box below.

17. In order to have BETTER MAINTAINED natural surface trails and better wildlife habitat, would you be willing to have FEWER trails?
Type your answer in the text box below.

18. Does the Poudre River, associated trails and natural areas seem WELL TAKEN CARE OF? If not, what could be done to improve it?
Type your answer in the text box below.

19. Please share any other comments here:
Type your answer in the text box below.

20. If you would like to be contacted about future opportunities to comment (such as open houses) please share your email or mailing address with us.

Thank you very much for sharing your feedback with the City of Fort Collins Natural Areas Program! If you have questions or further comments, contact us at naturalareas@fcgov.com or 970-416-2815. Visit us at www.fcgov.com/naturalareas

Appendix A-3: On-Site & On-line Public Feedback Results

Onsite and Online Poudre Plan Feedback, All Responses			
Gender	**Online**	**Paper**	
Male	73 (59%)	52%	
Female	49 (40%)	43%	
Age	**Online**	**Paper**	
Under 18	(0) 0%	2%	
19-29	(4) 3%	24%	
30-50	(31) 25%	33%	
51-70	(81) 66%	30%	
Over 71	(6) 4%	6%	
Likes (most people listed several)	**Online**	**Paper**	**Total**
Natural Beauty/naturalness/like the natural areas/scenery	48	26	74
Accessibility, ease of access	30	23	53
Refuge from urban setting, quiet, escape, solitude	31	21	52
Biking, cycling, bike trails	37	10	47
Wildlife, wildlife viewing, habitat	26	12	38
Close to home or downtown, convenient	16	12	28
The way trails are maintained, clean, well maintained, smooth	17	11	28
Hiking/walking/ running	18	7	25
Trails (includes paved and soft surface), bridges	10	8	18
The connection of trails, encouragement to continue connections	13	2	15
Valuable asset, community gem, a reason we moved here etc	13	2	15
Screening by foliage, the forest, plants, trees, greenery	11	3	14
Bird watching, bird life	12	1	13
Place to see/hear the water	8	4	12
Everything	4	7	11
Swimming/tubing	2	7	9
Safety, friendly	7	2	9
Fishing	5	3	8
Community gathering place	7	1	8
Place to walk dog(s)	5	2	7
Seasons- place to see seasons	4	1	5
Photo opportunities	4	1	5
Free	2	2	4
Rope swings	1	2	3
Horse riding	2	1	3
Commuting	2	1	3
Views	3	0	3
Parking	3	0	3
Cool place in summer	3	0	3
Variety of habitats	2	0	2
Interpretive signs, maps	2	0	2
Boating	1	0	1
Variety of things to do	1	0	1

Fitness, excercize	1	0	1
Place to get coffee and see wildlife	1	0	1
I don't like it-these areas are not natural, used to be policed by citizen rangers, now most don't go there, city doesn't want people in their alleged natural areas. Don't like the maintence- spraying weeds after they went to seed- waste of money.	1	0	1
I don't go there- access is too limited, used by some bikers but not walkers.	1	0	1
Would like more fishing	1	0	1
Would like more	0	1	1
Should help preserve it	1	0	1
Well maintained trails at Bobcat Ridge	1	0	1
Trails need maintenance in some places but overall are good	1	0	1
History	1	0	1
Helps kids connect to nature	0	1	1
Stop glade- save the poudre	1	0	1
Could be Improved	**Online**	**Paper**	**Total**
Nothing, I like it how it is, no suggestions etc	9	18	27
More trail connections, more trail mileage	14	9	23
Clean up trash	6	12	18
Bumpy trails, blacktop trails	10	8	18
More water in the river/flows	9	2	11
Increase fishing locations/opportunties, fishing for kids	5	5	10
Can't see the river from the path, add views	8	1	9
Wayfinding/signage	4	4	8
On street sections of trail (ie Linden, Lemay), underpass at Shields	7	1	8
More natural areas	6	1	7
Add bathrooms	3	3	6
Interp signage	4	2	6
More dog parks/off leash areas for dogs/days when dogs can run free/dog swimming	4	2	6
Trail manners- right of way, signs about this	5	1	6
Better access- unspecified	2	3	5
Management of downtown area- social trails, rip rap	4	1	5
Add picnic areas, place for downtown workers to lunch	4	1	5
Better water quality	4	1	5
Website with each natural area, which are closed, better publicity	5	0	5
Transients/ homeless people	5	0	5
Kayak park	3	1	4
More (shaded/better) benches	3	1	4
Allow dogs at Coyote Ridge, allow leashed dogs in regional natural areas	4	0	4
Tubing safety (ie require life vests)	1	2	3
Access at shields, college, lemay	2	1	3
Increase fish habitat	2	1	3
Unfriendly rangers	3	0	3
Put in/take outs for tubing/fishing	1	1	2
Include/more soft surface option next to paved trails	1	1	2
Better maintenance on water fountains, more water fountains	1	1	2
Weeds	1	1	2

More programming	1	1	2
Clean up rip rap, cables, junked cars	1	1	2
Widen trails to give space to pass	1	1	2
Dogs off leash are a problem, control dogs	1	1	2
Keep wildlife corridors open, college ave choke point	2	0	2
Add lighting to increase safety	2	0	2
Shields bridge safety and parking	2	0	2
Fishing by flies and lures only and habitat stamp/catch and release	2	0	2
Refreshment stands	2	0	2
Would like access to poudre behind arapaho bend	2	0	2
Make more like river walk, like Salida	2	0	2
Remove graffiti	2	0	2
Too much signage- over regulated	2	0	2
More barriers/screening from nearby industrial areas and roads	2	0	2
More parking	0	2	2
Recycle cans, more trash cans	0	2	2
Access from Old Town	1	0	1
Boat or wade in between shields and taft	1	0	1
Better trail maintainance	1	0	1
Allow access from everywhere, not just trailheads	1	0	1
Fix fence at Butterfly Woods, add signage	1	0	1
Close more areas to dogs, bikes, fishing for wildlife	1	0	1
Add artwork	1	0	1
Walkway from N College/Lopez Park southeast to Timberline- no bikes	1	0	1
Add gathering places	1	0	1
Add boating areas	1	0	1
Ampitheatre behind new museum	1	0	1
Provide boat rental service	1	0	1
Archery range	1	0	1
Concern about over management	1	0	1
Add a donation box	1	0	1
Don't know- I don't go down there anymore	1	0	1
Horse manure near the river	1	0	1
More mowing	1	0	1
Open natural area paths to bikes	1	0	1
Safer access by bike from other parts of city	1	0	1
Provide dog training akc tracking	1	0	1
Move trail AWAY from river	1	0	1
Stop rock "art" in river near McMurry Beach	1	0	1
Naturally contour Riverbend Ponds and Cottonwood Hollow	1	0	1
Protect cottonwood forest between shields and college	1	0	1
Don’t remove dead trees unless blocking trails	1	0	1
Access to paved trail from wood st	1	0	1
No kayak park	1	0	1
Keep campgrounds open	1	0	1
Less gravel trail at Riverbend Ponds	0	1	1
Don’t use trails as a service rd	0	1	1
More bald eagles	0	1	1

More conservation, less recreation	0	1	1
Keep them free	0	1	1
More trees	0	1	1
More walk in campsites	0	1	1
Soft surface trails- no pavement	0	1	1
Paint steel bridges	0	1	1
Pedestrian lane beside bike trails	0	1	1
Add tree stump chairs	0	1	1
Riparian buffer zones improvements look more natural	0	1	1
Remove downed trees	0	1	1
Flooding of trail	0	1	1
Surf swells	0	1	1
Tear down wires at Gateway	0	1	1
Tubing access on private land	0	1	1
Clean up trailers	0	1	1
What is Important To You?	**Total-both online and paper, didn't separate**		
Ecological (includes wildlife, that they stay natural)	92		
Recreation	60		
Aesthetic (includes "clean")	44		
Conservation (includes here for eternity, preservation)	20		
Spiritual (includes peaceful, quiet, escape)	16		
Easy access/closeby	13		
Retreat from urban setting	12		
Free	9		
Everything	7		
Education	4		
Historic	3		
Keep it how it is	3		
Homeless people, teen parties, safety	3		
Cultural	1		
Source of water	1		
Keep technology away	1		
Economic	1		
Off leash dog problem is out of hand	1		
It was nice before over-regulation, chemical spraying, killing seed producing plants that support wildlife	1		
Potty areas for humans	1		
I worry about fire danger	1		
Desire off leash areas, not like Soapstone where you can't even enter with dogs in your car.	1		
That people are considerate to each other	1		
Scientific	0		
How and Where Could the ACCESS be improved?	**Online**	**Paper**	**Total**
Access is fine how it is/don't know	46	21	67
Trail connection/extension request	15	0	15
Shields Street Bridge/parking	9	3	12

Linden Street bridge area	5	0	5
Lemay/Mulberry area	4	1	5
On street sections at Mulberry and Lemay	4	0	4
Keep trails close to the river	3	0	3
Arapaho Bend has signs saying no river access- change that	2	1	3
More parking areas	0	3	3
Riverbanks	2	0	2
Don't destroy natural habitat around the trails	2	0	2
Lincoln near bridge	2	0	2
Access from old town	2	0	2
bathrooms, bathroom at taft parking lot	2	0	2
From wood street	2	0	2
East of College and North of Cherry	1	1	2
West side of town	0	2	2
From Vine Drive and Lincoln Middle School to the trail	1	0	1
From Michaud Lane to Poudre Trail	1	0	1
Put an underpass under Riverside from East Laurel and Riverside Park to Lemay	1	0	1
Lopez Park	1	0	1
New Discovery Museum	1	0	1
Connection behind Fort Fun	1	0	1
Timberline as a pedestrian area with view/rest stops	1	0	1
East Prospect	1	0	1
Access for dogs needs to be improved at Soapstone	1	0	1
I wouldn't like to see many more parking areas added	1	0	1
Best access is at Lee Martinez Park and Legacy	1	0	1
Branch trails are important- we have to ride down busy streets to get to the trail	1	0	1
Bridge over river from ELC to north bank	1	0	1
Foot bridge between Lemay and Timberline	1	0	1
Don't improve this, it will lead to more crowds and development	1	0	1
Easier access from CSU, not sure how	1	0	1
Between lions park and taft because of gravel mining in the area	1	0	1
Dirt road to elc	1	0	1
Access from Harmony Rd	1	0	1
Access from the south part of town	1	0	1
Smoother paths at riverside ponds	1	0	1
Gravel ponds on taft hill	1	0	1
Would like a map showing where I can park	1	0	1
More access for dogs off leash	1	0	1
Parking- not clear where to park	1	0	1
Restore lincoln greens to a natural area	1	0	1
Lions park sure is great- haven't explored other places	1	0	1
Connection from Mcmurry(hemlock) to bike trail- confusing, no signs	1	0	1
many areas that require very little walking (some of us are old)	1	0	1
uneven bike trail	1	0	1
Taft to Shields	1	0	1
Short trails to access the river-now people plow through the brush	1	0	1

Share parking lots with buisnesses- partner	1	0	1
Campgrounds up the canyon	1	0	1
Nas east of old town, south of mulberry don't feel safe	1	0	1
Dog swimming area	1	0	1
Widen sidewalks and allow biking on them so we can get to trail on busy st	1	0	1
Legacy is spooky	1	0	1
Access to tubing on public lands	0	1	1
Bridge for pedestrians and/or bicyclists	0	1	1
End of wood street	0	2	1
Finish the trail to Greeley	0	1	1
Trail along Shields would be nice	0	1	1
Do not approve of permanent trails along river edge just small dirt & game trails	0	1	1
I-25 connedtion	0	1	1
Information - like a magazine on the Natural Areas	0	1	1
Lemay and Old Town made more contiguous	0	1	1
Maybe signs	0	1	1
More access	0	1	1
More outside of downtown access	0	1	1
North of Laporte	0	1	1
The river should have more places that over look it so people can see it from different views	0	1	1
Trail that goes through Old Town is a little confusing	0	1	1
Tube from Taft and College	0	1	1
Would like to ride horses from Prospect to transfer station	0	1	1
Please rate these:	**Easy**	**Medium**	**Difficult**
Finding your way TO the Poudre River (paper)	85%	14%	0
Online	83%	14%	2%
Finding your way ALONG the Poudre River (paper)	93%	11%	0
Online	83%	15%	1%
Getting INTO/Out of the river for tubing, kayaking or canoeing (paper)	56%	38%	4%
Online	25%	54%	20%
Parking for river access (paper)	57%	33%	12%
online	38%	45%	15%
How and where could *finding your way*, *getting into/out of the river* and *parking* be improved?			
	Online	**Paper**	**Total**
Shields Street Bridge/parking on Shields/entry to path at Shields	20	7	27
Not sure, n/a, can't think of any, etc	26	0	26
More access (unspecified), more parking, handicap accessible parking, 1 in p-lots walker friendly terrian	7	8	15
Maps and trail information, wayfinding signage, map, website	9	5	14
Put in/take outs for tubers (marked, signs), boat ramps, swimming	12	2	14

areas,map for tubing			
It doesn't need improvement- I don't support development, I like it how it is	9	4	13
I access by bike/ walking, I don't go in water	9	3	12
Lemay, Mulberry could use medical offices as parking	3	1	4
More parking in Eastern FC	1	2	3
Between Linden and ELC- access points are few, far between- need parking	1	1	2
Smooth out dirt road to ELC, maintain access at ELC	2	0	2
Put in a kayak park	1	1	2
Parking lot at Overland fills up during tubing season	1	1	2
Public parking (we use private now) under Prospect	1	1	2
Picnic areas	1	0	1
Grading down to the river	1	0	1
Hemlock Street	1	0	1
This question is too confusing	1	0	1
Is private property marked?	1	0	1
Sign on College pointing to McMurry Ponds	1	0	1
Allow access from anywhere on borders	1	0	1
Best access is from Lee Martinez and Legacy parks	1	0	1
Trail maintence (though its pretty darn good)	1	0	1
More bathrooms	1	0	1
Improve paths north of the big pond	1	0	1
Old Town area	1	0	1
Old parks signage needs to be replaced (intersection of Poudre and Spring Creek tr)	1	0	1
Trail connection/extention request	1	0	1
Prefer not to see more tubers/kayakers	1	0	1
An access point around Lee Martinez	1	0	1
Wish we didn't have to bike on streets to get to poudre trail	0	1	1
I only tube below Gateway, easy	0	1	1
Taft lot is good	0	1	1

Please rate your experience on these:	**Very good**	**Good**	**Fair**	**Poor**
Hiking- paper	61%	36%	3%	0
Hiking-online	62%	33%	2%	1%
Biking-paper	64%	32%	4%	0%
Biking-online	61%	34%	2%	1%
Fishing-paper	29%	38%	31%	1%
Fishing-online	11%	46%	35%	7%
Tubing etc paper	28%	45%	16%	11%
Tubing etc online	20%	40%	27%	12%
Children playing-paper	40%	40%	13%	6%
Children playing-online	34%	47%	12%	6%
Picnicking- paper	45%	42%	9%	3%

Picnicking- Online	35%	46%	13%	4%
Wildlife Watching-paper	35%	45%	18%	2%
Wildlife Watching-online	42%	44%	9%	3%
Quiet reflection-paper	49%	38%	11%	2%
Quiet reflection-online	45%	39%	12%	1%
Amenities- paper	24%	38%	34%	4%
Amenities- online	18%	46%	27%	7%

How and where could the RECREATION be improved?	**Online (Q 10 & 11)**	**Paper**	**Total**
More picnic tables (1-around Aztlan, Engines Lab, 2-around poudre ponds, 1-covered tables at Legacy,1-at arapaho bend,1-KFP)	23	12	35
Like how it is now, can't think of any etc	27	4	31
More trash cans (I like the ones decorated by kids), more trash collection	19	11	30
Not sure, not applicable	23	0	23
More benches (2-away from trail traffic, 1-shaded, 1-by rope swing, 1-btw prosp/college	11	2	13
In stream flows to improve fishing, boating	7	3	10
Change regs to catch and release, enforce limits, more stocking, short docks,holding structures	4	4	8
More, more access, more natural areas	6	2	8
Areas should be left as natural as possible	6	2	8
More restrooms (1-at Arapaho Bend, south side, at Shields, at trailheads)	8	0	8
Trail connections, add mileage	6	0	6
Put in/take outs for tubers, boat ramps, swimming areas,map for tubing	3	3	6
Map showing parking, signage, access points for each activity	6	0	6
Make dams safe for boating over, portages	4		4
Put in kayak park	3	0	3
Put trails closer to the river	3	0	3
Mountain biking on the trails in and around the nas- they are closed now, improve mnt bike trails	2	1	3
Concern over homeless folks (1-College to Lemay area especially)	3	0	3
Better dog pick up bags- current brand hard to open, more poop Bag stations	3	0	3
Cite off leash dogs	2	0	2
Keep it dog on leash friendly	2	0	2
Respect between visitors	2	0	2
These are mutually exclusive- use zones to designate areas for each	2	0	2
All along trail, everywhere	2	0	2
Locating the river in Old Town	1	0	1
Arapaho Bend- access from Prospect through to Arapaho Bend	1	0	1
Provide access to river upstream from Watson lake	1	0	1

Around ELC access to swimming holes	1	0	1
Ban swimming on the river beach area	1	0	1
Educate about trail ettiquette	1	0	1
Fewer regulations (stopped by a ranger for riding two by two, will never ride again)	1	0	1
Fossil Creek Reservoir	1	0	1
Clean up junk, rip rap	1	0	1
Close areas to dogs, bikes, fishing to promote wildlife viewing	1	0	1
Provide off leash dog areas	1	0	1
There are places outside of town for tubing, noisy, incompatible with wildlife	1	0	1
Like the lack of picnic tables- can use meadows	1	0	1
Keep it in the canyon for the most part	1	0	1
Mow trails	1	0	1
Develop the south part of the river/trail	1	0	1
Reduce noise pollution	1	0	1
Riverside Ponds	1	0	1
Restore damaged riverbanks	1	0	1
Side trails for wildlife watching	1	0	1
Barren section between overland and shields doesn't even follow the river	1	0	1
College to taft is the nicest section	1	0	1
Linden street section should be moved eastwards	1	0	1
Train rangers that off trail or sitting quietly is not wrong	1	0	1
More places for relaxing	0	1	1
Wider paths for more bikes	0	1	1
Signs about wildlife in a specific area	0	1	1
No jumping off shields st bridge	0	1	1
Don’t disturb rivers edge	0	1	1
Take out parking lot at Legacy-spooky	1	0	1
Less fences	1	0	1
Better access at slippery side bridge upstream from rr bridge	1	0	1
Turn graffitti into murals	1	0	1
Better access near Legacy park	1	0	1
Fix up small ponds by upper bike bridge and let us swim there, deepen (to prevent scum in july/aug)	1	0	1
West of shields	1	0	1

Rate the level of importance of these features					
5 was the average for each feature on the paper survey					
Online:	**5 most**	**4**	**3**	**2**	**1 least**
Cottonwood Forests	45%	35%	14%	1%	3%
Ponds	45%	37%	10%	6%	0%
Grasslands	33%	33%	19%	10%	2%
Recreation Opportunities	22%	41%	24%	6%	6%
Wildlife Corridor	74%	13%	10%	0%	1%
The River itself	86%	7%	5%	0%	0%

How satisfied are you with information on maps, brochures, signs?	Very satisfied	Somewhat satisfied	Neutral	Don't use	Somewhat dissatisfied	Very dissatisfied
Online	45%	31%	11%	5%	5%	0%
Paper	34%	27%	12%	20%	6%	0%

What topics would you like to see on education/interp signs?	Online	Paper	Total
Wildlife (includes birds and fish, corridors)	38	17	55
History, agricultural use, heritage area	29	10	39
Plants	22	7	29
River (includes origin, riparian ecology, water quality, importance of flows)	15	9	24
Don't need/want any signs (brochures are ok-online-4)	11	11	22
Wayfinding/directions/map/where to do X recreation	6	11	17
Conservation-individual responsibility, restoration	6	5	11
Anything/general/ecology	6	3	9
General nature	2	6	8
Warnings- tubing, high water etc	2	2	4
Fishing, kayaking instructions	2	1	3
Mile markers, facility locations etc.	1	2	3
Respect other visitors, yield etc	3	0	3
More signs, love em	3	0	3
Policy	0	1	1
Human impacts	0	1	1
Insects	0	1	1
Rules / regulations and safety info - more frequent signs	0	1	1
Importance of picking up trash in English and Spanish	0	1	1
Climate change	1	0	1
Change signs to read Wildlife protected areas, nothing natural about gravel pit filled with non-native fish etc.	1	0	1
Leave no Trace	1	0	1
Archaeological information	1	0	1
Cross promotion of network of natural areas	1	0	1
Place names-background of those	1	0	1
Info now is good-thank you	1	0	1

How safe do you feel?	Not very safe	Somewhat	Usually	Always
Online	0%	13%	50%	35%
Paper	3%	10%	45%	42%

What could the city do to make you feel safer?	Online	Paper	Total
Clear out homeless camps, take care of transients, give homeless jobs	20	9	29
More patrols	15	7	22
I feel safe	10	1	11
Nothing, I don't know	5	3	8
Not the city's responsibility	4	1	5
Lights are not the answer, no lighting please	3	1	4
Add view corridors, more visibility	4		4
Post signs about trail manners	2	2	4

Lighting (1-in underpasses)	1	2	3
More emergency phones	3	0	3
Sign for designated take outs, difficult rapids, mark unsafe things	1	2	3
Take care of teens who drink, loiter, do drugs by river	2	0	2
Enforce off leash dog regs, prevent aggressive dogs	1	1	2
Mountain lions and snakes make me nervous	0	2	2
Alerts about rushing or deep water	1	0	1
Educate people to be more aware of their surroundings	1	0	1
Keep up with graffiti and vandalism	1	0	1
Don't isolate picnic tables or benches	1	0	1
Less trash in the grass	1	0	1
More access points so there is somewhere to escape if you feel uncomfortable	1	0	1
Occasional dogs	1	0	1
Only the wardens make me feel unsafe	1	0	1
More bathrooms	1	0	1
East of lemay and south of mulberry feels isolated- add park, playground to bring people	1	0	1
We have rangers who are doing a good job	1	0	1
Close during dangerous times (high water)		1	1
Difficult to improve without degrading other qualities		1	1
Martinez park trail is creepy		1	1
Could you accept the CLOSURE and RESTORATION of some areas?	**Online**	**Paper**	
Yes	96 responses (81%)	80 responses 94%	
No	12 responses (10%)	5 responses 5%	
Maybe	7 responses (0.5%)		
For better maintained trails, would you be willing to have FEWER trails?	**Online**	**Paper**	
Yes	32 (27%)	63%	
No	59 (51%)	37%	
Maybe	22 (19%)		
? Or not sure	2 (.01%)		
Does this area seem well taken care of?	**Online**	**Paper**	
Yes	92 (82%)	96%	
No	5 (4%)	4%	
Somewhat	8 (7%)		
Too manicured	3 (2%)		
Other comments	3 (2%)		
Please share any other comments here	**Online**	**Paper**	**Total**
River is an asset to the city, I love it, we are lucky to have	19	20	39
Good job, thank you, keep up the good work	26	9	35

Request for paved trail connections/extentions	4	1	5
Access to river from Old Town, Overland to Shields, unspecified, 24/7/365	4	0	4
Angry about dog-unfriendly policies, 1-especially at Soapstone	4	0	4
No other comments, okay for now etc	2	1	3
Use volunteers to help offset costs	1	2	3
Naturalness should be maintained, ok to reduce # of visitors	2	0	2
Make river more like Boulder or Steamboat,resurect mill race	2	0	2
Love the equestrian experience, continue to provide horseback access	2	0	2
Don't change the character of the river	2	0	2
Concern about NISP	2	0	2
Economic benefits of river are many	1	0	1
Enhance the experience and protect sensitive areas	1	0	1
Allow catch and release by flies and artificial lures in nat areas	1	0	1
Please open Arapaho Bend stretch of Poudre to fishing	1	0	1
More maps and suggested routes for tubing	1	0	1
I support the acquision of Soapstone Prairie	1	0	1
Develop one side of the river as a river walk, other side wild	1	0	1
Please designate some areas dog-free	1	0	1
Events along the paved trail should just use half the trail	1	0	1
Concern about buried junked cars west of beach	1	0	1
Clean up by removing undergrowth	1	0	1
Provide handicap access -paved surfaces to waters edge	1	0	1
Education helps- provide field trips for school children	1	0	1
Keep anglers happy, we are the ones who pay for habitat restoration	1	0	1
Fishing has declined	1	0	1
Glade might help your program, look at it as an opportunity	1	0	1
Restroom at Taft	1	0	1
Remove abandoned diversion structures	1	0	1
I support setting aside natural areas, but not taking property out of private hands	1	0	1
Concern about lack of access at Fossil Creek Reservoir	1	0	1
If we pay for it with taxes, we should have access to it	1	0	1
Suggestion to try adopt a natural area	1	0	1
A map would help me answer survey questions	1	0	1
Too many rules at natural areas	1	0	1
Establish areas where kids can play including forts, fly kites, play in the mud	1	0	1
I love russian olive trees, don't cut them down	1	0	1
Suggestion to reverse dog rules at Riverbend/Running Deer	1	0	1
Survey was cumbersome- add more multiple choice ?s	1	0	1
Too many people camping along the river making it a mess	1	0	1
Trails are transportation, not just recreation	1	0	1
Norm was exceptionally helpful	0	1	1
Suggestion to do surveys in other nat areas, not just along poudre	0	1	1
Bar on the river	0	1	1
Parking at Hickory St should be promoted more	0	1	1
I appreciated pruning the city did- improved acess but left shade	0	1	1

and habitat			
Preservation of wildlife but still places for human access and observ	0	1	1
More promotion of the river via tv and media	0	1	1
I've walked here since 1979	0	1	1
More info/maps about canoeing	0	1	1
Don't add trails or regs at Rivers Edge, leave open to wildlife enthus and anglers	0	1	1

Appendix A-4: Open House Feedback Form

Poudre River Natural Areas Public Feedback 2010
Please help the City of Fort Collins Natural Areas Program manage lands along the river by providing your thoughts.

1. What do you **like** about the **management actions** proposed for the natural areas along the Poudre River? Please be as specific as possible.

2. What do you think **could be improved** about the management actions proposed for the natural areas along the Poudre River? Please be as specific as possible.

Optional- Please tell us about yourself:
I am: ___ male ___ female

Age: ___ under 18 ___19-29 ___30-50 ___51-70 ___ over 71

Please share any other comments here:

If you would like **to be contacted** about the **final stages of the management plan process**, please share your email or mailing address here:

Appendix A-5: Virtual Open House Feedback Form

Virtual Open House: Poudre River Natural Areas
After reading the pdf document that describes overarching goals and site by site proposed management actions, please share your thoughts here.

There are 6 questions, which are: what do you like about the management actions, what could be improved, demographics, other comments and a chance to get information on the rest of the process.

The City of Fort Collins Natural Areas Program appreciates your help in managing 19 natural areas along the river. Thanks for participating!

What do you LIKE about the management actions proposed for the natural areas along the Poudre River? Please be as specific as possible.
Type your answer in the text box below. Feel free to skip if you do not have comments

What COULD BE IMPROVED about the management actions proposed for the natural areas along the Poudre River? Please be as specific as possible.
Type your answer in the text box below. Feel free to skip if you do not have comments.

Optional- tell us about yourself, are you:

- ☐ Female
- ☐ Male

Optional- tell us about yourself, how old are you?

- ☐ Under 18 years
- ☐ 19-29
- ☐ 30-50
- ☐ 51-70
- ☐ Over 71

Please share any other comments here:
Type your answer in the text box below. Feel free to skip if you do not have comments.

If you would like to be contacted about the final stages of the management plan update process please share your email or mailing address with us.
Type your answer in the text box below. Feel free to skip if you do not have comments.

We got your answers. Thank you very much for your interest and involvement in the natural areas along the Poudre River!
If you have further questions, please call the City of Fort Collins Natural Areas Program office, 970-416-2815 or email Rick Bachand, Natural Areas Environmental Program Manager, rbachand@fcgov.com .

Appendix A-6: Open House Feedback Results (at event and virtual/on-line).

Open House Feedback (event/paper)	
What do you like about the management actions proposed?	
Too many restricted areas only 43% is open to off trail- data to back up this restrictiction? I doubt it.	
Directing Poudre River trails away from river and riparian areas	
Enforcing the closed and resource protection areas	
Collaborating with Lafarge on what they are presently mining would be critical to end up with a usable area	
Proposed trail through Arapaho	
Carp derbies good	
I love that it has not been "gentrified"	
I'm not interested in it being too pretty, love the natural grasses etc.	
I like the availability of use to all users to experience nature and enjoy wildlife	
Like: focus on refuge from urban life, opportunities for solitude	
Improvement of pedestrian access to Udall and Gustav Swanson	
Focus on maintaining ecological values	
Esp. appreciate the recognition of bottleneck in the wildlife corridor at College and E,importance of minimizing/eliminating it.	
What could be improved about the management actions proposed?	
Have a good reason (not just feeling) for restricting access!	
Getting the Poudre Trail to interconnect with the trail to Windsor and Greeley (make it more of a priority)	
Connecting the Poudre River Trail to the Fossil Creek area would be equally or more important.	
Proposed trail through Arapaho good	
Put in new parking lot and close center trails at Running Deer- put trail south of Hagemans along fence	
Can walking trails have grass killed so they won't have to be cut?	
Running Deer sometimes has strollers.	
Additional toilet facilities at the Taft parking lot and possibly Shields would be great esp for young children.	
Improve equestrian trailer parking with bathroom facilities plus mounting a horse for disabled riders	
Riding my horse in the natural areas is the only way my body will allow me to enjoy nature.	
Thank you for all the trails you provide along the Front Range and beyond!	
Maximize collaborative efforts to allow/encourage seasonal overbank flooding for cottonwood regeneration and groundwater recharge oops already in conservation targets	
I prefer visitor management thru education and patrolling rather than through infrastructure.	
Demographics	
Male	4
Female	3
Under 18	0

19-29	0
30-50	1
51-70	5
over 71	1
Other comments	
Thanks!	
Would like Soapstone available to dogs on leash!	
The Poudre River is our area's most valuable resource and whatever we can do to protect and enhance it the better.	
Great job	
Unit D- looks large enough for a good equestrain trail and parking for trailers	
Unit E- great winter riding area for equestrians trail and parking for trailers	
Unit G- Arapaho parking for trailers with horses and equestrian trails	
These places allow horses (yay) but prking is min and then used by cars(not enforced to leave open for trailers)	
Please provide mounting blocks or rocks for disabled riders (see Bobcat thank you)	
Please think about minimizing pavement within natural areas. For wheelchair access consider a packed crusher surface.	
Try to maximize forest/buffer width between river and downtown to allow wildlife movement.	
Open House Feedback (online)	
What do you LIKE about the management actions proposed for the natural areas along the Poudre River?	
Great ideas....you have it right!	
I like the new zoning. however, it's confusing as to how you can protect the resources while allowing off-trail use? the numbers (percentages) don't make sense to me at units a and f.	
I like the overall appearance and tone of the plan. i especially like how public input from surveys, etc. was utilized. the goals and management actions are practical and doable. the photos are nice.	
I like the way the indvidual charact.s of the natural areas is addressed, and the recom. actions are tailored to each nat area.	
Leave the butterfly woods area alone.	
Seems like a good overall balance between ecological and user needs	
There is a strong focus on managing the land to improve its quality as natural habitat	
Well. it looks good on paper. but you forget. you write a small bit about access. you already taken away a parking area. to acess the trail. one that handicap. wouldn't have to walk a mile to get to. a place i have always been able to access the river easly. and now it's gone. off sheilds there is no parking to speak of. if you have ever been through there in the summer.	
Very nice presentation. clear and thorough. i like attention to wildlife, maintaining and improving cottonwood forest, and discouraging/removing non-native species.	
What COULD BE IMPROVED about the management actions proposed for the natural areas along the Poudre River? Please be as specific as possible.	
4)trail access from the visitor's center doesn't seem very obvious. this building is a great infrastructure that doesn't seem to get much use from locals.	
5. what is cfc parks?"	

Develop a simple brochure to promote your ideas,,,,put in the colorodoan etc...	
Leave the actions of private enterprise alone. government should stay out of the business of regulating gravel pit operations.	
Prioritization of the recommended actions, and to the extent feasible, the time frames in which the actions are planned to be implemented.	
Take away fees to use. should be free	
Tubing access is not a high priority for me, but considering people want it, improving access at designated areas might help reduce undesired access at other areas.	
Optional- tell us about yourself, are you:	**Total**
Female	7
Male	10
Optional- tell us about yourself, how old are you?	**Total**
Under 18 years	0
19-29	0
30-50	6
51-70	9
Over 71	2
Please share any other comments here:	
I really think that all natural areas should be free to use.	
My dog and i walk along the poudre each day...it is the highlight of the day...do everything you can to preserve this fc treasure	
New belgium and stryker foundation could be partners in developing" a natural area/ ampatheater across from ranchway feeds."	
Thank you for your proactive, thoughtful management.	
Unit a. how will you preserve" dying cottonwoods in the butterfly area? what mgt. actions are available?	
unit b. what does improve way-finding mean?	
unit c. consider elevating the overlook deck to tree-top height. is it true that nbb is #1? not csu?	
unit f. no mention of archery range. this is a wonderful area.	
thanks!	
"	
If you would like to be contacted about the final stages of the management plan update process please share your email or mailing address with us.	

Appendix A-7: Draft Plan Feedback Form

Poudre River Natural Areas Management Plan Update
Hello and thank you for your interest in how the City of Fort Collins Natural Areas Program plans to manage the city-owned/managed natural areas along the river.
Please read the draft plan then enter your comments here.
There is only one "question," which is a text box where you can write your comments and your contact information.

Please share your comments here. Be as specific as possible (and note the specific page number you are refering to if applicable). We encourage you to include your name and contact information (email or phone), although anonymous comments are accepted.
Type your answer in the text box below.

We got your response. Thank you for participating!
City of Fort Collins Natural Areas Program
naturalareas@fcgov.com
www.fcgov.com/naturalareas

Appendix A-8: Draft Plan Feedback Results

Great job! unit b pg 11-12. realign bridge at river. really important. great opportunity for the river and access to it. unit b: mcmurray pond. hearsay, but i have heard comments regarding water quality in middle of summer. seems unhealthy. unit d: springer/ poudre river trail/lemay realignment. very important! this will be great improvement to pedestrian/bicycle/auto safety. thanks for the opportunity to comment.
How do i tell people the bunker on running deer was closed because it was not used. in winter it was the only place you could see the portion of the lake that does not freeze over. on the part of the lake that froze animal tracks could be seen. i don't know who said it was not used because it was. i hope that maybe the fire tower when moved might be placed so you can see the part that does not freeze over. the rest of the plan i basically agree with.
I am concerned that the "environmentalist agenda" is in play here and that the regular citizens of fort collins won't be represented. one key article that presents an opposing view can be found at: http://netrightdaily.com/2011/04/how-the-nature-conservancy-secures-government-land-grabs/ thanks for considering this viewpoint.
I am very concerned about the impact of the homeless/transient population on the ecological health and visitor experience in the poudre river natural areas. i visit many of the natural areas almost daily and constantly witness and encounter these impacts. i could tell you of atleast three makeshift campsites that are in continual use. i've picked up more beer and liquor containers around these sites than i can remember. i've had to shelter my son from the vulgar language of one very intoxicated, dishelved person whom i would guess was transient. these folks know where the rangers don't go. these sites include: - udall - williams - springer please consider this issue as you prepare the management plan. thank you
I'm only interested in the downtown portion on this plan. i do not want to see anything stand in the way of a riverfront in fort collins. people of all ages deserve a chance to hangout have dinner on our waterfront. i could care less about west of college or east of mulberry. i want to see our waterfront developed for restaurants, entertainment and parkside trails. our seniors most of which do not bike or hike need a place to enjoy the river too.
The plan states on page (2nd paragraph): "because river flows are the primary driver of ecosystem funtion, the development of additional right, which would divert more water out of the river, is currently the key issue fro the future health of the poudre river. several water supply and storage projects are currently in the planning or permitting stages..." i'm not going to type the entire paragraph, but i would i do think a position on the glades project need to be established and communicated by city government that supports the vitality of the river and the importance of conservation. this section stops short of making a recommendation or taking a stand. this should be resolved.

Is there a budget that goes with this report? we should know what it will cost, and who is going to pay, before we buy it. this proposal needs to give more attention to protecting the rights of property owners. any management/action plans, especially in the publically-popular planning unit b, need to include protecting the privacy and property of existing landowners adjacent to or near natural areas, e.g., no-climb fencing and gating reinforcement, replacement, and construction along properties abutting existing or planned public-access feeder routes, increased law enforcement patrols at peak seasonal periods and after hours, restrooms and trash receptacles/regular removal at high-impact areas. the tourists need to be kept safe with money set aside for increased presence of rangers and other public safety personnel. lately, it seems like one tuber gets killed annually on this river corridor. the mcmurry beach either needs to be closed or improved as a formal access point, and staffed with a lifeguard. the mcmurry “beach” area is a public safety hazard waiting for some two-year-old child from the trailer park across the river to step in, and improperly supervised, be swept away at high water to die by drowning. this beach was formed by the spring creek flood, and can just as easily be washed away, along with all of its planned improvements. the beach is a major contributor to undesirable behavior along the poudre by way of alcoholic-beverage parties, dirty-diaper trash, late-night skinny dipping, screaming, swinging into the river from trees, and people pooping in the nearby bushes. horseback riding must continue to be an accepted use. (if they can make it work in san francisco’s urban golden gate park, we can make it work all along the poudre.) horses do not appear to present a problem in this proposal, but because of the sheer number of pages in the report, it is difficult to understand exactly what will change by way of allowed uses. summary tables, sort of like a aaa campground guide, would be helpful. bullfrog control: their songs are beautiful, and their large population may just be a cyclical fluctuation between the predator-prey balance. they may also be the only wildlife willing and able to stay, given the steadily increasing pressure by humans. we have had several snapping turtles flee the river on to our property, so i wonder if that is why there are so many bullfrogs. since turtles don’t run very fast, i suspect a number of them have been turtle-napped by passersby. thank you for all the work you have put into this report.
Leave the river alone natural is always better
My greatest area of concern is the first portion of the plan - butterfly woods to shields street. i support the concern for the cottonwoods, my favorite trees. i know they need a lot of water. also, once mining is complete this whole area will be an amazing wildlife/bird area. it is already a tremendous fly-zone for birds. thanks for asking
Ok the protection sounds good but i wouldent add more parking lots and cutting the high grass and adding unatural setting ruins everything.
Please leave the river alone and quit wasting our tax dollars for your paid recreation and man made structures.
Re:planning unit c natural areas program. my bigest concern is, i want to see our river developed downtown and only downtown! enhancment of our downtown riverfront is critical to older voters of fort collins who will not be using other parts of the river. we need access points for restaurants and river-walk. older adults need to enjoy the river over dinner, drinks and special events. future redevelopment of our river downtown is my only concern for the river. enhancment of our river downtown is key to the future of our oldtown villege.

Appendix B: Tree Table

Summary of the key features and concerns of important trees and shrubs in the riparian forest.

Species (shrub or tree)	Geographic origin and distribution	Reproduction method/ shade tolerance	Wildlife values	Currently dominant?	Expected to be dominant in future?	Issues, concerns
Native						
Black Chokecherry *Prunus virginiana* ssp. *Melanocarpa* (shrub)	Native throughout the West northern Great Plains and much of Canada. Can tolerate dry to moist soils from plains to montane elevations.	Seed and vegetatively. Prefers open sunny locations- can tolerate some shading.	Very important for food and habitat. Fruits, leaves, and twigs are utilized by wide range of animals from birds to bears.	No	Unlikely	This important food source is infrequent due to lack of river migration and associated development of terrace above the channel. Shrub dependent birds are completely missing along the corridor. Restoration and policy should prioritize chokecherry establishment and self perpetuation.
Box elder *Acer negundoL* (tree in subcanopy)	Many riparian and palustrine systems throughout the west and much of the US.	Propagates both sexually and asexually and responds positively to disturbance. Vulnerable to insect damage and root rot, weak wood so not good for restoration. Moderately shade tolerant.	Birds, squirrels feed on seeds	Yes, in some locations (mid-seral forests in the subcanopy).	Unknown (may be unlikely due to lack of regular disturbance)	Though ubiquitous, today's populations may be at lower frequencies than historic occurrences. Little to no evidence of regeneration. As with other natives, this may be due to lack of river migration and flooding.
Lanceleaf cottonwood *Populus x acuminate* (tree in canopy)	Found in the overlapping ranges of narrowleaf and plains cottonwood (4,500 to 8,500ft)	Reproduces by suckering and by layering. It is not known whether it can reproduce by seed or not.	Similar to its parent species.	No	Unlikely (unless highly promoted)	Similar growth form to plains cottonwood, but ability to "sucker" may increase the chances of persisting in future If heavily promoted (planted) could possibly replace structure and role of plains cottonwood.
Narrowleaf cottonwood (*Populus angustifolia*) (tree in canopy)	Throughout the west at montane elevations Fort Collins is the lowest extent of it	Establishment from seed is poor, very successful with vegetative reproduction (sprouting from root	Wildlife value similar to plains cottonwood (but relatively less important), for	Yes	Yes	The one cottonwood that appears to be thriving at all ages due to its ability to reproduce vegetatively. Climactic warming may reduce its role on

Species (shrub or tree)	Geographic origin and distribution	Reproduction method/ shade tolerance	Wildlife values	Currently dominant?	Expected to be dominant in future?	Issues, concerns
	elevation (5,000 to 8,000 ft).	and stem fragments. Sprouting is linked to disturbances that scarify the roots or stems.	wildlife at higher elevations.			the front range and limit its geographic range to montane elevations.
Plains cottonwood *Populus deltoides* ssp. *Monilifera* (tree in canopy)	Throughout the west and great plains. Fort Collins is the highest extent of its elevational (3,500 to 5,000 ft).	Primarily by seed, can produce vegetativly. Seed viable for 1-2 weeks. Not shade tolerant, dependent on flooding, scour and open bare soil for germination.	Provides habitat for majority of all bird species breeding in northeastern Colorado. Also important food or habitat for beaver, porcupines, mule deer, fox squirrel.	Yes	No	Loss of this keystone species may lead to changes in ecosystem structure and loss of diversity. Changes in hydrology of the river (magnitude and frequency of floods), and resulting sedimentation, and river migration drastically reduces opportunities for large recruitment events.
Peachleaf willow *Salix amygdaloides* (tree in subcanopy)	Many riparian and palustrine systems throughout west.	Primarily by seed, sometimes from broken limbs. Seeds are viable only for a few days. Sensitive to competition and shading, dense tall grass reduces transplant survival.		Yes	Unknown (probably not)	Desired native that provides structural diversity and is competitive with non-native species and altered conditions.
Red-osier dogwood *Cornus sericea* (shrub)	Range extends down the Rocky Mountain spine and across much of the northern United States and Canada	Vegetative and by spreading limbs is most important, also by seed. Likes wet soils, grows close to waters edge in full light	Red-osier dogwood provides cover and shade that cools water temperatures in streams for trout	No	Unlikely	Observed very infrequently along the Poudre.
Snowberry S*ymphoricarpos albus* (shrub)	Range extends down the Rocky Mountain spine to southern Colorado and across much of the northern United States and Canada	Primarily by rhizomes, secondarily by seed	important as both cover and food for variety of bird and small mammal populations	Yes	Yes	Because snowberry can thrive in shaded conditions, it is one of the most common shrubs (albeit still sparse) in the older forests of the urban reach.
Wood's Rose *Rosa woodsii*	Range includes much of western	Can tolerate sunny and shaded conditions	Rose hips are a very important	Yes	Probably (?)	Unclear if this species is persistent at its historic

Species (shrub or tree)	Geographic origin and distribution	Reproduction method/ shade tolerance	Wildlife values	Currently dominant?	Expected to be dominant in future?	Issues, concerns
(shrub)	United states with exception of Texas and Pacific states.		source of food for variety of wildlife in the riparian areas.			frequency. One of few species doing well because of its natural persistence in canopy forests.
Locally non-native regionally native						
Green ash *Fraxinus pennsylvanica* (tree in subcanopy)	Native to states east of Colorado and has migrated "up river" to the Poudre (and westward) due to modified conditions of river system	Seed and vegetatively. Seeds are viable for up to 4 years. young trees are shade tolerant, tolerance declines as they mature.	Green ash trees and habitats provide food and/or cover for game and nongame birds, American beavers, other small mammals, deer, bison, livestock, insects, and aquatic species.	Yes	Yes	Seed persistent and the tree can withstand extreme conditions found in riparian zones. Anticipated to replace cottonwoods in future forest, While locally non-native, it may be more desirable than then exotics listed below.
Non-native						
Common Buckthorn (*Rhamnus cathartica*) (shrub)	Native to Europe now spread across most of US except West coast..	Reproduces from seed, also very successful at resprouting from stumps. It prefers lightly shaded areas and can tolerate many different soil types	Not a preferred food source.	No	No (?)	Common buckthorn crowds out native shrubs and plants. Dense seedlings crowd out other plants. Once it is established it is difficult to remove.
Crack willow *Salix fragilis* (tree in canopy)	Not native to this continent (Eurasia origin)	Crack willows are known for their fragile branches which readily break off of the plant. The broken stems readily root in the soil that they drop on. Stems can also travel downstream and colonize new areas. They can also reproduce by seed and they are insect	Bird, deer and medium sized mammals forage on crack willow.	Yes	Unlikely (unknown)	Crack willow has established in riparian areas across the west. Lack of sunny (open canopy) conditions may be depressing crack willow regeneration. Role in future unknown, influence on ecosystem could be widespread or nominal.

Species (shrub or tree)	Geographic origin and distribution	Reproduction method/ shade tolerance	Wildlife values	Currently dominant?	Expected to be dominant in future?	Issues, concerns
		pollinated. .				
Russian olive (tree in subcanopy)	Not native to this continent (from Siberia). Thrives in a wide range of soil types (and moisture levels).	Reproduces entirely from seed and also very successful at resprouting from stumps	Edible fruit is beneficial to wildlife and birds, but is used to a lesser degree than some native trees.	No	Likely (unless heavily managed against)	Aggressive throughout west, if the Natural Areas Program does not continue to mange very proactively against this tree it will reestablish.
Siberian elm *Ulmus pumila* (tree in canopy)	Not native to this continent (from Siberia). Thrives in a wide range of soil types (and moisture levels).	Plant reproduces from seed. Thickets of seedlings form around seed bearing trees.	Seeds eaten by a variety of small wildlife.	No	Yes	Prolific seed production and ability to withstand unusually wide range of soil and sunlight conditions makes it very competitive in the floodplain. Because of the challenge of managing this elm, and the seed source from adjacent landscaped urban neighborhoods there is significant concern in the potential dominance in the future the riparian forest.

Appendix C: Pond Table

Floodplain ponds, key characteristics listed from upstream to downstream.

Natural Area	Pond name (CDOW name if different)	Size	Known Species Present	Fish Stocking (CDOW)	Fishing Access
North Shields Ponds	Sterling Pond	13.8 acres	Bluegill, Green Sunfish, Black Bullhead, Yellow Perch, White Sucker, Fathead Minnow	None	Fishing allowed from the east bank
North Shields Ponds	North Shields Pond	9 acres	Largemouth Bass, Bluegill, Channel Catfish, Green Sunfish, Black Bullhead, Common Carp, White Sucker	Channel Catfish, Bluegill	Fishing allowed. Existing ADA fishing pier; existing "Fishing Steps" to decrease bank erosion
Magpie Meander	Wood Duck Pond	0.5 acres	No data		Fishing allowed. Existing ADA fishing pier
McMurry	Sunfish Pond (McMurry Pond west)	5.5 acres	Green Sunfish	None	Fishing allowed
McMurry	McMurry Pond (McMurry Pond east)	7.5 acres	Largemouth Bass, Bluegill, Channel Catfish, Green Sunfish, Black Crappie, Pumpkinseed, Common Carp, White Sucker, Yellow Perch	Largemouth Bass, Bluegill and Channel Catfish	Fishing allowed. Existing Boat Launch Area
Gustav Swanson	Coy Pond West	0.5 acres	No data		
Gustav Swanson	Coy Pond East	0.5 acres	No data		
Udall	Goose Pond	1.7 acres	No info	None	No fishing.
Udall	Spruce Pond	1.9 acres	No info	None	No fishing.
Udall	Moose Pond	1.3 acres	No info	None	No fishing.
Kingfisher Point	Gadwall Pond (Kingfisher Point NW Pond)	18.8 acres	Largemouth Bass, Bluegill, Yellow Perch, Pumpkinseed, Green Sunfish, Emerald Shiners, Common Carp	none	Fishing access on south and east sides.
Kingfisher Point	Canvasback Pond (Kingfisher	10 acres	Black Crappie, Bluegill, Bullhead	none	Fishing access on north, west, and east sides.

Natural Area	Pond name (CDOW name if different)	Size	Known Species Present	Fish Stocking (CDOW)	Fishing Access
	Point SW Pond)				
Cattail Chorus	Goldeneye Pond	14.5 acres	Smallmouth Bass, Largemouth Bass, Bluegill, Green Sunfish, Yellow Perch, Common Carp	Smallmouth Bass	No fishing
Cattail Chorus	Dragonfly Pond	10 acres	No data	No data	No access
Cattail Chorus	Heron Pond	2.0 acres	No data	No data	No access
Cattail Chorus	Wigeon Pond	3.9 acres	No data	No data	No fishing.
Cattail Chorus	Confluence Pond	3.2 acres	No data		No fishing.
Cattail Chorus	Blackbird Pond	0.5 acres	No data	No data	No fishing.
Cattail Chorus	Chorus Frog Pond	0.8 acres	No data	No data	No access
Cattail Chorus	Song Sparrow Pond	0.5 acres	No data	No data	No access
Riverbend Ponds	Bluegill Pond (#1) and Wiper Pond (#3)	18.2 (8.8 acres 9.3 acres)	Largemouth Bass, Bluegill, Channel Catfish, Green Sunfish, Common Carp, Black Crappie, Gizzard Shad, Yellow Perch	Largemouth Bass	Fishing allowed
Riverbend Ponds	Trout Pond (#2)	7.2 acres	Largemouth Bass, Bluegill, Channel Catfish, Green Sunfish, Black Bullhead, Common Carp, White Sucker, Black Crappie, White Crappie, Gizzard Shad,	Bass and Bluegill	Fishing allowed. Existing ADA fishing pier.
Riverbend Ponds				Bass and Bluegill	Fishing allowed
Riverbend Ponds	Turtle Pond (#4)	2.7 acres	Bass, Bluegill, Green Sunfish, Black Bullhead, Common Carp, Gizzard Shad	Bluegill	Fishing allowed
Riverbend	Big Pond (#5)	43.4	Largemouth Bass, Bluegill, Green Sunfish,	Largemouth Bass	Fishing allowed

Natural Area	Pond name (CDOW name if different)	Size	Known Species Present	Fish Stocking (CDOW)	Fishing Access
Ponds		acres	Common Carp, White Sucker, Black Crappie, Gizzard Shad, Yellow Perch		
Riverbend Ponds	Milne West Pond (#6)	6.5 acres	Largemouth Bass, Bluegill, Channel Catfish, Green Sunfish, Common Carp, Black Crappie, Gizzard Shad, Smallmouth Bass, Wiper	Wiper	Fishing allowed
Riverbend Ponds	Milne East Pond (#7)	1.9 acres	Largemouth Bass, Bluegill, Green Sunfish, Black Bullhead, Carp, White Sucker, Black Crappie, Gizzard Shad	None	Fishing allowed
Prospect Ponds	Skunk Pond (#1)	14.4 acres	Common Carp, Sunfish, Fathead Minnows	None,	Fishing allowed
Prospect Ponds	Merganser Pond (#2)	12.9 acres	Black Crappie, Common Carp, Fathead Minnows	Crappie, Channel Catfish.	Fishing allowed
Prospect Ponds	Catfish Pond (#3)	11.9 acres	Largemouth Bass, Bluegill, Green Sunfish, Black Crappie, White Crappie, Gizzard Shad, Channel Catfish, White Sucker, Common Carp	Largemouth Bass, Bluegill, Channel Catfish, Black Crappie	Fishing allowed
Cottonwood Hollow	Muskrat Pond	13.2 acres	No data	No data	No fishing.
Cottonwood Hollow	Artist Point Pond	3.2 acres	No data	No data	No fishing.
Cottonwood Hollow	Pelican Pond	9.0 acres	No data	No data	No fishing.
Running Deer	Unnamed water bodies /#1-5		No data		No fishing.
Arapaho Bend	Little and Big Bass Ponds	5.3 acres + 16.4 acres	Largemouth Bass, Bluegill, White Crappie, Black Crappie, Green Sunfish, Gizzard Shad, Yellow Perch, Common Carp	Largemouth Bass, Bluegill	Fishing allowed except from east bank (the banks closest to the river)
Arapaho Bend	Cormorant Pond	2.8 acres	Largemouth Bass, Bluegill, Green Sunfish, Gizzard Shad, Common Carp	None, self sustaining	Fishing allowed
Arapaho Bend	Snapper Pond	4.6 acres	Largemouth Bass, Bluegill, White Crappie, Black Crappie, Yellow Perch,	Channel Catfish	Fishing allowed

Natural Area	Pond name (CDOW name if different)	Size	Known Species Present	Fish Stocking (CDOW)	Fishing Access
			Green Sunfish, Pumpkinseed, Common Carp		
Arapaho Bend	Beaver Pond	34.5 acres	Bass, Smallmouth Bass, Wiper, Bluegill, Black Crappie, White Crappie, Channel Catfish, Yellow Perch, Black Bullhead, Gizzard Shad, White Sucker, Common Carp,	Largemouth Bass, Smallmouth Bass, Wiper, Bluegill, Black Crappie, Channel Catfish	Fishing allowed
Arapaho Bend	Old Wayside Pond (West I-25 Pond)	5.5 acres			No access; no fishing.
Arapaho Bend	Whitetail Pond (East I-25 Pond)	6.0 acres	No info	None	No access; no fishing.

Appendix D-1: Wildlife Observed on Poudre River Natural Areas (1974-2010)

Sites: Butterfly Woods (BW), North Shields Ponds Natural Area (NS), Magpie Meander (MM), McMurry (MC), Salyer (SA), Rivers Edge (RE), Gustav Swanson (SW), Udall (UD), Springer (SP), Williams (WI), Kingfisher Point (KP), Cattail Chorus (CC), Riverbend Ponds (RI), Prospect Ponds (PP), Cottonwood Hollow (CH), Running Deer (RD), Arapaho Bend (AB).

Species: U = unusual; I = Introduced; FT = Federal Threatened; FE = Federal Endangered; ST = Colorado Threatened; SC = Colorado Species of Concern.

Occurrence: X = recorded on site; X0 = not detected in last 20 years.

Sources: Compiled from observations by local naturalists, Colorado Division of Wildlife, Colorado Field Ornithologists reports, and Natural Areas Program staff. Not all sites have been intensively surveyed; therefore, some species may be present on a site and not yet be reflected in these tables.

BIRDS	NATURAL AREA																
	BW	NS	MM	MC	SA	RE	GS	UD	SP	WI	KP	CC	RI	PP	CH	RD	AB
Greater white-fronted goose												X	X				
Snow goose		X									X	X	X	X			X
Canada goose	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tundra swan (U)													X				
Wood duck		X	X	X					X		X	X	X	X			X
Gadwall											X	X	X	X	X	X	X
Eurasian wigeon (U)												X					
American wigeon		X		X	X		X	X	X		X	X	X	X	X	X	X

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Mallard	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Blue-winged teal		X					X	X	X		X	X	X	X	X		X
Cinnamon teal											X	X	X	X		X	X
Northern shoveler											X	X	X	X	X	X	X
Northern pintail												X	X	X	X		X
Green-winged teal							X				X	X	X	X	X		
Canvasback		X									X	X	X	X			
Redhead											X	X	X	X	X		X
Ring-necked duck											X	X	X	X	X		
Greater scaup (U)														X			
Lesser scaup											X	X	X	X			X
White-winged scoter (U)														X			
Long-tailed duck (U)		X															
Bufflehead											X	X	X	X	X		
Common goldeneye		X							X		X	X	X	X	X		
Barrow•s goldeneye (U)													X	X			
Hooded merganser											X		X	X			
Common merganser		X					X	X			X	X	X	X	X		X
Red-breasted merganser (U)																	X

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Ruddy duck													X	X			
Ring-necked pheasant (I)											X	X	X				
Wild turkey (U)								X	X		X						
Northern bobwhite (U)												X	X				
Pied-billed grebe		X									X	X	X	X	X	X	X
Horned grebe													X				X
Eared grebe												X	X				X
Western grebe											X	X	X				X
Clark's grebe											X	X	X				X
American white pelican											X	X	X		X		X
Double-crested cormorant											X	X	X	X	X		X
American bittern (U)												X	X		X		
Least bittern (U)													X		X		
Great blue heron	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Great egret (U)													X		X		
Snowy egret													X		X		X
Cattle egret (U)													X				
Green heron (U)							X				X	X	X	X	X		
Black-crowned night-heron		X					X		X		X	X	X	X	X	X	X

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
White-faced ibis													X				
Turkey vulture											X	X	X	X	X	X	X
Osprey		X		X	X		X				X	X	X	X	X	X	X
Bald eagle (SC)		X					X				X	X	X	X	X	X	X
Northern harrier											X	X	X	X		X	
Sharp-shinned hawk											X	X	X	X			X
Cooper's hawk											X		X				
Northern goshawk												X	X				
Broad-winged hawk (U)				X									X				
Swainson's hawk							X							X	X		
Red-tailed hawk	X	X	X	X							X	X	X	X	X	X	X
Ferruginous hawk (SC)											X			X			
Rough-legged hawk		X										X	X	X			
Golden eagle													X				
American kestrel	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Merlin											X		X	X			
Peregrine falcon (SC)													X				
Prairie falcon													X				X
Black rail (U)													X				

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Virginia rail												X	X		X	X	X
Sora				X							X	X	X		X	X	
American coot				X							X	X	X	X	X	X	X
Killdeer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black-necked stilt (U)													X				
American avocet											X	X	X	X	X		X
Greater yellowlegs							X				X	X	X	X	X		
Lesser yellowlegs							X				X	X	X				
Solitary sandpiper													X	X			
Willet													X		X		
Spotted sandpiper						X							X		X	X	X
Whimbrel (U)													X				
Marbled godwit (U)												X	X				
Western sandpiper													X				
Least sandpiper												X		X			
Baird's sandpiper															X		
Long-billed dowitcher													X		X		
Wilson•s snipe							X		X		X	X	X	X			
Wilson's phalarope															X		

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Franklin's gull													X	X	X		
Bonaparte's gull													X				
Ring-billed gull		X		X			X	X			X	X	X	X	X	X	X
California gull												X	X		X		
Herring gull												X	X	X			
Glaucous gull (U)												X	X				
Caspian tern (U)													X		X		
Forster's tern		X									X	X	X		X		
Least tern (U)															X		
Black tern													X				
Rock pigeon (I)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Eurasian collared dove (I)																	
White-winged dove (U)													X				
Mourning dove	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow-billed cuckoo													X				
Barn owl													X				
Eastern screech-owl							X				X	X	X	X	X		
Great horned owl		X									X	X	X	X	X		X
Long-eared owl (U)													X				

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Short-eared owl (U)													X				
Common nighthawk		X		X	X	X	X	X	X		X	X	X	X	X	X	X
Common poorwill													X		X		
Chimney swift							X	X					X				
Broad-tailed hummingbird													X				
Belted kingfisher	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red-headed woodpecker (U)													X	X			
Red-naped sapsucker (U)													X				
Downy woodpecker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hairy woodpecker												X	X	X			
Northern flicker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Olive-sided flycatcher							X						X	X			
Western wood-pewee	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Willow flycatcher												X	X				X
Least flycatcher													X			X	
Cordilleran flycatcher	X												X				
Say's phoebe												X	X				
Western kingbird	X										X	X	X	X	X	X	X
Eastern kingbird		X		X							X	X	X	X	X	X	X

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Loggerhead shrike													X	X			
Northern shrike												X	X			X	
Plumbeous vireo												X	X	X			
Warbling vireo		X		X			X				X	X	X	X	X	X	X
Red-eyed vireo (U)							X						X	X			
Steller's jay															X		
Blue jay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black-billed magpie	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American crow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Common raven													X				
Horned lark											X	X	X				X
Tree swallow	X										X	X	X	X	X	X	X
Violet-green swallow											X	X	X	X	X	X	X
Northern rough-winged swallow											X	X	X	X	X	X	X
Bank swallow											X	X	X	X	X		X
Cliff swallow						X	X						X	X	X		X
Barn swallow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black-capped chickadee	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mountain chickadee		X							X			X	X		X		

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Red-breasted nuthatch												X	X				
White-breasted nuthatch											X	X	X				
Brown creeper							X				X	X	X	X			
Rock wren													X			X	
House wren	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Winter wren (U)														X	X		
Marsh wren (U)		X											X		X	X	
American dipper			X						X								
Golden-crowned kinglet													X				
Ruby-crowned kinglet												X	X	X			
Blue-gray gnatcatcher													X				
Western bluebird												X	X				
Mountain bluebird													X	X			X
Townsend's solitaire												X	X				
Veery (U)												X	X				
Swainson's thrush									X			X	X	X			
Hermit thrush				X									X				
American robin	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gray catbird													X	X			

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Northern mockingbird (U)											X	X	X				
Sage thrasher													X				
Brown thrasher (U)		X											X				
European starling (I)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American pipit													X				
Bohemian waxwing												X	X				
Cedar waxwing				X			X				X	X	X	X			X
Blue-winged warbler (U)												X	X				
Tennessee warbler (U)												X	X	X			
Orange-crowned warbler													X	X			
Virginia's warbler												X	X				
Yellow warbler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Magnolia warbler (U)													X	X			
Black-throated blue warbler (U)														X			
Yellow-rumped warbler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Townsend's warbler												X	X	X			
Palm warbler (U)													X				
Blackpoll warbler		X										X	X				
American redstart													X				

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Prothonotary warbler (U)														X			
Swainson's warbler (U)													X				
Ovenbird											X		X				
Northern waterthrush	X												X				
Kentucky warbler													X				
Mourning warbler (U)													X				
MacGillivray's warbler						X						X	X				
Common yellowthroat		X		X				X			X	X	X		X	X	X
Wilson's warbler				X							X	X	X	X			X
Yellow-breasted chat													X				
Green-tailed towhee												X	X		X		
Spotted towhee											X	X	X				
American tree sparrow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chipping sparrow							X				X	X	X				
Clay-colored sparrow													X		X		
Brewer's sparrow		X											X		X		
Vesper sparrow		X									X	X	X			X	
Lark sparrow											X	X	X				
Black-throated sparrow (U)												X	X				

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Lark bunting (U)													X				
Savannah sparrow		X											X				X
Song sparrow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lincoln's sparrow		X											X				
Swamp sparrow (U)													X				
Harris' sparrow (U)													X				
White-throated sparrow											X	X	X				
White-crowned sparrow											X	X	X	X	X	X	X
Golden-crowned sparrow (U)													X				
Dark-eyed junco	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Western tanager		X									X	X	X	X	X		X
Rose-breasted grosbeak (U)				X	X												
Black-headed grosbeak (U)		X			X				X	X			X		X	X	
Blue grosbeak (U)									X		X	X	X		X	X	X
Lazuli bunting											X		X				X
Indigo bunting (U)									X		X						
Red-winged blackbird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Western meadowlark											X	X	X	X	X	X	X
Yellow-headed blackbird											X	X	X	X	X		

BIRDS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Rusty blackbird (U)		X											X	X	X		
Brewer's blackbird		X										X	X	X		X	
Common grackle	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Great-tailed grackle (U)													X				
Brown-headed cowbird		X	X		X			X			X	X	X	X	X	X	X
Orchard oriole (U)													X			X	X
Bullock•s oriole	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
House finch		X					X		X	X	X	X	X	X	X	X	X
Pine siskin							X		X				X				
Lesser goldfinch													X				
American goldfinch	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evening grosbeak													X				
House sparrow (I)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TOTAL BIRDS: 230 SPP.	**34**	**64**	**33**	**45**	**35**	**33**	**54**	**37**	**44**	**31**	**103**	**131**	**210**	**112**	**99**	**66**	**86**

MAMMALS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Masked shrew (U)									X								
Fringed myotis (U)									X								

MAMMALS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Long-legged myotis (U)				X					X								
Western small-footed myotis (U)				X													
Little brown bat				X				X	X		X			X			X
Red bat									X								
Hoary bat				X							X						X
Silver-haired bat				X							X						X
Big brown bat				X			X		X		X	X	X	X			X
Eastern cottontail	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rock squirrel		X									X		X				
Fox squirrel	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plains pocket gopher							X				X	X	X				
Beaver		X		X		X	X				X	X	X	X	X	X	X
Western harvest mouse													X				
Deer mouse	X										X		X				
Mexican woodrat	X																
Prairie vole	X										X		X				
Meadow vole							X				X	X	X				
Muskrat		X		X			X				X	X	X	X	X		X
Norway rat (I)								X									

MAMMALS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
House mouse (I)	X										X		X				
Coyote											X	X	X			X	X
Red fox	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X
Black bear (U)									X	X			X				
Raccoon	X					X					X	X	X	X	X	X	X
Mink (U)				X							X		X		X	X	X
Striped skunk							X				X	X	X				X
River otter (U)															X		
Elk (U)															X		
Mule deer	X	X	X				X	X	X		X	X	X	X	X	X	X
White-tailed deer									X		X	X	X	X	X	X	X
TOTAL MAMMALS: 32 SPP.	**9**	**7**	**4**	**10**	**2**	**5**	**10**	**6**	**9**	**3**	**21**	**13**	**20**	**10**	**11**	**9**	**15**

AMPHIBIANS AND REPTILES	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Tiger salamander													X				
Woodhouse's toad		X	X	X	X			X					X		X	X	
Chorus frog		X	X				X	X			X	X	X	X	X	X	
Bullfrog		X	X	X			X				X		X	X		X	

AMPHIBIANS AND REPTILES	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Northern leopard frog (SC)													X0				
Snapping turtle		X		X			X					X					
Painted turtle		X	X	X			X				X	X	X	X	X	X	X
Ornate box turtle											X						
Racer											X						
Northern water snake															X		
Bullsnake											X	X	X				
Plains garter snake	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Prairie rattlesnake													X		X		
TOTAL HERPTILES: 13 SPP	**1**	**6**	**5**	**5**	**2**	**1**	**5**	**3**	**2**	**1**	**7**	**5**	**9**	**4**	**6**	**5**	**2**

FISHES	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Gizzard shad													X				X
Rainbow trout (I)				X					X				X				
Mountain whitefish (I)				X					X								
Brown trout (I)		X		X			X		X		X	X	X				X
Stoneroller									X								X
Common carp (I)	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Brassy minnow (ST)																	X
Common shiner (ST)				X					X								X
Emerald shiner (I)											X						
Sand shiner		X		X					X				X				X
Fathead minnow		X	X	X					X				X		X	X	X
Longnose dace				X					X				X				X
Creek chub				X					X				X				X
Longnose sucker				X					X				X				X
White sucker				X			X		X		X	X	X	X			X
Black bullhead		X		X							X	X	X				X
Channel catfish		X		X									X	X			
Plains topminnow				X					X				X				X
Plains killifish									X				X				X

FISHES	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Green sunfish				X					X		X		X	X			X
Pumpkinseed (I)				X					X		X						X
Orangespotted sunfish									X								X
Bluegill (I)		X		X					X		X		X	X			X
Hybrid sunfishes(I)		X		X									X	X			
Smallmouth bass (I)				X					X		X		X				
Largemouth bass (I)		X		X					X		X		X	X			X
Wiper (I) (Hybrid bass)													X				X
White crappie (I)													X	X			
Black crappie (I)		X		X							X		X	X			X
Johnny darter				X									X				X
Yellow perch (I)		X		X					X		X		X	X			X
Walleye (I)														X			
Tiger muskie (I) (Hybrid)														X			
TOTAL FISHES: 33 SPP	**1**	**11**	**2**	**21**	**1**	**1**	**3**	**1**	**21**	**0**	**12**	**7**	**24**	**12**	**3**	**3**	**24**

Appendix D-2: Plants Observed on Poudre River Natural Areas (1990-2010)

Site: Butterfly Woods (BW), North Shields Ponds (NS), Magpie Meander (MM), McMurry (MC), Salyer (SA), River•s Edge (RE), Gustav Swanson (GS), Udall (UD), Springer (SP), Williams (WI), Kingfisher Point (KP), Cattail Chorus (CC), Riverbend Ponds (RI), Prospect Ponds (PP), Cottonwood Hollow (CH), Running Deer (RD), Arapaho Bend (AB).

Species: N = Native to the Fort Collins Growth Management Area (GMA); I = Introduced, not native to the Fort Collins GMA; FT = Federal Threatened; CR = Colorado Rare Plant (CO Natural Heritage Program); U = Uncommon Species in GMA.

Occurrence: X = Recorded from site; XR= Removed from site.

Source: Compiled from surveys by professional ecologists and Natural Areas Program staff. Not all sites have been intensively surveyed; therefore, some species may be present on a site and not yet reflected in these tables. Nomenclature follows William A. Weber and Ronald C. Wittmann (1996: ▪Colorado Flora: Eastern Slope•).

TREES AND SHRUBS	NATURAL AREA																
	BW	NS	MM	MC	SA	RE	GS	UD	SP	WI	KP	CC	RI	PP	CH	RD	AB
Rocky Mountain maple (*Acer glabrum*) I													X				
Silver maple (*Acer saccharinum*) I						X											
Thinleaf alder (*Alnus tenuifolia*) N	X	X		X	X	X	X	X	X		X	X	X				
Saskatoon serviceberry (*Amelanchier alnifolia*) N		X					X										
Utah serviceberry (*Amelanchier utahensis*) I		X															
Indigobush amorpha (*Amorpha fruticosa*) N	X	X			X		X						X				X

TREES AND SHRUBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Fringed sage (*Artemisia frigida*) N	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Four-winged saltbush (*Atriplex canescens*) N				X	X		X										
Western river birch (*Betula fontinalis*) N	X	X		X	X		X		X				X				
New Jersey tea (*Caenothus herbaceus*) I							X										
Common hackberry (*Celtis occidentalis*) I												X	X				
Netleaf hackberry (*Celtis reticulata*) N							X										
Sand cherry (*Cerasus pumila besseyi*) N		X					X						X				
True mountain mahogany (*Cercocarpus montanus*) N							X										
Rubber rabbitbrush (*Chrysothamnus nauseosus*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Low rabbitbrush (*Chrysothamnus viscidiflorus*) N	X	X		X	X	X	X	X				X			X	X	X
Western hawthorn (*Crataegus macracantha* var. *occidentalis*) N							X										
Russian olive (*Elaeagnus angustifolia*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New Mexico privet (*Forestiera neomexicanus*) I													X				

TREES AND SHRUBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Green ash (*Fraxinus pensylvanica* var. *lanceolata*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Honeylocust (*Gleditsia triocanthos var. inermis*) I				X							X						
Broom snakeweed (*Gutierrezia sarothrae*) N							X										X
Cliff jamesia (*Jamesia americana*) N							X										
Eastern red cedar (*Juniperus virginiana*) I											X		X	X	X	X	X
Common honeysuckle (*Lonicera tatarica*) I				X	X	X	X				X			X			
Creeping barberry (*Mahonia repens*) N							X										
Inland boxelder (*Negundo aceroides*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sand sagebrush (*Oligosporus filifolius*) N							X										
Common chokecherry (*Padus virginiana melanocarpa*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Shrubby cinquefoil (*Pentaphylloides floribunda*) I							X										
Mountain ninebark (*Physocarpus monogynus*) N							X										
Common ninebark (*Physocarpus opulifolius*) N, U														X			

TREES AND SHRUBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Blue spruce (*Picea pungens*) I													X				
Austrian pine (*Pinus nigra*) I													X				
Ponderosa pine (*Pinus ponderosa*) N				X		X							X				
Lanceleaf cottonwood (*Populus* x *acuminata*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
White poplar (*Populus alba*) I						X											
Narrowleaf cottonwood (*Populus angustifolia*) N	X	X		X	X		X	X					X	X	X	X	X
Plains cottonwood (*Populus deltoides monilifera*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American plum (*Prunus americana*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nanking cherry (*Prunus tomentosa*) I													X				
Antelope bitterbrush (*Purshia tridentata*) N							X										
Bur oak (*Quercus macrocarpus*) I								X	X								
Common buckthorn (*Rhamnus cathartica*) I	X	X		X	X		X		X	X	X	X	X				
Three-leaf sumac (*Rhus aromatica trilobata*) N		X		X		X	X		X				X				X
Smooth sumac (*Rhus glabra cismontana*) N							X										
American black currant (*Ribes americanum*) N (CR)	X								X		X						

TREES AND SHRUBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Golden currant (*Ribes aureum*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wax currant (*Ribes cereum*) N		X					X										
Wolf•s gooseberry (*Ribes wolfii*) I							X										
Black locust (*Robinia pseudoacacia*) I													X				
Woods rose (*Rosa woodsii*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red raspberry (*Rubus idaeus melanolasius*) I							X										
Black raspberry (*Rubus occidentalis*) I	X																
Rocky Mountain juniper (*Sabina scopulorum*) N						X											
Golden willow (*Salix alba* var. *vitellina*) I		X									X		X				
Peachleaf willow (*Salix amygdaloides*) N	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X
Coyote willow (*Salix exigua*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Crack willow (*Salix fragilis*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bluestem willow (*Salix irrorata*) N		X															
Crack willow (*Salix* x *rubens*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black greasewood (*Sarcobatus vermiculatus*) N													X				
Silver sagebrush (*Seriphidium canum*) N		X															

TREES AND SHRUBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Big sagebrush (*Seriphidium tridentatum*) I													X				
Silver buffaloberry (*Shepherdia argentea*) N							X						X				
European mountain-ash (*Sorbus aucuparia*) I													X				
Prince's plume (*Stanleya pinnata*) N													X				
Red-osier dogwood (*Swida sericea*) N	X	X		X	X	X	X				X	X	X				X
Common snowberry (*Symphoricarpos albus*) N	X	X				X	X										X
Western snowberry (*Symphoricarpos occidentalis*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mountain snowberry (*Symphoricarpos rotundifolius*) N							X										
Lilac (*Syringa vulgaris*) I					X								X				
Saltcedar (*Tamarix ramosissima*) I											X		X	X	X	X	X
Western poison ivy (*Toxicodendron rydbergii*) N				X	X		X									X	X
American elm (*Ulmus americana*) I		X					X				X		X				
Siberian elm (*Ulmus pumila*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American cranberry bush (*Viburnum edule*) N						X											
Small soapweed (*Yucca glauca*) N					X		X	X					X			X	X

TREES AND SHRUBS	NATURAL AREA																
	BW	NS	MM	MC	SA	RE	GS	UD	SP	WI	KP	CC	RI	PP	CH	RD	AB
No. Tree and Shrub Species (78 total; 60% native)	27	34	16	29	29	28	50	22	23	16	28	22	44	22	21	23	28

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	NS	MM	MC	SA	RE	GS	UD	SP	WI	KP	CC	RI	PP	CH	RD	AB
Indian ricegrass (*Achnatherum hymenoides*) N		X					X				X						
Western needlegrass (*Achnatherum nelsonii*) N																	X
Jointed goatgrass (*Aegilops cylindrica*) I													X				X
Macoun wild rye (*Agrohordeum macounii*) N				X	X	X									X		
Crested wheatgrass (*Agropyron desertoram*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Redtop (*Agrostis gigantea*) I					X		X										X
Redtop bentgrass (*Agrostis stolonifera*) I					X			X									X
Shortawn foxtail (*Alopecurus aequalis*) N								X					X	X	X		
Big bluestem (*Andropogon gerardii*) N		X		X	X	X	X	X				X	X	X	X	X	X

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Sand bluestem (*Andropogon hallii*) N							X										
Cheatgrass brome (*Anisantha tectorum*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Purple threeawn (*Aristida purpurea*) N							X										
Wild oat (*Avena fatua*) I		X											X				
American sloughgrass (*Beckmannia syzigachne*) N								X									
Alkali bulrush (*Bolbochoenus maritimus paludosus*) N								X					X		X		
Sideoats grama (*Bouteloua curtipendula*) N	X	X		X	X	X	X	X			X	X	X	X	X	X	X
Smooth brome (*Bromopsis inermis*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nodding brome (*Bromopsis lanatipes*) N							X										
Japanese brome (*Bromus japonicus*) I		X			X	X		X	X	X			X	X	X		X
Buffalograss (*Buchloe dactyloides*) N	X	X		X	X	X	X	X			X	X	X	X	X	X	X
Bluejoint reedgrass (*Calamagrostis canadensis*) I					X	X											
Prairie sandreed (*Calamovilfa longifolia*) N		X					X										
Bebb's sedge (*Carex bebbii*) N		X						X									
Woolly sedge (*Carex lanuginosa*) N		X			X								X				X

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Nebraska sedge (*Carex nebrascensis*) N		X	X	X	X	X		X	X	X	X		X		X		X
Silver sedge (*Carex praegracilis*) N					X								X				
Mat sandbur (*Cenchrus longispinus*) N							X						X				
Big mountain brome (*Ceratochloa marginata*) I							X										
Blue grama (*Chondrosum gracile*) N	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
Foxtail barley (*Critesion jubatum*) N		X			X	X	X	X					X	X	X	X	X
Bearded flatsedge (*Cyperus aristatus*) N													X				X
Orchardgrass (*Dactylis glomerata*) I	X	X	X	X	X	X			X	X			X	X			X
Tufted hairgrass (*Deschhampsia caespitosa*) I							X		X	X							
Inland saltgrass (*Distichlis spicata stricta*) N	X	X	X	X			X				X	X	X	X	X	X	X
Barnyardgrass (*Echinochloa crus-galli*) I		X			X	X	X						X	X			X
Common spikesedge (*Eleocharis palustris*) N		X			X			X					X		X		X
Dwarf spikesedge (*Eleocharis parvula*) N															X		
Canada wild rye (*Elymus canadensis*) N	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Bottlebrush squirreltail (*Elymus elymoides*) N											X						
Thickspike wheatgrass (*Elymus lanceolatus*) N		X					X										X
Slender wheatgrass (*Elymus trachycaulus*) N	X						X										X
Beardless Virginia wild rye (*Elymus virginicus*) N					X												
Quackgrass (*Elytrigia repens*) I							X		X	X	X	X	X			X	X
Stinkgrass (*Eragrostis cilianensis*) I	X	X	X	X	X	X	X	X			X	X	X	X			X
Purple lovegrass (*Eragrostis spectabalis*) I																X	
Sand lovegrass (*Eragrostis trichodes*) I		X					X										
Tall fescue (*Festuca arundinacea*) I							X										
Red fescue (*Festuca rubra*) I														X			
Mountain fescue (*Festuca saximontana*) I														X			
American mannagrass (*Glyceria grandis*) N								X									X
Fowl mannagrass (*Glyceria striata stricta*) N		X			X												
Needle-n-thread (*Hesperostipa comata*) N	X			X	X	X	X				X	X	X		X	X	X

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Baltic rush (*Juncus arcticus ater*) N		X			X			X					X	X	X	X	X
Toad rush (*Juncus bufonius*) N													X				
Rush (*Juncus compressus*) I																	X
Colorado rush (*Juncus confusus*) N		X											X				
Dudley rush (*Juncus dudleyii*) N	X							X	X				X				
Inland rush (*Juncus interior*) N					X										X		X
Longstyle rush (*Juncus longistylus*) N													X				
Jointed rush (*Juncus nodosus*) N					X								X				X
Torrey rush (*Juncus torreyi*) N															X		X
Rice cutgrass (*Leersia oryzoides*) I													X				
Great Basin wildrye (*Leymus cinereus*) N						X					X	X			X	X	
Crested ryegrass (*Lolium perenne*) I							X										
Alkali muhly (*Muhlenbergia asperifolia*) N													X				X
Green muhly (*Muhlenbergia racemosa*) N					X												
Green needlegrass (*Nassella viridula*) N											X	X					X
Common witchgrass (*Panicum capillare*) I	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Switchgrass (*Panicum virgatum*) N	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X
Western wheatgrass (*Pascopyrum smithii*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Reed canarygrass (*Phalaroides arundinacea*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Timothy (*Phleum pratense*) I		X									X			X			X
Canada bluegrass (*Poa compressa*) N		X			X		X						X				
Wood bluegrass (*Poa nemoralis*) N		X			X												
Fowl bluegrass (*Poa palustris*) I		X			X	X			X	X			X				
Kentucky bluegrass (*Poa pratensis*) I	X	X					X	X		X	X		X			X	X
Sandberg bluegrass (*Poa secunda*) N							X										
Rabbitfoot polypogon (*Polypogon monspeliensis*) I		X			X	X							X	X	X		X
Beardless bluebunch wheatgrass (*Pseudoroegneria spicata*) I													X				
Weeping alkaligrass (*Puccinellia distans*) I															X		
Tumble grass (*Schedonnardus paniculatus*) N														X			
Little bluestem (*Schizachyrium scoparium*) N	X	X		X	X	X	X	X			X	X	X	X			X

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Hardstem bulrush (*Schoenoplectus lacustris acutus*) N	X	X		X								X	X			X	X
American bulrush (*Schoenoplectus pungens*) N	X	X			X	X		X	X			X	X	X	X	X	X
Softstem bulrush (*Schoenoplectus lacustris creber*) N								X					X		X	X	X
Panicled bulrush (*Scirpus microcarpus*) N		X			X			X					X				
Pale bulrush (*Scirpus pallidus*) N								X									
Winter rye (*Secale cereale*) I	X																
Foxtail (*Setaria geniculata*) I	X														X		
Yellow bristlegrass (*Setaria glauca*) I					X	X							X				
Green bristlegrass (*Setaria viridis*) I		X		X			X		X	X	X			X	X		
Yellow indiangrass (*Sorghastrum avenaceum*) N		X		X	X	X		X	X		X	X	X	X			
Prairie cordgrass (*Spartina pectinata*) N		X			X		X		X	X			X				X
Alkali sacaton (*Sporobolus airoides*) N															X		
Tall dropseed (*Sporobolus asper*) N							X							X	X	X	
Sand dropseed (*Sporobolus cryptandrus*) N	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Green needlegrass (*Stipa viridula*) N	X	X											X				

GRASSES AND GRASSLIKE PLANTS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Tall wheatgrass (*Thinopyrum ponticum*) I					X	X							X	X	X		X
Sixweeks fescue (*Vulpia octoflora*) N														X	X		X
No. Grass and Grasslike Species (99 total; 67% native)	**25**	**45**	**13**	**23**	**44**	**30**	**40**	**33**	**18**	**17**	**26**	**23**	**54**	**32**	**36**	**24**	**49**

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Western yarrow (*Achillea lanulosa*) N							X						X	X			X
Common yarrow (*Achillea millefolium*) I		X					X										
Diffuse knapweed (*Acosta diffusa*) I											X		X				
Russian knapweed (*Acroptilon repens*) I													X	X	X	X	X
Blue flax (*Adenolinum lewisii*) N		X		X	X		X			X			X	X	X		X
Roadside agrimony (*Agrimonia striata*) N					X						X						
Textile onion (*Allium textile*) N		X															
Alyssum (*Alyssum parviflorum*) I	X	X		X	X	X		X			X	X	X	X	X	X	X

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Redroot amaranth (*Amaranthus retroflexus*) I		X			X		X						X				X
Ragweed (*Ambrosia artemisiifolia*) I												X	X				
Western ragweed (*Ambrosia psilostachya coronopifolia*) N					X	X		X			X	X	X	X			X
Giant ragweed (*Ambrosia trifida*) I		X			X	X	X	X	X						X		X
Meadow anemone (*Anemonidium canadense*) N					X	X	X				X		X				
Rose pussytoes (*Antennaria rosea*) N		X															
Spreading dogbane (*Apocynum androsaemifolium*) N	X				X		X										
Hemp dogbane (*Apocynum sibricum*) N	X				X				X			X	X	X		X	X
Smaller burdock (*Arctium minus*) I	X				X	X			X		X	X	X	X			
Hedgehog pricklepoppy (*Argemone hispida*) N								X				X	X	X	X	X	X
Many-flowered pricklepoppy (*Argemone polyanthemos*) N					X		X				X						
Prairie sage (*Artemisia ludoviciana*) N	X	X		X			X				X	X	X		X	X	X
Swamp milkweed (*Asclepias incarnata*) N		X	X		X	X	X				X	X	X	X	X	X	X
Showy milkweed (*Asclepias speciosa*) N	X	X	X	X	X	X			X		X	X	X	X	X	X	X

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Garden asparagus (*Asparagus officinalis*) I	X	X	X	X		X			X	X	X	X	X			X	X
Common catchweed (*Asperugo procumbens*) I		X					X	X	X	X	X	X		X		X	
Smooth aster (*Aster laevis* var. *geyeri*) N							X										
Siskiyou aster (*Aster lanceolatus hesperius*) N																	X
Two-grooved milkvetch (*Astragalus bisulcatus*) N																X	
Mexican azolla (*Azolla mexicana*) N													X				
Ragleaf bahia (*Bahia dissecta*) N													X				
Belvedere summercypress (Kochia) (*Bassia sieversiana*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nodding beggarticks (*Bidens cernua*) N												X	X		X		X
Devils beggarticks (*Bidens frondosa*) N												X	X				
Tall beggarticks (*Bidens vulgata*) I																X	
Aster (*Brachyactis ciliata angusta*) N																	X
Canada thistle (*Breea arvense*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Low poppymallow (*Callirrhoe involucrata*) N		X															

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Nuttall mariposa lily (*Calochortus nuttalii*) I							X										
Creeping bellflower (*Campanula rapunculoides*) I												X	X	X	X		
Harebell (*Campanula rotundifolia*) N		X					X										
Shepherds purse (*Capsella bursa-pastoris*) I	X	X		X	X		X						X	X		X	X
Pepperweed whitetop or Hoary cress (*Cardaria draba*) I				X	X	X							X				
Musk thistle (*Carduus nutans*) I	X			X	X	X		X			X	X	X	X	X	X	X
Hornwort (*Ceratophyllum demersum*) N				X								X	X				X
Ridgeseed euphorbia (*Chamaesyce glyptosperma*) N													X				
Missouri euphorbia (*Chamaesyce missurica*) N							X						X				
Lambsquarters goosefoot (*Chenopodium album*) I													X				
Pitseed goosefoot (*Chenopodium berlandieri*) N																	X
Oakleaf goosefoot (*Chenopodium glaucum*) I															X		X
Blue mustard (*Chorispora tenella*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Common chicory (*Cichoryum intybus*) I		X			X	X											
Wavyleaf thistle (*Cirsium undulatum*) N														X			
Bull thistle (*Cirsium vulgare)* I															X		
Western virginsbower (*Clematis ligusticifolia*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rocky Mountain beeplant (*Cleome serrulata*) N		X					X				X						X
Blue-eyed Mary (*Collinsia parvaflora*) N													X				
Poisonhemlock (*Conium maculatum*) I					X		X						X				
European bindweed (*Convolvulus arvensis*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Canadian horseweed (*Conyza canadensis*) I	X	X		X			X				X	X	X	X	X	X	X
Plains coreopsis (*Coreopsis tinctoria*) N		X															
Douglas clematis (*Coriflora hirsutissima*) N	X						X										
Golden corydalis (*Corydalis aurea*) N													X				
Slender hawksbeard (*Crepis capillaris*) I													X				

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Marsh elder (*Cyclachaena xanthifolia*) N							X										
Common houndstongue (*Cynoglossum officinale*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Buttercup (*Cyrtohyncha ranunculina*) N													X				
Prairie clover (*Dalea cylindriceps*) N																	X
Purple prairie clover (*Dalea purpurea*) N		X					X										
Geyer larkspur (*Delphinium geyeri*) N							X										
Richardson tansymustard (*Descurainia richardsonii*) N													X				
Flixweed tansymustard (*Descurainia sophia*) I	X	X			X			X	X	X	X	X	X	X	X	X	X
Venuscup teasel (*Dipsacus fullonum*) I							X		X								X
Prairie dogweed (*Dyssodia papposa*) N	X						X										
Wild mock cucumber (*Echinocystis lobata*) N		X	X		X	X			X		X		X	X			X
Common waterpod (*Ellisia nyctelea*) I											X						
Sticky willowweed (*Epilobium ciliatum*) N					X			X			X		X		X		X
Field horsetail (*Equisetum arvense*) N	X	X	X		X						X		X				X

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Spreading fleabane (*Erigeron divergens*) N		X		X									X				
Trailing fleabane (*Erigeron flagellaris*) N													X				
Oregon fleabane (*Erigeron speciosus*) N		X															
Sulphur eriogonum (*Eriogonum umbellatum*) N		X					X										
Crane's bill (*Erodium cicutarium*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plains wallflower (*Erysimum asperum*) N		X					X							X			
Spotted Joe pye weed (*Eupatorium maculatum*) N			X		X								X			X	
Prairie gentian (*Eustoma grandiflorum*) N (CR)													X			X	
Dullseed cornbind (*Fallopia convolvulus*) I													X	X			
Bracted strawberry (*Fragaria vesca*) N							X		X								
Drug fumitory (*Fumaria officinalis*) I	X	X			X			X					X		X		
Common perennial gaillardia (*Gaillardia aristata*) N		X					X						X	X			X
Catchweed bedstraw (*Galium aparine*) I	X				X	X			X	X			X		X		

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Scarlet gaura (*Gaura coccinea*) N																	X
Smallflower gaura (*Gaura mollis*) N		X			X	X	X					X	X	X	X		X
Common sea milkwort (*Glaux maritima*) N													X				
American licorice (*Glycyrrhiza lepidota*) N	X			X	X	X	X	X	X	X	X	X	X	X		X	X
Curlycup gumweed (*Grindelia squarrosa*) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Shore buttercup (*Halerpestes cymbalaria saximontana*) N					X								X		X		X
Halogeton (*Halogeton glomeratus*) I								X									
Blister buttercup (*Hecatonia scelerata*) N															X		
Common sunflower (*Helianthus annuus*) N		X									X		X	X	X	X	X
Sunflower (*Helianthus nuttallii*) N													X				X
Prairie sunflower (*Helianthus petiolaris*) N					X						X		X	X	X		X
Sunflower (*Helianthus pumilus*) N													X				X
Common parsnip (*Heracleum sphondylium montanum*) N					X												
Dames rocket (*Hesperis matronalis*) I					X	X	X		X	X	X		X				

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Mountain golden aster (*Heterotheca foliosa*) N							X										
Hairy goldaster (*Heterotheca villosa*) N	X	X	X	X			X				X	X	X				X
Scouringrush (*Hippochaete hyemalis*) N					X		X						X				
Smooth horsetail (*Hippochaete laevigata*) N					X								X	X	X	X	X
New Mexican hop (*Humulus lupulus*) N					X												
Wild iris (*Iris missouriensis*) N		X			X												
Poverty sumpweed (*Iva axillaris*) N	X												X				
Prickly lettuce (*Lactuca serriola*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chicory lettuce (*Lactuca tatarica*) N																	X
Henbit deadnettle (*Lamium amplexicaule*) I		X			X												
Blueburr stickseed (*Lappula redowskii*) N								X	X								
Common duckweed (*Lemna minor*) N		X	X	X	X							X	X		X	X	X
Common motherwort (*Leonurus cardiaca*) I					X				X		X		X	X	X		
Prairie pepperweed (*Lepidium densiflorum*) I	X															X	

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Clasping pepperweed (*Lepidium perfoliatum*) I													X	X	X	X	X
Ox-eye daisy (*Leucanthemum vulgare*) I											X		X				
Dotted gayfeather (*Liatris punctata*) N		X					X										X
Dalmation toadflax (*Linaria genistifolia subsp. dalmatica*) I	X			X	X							X	X		X		
Butter-and-eggs toadflax (*Linaria vulgaris*) I					X						X						
Silvery lupine (*Lupinus argenteus*) N		X															
Matrimony vine (*Lycium barbarum*) I						X											
American bugleweed (*Lycopus americanus*) N													X		X		
Bugleweed (*Lycopus asper*) N																	X
Fringed loosestrife (*Lysimachia ciliata*) N					X												
Purple loosestrife (*Lythrum salicaria*) I							XR	XR									
Bigelow aster (*Machaeranthera bigelovii*) N															X		
Hoary aster (*Machaeranthera canescens*) N	X																X
Tansyleaf aster (*Machaeranthera tanacetifolia*) N							X										

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Starry false solomonseal (*Maianthemum stellatum*) N					X				X		X	X	X	X			
Running mallow (*Malva neglecta*) I		X			X		X						X	X	X	X	X
Common hoarhound (*Marrubium vulgare*) I	X																X
Black medic (*Medicago lupulina*) I	X				X								X	X			X
Alfalfa (*Medicago sativa*) I	X	X		X			X		X	X	X	X	X				X
White sweetclover (*Melilotus alba*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow sweetclover (*Melilotus officinalis*) I	X	X		X	X	X	X	X	X		X	X	X		X	X	X
Field mint (*Mentha arvensis*) N									X				X				X
Mintleaf beebalm (*Monarda fistulosa menthifolia*) N	X	X					X				X	X	X			X	
Horsemint (*Monarda pectinata*) N												X					
Watercress (*Nasturtium officinale*) I								X									X
Tufted loosestrife (*Naumburgia thyrsiflora*) N (CR)			X	X	X				X								
Field pepperweed (*Neolepia campestre*) I														X	X		
Catnip (*Nepeta cataria*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ten-petal mentzelia (*Nuttallia decapetala*) N							X										

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Desert mentzelia (*Nuttallia multiflora*) N																	X
Tufted evening primrose (*Oenothera caespitosa*) N		X															
Yellow evening primrose (*Oenothera villosa*) N		X		X	X	X		X				X	X	X	X	X	X
Sagewort wormwood (*Oligosporus pacificus*) N	X																
Bigroot pricklypear (*Opuntia macrorhiza*) N							X					X	X				
Plains pricklypear (*Opuntia polyacantha*) N	X			X									X		X	X	X
Louisiana broomrape (*Orobanche ludoviciana*) N																	X
Umbrellawort (*Oxybaphus nyctagineus*) N					X								X				X
Virginia creeper (*Parthenocissus vitacea*) N	X				X		X										
Virginia creeper (*Parthenocissus quinquefolia*) I	X	X		X	X	X					X	X	X	X	X	X	X
Garden parsnip (*Pastinaca sativa*) I																	
Sidebells penstemon (*Penstemon secundiflorus*) N							X										

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Rocky Mountain penstemon (*Penstemon strictus*) I		X															
Swamp smartweed (*Persicaria coccinea*) N									X				X			X	
Curltop lady•s thumb (*Persicaria lapathifolia*) I									X				X		X		X
Spotted lady's thumb (*Persicaria maculata*) I									X				X	X			X
Pennsylvania smartweed (*Persicaria pensylvanica*) N														X	X		X
Virginia groundcherry (*Physalis virginiana*) N														X			
Rippleseed plantain (*Plantago major*) I		X			X		X						X				X
False salsify (*Podospermum laciniatum*)	X	X		X	X												
Toothed euphorbia (*Poinsettia dentata*) I		X			X									X			X
Prostrate knotweed (*Polygonum arenastrum*) I					X		X				X		X	X	X		X
Bushy knotweed (*Polygonum ramosissimum*) I							X								X		
Common purslane (*Portulaca oleracea*) I							X						X				X

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Leafy pondweed (*Potamogeton foliosus*) N				X													
Norwegian cinquefoil (*Potentilla norvegica*) I																	X
Pennsylvania cinquefoil (*Potentilla pensylvanica*) N													X		X		X
Common selfheal (*Prunella vulgaris*) I													X				
Cottonbatting cudweed (*Pseudognaphalium stramineum*) N													X				X
Purpleflower groundcherry (*Quincula lobata*) N													X				
Upright prairie coneflower (*Ratibida columnifera*) N		X			X	X	X				X	X	X	X			X
Watercress (*Rorippa palustris hispida*) N					X			X	X				X	X	X		X
Black-eyed Susan (*Rudbeckia hirta*) I				X	X		X										
Cutleaf coneflower (*Rudbeckia laciniata ampla*) I				X	X	X						X	X	X			
Curly dock (*Rumex crispus*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Golden dock (*Rumex maritimus fueginus*) N								X							X		
Narrowleaf dock (*Rumex stenophyllus*) I															X		X

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Common arrowhead (*Sagittaria latifolia*) N									X			X					
Tumbling Russian thistle (*Salsola australis*) I	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bouncingbet (*Saponaria officinalis*) I				X	X		X	X			X		X				X
Broom groundsel (*Senecio spartioides*) N							X						X				
Forked silene (*Silene noctiflora*) I													X				
Bladder campion (*Silene vulgaris*) I	X																
Tumble mustard (*Sisymbrium altissimum*) I	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X
Carrion flower greenbrier (*Smilax lasioneuron*) N (CR)									X								
Hairy nightshade (*Solanum physalifolium* var. *nitidibaccatum*) I							X										
Cutleaf nightshade (*Solanum triflorum*) I							X										
Canada goldenrod (*Solidago canadensis*) N	X										X	X	X	X			X
Giant goldenrod (*Solidago serotinoides*) N		X			X	X											
Missouri goldenrod (*Solidago missouriensis*) N							X										

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Field sowthistle (*Sonchus arvensis*) I																	X
Prickly sowthistle (*Sonchus asper*) I													X		X		
Burreed (*Sparganium eurycarpum*) N (CR)		X															
Sandspurry (*Spergularia media*) N													X		X		X
Scarlet globemallow (*Sphaeralcea coccinea*) N	X						X						X	X			X
Daisy fleabane (*Stenactis strigosus*) N																	X
Common tansy (*Tanacetum vulgare*) I													X	X			
Common dandelion (*Taraxacum officinale*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jerusalem oak goosefoot (*Teloxys botrys*) I															X		
Purple meadowrue (*Thalictrum dasycarpum*) N	X			X	X				X					X			X
Thelesperma (*Thelesperma megapotamicum*) N													X				
Spreading golden banner (*Thermopsis divaricarpa*) N		X															
Prairie golden banner (*Thermopsis rhombifolia*) N			X	X													
Field pennycress (*Thlaspi arvense*) I	X						X									X	

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Leafy spurge (*Tithymalus esula/uralensis*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Townsendia (*Townsendia grandiflora*) N							X										
Prairie spiderwort (*Tradescantia occidentalis*) N		X					X						X				X
Western salsify (*Tragopogon dubius major*) I					X		X	X	X	X			X	X			X
Puncturevine (*Tribulus terrestris*) I	X						X						X				X
Red clover (*Trifolium pratense*) I							X						X				
White clover (*Trifolium repens*) I					X												
Seaside arrowgrass (*Triglochin maritimum*) N													X				
Narrowleaf cattail (*Typha angustifolia*) N							X						X				X
Common cattail (*Typha latifolia*) N	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Tall nettle (*Urtica gracilis*) N		X			X		X		X				X	X			X
Flannel mullein (*Verbascum thapsus*) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bigbract verbena (*Verbena bracteata*) I		X		X			X						X				X
Blue verbena (*Verbena hastata*) N		X			X				X		X	X	X	X			X
Hoary vervain (*Verbena stricta*) N							X										

WILDFLOWERS, VINES, AND OTHER FORBS	NATURAL AREA																
	BW	**NS**	**MM**	**MC**	**SA**	**RE**	**GS**	**UD**	**SP**	**WI**	**KP**	**CC**	**RI**	**PP**	**CH**	**RD**	**AB**
Water speedwell (*Veronica anagallis-aquatica*) I					X			X					X		X		X
Hairy vetch (*Vicia villosa*) I									X	X							
Canada violet (*Viola scopulorum*) N														X			
Many-flowered aster (*Virgulus ericoides*) N													X			X	
White prairie aster (*Virgulus falcatus*) N																	X
Riverbank grape (*Vitis riparia*) N									X	X							X
Cocklebur (*Xanthium strumarium*) I									X				X	X	X	X	X
No. Wildflower, Vine, other Forb Species (252 total; 62% native)	**55**	**74**	**28**	**45**	**84**	**42**	**85**	**38**	**48**	**28**	**49**	**54**	**130**	**69**	**67**	**51**	**108**

Total No. of Plant Species on Poudre River Natural Areas = 429 (62% Native).

Appendix E: Land Acquisition History for Poudre River Natural Areas

Natural Area	2011 Acres	Acquisition History	Year 1st Opened
Butterfly Woods	24.1	City purchased in 1996 for $191,208 (63% from City NAP funds; $37% from City Parks' State Lottery Conservation Trust Funds).	2004
North Shields Ponds	53.8	City purchased 10 acres in 1962 from Poudre Valley Bank for unknown amount; 43.8 acres (formerly Sterling Natural Area) leased by NAP from PSD for $1 since 2007.	1962
Magpie Meander	7.2	NAP purchased 7.2 acres in 1995 for $62,878 (formerly Hickory Natural Area).	2005
McMurry	43.9	Hattie McMurry donated 26.4 acres to Larimer County Parks in 1965, which was transferred to City in 2003; NAP purchased 17.5 acres in 1998 for $249,905 (97% funded by GOCO Legacy Grant).	1975
Salyer	24.0	Salyer Family donated 24 acres to Parks in 1985.	1985
River's Edge	9.5	NAP purchased 6.5 acres in 1994 for $21,255 (formerly Legacy Park Natural Area) and 3.0 acres in 2001 for $10,555.	1996
Gustav Swanson	10.4	City Light & Power purchased 10.5 acres in 1955 for $2,750 and transferred 8.9 acres to City Parks in 1987; Davis and Associates donated 0.9 acres in 1998; 0.4 acres acquired from State in 1994 through College Avenue Gateway Bridge project; NAP purchased 0.2 acres in 2002 for $15,985.	1988
Udall	26.2	City purchased Udall in 1994 for $273,617 (74% NAP; 26% Stormwater Utility) plus Willow Run Partnership bargain sale donation.	Not yet open
Springer	20.7	Springer-Fisher, Inc., donated 20.7 acres in 1990.	1990
Williams	1.4	Jack Williams donated 1.4 acres in 1990.	1990

Natural Area	2011 Acres	Acquisition History	Year 1st Opened
Kingfisher Point	146.9	Nix Family donated 2.3 acres in 1979, 1.5 acres purchased by Parks in 1979 for $10,000, and 2.3 acres purchased by Parks in 1988 for $66,500 with State Lottery Conservation Trust Funds (all formerly Bignall Natural Area); Flatiron Gravel Company donated 2.1 acres in 1983 (formerly Riverbend Ponds); NAP purchased 25.1 acres in 1997 for $515,156 (77% GOCO Legacy Fund) plus Nix Family bargain sale donation (formerly Nix Natural Area), 73.7 acres in 1998 for $505,111, 17.7 acres in 1999 for $35,767, 14.4 acres in 2000 for $110,040, 6.3 acres in 2000 for $164,060 (4% Stormwater Utility), and 1.5 acres in 2004 for $410 plus a bargain sale donation Stockover Enterprises, LLC.	1980
Cattail Chorus	104.7	Flatiron Gravel Company donated 18.4 acres in 1983 (formerly Riverbend Ponds); NAP purchased 40.0 acres in 1997 for $243,986 (55% funded by GOCO Legacy Grant) plus Williams and Associates bargain sale donation and another 46.3 acres for $158,820 plus bargain sale donation from Williams and Associates (formerly Kingfisher Point).	1980
Riverbend Ponds	218.4	Parks purchased 96.5 acres from 1977-1988 for $160,486; Flatiron Gravel Company donated 117.3 acres in 1983; NAP purchased 4.6 acres in 1999 for $21,000.	1978
Cottonwood Hollow	88.0	NAP purchased 48 acres in 1994 for $48,506, 37.6 acres in 1996 for $183,313, and 2.4 acres in 1998 for $3,262.	2000
Running Deer	279.4	NAP purchased 83 acres in 1998 for $620,167; 174 acres in 2000 for 1.27 million (16% funded by GOCO Legacy Grant); 6 acres in 2000 for $340,115; and 16.4 acres in 2007 for $201,401.	2002
Prospect Ponds	46.5	Water Utility purchased 40.7 acres in 1974; Parks started managing in 1981; NAP purchased 3.5 acres in 1996 for $17,578 and 2.3 acres in 1998 for $3,126 (both formerly Cottonwood Hollow).	1976
Arapaho Bend	297.1	NAP purchased 236.5 acres in 1995 for $1.6 million; 38 acres donated 2000; 22.6 acres were acquired in land exchange for State Wayside by Welcome Center on former Resource Recovery Farm.	1999