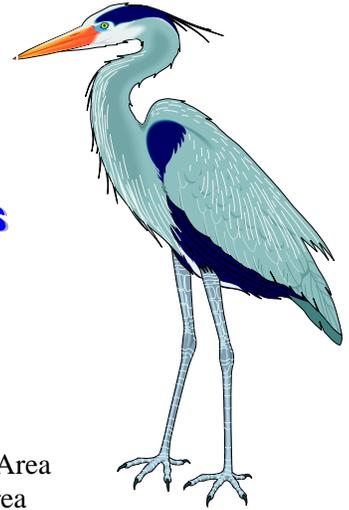


Cache la Poudre River Natural Areas Management Plan



Five-year Site Management Plans for

Site #96P1
North Shields Pond Natural Area
Hickory Natural Area
Salyer Natural Area
Legacy Natural Area
Gustav Swanson Natural Area
Udall Natural Area
Williams Natural Area
Springer Natural Area

Bignall Natural Area
Nix Natural Area
Kingfisher Point Natural Area
Cattail Chorus Natural Area
Riverbend Ponds Natural Area
Cottonwood Hollow Natural Area
Prospect Ponds Natural Area
Arapaho Bend Natural Area

Compilation Date: February 1999
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Recommendations in this plan are a combination of professional recommendations, public input, and political processes and should not be construed as being supported by individual team members.

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PREFACE

This management plan was written and compiled in 1997/1998. Process complications delayed adoption until 2002. In general, information in this plan reflects conditions and plans as of 1998. However, occasional mention is made of management changes between 1998 and 2001.

In 1993, the City of Fort Collins formed the interdepartmental Open Lands Natural Areas (OLNA) Management Team to address management issues associated with City-owned open lands and natural areas and to complete management plans for all City-owned natural areas. The team completed the "General Management Guidelines for City-owned Open Spaces and Natural Areas" in October 1994, the "Cathy Fromme Prairie Site Management Plan" in June 1995, and the "Foothills Natural Areas Management Plan" in January 1997. In March 2001, the Natural Resources Department completed the "General Management Guidelines for Natural Areas and Agricultural Lands Managed by the City of Fort Collins Natural Resources Department," which is an updated, expanded version of the "General Management Guidelines for City-owned Open Spaces and Natural Areas" only as that document would apply to sites managed by the Natural Resources Department.

Natural area management plans are generally based on the "General Management Guidelines for City-owned Open Spaces and Natural Areas" which, after extensive review by the public and City Council, was approved by the Natural Resources Advisory Board and the Parks and Recreation Board, and the subsequent "General Management Guidelines for Natural Areas and Agricultural Lands Managed by the City of Fort Collins Natural Resources Department." However, on sites with considerable historic use, the public often requests that historic uses continue, therefore, exceptions to the guidelines do occur. Additionally, management of Cache La Poudre River natural areas will occur in tandem with other City plans that apply to lands along the river. These include the "Poudre River Land Use Study," the "Strategy for Gravel Lands Along the Poudre River," and the "Master Drainage Way Plan." Where this natural areas management plan refers to possible considerations of the "Strategy for Gravel Lands Along the Poudre River," it should be noted that these are early considerations, and do not necessarily reflect final recommendations of the study. They are mentioned here to allow the public to be aware of possible site impacts.

The Cache La Poudre River Natural Areas Management Plan contains three types of information: historical information that may have significance for future or unforeseen management decisions; existing ecological and human use information important in making management decisions; and recommendations for management of the sites.

The Cache La Poudre River Natural Areas Management Plan is based on site inventory in late 1997 (when the first draft of this management plan was written). At that time, the Cache La Poudre River natural areas inventory included 20 City-owned natural areas along the river managed by the City's Natural Resources Department. Sites acquired after that time will be addressed in the 5-year update, or if warranted, in a separate, interim individual site management plan which will then be incorporated into the 5-year update. Four sites (Mulberry Water Reclamation Facility, Drake Water Reclamation Facility, Resource Recovery Farm, and the "Pickle Plant") are identified in the introduction of this management plan but are not included in the management section. Three sites (Lee Martinez Park Natural Area, Old Fort Collins Heritage Park Natural Area, and Archery Range Natural Area) were included in early drafts of this management plan, but were removed because they

are owned and managed by the Parks Department. Site-specific plans are presented for 17 natural areas:

Site #96P1	Springer Natural Area
North Shields Pond Natural Area	Bignall Natural Area
Hickory Natural Area	Nix Natural Area
Salyer Natural Area	Kingfisher Point Natural Area
Legacy Natural Area	Cattail Chorus Natural Area
Gustav Swanson Natural Area	Riverbend Ponds Natural Area
Udall Natural Area	Cottonwood Hollow Natural Area
Williams Natural Area	Prospect Ponds Natural Area
	Arapaho Bend Natural Area

The purpose of the management plan is fourfold: (1) provide opportunities for appropriate public use, (2) to an acceptable extent, protect the natural values of the natural areas along the Poudre River, (3) invite professional and public comment regarding management of these natural areas, and (4) provide opportunities for public education.

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APPENDIX A: List of Plants Observed on Poudre River Natural Areas (27 pages)

APPENDIX B: List of Animals Observed on Poudre River Natural Areas (15 pages)

APPENDIX C: List of Butterflies Observed along the Poudre River (2 Pages)

APPENDIX D: List of Aquatic Insects Collected from the Cache La Poudre River (2 pages)

APPENDIX E: Natural Area Planting Survival Rates (2 pages)

APPENDIX F 5-Year Site Management Implementation Plan (33 pages)

(This table identifies approximate costs and implementation dates to assist staff in planning efforts)

APPENDIX G: Public Comments on Management of the Poudre River Natural Areas

† Site jointly owned by City of Fort Collins Natural Resources Department and Fort Collins Utilities and will become subject to a Memorandum Of Understanding to be developed between the two departments.

†† Site owned by Fort Collins Utilities and will become subject to a Memorandum Of Understanding to be developed between the two departments.

††† There may be discrepancies in figures 1, 7, and 11. Any errors will be corrected in the update of this management plan.

Introduction

DOCUMENT FORMAT

Segments

The “Cache La Poudre River Natural Areas Management Plan” is divided into three major segments.

Introduction - This segment of the document contains general background information that should assist the reader in understanding the discussions throughout the document.

Site Descriptions - This segment describes the location, history, values, and present conditions of each site, but does not discuss management. If the reader is concerned about how some aspect, e.g., a present condition, is to be changed or maintained, the reader should refer to the Site Management Goals, Needs, and Opportunities segment.

Site Management Goals, Needs, and Opportunities - In this segment, the reader will find aspects of general management as well as management needs and opportunities of each individual Poudre River natural area.

BACKGROUND

History

The Cache La Poudre River (also referred to as “the Poudre,” “the river,” or “the Poudre River”) has been a focal point of Fort Collins since early settlement times, and it will continue to hold special interest for residents, visitors, and the commercial community. Its importance is reflected in the fact that, over the years, more than 20 studies and planning documents have been initiated to identify the community’s desires for the river corridor. (For a coordinated review of these plans, see “Poudre River Land Use Framework,” City of Fort Collins et al., 1993.) It is important to note that the “Cache La Poudre River Natural Areas Management Plan” is **not** one of these overall Poudre River visioning documents. Rather, it is limited to presenting a conceptual plan for management of City-owned natural areas along the river, using information from the visioning documents as appropriate.

The natural areas addressed in this plan lie in what the “City of Fort Collins Natural Areas Policy Plan” (NAPP) identifies as the “Poudre River Resource Area.” The scope of the “Cache La Poudre River Natural Areas Management Plan” extends from North Overland Trail to Harmony Road near Interstate 25 (I-25).

This plan will be updated every five years, and the updates will include sites added to City ownership after completion of the initial draft (February 1998) of this management plan.

Origin and Changes

The Cache La Poudre River originates in the Poudre Ponds in Rocky Mountain National Park, flows northeastward a short distance, then eastward through the Poudre Canyon into Fort Collins, eastward to Greeley, and finally joins the South Platte River east of Greeley.

Changes in the river’s environs are evident by comparing comments in the Colorado Water Resources Research Institute’s 1978 study (“Plains Segment of the Cache La Poudre River Colorado”) with what we see along the river today. The 1978 study indicated that the river was “primarily an agriculturally-oriented, low-human-population-density area with only higher-education-oriented urban Fort Collins providing a moderate rate of growth in human pressure on the stream.” This is quite a different picture from pressure on the river today, including pressure from Fort Collins’ current 100,000+ population. The study described what is now Colorado Highway 14 west of Fort Collins over Cameron Pass as, “an unpaved non-winter-maintained road,” with minimal traffic. Again, 20 years have brought massive changes.

The Poudre is a complex, sophisticated water management system. Large quantities of water are diverted at several points to supply water rights owners’ needs or to be stored in reservoirs for later use. Further downstream,

water is returned to the river after being used for irrigation, domestic, or industrial applications.

Natural Features Waterways have unique functions in the natural world, providing exceptional opportunities to enhance the enjoyment of these areas and exceptional responsibilities for protecting these natural areas not only from development, but also from being “loved to death” by an ever expanding human population. These opportunities and responsibilities include –

★ Natural ecosystem maintenance - Even though the Poudre has been highly managed, occasionally it floods and reminds us that the river ultimately is in charge. The river needs room to flow and function naturally, including flooding, which is one of nature’s ways of managing a river’s ecosystem.

★ Unique habitat in the arid West - Rivers, especially in arid environments, are home to many plant and wildlife species that cannot live in the adjacent, drier surroundings. Protection of these unique environments is crucial.

★ Recreation - People find rivers and riparian (riverbank) areas inviting places for recreation. The fact that some of the natural areas in this management plan were purchased years ago by the City’s Parks and Recreation Department is testimony to this desire for river-oriented recreation.

The function of this management plan is to maintain the ecological features and river-oriented character of these natural areas at an acceptable level, provide recreational opportunities, and preserve open lands for the public.

Exclusions Four City-owned sites along the river are identified as having natural values but are not discussed in this plan.

Water Reclamation Facilities – Portions of two facilities owned by the Water Utilities (Mulberry Water Reclamation Facility and Drake Water Reclamation Facility) border the river and are included in the City’s natural areas inventory because of their natural values. The river frontage of the Mulberry Water Reclamation Facility is characterized by mature cottonwoods and willows (used by a variety of songbirds, woodpeckers, and owls) and by river and side channel wetlands (used extensively by waterfowl, particularly in late fall to early spring). The river frontage of the Drake Water Reclamation Facility is characterized by mature cottonwoods and willows with excellent understory of native shrubs and patches of wetland plants; a wooded area used by a variety of songbirds, woodpeckers, and owls; and by river and wetland areas used mostly by urban waterfowl and waterbirds. There is no public access to these sites, nor is any anticipated, so management issues addressed in this plan are irrelevant to these sites.

Resource Recovery Farm – Portions of this site are characterized by wetlands, mature cottonwood forest, and shrub habitat (along lower Boxelder

Creek); a nesting site for red-tailed hawks and great horned owls; high year-round use by songbirds; and use by mule deer and a resident herd of about 10 white-tailed deer. This 377-acre site, owned and operated by the Water Utilities, is near Prospect Road and I-25. At the outset of drafting this management plan, the Resource Recovery Farm was used as an experimental facility for sludge application on agricultural land. As of the adoption date of this management plan, portions of the site east of the Boxelder Creek had been purchased by the Natural Resources Department and incorporated into Running Deer Natural Area. A separate management plan for that natural area will be written and folded into the five-year update of the Cache la Poudre River Natural Areas Management Plan.

“Pickle Plant” - This site at 500 Riverside Avenue was purchased in 1995 for \$290,424 with funding from Conservation Trust Funds (\$110,212), Wastewater Utility Capital funds (\$110,212), and an advance lease payment from a private business (\$70,000). The site was purchased to prevent marginal industrial or commercial redevelopment; to restore the streambank, habitat, and natural resource values; and to act as a buffer for Mulberry Water Reclamation Facility. A private business has leased the building on the site for five years. Depending on the site’s future uses, it may be included in future management plans.

**Floodway/
Floodplain
Designation**

Floodway and floodplain designations are referred to in this management plan. These terms designate the area in which the river naturally flows and the wider area that may be subject to flooding. These designations carry specific guidelines and regulations (local and federal) relative to the types of structures and activities allowable in these areas.

The City’s “Guidelines For The Management and Administration of Floodplains” defines a **floodway** as, “the channel of a river or other watercourse in the adjacent lands areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface more than a designated height.” In layman’s terms, this is the area where the river usually flows.

The official definition of **floodplain** is “the land in a drainageway within a community subject to a one-percent or greater chance of flooding in a given year. The floodplain encompasses the flood fringe and the floodway (conveyance zone).” In layman’s terms, this is land near the river that can be expected to be under water in a “flood.” This could range from a little water at ground level up to destructive currents of water. It is referred to as the 100-year floodplain because calculations are based on a flood that has a 1% expectancy to occur any given year.

Fig. 1 - Poudre River natural areas map

TABLE 1: POUUDRE RIVER NATURAL AREAS ACQUISITION SUMMARY

The City began acquiring natural areas along the river over 30 years ago. The following comprise the Poudre River natural areas as of 1998.

Natural Area/Location	Date Acquired	Cost/Funding Source	Classification	Size
Site #96P1 /slightly east of Overland Trail on the south side of the river	November 1996	\$192,000/\$120,000 from City natural area funds; \$72,000 from Conservation Trust Open Space and Trails	Urban	24 acres
North Shields Pond Natural Area / North of the river; west side of Shields Street	1962	Acquired from Poudre Valley Bank; cost unknown	Urban	10.01 acres
Hickory Natural Area /western edge of Hickory Park	1995	Natural area portion: \$62,878/1992 City natural area tax funds	Urban	11.4 acres
Salyer Natural Area /between Legacy Park and McMurry Ponds	1985	Appraised value: \$75,000/Donated by Dr. and Mrs. Everett Salyer	Urban	24.42 acres
Legacy Natural Area /across the river from Lee Martinez Park	1975	Conveyed to the City from the U.S. Forest Service	Park land and urban natural area	8 acres
	1994	\$19,843/1992 City natural areas tax funds	Urban	4.82 acres
Gustav Swanson Natural Area /west side of Linden Street on the north side of the river	10.5 acres purchased by Light & Power in 1955; in '87 transferred to Parks Dept. as natural area.	No compensation involved in transfer from Light and Power.	Urban	11.82 acres
	0.93 acres adjacent to storage facility - 1988	Donated by Davis and Associates (Linden Tech Self Storage Center Partnership).		
	0.39 acres acquired	Acquired through land trade/purchase with the State		

Natural Area/Location	Date Acquired	Cost/Funding Source	Classification	Size
	February 1994	in the College Avenue Gateway Bridge project		
Udall Natural Area /between the river and Riverside Avenue, and extending roughly from East Lincoln Avenue to East Olive Street. (Site jointly owned between City of Fort Collins Natural Resources Dept. and Fort Collins Utilities and will be subject to an MOU between the two departments.)	1994	\$273,025 (land: \$232,275; water: [1/10 interest in Coy Ditch] \$40,750)/Funding : Storm Drainage Fund (6 acres) - \$55,746; Capital Projects Fund/City natural area funds - \$176,529 for 19 acres of land and \$40,750 for water. Actual value: \$335,000; the \$61,975 difference was a gift from the owners (the Willow Run Partnership).	Restorative	25 acres
Williams Natural Area /bordered by Mulberry and Lemay	1990	Donated by Jack Williams	Urban	1.4 acres
Springer Natural Area /bordered by Riverside and Lemay; and extending along the river east of Lemay. (Site jointly owned between City of Fort Collins Natural Resources Dept. and Fort Collins Utilities and will be subject to an MOU between the two departments.)	1990	Donated by Springer-Fisher, Inc.	Sensitive	23.73 acres
Bignall Natural Area /on the Poudre River Trail approximately one mile east of Lemay Avenue	3.8 acre parcel: 1979	2.3 acres donated by Tom and Alice Nix; \$10,000 paid for remainder	Restorative	6.1 acres
	2.3 acre parcel: 1988	\$66,500/Conservation Trust Fund Poudre River Open space Acquisition Acct.; purchased from Stephen and Maryann Bignall		
Nix Natural Area /south of the river, at the east end of Hoffman Mill Road	1996	\$515,000/City natural area funds (includes \$40,485 for 13 shares each of Arthur Irrigation Co. and Emigh Lateral Ditch Co.)	Restorative	30.8 acres
Kingfisher Point Natural Area /between the river and Prospect, bisected by Timberline Road extension	1996	\$400,000/1992 Natural Areas funds and \$850,000 donation from Williams and Assoc.	Restorative	58.29 acres
Cattail Chorus Natural Area /a series of ponds on the north side of the Poudre River	1996	(Part of the above acquisition. It was separated out because of its vastly different characterization)	Sensitive	40 acres

Natural Area/Location	Date Acquired	Cost/Funding Source	Classification	Size
Trail, approximately 1/5 mile east of Timberline Road extension.				
Riverbend Ponds Natural Area /north of Prospect roughly between Summit View Drive and the river	1977 through 1988	Much of the acquisition history is unavailable. The Flatiron/Milne portion was donated for public recreation use in 1983.	Sensitive	220.58 acres
Cottonwood Hollow Natural Area / along the east side of the river, south of Prospect	48 acres fronting Prospect Road: 1994	Purchased from W.R.E.N. Broadcasting Company, Inc. for \$35,000/City natural area funds	Sensitive	88 acres
	Southern 40 acres: 1996	Purchased from University Sports Network, Inc., for \$200,000/City natural area tax funds		
Prospect Ponds Natural Area /south of Prospect at Sharp Point Drive. (Site owned by Fort Collins Utilities and will become subject to an MOU to be developed between the Utilities and the City of Fort Collins Natural Resources Department.)	Water Dept. acquired in 1974; came under Parks management in 1981	Purchased by the Water Utilities	Urban	25.10 acres
Arapaho Bend Natural Area /bounded by I-25, Co. Rd. 7, Harmony Rd., and Horsetooth Rd.; also a small parcel west of Co. Rd. 7 near Harmony and a parcel east of I-25	1995	\$1,600,000/1992 City natural areas tax funds	Restorative	278 acres
TOTAL Poudre River Natural Areas				891.47 acres

CLASSIFICATION

Context

The “General Management Guidelines For City-Owned Open Spaces and Natural Areas” (Balok et al. 1994), upon which site management plans are based, suggests appropriate activities for natural areas in order to incorporate public enjoyment, reasonable and prudent human safety, and ecological protection/enhancement. The document identifies three classifications of natural areas: sensitive, urban, and restorative.

Definitions of “sensitive,” “urban,” and “restorative” sites are taken from the “General Management Guidelines For City-Owned Open Spaces and Natural Areas.”

Sensitive

Sensitive sites have sensitive plant or animal species, or geological features, that need special consideration when developing a site management plan. These includesites that support rare plants, unique native plant communities, concentrations of large raptors, rare nesting birds, concentrations of migratory bird species, and key areas for wintering deer, as well as fragile rock out-crops or other geological features that can be impacted by high visitor use. This designation carries with it the understanding that the primary function of management, and therefore a principle management concern, is the maintenance of those sensitive species and features.

The following Poudre River natural areas fall into the *sensitive* category:

Springer Natural Area (the American black currant [Colorado Rare Plant] is on the site)

Riverbend Ponds Natural Area (the prairie gentian [Colorado Rare Plant] is on the site; key migratory bird habitat)

Cattail Chorus Natural Area (concentrations of migratory bird species)

Cottonwood Hollow Natural Area (migratory waterfowl, other sensitive wildlife species)

Urban

Urban sites provide good wildlife habitat, but do not have any particular sensitive plant or animal species or geological features that need special consideration when developing a site management plan. These sites are usually close to, and surrounded by, more developed areas of Fort Collins or have been more impacted by recreational, agricultural, or other human land uses than sensitive natural areas. Sites are often composed of greater amounts of exotic plants than the sensitive areas. These sites may be managed as multiple use areas, but a priority will be placed on maintaining the natural character of the site.

The following Poudre River natural areas fall into the *urban* category:

Site #96P1

North Shields Pond Natural Area

Hickory Natural Area

Salyer Natural Area

Legacy Natural Area

Gustav Swanson Natural Area

Williams Natural Area

Prospect Ponds Natural Area

Restorative Restorative sites are undergoing restoration or do not currently fit into the above two categories, but are slated for restoration or enhancement in the future so they will fall into the urban or sensitive category. The restorative category serves as an early planning tool and way to inform adjacent landowners of future intended site management (i.e., “natural area” – less maintenance than “greenway” or “parkland”). This is a temporary classification until the site is upgraded to another classification upon successful completion of restoration activities.

The following Poudre River natural areas fall into the *restorative* category:

Biggall Natural Area
Udall Natural Area
Nix Natural Area

Kingfisher Point Natural Area
Arapaho Bend Natural Area

PUBLIC INPUT

Opportunities These are public natural areas. Therefore, public input is important in developing a management plan. Through media outreach, an open house, and discussion with staff, the public was encouraged to provide input on the Cache La Poudre River Natural Areas Management Plan. All public comments were reviewed and appear as appendix F (available for review upon request) of the management plan. Two City Council-appointed citizen advisory boards (Natural Resources Advisory Board and Parks and Recreation Advisory Board) provided recommendations after reviewing the draft plan.

It is not possible to develop a plan that fulfills everyone's desires for the areas, because comments often are in conflict with each other. However, attempts have been made to address the public's and citizen advisory boards' concerns to the extent possible within the overall direction of protecting the resources of these natural areas.

Site Descriptions

GENERAL DISCUSSION

Context

This management plan was written and compiled in 1997/1998. Process complications delayed adoption until 2002. In general, information in this plan reflects conditions and plans as of 1998. However, occasional mention is made of management changes between 1998 and 2001.

This segment of the management plan describes the location, history, values, and present conditions of each site, but does not discuss management. To find out how an aspect, e.g., a present condition, will be changed or maintained, refer to the Site Management Goals, Needs, and Opportunities segment that begins on page 32.

While many characteristics are common to all river corridor natural areas, each site also has unique characteristics. Some sites are diverse, others have more limited characteristics. A few of these natural areas are jointly owned by City of Fort Collins Natural Resources Department and Fort Collins Utilities or solely by Fort Collins Utilities. Many of the natural areas are adjacent to developed parks, providing varied recreational opportunities. Together, the sites form a mosaic of river-related habitat, recreation, and aesthetic qualities that make Fort Collins attractive to humans as well as to wildlife.

Plant and wildlife data cited in this section are taken from various research projects (summarized data appear in appendices A - D). Not all sites have received the same level of research. Therefore, species may appear, but have not been reported, on additional sites. Even so, the data are useful for revealing that some species appear less often, thereby emphasizing the importance of individual sites.

Species Diversity

The total number of plant and animal species reported on Poudre River natural areas begins to tell the story of diversity and provides insight into the value of these natural areas. A total of 278 wildlife species have been reported in Poudre River natural areas: 216 birds, 23 mammals, 10 amphibians and reptiles, and 29 fishes. A total of 405 plant species have been reported on these natural areas: 76 trees and shrubs (62% native); 96 grasses and grasslike plants (65% native); and 233 wildflowers, vines, and other forbs (60% native). Two of the plant species (American black currant and prairie gentian) are listed as Colorado imperiled or rare species. Two bird species (American white pelican and Barrow's goldeneye), three fish species (common shiner, plains topminnow, and Johnny darter), and two butterfly species (smokey-eyed brown and twospotted skipper) are listed as Colorado

Species of Concern. Two bird species have federal designations: the bald eagle is listed as threatened; the peregrine falcon is listed as endangered.

Commonalities The following 18 plant species have been reported on all Poudre River natural areas:

Native Species

Inland boxelder	Western virginsbower	Woods rose
Lanceleaf cottonwood	Coyote willow	Curlycup gumweed
Plains cottonwood	Western snowberry	

Introduced Species

Russian olive	Crested wheatgrass	Smooth brome
Cheatgrass brome	Reed canarygrass	Blue mustard
Canada thistle	Common dandelion	Leafy spurge
Flannel mullein		

The following 14 animal species have been reported on all Poudre River natural areas:

Canada goose	Killdeer	Belted kingfisher
Northern flicker	Black-billed magpie	American crow
Black-capped chickadee	American robin	European starling
Song sparrow	Red-winged blackbird	Common grackle
Fox squirrel	Mallard	

When reading specific site descriptions, it should be remembered that these species are present, but because they are found on all sites, they are seldom mentioned in individual site descriptions.

INDIVIDUAL SITES

Site #96P1

Land Use

This 24-acre urban natural area is as yet unnamed because it is not known how much land, or which lands, may ultimately make up the natural area complex in this area. Such determination is anticipated during the five-year life of this management plan. When the entire natural area is determined, it will be possible to choose a more appropriate name for the entire natural area than might be selected at the present time.

The site, which was formerly used as a small-fruit agricultural area, is bounded by private agricultural/large lot residential property on the north, west, and south and by gravel mining to the east. An abandoned railroad right-of-way (tracks removed) runs along the southern border of the site. The site includes an abandoned irrigation ditch, a City of Fort Collins sanitary sewer easement on the northeast portion of the site, and a telephone easement along the north side of the abandoned railroad track.

Plant

Communities**

The site has not been formally surveyed, but it is known to contain old stands of cottonwood, particularly along former waterway edges. Most of the site is open grassland, with native grasses such as sand dropseed and Canada wild rye, as well as a variety of introduced grasses, growing on the site.

Wildlife

Communities

Four species of mammals (fox squirrel, red fox, raccoon, and mule deer) use the site. Twelve species of birds, including mourning dove, downy woodpecker, and red-winged blackbird, have been seen on the site.

North Shields Pond Natural Area

Land Use

This 10.01-acre urban natural area is bordered on the south by the Larimer County Emergency Center, on the west by the river, on the east by Shields Street, and on the north by residential development. The entire site is in the floodplain.

By 1956 gravel mining had begun in areas adjacent to the pond. Aerial photos suggest that the pond came into existence between 1956 and 1969. Previously, the site was open grass with standing trees. By 1969, there was housing development north of the pond. West of the pond there is an old diversion structure where the Josh Aims Irrigation Ditch went through the property, possibly providing a source of groundwater flow. The ditch was partially filled in around 1980. Area residents report that a spring existed at the western end of the pond, with a peak flow two to four feet wide. Pre-

** Formal plant survey not performed on this site. Reportings are informal observations.

sumably, when gravel operations resumed on adjacent property around 1990, the spring was filled with gravel.

In 1987, Northern Colorado Water Association secured an easement for a 12-inch water transmission line within the 30-foot right-of-way along Shields Street, and extending slightly outside the right-of-way onto North Shields Pond Natural Area. The easement includes a meter and vault within the entrance road. These underground facilities pose no problem with vehicles passing over them. The agreement called for all disturbed areas to be returned to original condition and stipulated that no excavated materials be put into the pond. The easement is close to a large cottonwood tree on the bank, and the agreement states that the water association is responsible for any damage to the tree that becomes evident within three years of excavation. Mitigation, should it be necessary, calls for bearing the cost of removing the tree and replacing it with five new 3-inch caliper cottonwoods.

Plant

Communities

According to available data, the site contains 27 species of trees and shrubs (85% native). Natives include fringed sage, American plum, and sand cherry as well as two species (silver sagebrush* and bluestem willow*) that have been reported on no other Poudre river natural area and five species (Saskatoon serviceberry*, western riverbirch*, mountain ninebark*, antelope bitterbrush, and wax currant*) reported on only one other Poudre River natural area. Introduced trees and shrubs include Utah serviceberry and crack willow.

Thirty-nine species of grasses and grasslike plants (67% native) have been reported on the site. Six of the native species (prairie sandreed, thickspike wheatgrass, Colorado rush, yellow indiangrass, Indian ricegrass, and green needlegrass) have been reported on only one other Poudre River natural area and five (big bluestem, buffalograss, fowl mannagrass, wood bluegrass, and paniced bulrush) have been reported on only two other Poudre River natural areas. Introduced grasses and grasslike plants include wild oat, sand love-grass, and Kentucky bluegrass.

Fifty-four species of wildflowers, vines, and other forbs (56% native) have been reported on the site. Natives include showy milkweed, common cattail, and prairie sage as well as eight species (rose pussytoes, low poppymallow, plains coreopsis, Oregon fleabane, silvery lupine, tufted evening primrose, burreed, and spreading golden banner) reported at no other Poudre River natural area and five species (harebell, purple prairie clover, sulphur eriogonum, plains wallflower, and wild iris) reported on only one other Poudre River natural area. Introduced species include common yarrow, redroot amaranth, and giant ragweed.

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Wildlife Communities The cattail marsh sees high use by migratory waterfowl, and the site's mix of wetland habitat is inviting to nesting waterbirds. The 30 species of birds seen at this site include great blue heron, snow goose, American wigeon, osprey, and great horned owl.

Mammals seen at the site include rock squirrel and muskrat. Four species of amphibians and reptiles (boreal chorus frog, bullfrog, common snapping turtle, and western painted turtle) have been seen at the site. Four native species of fish (sand shiner, fathead minnow, black bullhead, and channel catfish) and four introduced species (bluegill, hybrid sunfishes, largemouth bass, and black crappie) have been reported in the waters of the site.

Hickory Natural Area

Land Use This 11.4-acre urban natural area is on the west side of the 10+ acre Hickory Park, which is west of Hickory Village Mobile Home Park northwest of the downtown area. Four acres of land purchased by the Stormwater Department for the Dry Creek Diversion Channel abut this area. The natural area is defined by the forested wetland area. The wooded small stream and pond are part of an old river meander. Half of the old river oxbow is owned by the City and included in this natural area. A barbed wire fence separates the natural area from private property to the west. The pond on the site is either from gravel mining or was dug out for cattle.

Plant Communities** The site has not been formally surveyed. Data are therefore the result of anecdotal reporting. Eleven species of trees and shrubs (82% native) have been reported on the site. The native species include fringed sage and American plum. A heavy invasion of Russian olive is the primary introduced tree species on the site. There are four grasses and grasslike plant species reported on the site, none of which is native.

There are a reported 16 species of wildflowers, vines, and other forbs (44% native) on the site. Natives include prairie golden banner (reported on no other Poudre River natural area), wild mock cucumber, common duckweed, and common cattail.

Wildlife Communities Habitat features, including a small pond, are used by a variety of birds (17 species reported) including great blue heron and yellow warbler. Nearby residents report 20-30 deer living in the natural area year round.

Salyer Natural Area

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Land Use

This 24.42-acre urban natural area, named for the site donor, is located west of Legacy Park and east of McMurry Ponds. Only 4.37 acres of the site are in the floodplain. The site was farmed for many years. Recently (until 1995) the site was a horse pasture. At the time the property was donated to the City, Poudre Valley Rural Electric Association had an undefined easement on the land on which they agreed to file a quit claim. The abandoned Josh Ames ditch runs through the site.

Plant Communities

The site is characterized by grasses and grasslike plants. Of the 34 grasses found on the site, 59 percent are natives, but in volume, introduced species prevail. The native species include sideoats grama, sedges, rushes, and wood bluegrass as well as two species (beardless Virginia wild rye and green muhly) reported on only one other Poudre River natural area. Introduced species include tall wheatgrass and barnyardgrass.

The site has a reported 22 species of trees and shrubs (82% native). The native species include four-winged saltbush (reported on only one other Poudre River natural area), indigobush amorphia, two varieties of rabbitbrush, and western poison ivy. Introduced trees and shrubs include common honeysuckle and lilac.

Sixty-six species of wildflowers, vines, and other forbs (50% native) have been reported on the site. Natives include showy milkweed, American licorice, and upright prairie coneflower as well as six species (roadside agrimony, spotted joe pye weed, common parsnip, New Mexican hop, wild iris, and fringed loosestrife) reported on only one other Poudre River natural area and two species (meadow anemone and black-eyed susan) reported on only two other Poudre River natural areas. Introduced species include giant ragweed, poisonhemlock, European bindweed, sweetclovers, and curly dock.

Wildlife Communities

The site is reportedly used by 15 common species of birds and waterfowl, including killdeer, belted kingfisher, and song sparrow, as well as by small mammals.

Legacy Natural Area

Land Use

This 12.82-acre urban natural area is across the river from Lee Martinez Park, extending east to the Union Pacific railroad tracks. The eight-acre Legacy Park site, a portion of which is included in the natural area designation, was conveyed to the City from the U.S. Forest Service with the stipulation that it remain a public park and recreation facility. This area was identified in the 1988 Parks and Recreation Master Plan as desirable open space and in the draft land use plan for the North College area as public natural area. A

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portion of this natural area (8.4 acres) is in the floodplain. The park/natural area interface can be identified by remnants of an old fence line.

Plant Communities The site consists of a small cattail area, wooded riparian habitat, areas of grassland and shrubland, and some small wetland/ponding areas. Seventy-three percent of the 22 tree and shrub species reported on the site, including some that were planted in recent restoration projects, are native, including Rocky Mountain juniper* (reported on no other Poudre River natural area; native to the area but not to the site), ponderosa pine* (reported on only one other Poudre River natural area; native to the area but not to the site), chokecherry, and common snowberry. Introduced species include common honeysuckle, white poplar, and Siberian elm.

Only 20% of the 15 species of grasses and grasslike plants on the site are native. The native species are foxtail barley, western wheatgrass, and American bulrush. The introduced species include tall wheatgrass and barnyardgrass.

Twenty-eight species of wildflowers, vines, and other forbs (36% native) have been reported on the site. Natives include western ragweed, American licorice, and giant goldenrod. Introduced species include garden asparagus, common chicory, European bindweed, and curly dock.

Wildlife Communities Fifteen bird and two mammalian species have been observed on the site. The site has good deer habitat, but use by deer has not been documented.

Gustav Swanson Natural Area

Land Use This 11.82-acre urban natural area was dedicated and named for Gustav A. Swanson July 31, 1988. The site consists of the original 11.43 acres extending from Linden Street to the Power Plant dam on the north side of the river as well as a small isolated piece of property (0.39 acres along College Avenue) that was obtained by the City during land transactions associated with the State's reconstruction of the College Avenue bridge over the river. The entire site is in the floodplain. The site has a history of recreational use dating back to 1887 when a private company purchased land in this general area and opened it as a public "park and pleasure grounds," with underbrush cleared out and platforms, a band stand, seats, and outbuildings installed. Later, the site was used as an archery range, a water treatment plant, and a city dump. The John G. Coy Ditch runs through the site, with two small on-

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site ponds releasing into the ditch. The site surrounds a parcel owned by the Colorado Wyoming Gas Company and is divided by the Burlington Northern Railroad right-of-way. The site was indicated as a potential wildlife habitat area in the Poudre River Trust Plan.

This natural area was established as a cooperative project between the City and several community groups (Audubon Society, Poudre River Trust, and adjacent property owners).

The site contains a handicapped accessible trail system. A handicapped accessible fishing pier was on the site until it was washed out by flooding in 1995. A pedestrian bridge was built over the Coy Ditch to provide access from the parking lot to the trail system.

The sandy soils on the Gustav Swanson Natural Area have been augmented by loam brought in for the sandhills prairie planting site.

Plant Communities

The site's 44 tree and shrub species (84% native) include those that were present at the time of acquisition as well as many planted during restoration. Native species include thinleaf alder*, western poison ivy, and small soapweed as well as seven species (sand sagebrush, netleaf hackberry*, true mountain mahogany*, western hawthorn*, cliff jamesia, creeping barberry, and smooth sumac*) reported on no other Poudre River natural area and eight species (saskatoon serviceberry*, four-winged saltbush, broom snakeweed, mountain ninebark, antelope bitterbrush*, wax currant*, silver buffaloberry*, and mountain snowberry) reported on only one other Poudre River natural area. Introduced species include wolf's gooseberry, red raspberry, and American elm.

Fifty-seven percent of the 35 species of grasses and grasslike plants reported on the site are native. They include sideoats grama*, mat sandbur, blue grama*, and switchgrass* as well as four species (sand bluestem*, purple threeawn, sandberg bluegrass, and tall dropseed) reported on no other Poudre River natural area and four species (prairie sandreed*, thickspike wheatgrass*, little bluestem*, and Indian ricegrass*) reported on only one other Poudre River natural area. Introduced species include redtop, quackgrass, and tall fescue.

Forty-nine percent of the 79 species of wildflowers, vines, and other forbs reported on the site are native. They include dotted gayfeather* and mintleaf beebalm as well as 13 species (many-flowered prickly poppy*, smooth aster, Rocky Mountain beeplant, geyer larkspur*, prairie dogweed, rag sumpweed, tansyleaf aster*, ten-petal mentzelia, bigroot pricklypear, sidebells penstemon, Missouri goldenrod, townsendia, and hoary vervain) reported on

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no other Poudre River natural area and seven species (harebell, Missouri euphorbia, Douglas clematis, purple prairie clover, sulphur eriogonum, plains wallflower, and broom groundsel) reported on only one other Poudre River natural area. Introduced species include redroot amaranth, Nuttall mariposa lily, poison-hemlock, European bindweed, and alfalfa.

Wildlife Communities Forty-six species of birds and waterfowl have been reported on the site including green-winged teal, herons (great blue, green, and black-crowned night), eastern screech-owl, bald eagle (federal threatened species), American kestrel, Bullock’s oriole, and pine siskin. There have been sightings of nine mammalian species including big brown bat, beaver, meadow vole, and mule deer. Four species of amphibians and reptiles (bullfrog, common snapping turtle, western painted turtle, and western plains garter snake) have been reported on the site. Two introduced (brown trout and common carp) and one native (white sucker) fish species have been reported in the river through this natural area.

Udall Natural Area

Context This site is jointly owned by City of Fort Collins Natural Resources Department and Fort Collins Utilities and will be subject to a Memorandum of Understanding (MOU) to be developed between the two departments.

Land Use This 25-acre restorative site is bounded by the river, Riverside Avenue, East Lincoln Avenue, and East Olive Street. Only 12.33 acres are in the flood-plain. The site is within the “Historic and Cultural Core” sub-area of Fort Collins. Reid Burton, a previous owner, was interested in the City owning the site so it would remain in open space. The site was named in honor of the late Rob and Dorothy Udall, advocates and volunteers on behalf of the river’s natural resource values.

Railroad tracks run along the top of the embankment parallel to Riverside Avenue. The tracks, the street, and the embankment combine to cut off visual and physical access to the site from Riverside.

The site is an undeveloped gravel terrace on the inside of a bend in the river. The gravel sits on a layer of shale bedrock.

Plant Communities Seventeen species (71% native) of trees and shrubs, 14 species (57% native) of grasses and grasslike plants, and 28 species (32% native) of wildflowers, vines, and other forbs have been reported on the site. The edge of the site along the river alternates from cutbank to bar and back to cutbank along the length of the bend. The cutbank on the north is reinforced by concrete rubble

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and includes a thick stand of Siberian elm. The bar, deposited on the south-east edge of the site, includes a more diverse wetland and riparian plant community. The gently sloping terrace landscape is made up of thin stands of mixed native and invasive grasses. A border of mixed deciduous trees, supported by runoff from the railroad embankment, extends along the southwest edge of the site. Cottonwood trees on the site suggests the presence of groundwater near the surface. An historic oak tree, the second largest burr oak in Colorado, grows at the Lincoln Street entrance to the site.

**Wildlife
Communities**

Fifteen species of birds and one mammalian species have been reported on the site.

Williams Natural Area

Land Use

This 1.4-acre urban natural area is at the southwest corner of the Mulberry Street and Lemay Avenue intersection, excluding a small strip of land next to the river on which a large billboard exists. On the City-owned portion along Lemay, there is one billboard for which the previous owner retained an easement (which expires December 31, 2005). The entire site is in the floodplain.

**Plant
Communities**

Even though vegetation on the site consists primarily of smooth brome and other introduced pasture grasses, a total of 13 species of grasses and grasslike plants (18% native) have been reported on the site. The natives are Canada wild rye and prairie cordgrass. Twenty-three species of wildflowers, vines, and other forbs (17% native) have been reported on the site. The natives include blue flax and riverbank grape. Introduced species include white sweet-clover, catnip, and tumble mustard. Twelve species of trees and shrubs (67% native) have been reported on the site. They include the native common chokecherry and golden currant and the introduced crack willow and Siberian elm.

**Wildlife
Communities**

The site gets some use by grassland and migratory songbirds and small mammals.

Springer Natural Area

Context

This site is jointly owned by City of Fort Collins Natural Resources Department and Fort Collins Utilities and will be subject to an MOU to be developed between the two departments.

Land Use

This 23.73-acre natural area, donated by Springer-Fisher, Inc. and named for Harold Fisher's mother, is bordered by Lemay and Riverside avenues, with a small portion extending along the river east of Lemay. The entire site is in the

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floodplain. The site is classified as sensitive because of the presence of a Colorado Imperiled Species (American black currant). The site contains a major stormsewer outfall from the Old Town Basin Area and, in addition to simply conveying stormwater flows, has the potential to help enhance stormwater quality before it enters the river.

Soils are mapped by the Soil Conservation Service as the Loveland clay loam to one percent slopes, which characteristically includes Poudre soils and soils over gravels at 40 to 60 inches.

**Plant
Communities**

Existing data indicates the presence of 17 tree and shrub species (71% native), 14 species of grasses and grasslike plants (29% native), and 32 species of wildflowers, vines, and other forbs (38% native). Aerial photos taken in 1950 depict vegetation on the upland portions as a composite of wetland and non-wetland types. However, at the time the City acquired the property, the upland portions contained no wetland vegetation. Instead, they included such upland plants as cheatgrass, bindweed, and kochia. The American black currant (a Colorado Rare and Imperiled Species that has been reported on no other Poudre River natural area, and on only one other site in Colorado) grows on the eastern side of the site. A significant portion of the site is dominated by mature cottonwood, willow, and boxelder. Burr oak also is present on the site.

The herbaceous stratum is diverse, including invading annual grasses, upland native species such as yellow indiagrass (a relic midgrass prairie species reported on only one other Poudre River natural area), and wetland species represented by cattails and reed canarygrass. Native forbs on the site include purple meadowrue and riverbank grape as well as two species (bracted strawberry and carrion flower greenbrier) reported on no other Poudre River natural area and three species (blueburr stickseed, common arrowhead, and swamp smartweed) reported on only one other Poudre River natural area. Introduced forb species include garden asparagus, catnip, and curly dock.

**Wildlife
Communities**

The plant community provides high value wildlife habitat. It is heavily used by migratory songbirds, key waterfowl, wading birds, and shorebirds. Twenty-eight species of birds, two mammalian species, and four species of fish have been reported on the site. The fish species (all natives) are fathead minnow, longnose dace, longnose sucker, and white sucker. The site also includes rare butterfly habitat.

For historical purposes, it is noted that, in 1988, Resource Consultants, Inc. and Cedar Creek Associates, Inc., while conducting a study of the site relative to the U.S. Army Corps of Engineers' requirement that at least a portion of the wetland be restored to its natural condition, reported that bald

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eagle, peregrine falcon, and river otter could potentially inhabit the site. These species, however, have not been seen on the site, and more recent scientific evaluators feel that these species are unlikely to use the site.

Bignall Natural Area

Land Use

This 6.1-acre restorative site is located on the Poudre River Trail about one mile east of Lemay Avenue. The site is high above the river, and none of it is in the floodplain.

The site includes three buildings: a 1,729 square-foot house, a four-car detached garage, and a shed, all of which were a private residence before the City purchased the site. At the time the property was purchased, possible uses included recreational programming, a rest/picnic/information area for trail users, environmental education programming, being rented out to environmental organizations such as Audubon and Sierra Club, a wildlife observation and bird banding site, a collection site for wildlife art, a demonstration backyard wildlife habitat/xeriscape area, and possibly a home for interns. None of these uses materialized, and the site has never been open to the public. Instead, in return for site maintenance and wildlife consulting, the house was leased for a few years to Kevin Cook, a local naturalist, as an office/classroom. It currently is occupied by Fort Collins Police Services as a dog training facility.

Plant Communities

The site contains primarily introduced pasture grasses and exotic trees, shrubs, and forbs. Specifically, 17 species of trees and shrubs (71% native), 12 species of grasses and grasslike plants (25% native), and 41 species of wildflowers, vines, and other forbs (48% native) have been reported on the site. The native trees and shrubs include American plum, common chokecherry, and three-leaf sumac. Introduced species include green ash, common honeysuckle, crack willow, and Siberian elm.

Native grasses and grasslike plants on this site include woolly sedge, bottlebrush squirreltail, and inland rush. Introduced grasses and grasslike plants include orchardgrass, quackgrass, Timothy, and green bristlegrass.

Native wildflowers, vines, and other forbs include both common waterpod (reported on no other Poudre River natural area), swamp and showy milkweed, wild mock cucumber, prairie sunflower, American bugleweed, golden dock, and blue verbena. Introduced wildflowers, vines, and other forbs include European bindweed, catchweed bedstraw, common motherwort, alfalfa, catnip, and curly dock.

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Wildlife Communities The forty-four species of birds and waterfowl seen on the site include great blue heron, barn owl, eastern screech-owl, blue grosbeak (an unusual species in this area), and lazuli and indigo buntings. Two mammalian species (Eastern cottontail and fox squirrel), and one amphibian/reptile species (plains garter snake) have been reported on the site.

Nix Natural Area

Land Use This 30.8-acre restorative natural area is an historic farm at the east end of Hoffman Mill Road. A small portion of the site extends across the river. At the time of purchase, the site was zoned for commercial use. The site is primarily outside the floodplain. There are three structures on the site: two houses and a barn (which are historically significant). Undeveloped land includes pasture land, small wetland areas, and riparian forest along the river. Two ditches, Arthur and Emigh Lateral, run through the site (the City owns 13 shares of each).

Plant Communities The site consists primarily of pasture grasses, but also contains 14 species of trees and shrubs (71% native) and 14 species of wildflowers, vines, and other forbs (14% native.)

Wildlife Communities Thirty-five bird species (including dark-eyed junco, western meadowlark, red-tailed hawk, great horned owl, and horned lark), five mammalian species (eastern cottontail, fox squirrel, deer mouse, house mouse, and red fox), and one amphibian/reptile species (western plains garter snake) have been reported on the site.

Kingfisher Point Natural Area

Land Use This 58.29-acre site begins a short distance east of the Bignall Natural Area and continues east along the river to approximately one-third mile north of where Prospect Road crosses the river. Approximately 16 acres of the site are in the floodway, and 49.5 acres are in the floodplain. The Timberline Road extension passes through the site, and the cost of the road right-of-way (approximately \$46,000) was reimbursed to the Natural Area Fund by the Timberline project. Beginning in the 1930s, this site was used as a dumping area for lime sludge, a by-product of sugar beet processing.

Plant Communities As a result of the sludge dumping, kochia (an invasive exotic weed) is the primary vegetation on the site. In addition, 17 species of trees and shrubs (71% native) and 23 species of wildflowers, vines, and other forbs (22% native) have been reported on the site. Native trees and shrubs include

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peachleaf willow and red-osier dogwood. Native wildflowers, vines, and other forbs include starry false salomonsel and mintleaf beebalm.

Wildlife Communities Seventy-six bird species (including white-crowned sparrow, great blue heron, wood duck, green-winged teal, common goldeneye, and eastern kingbird), 10 mammalian species, three amphibian/reptile species, and one fish species (common carp) have been reported on the site. Anglers presumably are catching other fish species, but reports of those species have not yet been received (CDOW is conducting fish surveys in 2000).

A Preble's meadow Jumping Mouse survey was done on a portion of the site in 1997, but no evidence of the mouse was found.

Cattail Chorus Natural Area

Land Use This 40-acre sensitive natural area, which extends north from the Poudre River Trail behind the Seven-Lakes Business Park, is characterized by naturalized reclaimed gravel ponds and riparian forest. It is a high quality wildlife habitat site. Spring Creek empties into the southwest pond of this natural area. Approximately 1,800 feet of the Spring Creek Trail and 1,200 feet of the Poudre River Trail border the site.

Fort Collins Utilities has utility easements on the site.

Plant Communities Fourteen species of trees (86% native) have been reported on the site. Natives include low rabbitbrush, cottonwoods, and American plum. The two natives among the six species of grasses reported on the site are hardstem bulrush and American bulrush. Twenty-three species of wildflowers, vines, and other forbs (39% native) have been reported on the site. The natives include devils beggarticks, hornwort, and common arrowhead, each of which has been reported on only one other Poudre River natural area. Introduced wildflowers, vines, and other forbs include ragweed, garden asparagus, and creeping bellflower.

Wildlife Communities Great blue heron, black-crowned night-heron, and Bullock's oriole are among the 124 bird species reported on the site. Eight mammalian species, including eastern cottontail, beaver, and meadow vole, have been reported on the site. Among the five amphibian/reptile species reported on the site are boreal chorus frog, common snapping turtle, and western painted turtle. One fish species (common carp) has been reported on the site.

Riverbend Ponds Natural Area

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Land Use

This 220.58-acre sensitive natural area, all of which is in the floodplain, is located on the north side of Prospect Road between Summit View Drive and the river. It can be accessed from Prospect Road, Cherly Street, and a road-way off of Mulberry that runs past Country Gardens nursery. The 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 River” identifies the eastern portion of the large pond (known during mining times as the Prospect North Pit) as an excellent example of Mined Valley Reclamation, which hydrologically links mines to create a unified landscape character and creates varied hydrologic conditions for plant community and wildlife habitat diversity. Soils on the site are primarily sandy clay loam.

The site includes recreational trails and interpretive features.

In 1985, Anheuser-Busch paid the City \$6,930.98 for a process wastewater line easement through the site. The line parallels a Boxelder sanitary sewer line.

Countryside Homeowners Association has a lawn irrigation system that pumps water from Riverbend Ponds to their holding well. The pump house straddles the fence line between the homes and the natural area.

Plant Communities

Thirty-five percent of the site is open lakes and ponds, 19 percent is riparian cottonwood forest, 11 percent is exotic and pest shrubs, another 11 percent is upland grassland, 10 percent is cattail marsh, and the remainder is riverine, wetland meadow, upland shrub, and shrub willow. Weather, flood cycles, and human intervention play a role in the changing vegetation communities of the site. For example, following the 1983 flood, many willows, cottonwoods, and other woody plants colonized the river gravel bars.

Because of its size and diversity, more plant species (a total of 207) have been reported on this natural area than on any other Poudre River natural area. Naturally occurring plants, as well as those that have been planted during restoration projects, include 40 species of trees and shrubs (58% native), 46 species of grasses and grasslike plants (61% native), and 121 species of wildflowers, vines, and other forbs (55% native). Native trees and shrubs include black greasewood and prince’s plume* (neither species reported on any other Poudre River natural area) and ponderosa pine* (native to the area but not to the site) and silver buffaloberry* (each reported on only one other Poudre River natural area). Introduced species include green ash, eastern red cedar, blue spruce, Austrian pine, saltcedar, and Siberian elm.

Native grasses and grasslike plants include three species (toad rush, longstyle rush, and beardless bluebunch wheatgrass) reported on no other Poudre River

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natural area and four species (bearded flatsedge, Colorado rush, little blue-stem, and green needlegrass) reported on only one other Poudre River natural area. Introduced species include quackgrass, stinkgrass, Kentucky bluegrass, and yellow bristlegrass.

The prairie gentian (Colorado rare species found on no other Poudre River natural area) is found in the wet meadow near the boardwalk. Additional native wildflowers, vines, and other forbs include Pennsylvania cinquefoil, scarlet globemallow, and two varieties of sunflower as well as 12 species reported on no other Poudre River natural area (Mexican azolla, ragleaf bahia, ridgeseed euphorbia, littleflower collinisa, golden corydalis, Richardson tansymustard, trailing fleabane, common sea milkwort, scouringrush, poverty sumpweed, purpleflower groundcherry, and buttercup) and nine species found on only one other Poudre River natural area (devils beggarticks, hornwort, Missouri euphorbia, cottonbatting cudweed, sunflower, swamp smartweed, broom groundsel, thelesperma, and seaside arrowgrass). Introduced species include ragweed, nodding beggarticks, creeping bellflower, pepperweed whitetop, and lambsquarters goosefoot.

**Wildlife
Communities**

The wide diversity of plant life makes Riverbend Ponds a key bird nesting and feeding area as well as key migratory bird habitat. Of the 216 species of birds reported on Poudre River natural areas, 201 have been seen at Riverbend Ponds. Of these, 36 species (including least bittern, Barrow’s goldeneye [Colorado Species of Concern], peregrine falcon [federal endangered species], and white-faced ibis) have been reported at no other Poudre River natural area.

The site also is home to a wide variety of mammals (18 species reported including raccoon, fox, skunk, and beaver), amphibians and reptiles (8 species reported including tiger salamander, northern leopard frog, and bull-snake), and fishes (23 species reported including two Colorado Species of Concern: plains topminnow and Johnny darter).

In 1990, Riverbend Ponds was a release site for Operation Osprey’s re-introduction program. The group put up an osprey hack tower and several nesting platforms on the site.

Cottonwood Hollow Natural Area

Land Use

This 88-acre sensitive site, all of which is in the floodplain, is surrounded by natural areas and other open lands, resulting in a contiguous area of more than 500 acres of public natural area. The site is bordered on the north by Prospect Road, on the west by Prospect Ponds Natural Area and by a feedlot

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that may be considered for future natural area acquisition, on the south by the Drake Water Reclamation Facility, and on the south and east by Colorado State University's (CSU) Environmental Learning Center. Immediately across the street to the north is the Riverbend Ponds Natural Area.

Cottonwood Hollow Natural Area includes ponds, naturalized wetlands, and 1,600 feet of the Poudre River. The site has four riparian zones: riparian forest, riparian shrub, emergent wetland, and wet meadow. Both Anheuser-Busch and Boxelder Sanitation District have wastewater lines near the ditch on the east side of the site.

All or portions of the site have been a feedlot (beginning in 1960), a farmed area (from the early 1950s until 1992), and most recently, a gravel mining site.

Plant Communities

Aerial photos taken in 1937 and 1950 show roughly 75% of the site to be forested, following patterns of old drainage channels or coinciding with lower portions of the site where the water table would have been nearer the surface. The northern portion of the site appeared to include either shrub cover or possibly wetland vegetation which also appeared to follow drainageways. When the site was converted to a feedlot, many cottonwoods were removed.

When the current reclamation project began, the pit floor was covered primarily by a mixture of sand and gravel overlying Caruso and Loveland clay loam. Currently, approximately half of the site is vegetated by emergents, grasses, shrubs, forbs, and small stands of cottonwood and saltcedar. The riparian forest is dominated by plains cottonwood and peachleaf willow. The riparian shrub zone is dominated by coyote willow. The emergent wetland and wet meadow are characterized by sedges, rushes, and cattails. In total, 16 species of trees and shrubs (63% native), 27 species of grasses and grasslike plants (63% native), and 61 species of wildflowers, vines, and other forbs (46% native) have been reported on the site.

Wildlife Communities

Waterfowl and shorebirds typically use the site. Patterson (1995) observed 50 avian species (over 1,500 individuals) in a 12-month study of the site. Additional studies and observations bring the total reported sightings to 68 species, which include American white pelican (Colorado Species of Concern), great egret, northern shoveler, bald eagle (federal threatened species), American avocet, Baird's sandpiper, cliff swallow, Steller's jay, and yellow-rumped warbler. Eight mammalian species, including red fox, elk, and both mule and white-tailed deer, have been reported on the site. The only amphibian/reptile species reported is the northern water snake.

Prospect Ponds Natural Area

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Context

This site is owned by Fort Collins Utilities. Portions of the site are currently managed by the City of Fort Collins Natural Resources Department and will become subject to an MOU to be developed between the two departments.

Land Use

This 25.1-acre urban natural area is on Sharp Point Drive between Prospect Road and the Drake Water Reclamation Facility. The entire site is in the floodplain. The site is composed of three historic gravel ponds (two of which were known during mining times as Johnson Pit and Reclamation Pit I) used extensively for fishing. The paved Poudre River Trail runs along the west and south sides of the ponds. A natural surface trail runs between the two ponds and along the east side of the southern pond providing access completely around that pond. A canal on the east side of the ponds contains some cemented rip-rap. There are two parking lots at the site, one midway along Sharp Point Drive and one at the end of Sharp Point Drive adjacent to the Drake Water Reclamation Facility. Adjacent to this second parking lot are the Water Utilities' demonstration wastewater treatment wetlands, constructed in 1995 to study the feasibility of using wetlands for denitrification and metals removal. The study, intended to be a two-year study, was extended an additional year because of poor cattail growth the first year.

The site includes recreational trails. CDOW stocks the ponds.

Plant Communities

The ponds are ringed by trees and shrubs, with a reported total of 18 species (67% native). Native species include common ninebark (reported on no other Poudre River natural area), common chokecherry, and three-leaf sumac.

Introduced species include common honeysuckle, crack willow, and salt-cedar.

Twenty-four species of grasses and grasslike plants (38% native) have been reported on the site. Natives include tumble grass (reported on no other Poudre River natural area), sixweeks fescue (reported on only one other Poudre River natural area), shortawn foxtail, and Baltic rush. Introduced species include tall wheatgrass, orchardgrass, mountain fescue, Timothy, and foxtail.

Fifty-six species of wildflowers, vines, and other forbs (46% native) have been reported on the site. Natives include blue flax, starry false solomonseal, Pennsylvania smartweed, and toothed euphorbia as well as three species (wavyleaf thistle, Virginia groundcherry, and Canada violet) reported on no other Poudre River natural area.

Wildlife

Ninety-eight species of birds have been reported on the site, including

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Communities double-crested cormorant, turkey vulture, wood duck, hooded merganser, northern harrier, Swainson’s hawk, merlin, least sandpiper, great horned owl, and ruby-crowned kinglet.

Five species of mammals (eastern cottontail, fox squirrel, beaver, muskrat, and white-tailed deer) have been reported on the site. Two amphibian/reptile species have been reported on the site: western painted turtle and bullfrog. Ten species of fish (four natives: white sucker, channel catfish, green sunfish, and walleye; six introduced: bluegill, hybrid sunfishes, largemouth bass, white and black crappie, and yellow perch) have been reported in the ponds.

Arapaho Bend Natural Area

Land Use This 278-acre restorative natural area is primarily bounded by I-25, County Road 7, Harmony Road, and Horsetooth Road. There also is a small parcel just west of County Road 7 near Harmony Road. These portions of the site were annexed into the City limits in 1999. Another small parcel (outside the City limits) sits on the east side of I-25. Most of the site (263.56 acres) is in the floodplain. While the site is undeveloped, and development potential is limited by the absence of sewers in the area, the site is within or near the Harmony Corridor, a prime site for future development as an employment center. In accordance with the City’s Harmony Corridor Plan, development of the surrounding area is expected to be a mixture of green corridor/open space and basic industrial and non-retail employment. The site is valuable not only for its natural resources and recreation opportunities, but also as a scenic entryway into the city.

The site includes approximately 88 acres of mined-out gravel ponds. A portion of the site has been farmed for several years. The site also has been used for cattle grazing. Horses have been grazed on the portion of the site west of County Road 7. The area around the old gravel ponds was a private recreation (fishing, water skiing, camping) area until the City purchased the site. Along with the land, the City purchased four shares of Boxelder Irrigation Company water.

Because of its visibility from both I-25 and Harmony Road, this has been highly valuable for billboard advertising. There were eight billboards on the property, with monthly rental income ranging from \$475 to \$600 per single-sided sign. By late 1998, the billboards had been removed. (There is still a billboard on the property east of I-25, but that part of the property is not yet in City management.)

Plant Twenty species of trees and shrubs (80% native) have been reported on the

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Communities site. Natives include broom snakeweed (reported on only one other Poudre River natural area), low rabbitbrush, peachleaf willow, and western poison ivy. Introduced species include crack willow, saltcedar, and Siberian elm.

Forty species of grasses and grasslike plants (58% native) have been reported on the site. Natives include five species (bearded flatsedge, Montana wheatgrass, American mannagrass, Torrey rush, and western needlegrass) reported on only one other Poudre River natural area and three species (mat sandbur, slender wheatgrass, and alkali muhly) reported on only two other Poudre River natural areas. Introduced species include bluejoint reedgrass, quackgrass, and Timothy.

An impressive 100 species of wildflowers, vines, and other forbs (53% native) have been reported on the site. Natives include shore buttercup, plains pricklypear, Canada goldenrod, two varieties of milkweed, and four varieties of sunflower as well as nine species (four varieties of aster, prairie clover, chicory lettuce, desert mentzelia, Louisiana broomrape, and daisy fleabane) reported on no other Poudre River natural area and five species (pitseed goosefoot, scarlet gaura, sunflower, cottonbatting cudweed, and bugleweed) reported on only one other Poudre River natural area. Introduced species include oakleaf goosefoot, Belvedere summercypress, and Virginia creeper.

Many people assume that this is the site of an historic tree known as the “Council Tree.” While the exact location is not known for sure, the site where the tree most likely occurred is north of Arapaho Bend Natural Area.

Wildlife Communities Forty-eight species of birds have been reported on the site. They include grebes, American white pelican (Colorado Species of Concern), double-crested cormorant, snowy egret, turkey vulture, prairie falcon, horned lark, and warbling vireo. Six species of mammals (fox squirrel, beaver, and muskrat) have been reported on the site. The western painted turtle is the only amphibian/reptile species reported on the site. Of the 13 species of native fishes reported in the waters of the site, three (common shiner, plains topminnow, and Johnny darter) are listed as Colorado Species of Concern. Four of the reported fishes (common carp, pumpkinseed, largemouth bass, and yellow perch) are introduced species.

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Site Management Goals, Needs, and Opportunities

GOALS

Context

The NAPP, the City Council adopted plan containing the City's natural area management policies, recognizes that natural areas not only provide "important habitats for the conservation of plants and animals and their associated ecosystems," but also provide "important habitats for people." The management policies focus on maintaining and enhancing sites to ensure protection of sensitive plant and animal communities while providing opportunities for public use. However, public input on specific site management plans may result in site management that does not necessarily adhere to NAPP policies. Additional considerations for Poudre River natural areas come from other river-related documents: "Poudre River Land Use Study," the draft "Strategy for Gravel Lands Along the Poudre River," and the "Master Drainage Way Plan." Management strategies and goals for Poudre River sites will come from consideration of all related documents (i.e., NAPP, the river-related documents, and "Cache la Poudre River Natural Areas Management Plan").

Objectives

The following objectives provide direction for Poudre River natural area management.

- ★ Manage, maintain, and enhance these natural areas to preserve and protect the native habitat and rare species of the sites, including native grasslands; the prairie gentian (Colorado rare species) plant population; and the native shrublands that provide key food and cover for a wide variety of wildlife species.
- ★ Control the invasion and spread of undesirable non-native plants (e.g., Russian olive) and illegal weeds (e.g., leafy spurge and Canada thistle) that threaten the integrity of the native habitat.
- ★ Provide opportunities for safe, accessible, and enjoyable public use of the sites, while minimizing disturbance to sensitive wildlife and plant communities.
- ★ Enhance user experience and enjoyment.
- ★ Provide recreational trails.
- ★ Enhance storm drainage facilities.
- ★ 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.

- ★ Manage human/ecosystem conflicts through design of public use areas, public information and education, habitat manipulation, and plant and animal population management techniques.

- ★ Involve citizens in the planning and management of these natural areas.

GENERAL SITE MANAGEMENT/MAINTENANCE

Context

This management plan was written and compiled in 1997/1998. Process complications delayed adoption until 2002. In general, information in this plan reflects conditions and plans as of 1998. However, occasional mention is made of management changes between 1998 and 2001.

General site maintenance is necessary for ecological protection and to provide a safe, pleasant environment for humans. The "General Management Guidelines for City-owned Open Spaces and Natural Areas" lists issues that have been a part of general maintenance of open lands since they were first acquired in the mid-1970s. The following general site maintenance needs and opportunities have been identified for Poudre River natural areas.

Archaeological Materials

In compliance with state law, areas to be disturbed by construction of trails, viewing areas, or other features will be surveyed for the presence of pre-historic cultural resources. On Poudre River natural areas, this may reveal Native American and other historic artifacts.

Trails

Although many people prefer a trail located close to a river or stream, recreational trail use can adversely affect riparian habitat. The need to carefully locate trails and manage their use is very important. Renovations and replacement of existing trails will be evaluated for environmental sensitivity. Where environmental concerns or resource conflicts are identified, trails will be relocated, to the extent possible, to less sensitive areas.

Trail placement and design in natural areas are determined jointly by staff from the Natural Resources Department and Parks Planning and Development. New trail segments are reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process.

Litter/Trash

Removal of trash and litter, particularly along the Poudre River trail, is a part of on-going maintenance.

There also are volunteer opportunities to help in keeping natural areas clean. These include the City's "Adopt A Natural Area" and "Adopt A Trail" programs, as well as Poudre River Trust's "Adopt A Waterway" program. These programs involve one-year commitments from groups and individuals who agree to monitor the adopted areas for litter control. Another clean-up opportunity is the annual Poudre River Clean-up that usually occurs in September.

Structures

People often report enjoying natural areas more when on-site buildings and structures are limited. It also is undesirable to have structures in floodplains,

and since most Poudre River natural areas are partially or entirely in the floodplain, structures in these natural areas should be limited. Therefore, non-historic structures on Poudre River natural areas will be removed, and no additional structures erected, unless they serve the public good or meet recreational or site management goals. In the Individual Site Management section of this management plan, structures planned for specific sites are identified.

Bicycle Facilities Parking lots, trailheads, and other appropriate facilities in Poudre River natural areas will be evaluated on a case-by-case basis to determine the need for bicycle parking facilities. The facilities will be installed at locations where visitors are likely to need to lock up bicycles to take advantage of the area's amenities, take part in educational events, or otherwise need to secure bicycles. Sites where these facilities are most likely to be needed include North Shields Pond Natural Area, Nix Natural Area, Kingfisher Point Natural Area, Cattail Chorus Natural Area, Riverbend Ponds Natural Area, Cottonwood Hollow Natural Area, Prospect Ponds Natural Area, and Arapaho Bend Natural Area.

Fencing Barbed wire is potentially dangerous not only to people but also to raptors and other wildlife. Therefore, it is standard practice to remove unnecessary barbed wire fences from natural areas and replace necessary fences with either smooth wire, western rail, or buck and rail unless the fence is adjacent to private land used for horse or cattle grazing, in which case barbed wire will remain.

Drinking Water and Restrooms Drinking water is available at or near Bignall Natural Area and Arapaho Bend Natural Area. Restroom facilities are available at North Shields Pond, Gustav Swanson Natural Area, and Riverbend Ponds and are planned for two additional sites (Hickory and Arapaho Bend). These facilities generally are provided at or near parking lots.

Integrated Pest Management The City uses Integrated Pest Management (IPM) techniques, which involve various means to control weeds and other pests. Insecticides are rarely used on natural areas. They will likely be used on natural areas along the river only to control any devastating insect pest outbreak.

Should gypsy moth be discovered on Poudre River natural areas, an IPM strategy involving *Bacillus thuringiensis* (BT) and egg masses that give rise to sterile masses will be employed.

To control weeds, the City uses IPM techniques including mowing, seasonal grazing, biological control (e.g., introduction of insect pests to control specific weed species), and herbicides. To comply with State, County, and City weed laws and ordinances, and to protect native plant communities, designated weeds must be controlled. State and County noxious weeds

include leafy spurge, Canada thistle, and the knapweeds. Even small stands of these weeds must be controlled to avoid spreading. An additional 35 plant species are designated as weeds in Fort Collins City Code. Certain species, or large stands, of invasive plants cannot be eradicated without herbicides. Only the least damaging, effective herbicides that are approved for the sites (e.g., wetlands) are used. Herbicides typically used on natural areas include Rodeo, 2-4D, Banvel, and a newer, less expensive broad leaf herbicide, Tordon. Of these herbicides, various ones are often mixed to enhance effectiveness. The herbicides are applied by licensed/trained sprayers, and care is taken when using herbicides near stands of rare plants (e.g., prairie gentian), other significant vegetation (e.g., bluestem stands), and wetlands.

In the past, predator insects have been introduced on some sites to control specific noxious weeds (e.g., leafy spurge). They have not been effective in controlling weeds, and in fact, after a few years, evidence of the insects could not be found. There is some indication that the insects need to be introduced in significantly greater concentrations (such as is done in research areas where successful control has been reported) in order to be effective. Smaller concentrations were initially used in the Fort Collins experiments because of the expense of this type of weed control. Heavier concentrations began to be used in 1999 as less expensive methods (i.e., staff collecting insects from donation sites) became available. Predator insects will continue to be used as management staff deems appropriate.

Purple loosestrife is a perennial that is a serious wetland pest. A 1995 City ordinance requires landowners within the city limits to remove purple loosestrife from their properties. Once established, this plant is extremely difficult to eradicate. Thus, all plants must be removed as soon as they are detected. Seedlings can be hand-pulled, but mature plants must be cut and a wetland-approved herbicide (e.g., Rodeo) applied to the cut stems to prevent resprouting. Even small roots remaining after hand-digging of mature plants will resprout; thus, herbicide use is necessary for this species. Purple loosestrife has been found and removed at the Gustav Swanson Natural Area. Poudre River natural areas will continue to be monitored for the plant.

In the future, to maintain the natural character of the sites, the City may remove non-invasive exotics that were planted when the sites were in private ownership. However, removal of non-invasives takes lower priority to most other management needs.

Invasive Grasses

Agricultural and other invasive non-native grasses are a problem on many Poudre River natural areas. These include smooth brome, cheatgrass, and others. These will be removed using IPM practices, i.e., herbicides will be used when mechanical, grazing, and biological methods are ineffective.

Russian Olive,

These trees and tree-size shrubs are exotic wetland pest species that threaten

Siberian Elm, Saltcedar the integrity of wetland habitat throughout the UGA. All of these species are well established along the river and will be removed as time and budgets allow. They are extremely difficult to eradicate. Methods will include up-rooting smaller shrubs (<1-inch caliper) with a weed wrench, cutting larger shrubs and applying a wetland-approved herbicide to the stump (necessary to prevent resprouting), and girdling the bark to kill the plant.

Snags General management policy for snag (dead trees that are still standing) management is to leave them in place for their wildlife habitat value unless they threaten structures or human safety, in which case they will be felled and either left lying on the site or removed from the site, depending on site functions (e.g., they would be removed from the site if their presence on the site would create a flood hazard).

Native Plant During construction of trails, viewing areas, or other earthwork activities, **Salvage** native plants will be salvaged for use in revegetation projects. Under the "General Management Guidelines for City-owned Open Spaces and Natural Areas," native species are required for seeding and planting projects (see Natural Resources Department 1996 for species list). Only on-site seed sources for rare plants (e.g., prairie gentian) can be used for reseeding and planting projects. Ideally, to preserve genetic integrity of existing plant communities, all seed and plant revegetation sources should be from existing plants of Poudre River environs. Unfortunately, because of the extent of needed revegetation and the lack of local seed and plant sources, local plant material cannot be obtained for all projects. However, native plants salvaged during trail construction and other earthwork can be used in revegetation projects, or soils containing seeds of native plants can be stockpiled for future revegetation uses.

Fires Poudre Fire Authority has jurisdiction and responsibility for control of wild-fires. Because Poudre River natural areas are in an urban area, fires will be controlled to protect lives and private property.

Fire will at times be used as a management tool to control certain weed species or for research purposes in establishing native grasses. Recent research is inconclusive as to whether fire is beneficial to western native shortgrass prairies or, unlike eastern midgrass and tallgrass prairies, actually damages shortgrass prairies. State air quality regulations do not allow the burning of toxic materials, so railroad ties and other treated wood that are present on a site to be burned will be removed before burning occurs. Because of local air quality concerns, attempts will be made to burn between the hours of 9 a.m. and 2 p.m., when air currents are more likely to remove the smoke rather than allowing it to hang over the city. On some sites, a surfactant, described as "similar to dishwashing liquid," will be applied to downed natural wood (which is desirable for wildlife habitat) to keep it from being involved in the burn.

Signs and Boundary Markers

To avoid inadvertent trespassing, property boundaries of all City-owned/managed natural areas will be staked with identifying markers. All existing and future signs and boundary markers on Poudre River natural areas will be kept in good condition.

General Education

There are many tools available in the field of education. In natural areas, interpretation is a primary education tool.

In planning interpretation for these natural areas, the entire Poudre River natural area complex was considered as a whole. Then, in addition to evaluating the interpretive opportunities shared by all sites, each site was evaluated for its unique interpretive opportunities. When completed, the final result will be a progression of different features, from site to site, providing information on a wide range of topics, both unique to individual sites and common to all sites. The visitor's experience will be much like that of visiting a museum or other interpretation facility, in that the visitor garners information on different topics from each exhibit. The difference is that the "interpretive facility" is the real world, and instead of viewing pictures or recreations, the visitor experiences the genuine article (e.g., sees a heron actually catch a fish for lunch, hears a rabbit scurry through fallen leaves as it seeks to escape a perceived predator, feels the cool shade of a forested riparian area as compared to an adjacent sunny grassland, smells the damp earth of the riparian forest, gets wet [just like the ducks] during an afternoon thunderstorm, etc.). Interpretive features will be designed to blend into the surroundings. Except on large sites with significant interpretation needs, interpretive features can be expected to consist of one or two appropriately sized and designed signs. Information kiosks will be placed on larger sites in order to provide general natural area information and brochures.

In addition to educational and interpretive features discussed in specific site management sections, the following general educational opportunities and materials are available. With the exception of the video, "The Cache La Poudre River, An Integral Part of Our Lives," Poudre River natural areas are a part, but not the exclusive focus, of these educational media:

"Nature Next Door" brochure - published by the City of Fort Collins Natural Resources Department. This brochure provides examples from all of Fort Collins' natural areas. In the future, a similar brochure is planned that is specific to Poudre River natural areas, identifying all of the natural areas along the river, discussing their shared characteristics, and describing how they differ from other types of natural areas (e.g., prairies).

"Nature Next Door" video - a 10-minute piece produced by the City of Fort Collins Natural Resources Department.

“The Cache La Poudre River, An Integral Part of Our Lives” - a 15-minute video produced by the City of Fort Collins Stormwater Department.

Master Naturalists - trained volunteers who provide guided interpretive walks, classroom presentations, and other programming about the wildlife and natural features of natural areas. This program is administered through the Natural Resources Department.

Watercraft Regulations Safety Operation of all watercraft on the Poudre River is to be in compliance with state regulations. The booklet, “Colorado Boating Statutes & Regulations,” **and** available from Colorado State Parks, explains these regulations.

Major Flood Interpretation At appropriate Poudre River natural areas, the extent and impact of some of the river’s major floods will be identified and explained.

Public Involvement Liability Early in the process of establishing the Gustav Swanson Natural Area, steering committee members (who were private citizens) were concerned about their liability relative to involvement in site restoration and management. Kathleen Allin (then assistant City Attorney) advised that since the committee was not appointed by the City, but came to the City with ideas about the use of the City-owned site, and offered to help implement those ideas, committee members probably could not be considered “public employees,” a designation that would provide protection under the Colorado Governmental Immunity Act. Therefore, members were advised to seek private counsel on this matter. No action is recommended at this time, but if groups have questions about their liability in such situations in the future, it may be wise to ask the City Attorney’s Office to again review this matter.

REGULATORY ISSUES

Context

While management through education is desirable and will be used extensively, other approaches are needed at times to protect sensitive wildlife species, plant communities, and geological features, to provide safety and enjoyment for visitors, and to reduce potential conflicts between adjacent neighbors and the natural areas. The following regulatory issues apply to Poudre River natural areas.

Informing Visitors/ neighbors

Various City Code regulations (including the City's Natural Areas Regulations and other regulations referenced in "General Management Guidelines for City-owned Open Spaces and Natural Areas") apply to public use of open lands not only to ensure a safe, pleasant visitor experience, but also to protect natural and recreational features of the City's open lands. It is ultimately the visitor's responsibility to know and abide by regulations governing the sites. However, as site managers, it is only reasonable that the City make such information readily available to site visitors and neighbors. Therefore, natural area regulations will be displayed at site entrances and should be included in appropriate brochures or other informational devices distributed to site visitors and adjacent neighbors of the natural areas.

Enforcement

The issue of enforcement of codified regulations on the City's open lands and natural areas has often been raised. Basic enforcement responsibility has always rested with Fort Collins Police (enforcement of City Code) and Humane Society of Larimer County (enforcement of City Code related to dogs and cats at large and some other animal ordinances). Because of the need to focus on enforcement in natural areas, in 1997 the City created a ranger position, hiring two rangers (later increased to three) to patrol not only Poudre River natural areas, but also all other natural areas and trails in the Fort Collins system. While the rangers are empowered to enforce regulations (i.e., issue citations), the initial approach with individuals, when appropriate, will be to advise the visitor of the rules and regulations and about adverse effects on the natural areas when these rules and regulations are violated. However, visitors who choose to ignore the rangers' advice will be cited.

Reporting Mechanisms

Site visitors and adjacent neighbors of the Poudre River natural areas need to be aware of regulations and how and when to report City Code violations and other management issues (e.g., damaged fences, injured or problem wildlife).

It has been difficult for neighbors and site visitors to know who to call for specific problems, because the appropriate agency to contact varies, depending on the issue (e.g., Police for firearms; Humane Society for abandoned pets; maintenance departments for fence repair; Colorado Division of Wildlife (CDOW) for large animals, such as deer, causing problems in neighborhoods). While all **life-threatening emergency** calls should always go to the

911 emergency number; **non-emergency** calls should go to the rangers, rather than callers having to determine which agency to call. The ranger will then notify the appropriate entity of problems not within the rangers' purview.

Easements Easements for public purposes, which may be expected to occur on natural areas, include utility easements (e.g., stormwater conveyance, water lines, power lines, irrigation canals) for maintenance and repair of existing systems or installation of new ones and for roadways. Existing easements are identified in specific site descriptions. Easements are granted only after review and approval by City Natural Resources staff; Parks, Stormwater, and other staff are involved where appropriate. Minimizing impact to natural resources and recreational structures of the site is required; unavoidable impacts require mitigation (e.g., buried water line would require reseeding with native grasses and forbs).

Leases Leases on Poudre River natural areas must correspond to site management goals. Few leases are granted on natural areas. On some natural areas that were used for farming or grazing when the City acquired them, leases to continue such operations may be allowed until the City can begin restoration processes.

Art In Public Places Article IX, Sec. 23-301 of the Fort Collins City Code requires that certain construction projects incorporate art. The requirements are based on project cost. The regulation applies to construction project, but not land purchase, costs. Poudre River natural area projects that must comply include trail building and parking lot construction as well as any interpretive buildings that might be erected. Specifically, for a construction project of less than \$50,000, project managers should try to include artistic and aesthetic values in the project; for a project costing between \$50,000 and \$250,000, a City selected artist (from among artists approved by the Art In Public Places Board) must be hired as part of the project team for the purpose of incorporating works of art into all aspects of the project (costs of the artist and the art to be borne by the project); for a project of more than \$250,000, one percent of the project cost must be put into the City's Art in Public Places Reserve Account which is administered by the Art in Public Places Board.

American's Disabilities The Americans With Disabilities Act (ADA) is a comprehensive Federal law **With Act** that prohibits discrimination against persons with disabilities. The ADA prohibits the City from excluding persons with disabilities from participation in, or denying them the equal benefits of, the City's services, programs, or activities.

Upon request, site brochures and other written materials will be provided to persons with vision impairment in the format requested by such persons. When requested by persons with hearing impairment, program presentations and guided walks will be augmented by a sign language communicator.

Natural areas will be accessible to persons with mobility limitations where reasonable. While this often is done by paving trails, in some situations, trails may be designed with crusher fines or other material that reduces the non-natural appearance, but still allows wheelchair access. The paved Poudre River Trail provides wheelchair access to most Poudre River natural areas. To facilitate access to non-paved trails in Poudre River natural areas, boardwalks and/or crusher fines are likely to be used.

FLOODPLAIN ISSUES

Context

In assessing potential adverse impacts of floodplain development and modification on the natural, beneficial functions of the floodplain, the City tries to minimize adverse environmental impacts and potential risk to the proposed action itself and to lives and property. Natural areas along the river often are a resource for managing the floodplain more naturally. The City's "Guidelines for the Management and Administration of Floodplains" identifies natural and beneficial values of floodplains in their natural, or relatively undisturbed, state.

Water Resources

Water resource values include natural moderation and attenuation of floods, water quality maintenance, and groundwater recharge. These resources and functions are part of, and/or benefit, the hydrologic cycles both on and below the surface. Examples include –

- ★ **Natural flood and erosion control** – Natural floodplains provide flood storage and conveyance and reduce flood velocities, flood peaks, and sedimentation.

- ★ **Water quality maintenance** – Natural floodplains filter nutrients and impurities from runoff, process organic wastes, and moderate temperature fluctuations.

- ★ **Groundwater recharge** – Floodplains promote infiltration and aquifer recharge and reduce frequency and duration of low surface flows.

Biological Resources

These values benefit plants and animals. Examples include –

- ★ **Biological productivity** – Floodplains support a high rate of plant growth and maintain the ecosystem's biodiversity and integrity.

- ★ **Fish and wildlife habitats** – Floodplains provide breeding and feeding grounds, create and enhance waterfowl habitat, and protect habitats for rare and endangered species.

Societal Resources

These values include historical, archeological, scientific, recreational, and aesthetic resources and functions that directly benefit humans. They include –

- ★ **Harvest of wild and cultivated products** – Floodplains enhance agricultural lands, provide sites for aquaculture, and restore and enhance forest lands.

- ★ **Recreational opportunities** – Floodplains provide areas for active and

passive uses, open space, and aesthetic pleasure.

★ **Research and education** – Floodplains contain cultural resources (historic and archaeological sites) and provide opportunities for environmental and other studies.

INDIVIDUAL SITE MANAGEMENT

Site #96P1

Context

A minimal amount of management of this as yet unnamed site is addressed in this five-year management plan. The subsequent five-year management plan is expected to occur when the configuration of the entire natural area complex in this area is known, and therefore, more specific, appropriate management can be recommended. There is currently no public access to the site, but staff has an agreement for management access across private property.

Plant

Poudre Fire Authority is looking for opportunities to train firefighters in

Community Management

wildland fire management. Therefore, in spring '97, an attempt was made to burn vegetation and old lumber from previous buildings on this natural area. Weather conditions, however, were not conducive, and the fire would not spread. Future attempts to burn the site will comply with burning guidelines in the "General Site Maintenance" section of this document. Surfactant will be applied to downed natural wood on the site (which is desirable for wildlife habitat) to keep it from burning.

Wildlife Management

Small and large mammals are known to use this urban natural area. There is no evidence of wildlife problems that require management intervention.

Water Management

The purchase contract stipulates that, during the lifetime of James H. Hyde and Margaret Hyde, from whom the City purchased the property, the site shall be used only for open space, park, trails, and recreational purposes. This stipulation includes a ban on gravel mining.

There is some minor erosion caused by the river naturally undercutting. However, there is no major problem. The fact that the site will be maintained naturally, i.e., natural vegetation allowed to remain in place, no heavy watering and mowing as would happen on a developed site, and no buildings being put on the site, erosion should not become a major problem.

Recreation Management

On this site, the Poudre River Trail is expected to follow the abandoned railroad right-of-way, then go north on the west side of the site to the river. A bridge is planned to take the trail to the north side of the river. Trail placement and design will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process.

No other recreational facilities are planned until the ultimate configuration of the natural area complex in this area has been determined.

Fig. 2 - Site #96P1 map

Interpretive Education

Interpretive features for this site are expected to include information about the family that previously owned the site and about its historic use. Additional interpretive features will be considered after the ultimate configuration of the natural area complex in this area has been determined. It is likely this ultimate natural area complex will have interpretive features about the unique role of rivers in arid environments and gravel mining and restoration.

There is evidence on the site that the river has been cutting down and moving to the north. This may be incorporated into the site’s interpretive features.

Research

Plant and wildlife surveys should be conducted on the site.

Miscellaneous Management Issues

Piles of rubble and old plumbing fixtures that have been dumped on the site will be taken to the landfill.

Fencing was improved in spring 1997. Barbed wire fencing was removed, and where necessary, replaced with horse fabric and wooden post and rail fencing. In some places, the fencing is only four feet high to allow deer to freely move through the site. Fencing internal to the site was removed.

A small amount of clothing and other debris has been found near the river, indicating that the site may at times be used by vagrants. The site will be monitored for this activity.

North Shields Pond Natural Area

Plant Community Management

In 1994, 250 shrubs were planted on this urban natural area (see Appendix E for one-year survival rates). In 1996, Parks staff supervised approximately 25 volunteers in planting 616 native bareroot shrubs. In 1997, 60 volunteers planted 800 native shrubs and 10 native trees, which were watered for the first year to get the plants established.

On-going projects include the planting of buffalo and blue gramma grasses (covering the seeds with jute until they become established); removing Siberian elm from the site; and replacing crack willow with river birch and other appropriate trees/shrubs.

In spring ‘97, several Siberian elm on the southwest side of the pond were cut down and allowed to fall into the pond as turtle and fish habitat. Turtles immediately (literally within hours of the trees being felled) began sunning themselves on the exposed portion of the felled trees.

Some of the large cottonwoods on the site have structural defects such as hollows, decay, or dead branches. Trees determined to be a threat to site visi-

tors will be removed or pruned to alleviate the hazard.

Fig. 3 - North Shields Pond map

Wildlife Management

CDOW stocks the pond annually with warmwater species (usually large-mouth bass, crappie, and/or channel catfish).

Bat boxes will be installed on the site.

Water Management

In early 1995, residents near the pond were concerned about the apparent dropping of the water level in the pond over the past few years. While 1995 was a high precipitation spring and summer, it was preceded by several dry years. A study of the water history of the area (Barton, 1995) concluded that the water levels that concerned the residents were likely the result of natural cycles (e.g., dry years followed by a wet year) and human activities (e.g., irrigation diversions). Longtime residents recall that before 1989 the pond would regularly overflow its banks. The pond is higher than the river, leading to the conclusion that the pond recharges the river through groundwater seepage during low flows, and the river recharges the pond through groundwater seepage during high flows.

In December 1987, Beth Dillon of the CDOW received permission to submerge Christmas tree structures in the pond to improve fish habitat. The trees were sunk by either cementing them to old tires or wiring them together with cement blocks. In winter '95-'96, the City's Parks Department put discarded Christmas trees on the ice with no anchoring, intending for them to sink as the ice melted. Before the ice melted, the trees blew around in the wind. After the ice melted, most trees sank, but some had blown into water too shallow to allow sinking. This type of fish habitat enhancement will be continued in the future if deemed appropriate.

There was a camper shell in the middle of the west end of the pond. It had reportedly been there "forever," but became noticeable only in recent years as the water level dropped. It was removed from the site in 1999.

Considerable eutrophication is evident in the pond (likely due to the filling of the spring in the past), but there have been no fish kills. The presence of green algae indicates organic pollution. CDOW has indicated an interest in experimenting with a blue dye that limits alge growth but does not kill the algae. City staff questions the effectiveness of this application on such a large area, but, since no harm to the wildlife or the habitat is anticipated, will allow CDOW to pursue this experiment at CDOW's expense.

There is a considerable amount of additional plant (cattail) growth on the west end of the pond. This may indicate a natural progression from a pond to a wetland. This progression will be allowed to continue at the west end. However, CDOW advice will be sought on the possibility of deepening the east end to maintain, and possibly improve, fishing at the site. As requested during review of the draft of this management plan, staff will determine

whether fishing enhancement is a goal for the site. If the decision is made to deepen the east end of the pond, a detailed construction plan will be developed.

Recreation Management Public access to the site is from Shields Street, with the parking lot on the south side of the pond. There are picnic tables and an accessible fishing pier (built in 1994) near the parking lot. Neighbors have created a small private pedestrian/bike trail access across private property on the north side of the site.

The pond is a popular fishing spot, heavily used by families, as well as by children biking to the site on their own.

There is an informal natural surface trail around the pond. Some of it, however, is not on City land, and parts of the trail are so informal as to be difficult to follow or negotiate. Staff recommends that the trail be improved and defined as needed to allow safe access on City property completely around the pond. Trail placement and design will be reviewed with the Natural Resources Advisory Board to obtain their input during the planning process. If deemed advisable, a detailed trail construction plan will be developed to ensure appropriate alignment, cut and fill, etc. Staff recommends that the trail remain natural surface except for the possibility of adding boardwalk sections in wet areas.

Within the past couple of years, portions of the trail near the parking lot were improved by edging with timbers and surfacing with recycled asphalt.

Other recent site improvements include the installation of several sets of “steps” along the bank to alleviate erosion problems where people have habitually gone down to the pond. The new “steps” are made of timber frames and surfaced with recycled asphalt. Some informal pond access points will be closed to restore eroded areas.

Interpretive Education The natural succession from a pond to a wetland is a unique opportunity for interpretation. The succession will be a changing phenomenon over the coming years. Therefore, the interpretive features should be designed so they can be easily changed as the natural area changes.

Since the site is heavily used by families, it is an ideal site for interpretive features, designed specifically for children, about the birds in the area and about the pond’s ecology. To encourage pride of ownership and to stimulate learning about the natural features, the children and young people who visit the site may be involved in helping to develop these interpretive features.

Miscellaneous Management Vagrants often use the forested area on the northwest side of the pond as a campsite. This creates not only a possible safety issue, but it also is often

Issues

extremely trashy. This should be frequently monitored by the police and the Rangers and should be cleaned up by maintenance personnel as needed.

The site sign is in poor condition and will be replaced.

Restrooms will be installed on the site.

Research

The CDOW will be asked to evaluate the fishing habitat of the pond to determine its validity as a fishery. They also will be asked to evaluate deepening the east end of the pond and to advise on other habitat improvements. If site changes are determined to be appropriate, detailed construction plans will be developed to ensure appropriate design.

The CDOW will be allowed to experiment with blue dye to limit alge growth if they so desire (at their own expense).

Hickory Natural Area

Plant**Community Management**

During a 1995 project, Boy Scouts cut down many of the Russian olives on this urban natural area. Because the stumps were not treated with herbicide, they are resprouting. They will, therefore, be freshly cut and treated with herbicide.

There is a lot of spurge on the site that will be eradicated with herbicide.

There are some old downed cottonwoods at the north end of the natural area. These will be left in place to provide habitat for woodpeckers, cavity nesters, and small mammals.

Wildlife**Management**

Site fencing will be evaluated. To protect wildlife, barbed wire fencing will be removed, or replaced with less damaging fencing material, except as needed to separate the natural area from cattle grazing on adjacent private property.

Recreation Management

The natural area is adjacent to a proposed developed park. The parking lot for the park (which may be built in 2001 or 2002) will serve both the park and the natural area. It is anticipated that the parking lot will be near Hickory Street, which currently dead ends at the park site, but when extended through to Shields Street sometime in the future, will run near the southern end of the natural area.

The site is not officially open to the public. However, the natural area can currently be used for birding. Visitors should park off-street at the end of Hickory Street and walk into the area. The existing fence is in place to keep vehicles off the property. The fence should be redesigned with the sharp "V" that allows access for pedestrians, but not for bicycles, motor bikes, etc.

When developed, the adjacent park will include active sports fields, basketball courts, and a playground/picnic area. Improvements also will include

Fig. 4 - Hickory, Salyer, Legacy map

restrooms, trails, and sidewalk connections to Hickory Street and the trail to Lee Martinez Park.

All recreational amenities of the site will be designed to appropriately allow for the Dry Creek Channel that will go through the site.

Interpretive Staff recommends that a 50-100-foot buffer be designed into the park/ **Education** natural area interface. This will be an ideal location for an interpretive trail _____ leading into the natural area. The trail, or spurs from it, should be designed to provide access to appropriate interpretation points. From a natural area perspective, a natural surface trail would be preferable, but trail surface cannot be decided until the Parks Department determines what the trail is to be used for (i.e., if it is to be used for roller blading, skateboarding, or must be accessible to persons needing accessible trails). Trail placement and design will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process. If appropriate, a detailed trail construction plan will be developed.

Several aspects of the site will be included in interpretive features. These include the wildlife of the area, the history of the oxbow, and the water diversion history of the river (using an abandoned headgate at the pond).

Research A formal plant survey will be conducted on the site.

Miscellaneous Management Issues The Boy Scout clean-up project in 1995 cleared out a lot of trash (an old shed, wire, etc.), but some trash still needs to be removed.

There is no evidence of vagrants using this site. Unless this changes, therefore, vagrant management is not necessary.

Salyer Natural Area

Plant Community Management The grasses on this urban natural area are in good condition, indicating that the previous horse grazing, which involved only two horses and one pony, was apparently well managed.

There is a lot of spurge on the site that needs to be eradicated.

In 1996, Poudre River Trust conducted a planting that included both Salyer and Legacy Natural Areas. They planted 17 ponderosa pine, 19 Rocky Mountain juniper, 10 plains cottonwood, 21 American plum, 20 common western snowberry, 31 three-leaf sumac, 32 golden currant, and approximately 9,000 square feet of western wheatgrass.

Wildlife Management Old corral posts and fences from previous horse grazing are still present on the site. The metal fence posts will be removed, but the wooden ones will remain.

Water Management River overflow runs through an area of the site near McMurry Ponds. Water runs through this area until late summer.

Recreation Management For years, the river overflow area had an informal crossing (just a narrow board someone placed across the water a long time ago) that visitors used for access between the site and the McMurry Ponds area. In fall '97, volunteers built a more substantial crossing.

A network of formal and informal trails allows walking and biking between Lee Martinez Park, Salyer Natural Area, Legacy Park and Natural Area, and Hickory Park and Natural Area (although it is necessary to walk along the roadway a short distance between Salyer Natural Area and the Hickory site).

Interpretive Education Interpretation will concentrate on the native plants of the site, using the wild iris as a focus for the interpretation.

Miscellaneous Management Issues The barbed wire fence along the site's northern boundary needs to be replaced with smooth wire or western rail.

A new site sign is needed because the previous one was destroyed by vandals.

Citizen involvement in the site includes a 1991 project in which volunteers from Poudre River Trust, citizen volunteers, and City staff spent three hours collecting several bags of trash and two dump truck loads of wire fence and posts. There still are some trash items and structural remnants (metal items, an old couch, an old house foundation, rip-rap, etc.) that need to be removed.

Legacy Natural Area

Plant Community Management Because this urban natural area is used extensively by vagrants, police and Parks Department personnel have removed some of the understory from the area to make it less attractive to vagrants. Brush piles left from this understory removal and other clean-up projects will be either removed (if they consist of undesirable species) or left as habitat for ground-nesting birds and small mammals.

In 1996, Poudre River Trust conducted a planting on Legacy and Salyer Natural Areas (see Salyer Plant Community Management section).

Russian olive on the site needs to be removed.

Wildlife Management

The vagrant management will reduce habitat for wildlife that depend on understory vegetation for shelter and/or for food.

Recreation Management

Persons with disabilities have reported that the parking lot at this site is a good place to sit in the car and enjoy watching the river. To enhance this use, an accessible parking place will be identified next to the river.

A paved trail on the west side of the park site connects Legacy Park to Lee Martinez Park, Salyer Natural Area, and with some on-street travel, to Hickory Park and Natural Area. A natural surface trail leads from the parking lot, angling through the edge of the park to the natural area, and loops through the forested portion of the natural area back to the park.

A couple of one-person benches (possibly just logs with seating cut-outs) will be placed just inside the forested area. The benches must not exceed one-person capacity to avoid vagrants using them as beds.

Interpretive Education

This is a good site at which to provide information about the tradeoffs associated with wildlife habitat removal (on this and other river corridor sites) to discourage vagrants. Such interpretation will describe the value of ground-level habitat for wildlife. It also will serve as a way to advise trail users that vagrants are a hazard on the site and appropriate precautions should be taken.

Miscellaneous Management Issues

A considerable amount of site clean-up, including removal of old cars, etc., has been completed.

Gustav Swanson Natural Area

Context

Winner of a Take Pride in America Award, this is a highly managed natural area in the heart of the city. A steering committee, made up of members of the City/community cooperative that established this nature area, developed a management plan for the area, with a goal toward minimum maintenance to reduce evidence of human activity and minimize on-going costs. Feeling that the management plan would take precedence over the steering committee, the committee was disbanded shortly after staff began drafting the Poudre River Natural Areas Management Plan.

The steering committee’s mission for the nature area is to protect and preserve the area to provide habitat essential to the conservation of plants, animals, and their associated ecosystems and to enrich the lives of citizens, especially those with handicaps, by providing opportunities for science, education, nature interpretation, art, fishing, wildlife observation, hiking, and other activities.

Fig. 5 - Gustav Swanson Natural Area Map

Community involvement is an important part of the site's management policy. Community members and organizations have donated time, funds, and materials to make the site's restoration successful. The volunteer work of steering committee members and of groups such as Eagle Scouts, Youth Conservation Corps, Operation Brightside, and Workenders (an alternative sentencing group), made many of the site improvements possible. From 1990 through 1993, volunteer time totaled approximately 3,000 hours.

**Plant
Community
Management**

Plant community management was a major focus of site restoration. The 1991 site maintenance manual focuses on restoring the natural conditions that existed in eastern Colorado's riverside forests. Only native plants characteristic of the region in presettlement times are included in restoration plantings, acknowledging that projects using native plants mature more slowly than those using horticultural stock. As plants find their niches, the ultimate results, while not showy, eventually will offer a subtly changing variety throughout the year. Planting arrangements are designed to be informal and clustered to mimic nature, not set out in patterns typical of manicured landscapes.

Restoration also was focused on eliminating weedy and non-native species, providing wildlife habitat demonstration plots, and screening portions of the site's perimeter. Much restorative planting activity has occurred, including 198 plants planted in August '91; 27 lb. of grass seed planted in April '93; and in June 1995, planting trees at the foot of the embankment (to screen trains) and grasses and shrubs on the hill near the block house that covers the old water treatment site (using the \$1,400 Gustav Swanson memorial fund). Plants have come from nursery stock of native species, transplants from natural areas, seeds from nearby natural areas, and plants raised from gathered seed. In 1991, the project received a \$2,285 grant from the Wildlife Habitat Mitigation Fund to complete a landscaping plan and purchase plants.

The maintenance manual directs the City to control weeds, remove undesirable plant species, and mow vegetation in 20-inch wide strips along path edges. The City also periodically mows between the trail and the fence in the Dorothy Udall Grove in an effort to control smooth brome and mows other portions of the site as needed to control weeds and other exotics.

Some plant trimming (e.g., around the regulatory sign in the parking lot to keep the sign visible) is required to facilitate visitor use.

This is one of the sites on which burning of grasses is being considered as a possible strategy to improve the grasses' health and control weeds.

Some herbicides are used on the site. This is contrary to initial policy, but non-chemical weed control was unsuccessful. For example, insects (two species of *Apthona*, which successfully controlled spurge in other Great

Plains states) were released for three consecutive years to try to control leafy spurge. The insects survived (at least for two years) but did not reduce the spurge stand. As a result of the lack of success with nonchemical measures, herbicides are now used. These include 2-4D (for leafy spurge), Barrel and Rodeo (for thistle), and Krenite (for unspecified weeds). Some hand-pulling still occurs, and spurge was mowed in the fall of 1995 to prevent its going to seed. This aggressive approach to non-native invasive species is needed because native grasses that have been the dominant ground cover in the past are losing out to leafy spurge and other aggressive weeds.

The site is monitored for purple loosestrife annually. The plant was found on-site and removed in 1995 and 1997.

There are on-going efforts to remove the many crack willows on the site.

The bank by the storage units will be stabilized and replanted. Timing will depend on the storage company's completion of improvements at the edge of the site.

In fall '97, weeds were removed on the 0.39-acre portion abutting College Avenue and native grasses and wildflowers were planted.

Wildlife Management

Some of the Arbor Plaza Mitigation Fund was used to develop/enhance wildlife habitat and to provide education and interpretation.

Beaver have been a problem. The 1991 maintenance manual states that the removal of nuisance animals, specifically beaver, will be implemented as approved by the steering committee. In response to a 1992 complaint from Link-n-Greens golf course that beaver in the Coy Ponds impeded their irrigation flow, a "grizzly" trash rack was built to prevent clogging of culverts under the service road. To reduce on-site beaver damage, trees are wrapped with chicken wire.

Water Management

With flood levels such as those experienced in 1995, water inundates the unpaved trail along the river. During larger floods, the river flows even farther into the site. This is recognized as a normal function, and there are no plans to move trails.

To water new plants, a "temporary" water tap was installed in 1993. There are no plans to remove this tap.

Recreation Management

Recreation includes walking, running, birdwatching, and fishing. The site also was intended as a picnic site for employees in the downtown area, but mosquitos and flies are extremely bad on the site, greatly reducing the enjoyment of relaxing or picnicking.

Access is from Linden Street. This access was provided after the City obtained a right-of-way to underground a portion of the Coy Ditch and cross it with a bridge and parking lot. The cost of the parking lot (and the bike trail) was \$9,622. Initial plans called for access from the old power plant by building a pedestrian bridge across the river. The power plant is no longer in public operation, so plans for this pedestrian bridge have been abandoned. However, if the bridge is ever built, it should to be designed as a “break-away” feature to avoid adversely affecting flows during a major flood. Another possible access feature is to take the Coy trail to College Avenue and tie it to the Poudre Trail. That possibility will be investigated and, if the trail is determined appropriate, a detailed trail construction plan will be developed.

The trail system through the site includes an asphalt loop trail providing access for persons needing accessible trails and an unpaved trail adjacent to the river. A \$15,000 Community Development Block Grant was awarded for the asphalt trail system because it made the area accessible to persons with disabilities. A 1986 site plan indicated that the more remote sections of the trail would remain at “useable” or “difficult” access levels to discourage bicycle use.

Site visitors are not required to remain on trails. In 1995, the steering committee decided against an “on-trail only” policy (even though it would reduce littering and loitering problems), feeling that such a policy would prevent kids from being able to explore and would kill people’s feelings of relaxation.

A small wooden bridge has been built on the non-paved trail at the point where annual water line flushing repeatedly washed the trail out. In 1996, the Water Department started putting a hose on the line when flushing, sending water into the river, not onto the trail.

Until 1995, a prized feature of the site was an accessible fishing pier. The pier, designed to break away in a flood, was washed out in 1995. If reconstructed with its original design, it will continue to wash out during high flows. Therefore, if rebuilt, the break-away structure will be reconstructed in a more stable fashion and elevated higher above the water to protect it from high flows. However, because there are several accessible fishing piers around town, this site will be reevaluated for its importance as an accessible fishing site. If the pier is not replaced, a bench will be placed at the site.

A portable toilet, maintained on the site at a cost of \$75/month (weekly servicing), is heavily used by site visitors, clients of the nearby homeless facility, and trail users.

Many celebrations and ceremonies have been held on the site to recognize volunteers and to celebrate the lives of those who have influenced the site’s development (e.g., the Lilley Memorial Garden dedication October 1991; the

Gustav Swanson memorial September 1995; the dedication of the Dorothy Udall memorial grove of trees). Various strategies are employed for these events. These include (in addition to general mowing, pruning, and litter removal) bringing in a gas generator to power a public address system, bringing picnic tables from other parks to provide ample seating, having entertainment groups perform on the site, mowing certain areas to provide access for picnicking, and barricading the trail to keep trail users away from the celebrations.

Some off-site activities interfere with enjoyable recreation. For example, loud music from groups that practice at the Linden Tech Storage Center has been an on-going problem. If it is determined that this is in violation of the City's noise ordinance, enforcement of the ordinance will be pursued if appropriate.

An even bigger problem is transients building shacks and fires on the site. This is not only unpleasant for visitors, but also dangerous. It is unsafe for individuals to visit the site alone. Site visitors witnessed a rape in early 1996. Transients who frequent the site are generally those who are turned away from nearby homeless facilities because they violate the no-alcohol and no-drugs policies of those facilities. According to the police, many of these transients have police records and should be considered dangerous. In accessing the site from the railroad tracks, transients have worn an informal trail between the tracks and the paved trail.

Many strategies have been used, and others are planned, to deal with the transient problem. Benches are designed with an arm rest in the middle to avoid transients sleeping on them. In 1996, police started doing more frequent sweeps to clear out transient encampments. Earlier, a large crack willow (a non-native species) was removed because it camouflaged camping and drinking activities. Police have asked that underbrush be removed, particularly along the river, so police and other observers on the Poudre Trail across the river can more easily see transient camps. Even though this removes some wildlife habitat, this underbrush removal is occurring. At one point in time, a nearby resident who used the site daily, joined the steering committee and offered to help patrol the site to reduce transient and other illegal activities. The steering committee discussed providing cellular phones for residents to use to call the police if they see illegal activities. The police supported this idea. There were many issues to be worked out, however, before such a decision could be made. A 911 call box was installed near the site entrance in late 1996 to improve access to emergency services. Rangers frequently monitor the site and, along with police, help to keep vagrants from camping on the site. Police also have asked for a wider bridge across the Coy ditch to allow them to patrol in police vehicles. The wider bridge also is needed for maintenance vehicle access. To accomplish this, the current bridge location may need to be realigned because of the sharp turn.

Vandalism, including graffiti, firewood cutting, and theft of chainlink fencing, also has been reported.

The isolated 0.39-acre portion adjacent to College Avenue is too small and inappropriately located for human access. In the future, land and/or easements may be acquired connecting this portion to the rest of the site, making human access appropriate.

Interpretive The steering committee indicated that interpretation should include plant **Education** communities, their adaptability to various environments, plant succession, competition from introduced species, and uses in landscaping.

Interpretive features of the site include a sign system, a brochure, and habitat demonstration areas. The signs were completed in 1992 at a cost of \$949 (three copies of each of the five signs). The extra copies were to replace signs that can no longer be repaired (e.g., graffiti cannot be removed without destroying the sign). Some of the signs have had to be replaced often enough that extra copies are no longer available. Graffiti, tagging, and complete removal of the interpretive signs continues to be a significant problem on the site.

There was initially some concern that it might be necessary to get sign permits for the interpretive signs. However, the City's sign code does not impact interpretive signage (such signs are classified as "official signs").

There is interest in augmenting the present sign system with interpretive features for the visually impaired.

An interpretive sign that was placed at the site entrance while the no-herbicide policy was in place indicates that no herbicides are used. The outdated information could be a problem for people with pesticide sensitivities who visit the site thinking they will not be exposed to pesticides. Therefore, the sign will be updated.

The shortgrass prairie sign is now inaccurate (because some of the species are no longer present as indicated on the sign) and will be replaced.

The interpretive sign that was on the fishing pier when it washed out will be installed on another appropriate portion of the site.

During the summer of 1993, a twilight talk series was held on the site. Topics included riparian birds, changing fish fauna of the river, tree insects, and the raptors. A barbecue grill and picnic tables were made available for those in attendance. The fact that mosquitos were a real problem for this type of activity is evident by the fact that attendees were advised to bring mosquito repellent.

Miscellaneous Management Issues

Routine site maintenance includes litter control, emptying trash containers, trail and parking lot sweeping, asphalt and base repair, mowing along the trail’s edge, weed control, and maintenance of signs, fences, benches, the bridge, and other public structures.

In 1989, remnants of an old wastewater plant (including a concrete manhole, two eight-foot high concrete buildings, a 20-foot x 13-foot concrete structure, a 30-foot tank, and a 34-foot tank and concrete base) were removed. A shed, which was present when the site was acquired, and which provided secure equipment storage during intense restoration activities, was removed because it no longer was of any use, and it required frequent clean-up as a result of graffiti (to reduce its attractiveness as a graffiti target, it was painted with a creative pattern in fall ‘97).

Udall Natural Area

Context

In the future, this site, which is jointly owned by Fort Collins Utilities and City of Fort Collins Natural Resources Department and which will become subject to an MOU to be developed between the two departments, will undergo major changes as the Stormwater and Natural Resources departments implement storm drainage improvements and restore the site. According to the Poudre River Land Use Framework, the goal for this “Historic and Cultural Core” sub-area of Fort Collins is to balance restoration of the natural riparian environment with the redevelopment of Old Town Fort Collins.

In 1995, a consultant was hired to develop a site restoration and management plan (“Udall Natural Area - Master Plan”). The following is a condensed summary of that management plan, which focuses on creating a natural resources based amenity that also contributes to improving the health of the river.

The master plan is expected to be implemented in three phases. Phase 1 includes constructing the wetlands and the water quality treatment facility, constructing the storm sewer outfall, site-wide revegetation, and the first interpretive piece, i.e., the bas relief or custom manhole at the stormsewer outfall. Phase 1 also includes excavation to create the ponds (see “Water Management”).

Phase 2 includes items related to public access to the site. Phase 3 includes the interpretive program and some landscaping items.

Plant Community Management

This restorative natural area will have four landscape types: (1) riparian, supporting cottonwood, willow shrubs, and grasses; (2) wet meadow, supporting grasses, sedges, and self-seeding annuals critical to bird habitat; (3) marsh, supporting emergent species; and (4) an open water zone.

An historic burr oak, the second largest in Colorado and probably planted by early settlers around 1860, is at the Lincoln Street edge of the site. The area around the tree has been used as a parking lot and truck turn-around for many years. This activity heavily compacted the soil and appears to have led to the tree's declining health. In 1995, the City's Forestry Department had the soil around the tree amended, using compression and water to fracture the soil,

Fig. 6 - Udall map

then injecting a mixture of organic matter and root stimulator (mostly phosphorous). This treatment stabilized the tree.

Wildlife Management The goal is to expand and enhance the site's wildlife habitat. The habitat will be integrated into the stormwater treatment component of the Mountain Avenue storm sewer project through the use of two of the natural features of the site: gravel and groundwater.

Trees will be wrapped (wire or screen) to protect them from beaver damage.

Water Management Typically, stormwater is collected and concentrated in underground pipes and conveyed directly to the nearest drainage. This site presents an opportunity for innovative stormwater run-off treatment. Removal of the majority of pollutants carried through a typical system requires slowing the rate of flow and detaining the water so the sediment falls out and the water then percolates into the ground. Constructing a facility to accommodate that process requires a large area. Most of the undeveloped upper terrace of this natural area will be used to combine the settling and filtration treatment measures proposed in the Stormwater Utility's plans for dealing with stormwater in this downtown area. This site's stormwater treatment system is comprised of a concrete-lined stilling pond where solid pollutants will drop out, a suspended screen or grate to filter floatable pollutants, a trapezoidal channel to distribute flows to the constructed wetlands, and the constructed wetlands where treatment will be augmented by both biological uptake and filtration.

The site master plan recommends gravel mining to create three shallow detention basins. By design, the basins will be flooded seasonally by groundwater flows and also will detain approximately 13-acre feet of spring stormwater flows. This is to be done at no cost to the City, i.e., the contractor will mine to City specifications in return for the right to process and sell the material.

Recreation Management Recreational access to the site will be designed in a controlled manner so the natural area can successfully provide wildlife habitat. There will be a small parking lot off of Lincoln Avenue. The first phase implementation includes a cul-de-sac trail at the far south end of the distribution channel. However, the design allows for future through trail connections south to the old pickle plant and north beneath the Lincoln Avenue bridge. The trail is designed to be 10 feet wide to double as maintenance access. It is designed to be constructed of either concrete or crusher fines combined with a soil stabilizer. A concrete ramp connection is planned from the trail at the headwall down to the storm sewer outfall. Trail placement and design will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process.

Interpretive This combined stormwater treatment/wildlife habitat feature in the downtown

Education

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area is a unique opportunity for interpretation. The trail will cross each wall as it passes along the constructed wetlands. At each crossing, be a sculptural interpretive piece that relates to a particular aspect of natural area. The first (nearest the parking lot) is expected to interpret tion of the city’s impacts on the river. The next interpretive feature address gravel as a valuable natural resource. The third could show sonal fluctuation in the groundwater table. The final piece may be an pretive blind for wildlife watching.

Research

A considerable amount of research has gone into the preparation of the management plan.

Williams Natural Area

**Plant
Community
Management**

The City is enjoined from planting large trees that would block public view of the billboards on the site, i.e., the large billboard on privately owned land adjacent to the river and the smaller sign on the easement along Lemay.

Low shrubs will be planted along the trail leading to the new bridge (see “Recreation Management”) to help in identifying the trail location for snow removal and to visually buffer the trail.

**Wildlife
Management**

The primary wildlife value of this urban natural area is in the forested area along the river. Except for the bridge construction (see “Recreation Management”), the goal will be to avoid disturbing this riparian area.

**Recreation
Management**

There is currently no good parking facility for people wishing to visit this site or the Springer Natural Area across the river or to access the Poudre River trail system at the Lemay/Mulberry intersection. The plan is to use the parking lot at the WalMart store on the northeast corner of the intersection. This is not ideal, however, because parking at that location requires pedestrians and bicyclists to cross heavy traffic to reach the trail.

Emergency call box #22 was located along the trail on this site. It was removed in 1999 because call boxes are more appropriate for isolated sites, and access to telephones, should an emergency occur, will be readily available when the WalMart complex opens.

**Interpretive
Education**

This site will be evaluated for interpretive needs/opportunities.

**Miscellaneous
Management
to the Issues**

Any work on the site, including plantings, trail building, or other construction work, must take into consideration a telephone cable that runs parallel trail on the north side of the river.

Fig. 7 - Williams & Springer map

Springer Natural Area

Context This site is jointly owned by Fort Collins Utilities and City of Fort Collins Natural Resources Department and will become subject to an MOU to be developed between the two departments.

Plant Community Management In the wetland, the vegetation community, dominated by willows and reed canarygrass, is particularly important for providing river bank stability. The upland bank/bar area includes a mature tree canopy valuable for wildlife cover, a sapling/shrub stratum with essential habitat elements for a variety of avian and mammalian species, and an herbaceous stratum with important elements for wildlife cover. These vegetation communities are expected to remain undisturbed.

Invading grasses and forbs have established on fill material. These will be converted to more valuable habitat.

The American black currant (listed as critically imperiled in Colorado) will not only be protected on the site, but it also can serve as a plant material source for enhancement plantings in other disturbed vegetation communities. In a severe snow storm in fall 1995, a large number of branches fell onto the American black currant, threatening to cut off the plant's light source. The branches were moved to an adjacent part of the site to protect the currant. During the 500+-year flood of 1997, a tremendous amount of silt was washed into the area where the current grows. (Clarification: the flood was at the 500+-year level on Spring Creek, but the impact along the Poudre River was not at the 500+-year level.) Some of the plants were buried completely; others had branches above the layer of silt. Cuttings of five plants were rooted, and planted off-site. These plants were transplanted back to the site in spring 1998 and the population appears to be doing well.

Platte River Power Authority does tree topping in this area as part of their overhead line maintenance. This activity can be expected to continue.

Wildlife Management The Springer site gets high use by migratory songbirds, waterfowl, water-birds, and butterflies. Migratory species are more sensitive to disturbance than resident species. Therefore, disturbance to this site will be minimized.

There is some beaver activity on the site. Larger trees are wrapped to provide some protection. Beaver are allowed to fell the smaller trees.

Because the cattail marsh has high habitat value for a variety of avian and mammalian species, and may be valuable as brood-rearing habitat for water-fowl species, disturbance to this plant community will be avoided.

Water Management

A three-stage constructed wetland is planned for the meadow portion of the site.

This site contains a major storm sewer outfall from the Old Town Basin Area. Additional outfall facilities, adjacent to the existing outfall, are proposed in the Old Town Master Drainage Plan, bringing the total stormwater capacity for the site to 410 cubic feet per second (cfs). The 100-year discharge is 600 cfs. Based on the existing condition of the area below the existing outfall, it appears that a system of wetland stormwater treatment is somewhat in place. This system will be enhanced.

Recreation Management

The site is designated as a sensitive natural area. Visitors must therefore remain on the trail to avoid negatively impacting sensitive features. There has been a single-file, natural surface trail that was informally created by site users. Staff initially recommended that the trail be expanded to the stormwater portion, and graveled. To avoid the safety problems associated with the trail dead ending at a major street (as it does now at Mulberry, causing people to dart across traffic to avoid retracing their steps to get back to their cars), it was recommended that the trail should loop around an interesting feature (e.g., a wetland or grove of trees) and return to the original trail. Staff has, since the first draft of this management plan, reconsidered this trail. To protect the rare plant and the sensitivity of this site, staff has determined that no human access (and therefore no trail) will be allowed on the portion of the site west of Lemay.

There have been serious vagrant problems on this site. Vagrants have frequently developed sophisticated encampments ranging from clearings to large tent facilities. Weapons have been found in many of these encampments. As a result of increased monitoring, the problem has diminished. However, the public is still advised not to visit the site alone. The police and the rangers continue to monitor this and other vagrant sites along the river frequently.

Interpretive With no human access to the site west of Lemay, no interpretive features **Education** will be installed on the western portion of site.

To give visitors an opportunity to see, and learn about, the American black currant, cuttings of the plant, and of the more common currant, were transplanted to a location along the paved trail at the easternmost edge of this site and an interpretive sign about the two species of currant was placed at that location.

Research

The site should be used to conduct research into the concept of stormwater treatment utilizing wetland areas.

In 1993, CSU student members of the Society of Conservation Biologists adopted the Springer Natural Area to do wildlife and plant surveys. But feel-

ing their safety threatened by the heavy vagrant use of the site, they abandoned the research. Vagrants continue to set up camp on this site. But Police Services and the Natural Areas and Trails Rangers, conduct frequent patrol of the site. When vagrant camps are discovered, they are removed.

Miscellaneous Management Issues

As a result of concrete waste disposal as far back as the late 1960s, a portion of a wetland was filled. The U.S. Army Corps of Engineers notified the previous owners that at least a portion of the wetland must be restored to its natural condition by removal of the fill material and concrete waste. The City assumed this restoration responsibility as a condition of accepting the land donation. Clean-up, funded by the Stormwater Utility, was completed in 1991.

Any plantings, trail building, or other construction work must take into consideration two utility lines: a gas line that runs along Mulberry and a fiber-optics line running about 50 feet inside the site parallel to Mulberry. These lines are all marked on the site.

Bignall Natural Area

Context

Fort Collins Police Services has an informal agreement to use this restorative natural area as a dog training facility. No management actions can be taken while the police occupy the site. However, it is recommended that the police move their dog training facility across the trail to the Nix Natural Area (see Nix Natural Area for details). After the police vacate the property, the following management actions are recommended.

Plant Community Management

Russian olive need to be removed from the site and the grassland reseeded with native species.

Wildlife Management

Standard beaver management (i.e., wrapping larger trees for protection, but allowing beaver access to smaller trees) occurs at the site.

Screech owl boxes on the site will be repaired and maintained.

Swallows nest in the banks of the site. Any riverbank activities should take this into consideration.

Water Management

There is a lot of bank erosion that may require mitigation.

Recreation Management

A drinking fountain has been installed along the trail at this natural area. A restroom also will be installed, and a picnic table will be placed on the

site.

The possibility of improving and modifying the existing deck at the side of

Fig. 8 - Bignall & Nix map

the house into a wildlife observation facility will be explored.

For human safety, it may be necessary to install solid wood or chain link fencing along the bank edge of the site.

Interpretive Education Interpretive themes for the site will include riverbank cutting, the swallows nesting in the banks, and the screech owls on the site.

Miscellaneous Management A 1988 professional inspection of the house found it to be of sound construction and in good condition for its age, but recommended monitoring some

Issues conditions (e.g., grading, water supply leak, water heater problems, ventila-

tion, low roof slope, a needed wood stove chimney pipe extension, and system concerns). A 1991 staff inspection found roofing problems, a gas line not up to City Code, a leaking water line, plumbing fixtures needing

septic propane need for accessible. repair, a mouse problem, questionable wiring, inadequate insulation, a new water heater, and the need to make the house handicapped

Because of these problems, and because the City now owns buildings on the adjacent Nix Natural Area, which are in better condition, pending approval of the Historic Preservation Department, the house on the site will be razed (with the possible exception of keeping the deck, as discussed in "Recreation Management"). The garage and shed also will be razed.

Nix Natural Area

Context The Natural Resources Department's Natural Areas Program is in severe need of a maintenance facility. Because of location and existing buildings, Nix Natural Area has been the focus of a site on which to put the maintenance facility. A contractor has developed detailed plans for the site. The following summarizes those plans.

Plant Community Management The present horse pasture will be restored to a native meadow. A major portion of the field between the railroad tracks and the houses will be put into native sod production and a starter area for native shrubs (to be transplanted to other natural areas). A small greenhouse will be installed to serve as a native plant nursery. The barn will be used for tool and seed storage. At one time, the City's Horticulture Department was considering a portion of this site to be used as community gardens. The community gardens would have needed 10-15 acres, probably between the houses and the railroad tracks. Topically, the community gardens would have fit well with the sod production and native shrub starter areas and with the demonstration Backyard Wildlife Habitat. In late '98, however, another site was chosen for

the community gardens.

Water Management

Ditch deliveries will be maintained to irrigate the pasture while the site is used for grazing.

It will probably be wise to keep the water delivery system to irrigate the sod and shrub production areas. But the system is old; it may need to be upgraded and may be a high maintenance cost item.

Recreation Management

Existing roadways on the site will be used as trails, providing two connecting points to the paved Poudre River trail.

Interpretive Education

Interpretive features will educate visitors about the process of restoring the site from an agricultural area to a natural area and will provide information about the native plant nursery.

A demonstration backyard wildlife habitat will be created near the houses, educating visitors about the various elements of such habitats and how they might use these features in their own yards.

Miscellaneous Management Issues

The site includes an historic farm with two houses and a barn, all of which have historic significance. With significant remodeling to bring the building up to City standards, the large house will be used as offices for natural area maintenance and ranger personnel and as Master Naturalist headquarters. The buildings also were evaluated as a possible conference center and/or indoor natural area education facility. It is not likely the buildings will be appropriate for such use.

An additional building will be erected south of the big house for maintenance operations (storage of vehicles, shop, etc.).

Police Services considered moving their dog training facility from the Bignall Natural Area to the small house at Nix. They determined that the costs to use the property were too great and that some of their uses would likely be deemed incompatible with the natural area.

Barbed wire fencing on the site will be removed. Non-barbed wire fencing will be maintained along the paved trail to avoid human access to inappropriate portions of the site.

Kingfisher Point Natural Area

Context

This restorative natural area is completely covered by lime as a result of sugar beet waste being dumped on the site since the 1930s. The waste is not a hazardous material, but will require reclamation to make the site hospitable

to native plants. Because of the unique issues on this site, a consultant has been employed to research the issues and possibilities of restoring the site. The consultant has determined what the area looked like before it became a sugar beet dump. Recreating this “before” look may become the reclamation goal, or at least it may be desirable to determine how much of this “before” look can be reasonably achieved. The consultant will establish a feasible phasing timeline for the plan. Following are additional aspects the consultant was asked to consider.

**Plant
Community
Management**
deter-
just
rooted
lime.
soil

Only plants native to the Poudre River riparian zone should be considered for restoration of the site. It should be determined if any native trees can be grown on the site or if the lime will destroy their roots. It should be determined whether trees can be successfully grown by digging out the lime where trees are planted. It also should be determined whether shallow-native grasses could grow successfully in top soil put on top of the Kochia obviously grows well in the lime. It should be determined, if top soil is spread over the lime and native grasses are planted, what will be required, on an on-going basis, to keep kochia from reestablishing.

The consultant is researching what other people have done with lime deposits and whether there are commercial uses of the lime (i.e., whether someone would remove the material in exchange for the product). Research to date indicates that conditions on this site are unique and will require unique mitigation.

Appropriate professional resources (e.g., soils experts at CSU) should be contacted for advise on the soil issues of this site. It has been suggested that with some top soil, and maybe a little compost, either placed on the lime or mixed into it, native plants will grow. It needs to be determined whether, in the long term, that is realistic, or if it is likely that when plant roots hit the lime deposits, or when the chemical builds to a high enough level within the plants, they will die, resulting in a healthy-looking site for a few years and then a sudden (or even gradual) failure.

Some have suggested that the only way to reclaim this area is to remove the lime. It should be determined, if that is possible, what it would cost, and since the material becomes airborne with minimal disturbance, how it can be removed without creating a severe air quality problem.

Characteristics of the lime deposits are being researched, e.g., whether it is at an even depth throughout or whether there are pockets of good soil near the surface in some places. If there are pockets of good soil near the surface, those may be the likely areas for deeply rooted plantings.

Development of pockets of riparian forests should be considered. However, it should not be a continuous forested area, because there is a desire to maintain

the views of the mountains from this site.

**Wildlife
Management**
passable

Fencing on the site should allow deer movement through the site. Near Timberline, the fencing should guide the deer to underpasses and culverts to avoid increased roadkill.

Fig. 9 - Kingfisher Point map

Water Management

The levee placed on the site during Timberline Road construction will require continual maintenance.

One consideration of the draft “Strategy for Gravel Lands Along the Poudre River” is to mine gravel resources from the site and, if deemed appropriate, use the lime material as backfill. Further research will be done to determine whether this is feasible.

Recreation Management

Trail placement and design will be determined jointly by staff from the Natural Resources Department and Parks Planning and Development. New trail segments will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process..

It may be appropriate to have a pedestrian-only path looping from the paved trail. It would provide recreation for families and others who want slower-paced activity. It also would provide recreation for those who want a short distance experience. This probably would be a natural surface trail. It might be appropriate for it to connect to the Poudre River Trail at the point where mountain range interpretation occurs, so visitors stopping to view the mountain range do not obstruct travel on the paved trail.

The paved trail should be pulled back from the river to reduce impact to the resource and to reduce erosion problems. It also should go through the site in such a way as to provide unobstructed views of the mountains. The final trail realignment will be determined through the restoration and site design process.

The parking lot at the Timberline access to Riverbend Ponds may become a prime access point for Kingfisher Point Natural Area. If so, trail/access improvements needed to provide good pedestrian/bicycle flow between the parking lot and Kingfisher Point Natural Area may need to be identified. The parking lot was enlarged and improved in 1999.

All-terrain vehicles have historically driven into the river from private property on the north side of the river. The City has now acquired property on the north side of the river that will make it possible to reduce this undesirable activity.

Interpretive Education

Site interpretation should include the history of the site from the pre-sugar beet era, to the lime dumping, on through the reclamation process.

Mountain range interpretation should occur at an appropriate point along the trail, (i.e., a sign [such as one in Rocky Mountain National Park] identifying the various peaks being viewed.)

Research

A great deal of research will be needed to make the determinations noted in the Plant Community Management segment above. Research and monitoring should continue to determine the success of the chosen restoration processes.

Miscellaneous Management

Relative to hydrology and entire site impacts, the consultant should address the location and design of the levee the Timberline project placed on Kingfisher Point Natural Area. It should be determined whether scouring is likely to occur, how this may change surface moisture characteristics of portions of the site (and which portions will be changed), and whether new blowout points will be created.

Issues

Adjacent construction project managers have expressed a desire to dump lime from their construction areas onto the site. It is desirable to avoid such dumping unless the site is mined for gravel and it is determined that the lime material is appropriate for backfill, or the lime is otherwise determined to be beneficial to the site. However, lime removed from the Timberline Road extension construction site was deposited on the site.

The Timberline Road extension project was required to have an Art in Public Places project. The art, which uses concentric circles both on a wall and in landform design, extends from the west side of Timberline Road onto the natural area near the point where Timberline crosses the river.

For historical purposes, it should be noted that in 1985, the Cultural Resources Board evaluated the Linden Company Water Flume for historical importance. They determined that there was no benefit in pursuing local landmark designation for the flume. The flume had been used to carry lime waste from the sugar beet factory to the site of the current natural area. At that time, the lime was thought to be a soil enhancement.

Cattail Chorus Natural Area

Plant Community Management

As stated in the site description section of this management plan, fourteen species of trees (86% native) have been reported on the site. Natives include low rabbitbrush, cottonwoods, and American plum. The two natives among the six species of grasses reported on the site are hardstem bulrush and American bulrush. Twenty-three species of wildflowers, vines, and other forbs (39% native) have been reported on the site. The natives include devils beggarticks, hornwort, and common arrowhead, each of which has been reported on only one other Poudre River natural area. Introduced wildflowers, vines, and other forbs include ragweed, garden asparagus, and creeping bellflower.

Russian olive needs to be removed from the site.

Wildlife Management
priority.

All management, including recreational access, of this sensitive natural area will place the site’s sensitive wildlife habitat features at the highest

enough

Fencing, particularly near the Spring Creek confluence, will be high off the ground to allow movement of the snapping turtles on the site.

Water Management

The culvert at the Spring Creek confluence may need to be improved to adequately handle backflow. A detailed construction plan will be developed to ensure appropriate design.

One consideration of the draft “Strategy for Gravel Lands Along the Poudre River” is to drain the Timberline Pit (a gravel pit adjacent to Kingfisher Point Natural Area currently being reclaimed) through Cattail Chorus.

Recreation Management
to a

This is a sensitive natural area, and all visitors must remain on the trail. A natural surface, pedestrian only, trail extends off the Poudre River Trail

placed at heron Signage

small mesa east of the westernmost pond. Bike racks have been placed at the trailhead. The purpose of the trail is to allow visitors to view the and many other resident and migrant bird species that use the site. Signage will remind visitors to keep voices low to reduce wildlife disturbance. Benches have been placed on the site for those wishing to spend time watching the site’s wildlife.

being disturbance. along that the the fencing

The maintenance road leading into the site will be gated to avoid it used as a trail. Its use as a trail would cause serious wildlife disturbance. Fencing has been removed from some areas of the Poudre River Trail the perimeter of this site. Fencing should be replaced to make it clear site is only to be accessed at the trailhead. Barbed wire fencing behind southwest pond will be removed. Barbed wire will be removed from along the paved trail (the non-barbed wire portion will remain).

con-but is trail will

A natural surface trail (which was used as a detour during paved trail construction) exists along a segment of the Poudre River Trail in this area, unsigned, leaving visitors unsure of whether they should use it. The be signed so visitors are aware that it is appropriate to use it.

trail near were

During the ‘97 flood, there were some small wash outs on the paved Spring Creek’s confluence with the Poudre on this site. The wash outs filled with pit run material.

As development goes in west of the site, it may be desirable to require an easement for parking and pedestrian access. Any access from this area will be

designed to lead visitors to the existing Spring Creek Trail and not onto the sensitive portion of the natural area.

Interpretive Education Interpretive features at the end of the natural surface trail provide information about the wildlife that use this area, particularly the winter roosting herons that can usually be seen at the pond west of the trail. Visitors also are

Fig. 10 - Cattail Chorus, Riverbend map

informed of the importance of viewing the wildlife in ways that minimize disturbance.

An interpretive feature along the paved trail on the south side of the site will identify Spring Creek's confluence with this area.

Research

A formal plant survey is needed on this site.

Miscellaneous Management Issues

Any earth work must ensure that it does not impact existing utility easements owned by Fort Collins Utilities.

Riverbend Ponds Natural Area

Context

The Countryside Park housing development, which is adjacent to this sensitive natural area, provided assistance for early management of the site. In 1978, the County required the developer to provide open space and a recreational area in the subdivision. The developer met this requirement by agreeing to contribute up to \$10,000 toward improvements at Riverbend Ponds. The City recommended the following improvements:

Priority 1: Install three drainage pans to the Flatiron and Riverbend Ponds at the end of the paved roads within the Countryside development. The developer did this, then gave the City the rest of the \$10,000 to do the other improvements.

Priority 2: Fill the washout at the northwest pond where the drainage has eroded the bank.

Priority 3: Fill in with rip-rap and fill dirt the washed out dike between the two large ponds.

Priority 4: Develop and identify the parking area on the northwest entrance to the Riverbend Ponds.

Priority 5: Grade bank slopes where needed; plant additional trees and shrubs; prepare ground and plant native grasses; install berms and landscaping between the Countryside Development and the City property.

Plant

Community Management

Many plantings have occurred on the site. In 1978, the City planted 100 Russian olive (note: this was before the City developed the policy of not planting Russian olive), 50 sand cherry, some red cedar, and some native grasses. Foothills mix grasses also have been planted on the site. The Releaf organization was actively involved in planting trees and shrubs on the site. In 1991, the organization received \$1,889 from the Wildlife Habitat Mitigation

Fund for an enhancement planting. Survival was notably better in areas that were watered by adjacent residents than those that were not watered.

Russian olive is a problem on the site. Continuous flooding/high water levels in the ponds could help eradicate this pest plant. The possibility of moving pre-'81 water around to accomplish this should be considered as part of the proposed study for this site (see "Water Management").

Saltcedar also is a problem on the site.

Wildlife Management

In 1991, Operation Osprey received a \$970 grant from the Wildlife Habitat Mitigation Fund to build and erect osprey nesting platforms on five sites, one of which was Riverbend Ponds Natural Area. Osprey from releases at this site have not been seen returning to nest. The hack towers were removed, but poles were left in place. The bridge and fencing also have been removed.

Regarding future wildlife introduction projects, if CDOW initiates such projects, the City will evaluate the appropriateness of releases on this site on a case-by-case basis.

If compatible with final recommendations of the draft "Strategy for Gravel Lands Along the Poudre River," ponds will be regraded to improve fish and shorebird habitat. Detailed regrading plans will be developed. As requested during review of the draft of this management plan, other areas for fish habitat will be explored.

Beaver are cutting lots of cottonwood around the ponds. Larger trees are being wrapped with chicken wire to reduce damage. There has been a beaver lodge on the west side of the trail for three years; the beaver have now built one directly opposite on the east side of the trail. Lodges are removed only when they impede water flow from one pond to another.

Screech owl boxes on the site will be repaired.

After the '83 flood, downed trees were put in an area west of the Timberline entrance. They were what was left after the public cut whatever they wanted (the public was invited to do this). Foxes in the area are believed to have used this habitat, but it was unsightly. Some of the pile has been removed, leaving a smaller, more aesthetically pleasing wood pile for rabbit and fox habitat.

The CDOW annually stocks the ponds with warmwater species (usually large mouth bass, crappie, and/or channel catfish). In addition, Trout Pond is stocked four or five times each spring with rainbow trout.

Over the years, residents have periodically called the City with concerns about wildlife, particularly raccoons, being killed as they crossed Prospect Road in the Riverbend Ponds area. Residents and ecologists have suggested

various solutions, ranging from elevating Prospect through this entire area (thereby allowing free movement under the roadway) to installing concrete tunnels at various points along the roadway. For various reasons, including cost and likelihood of success, no corrective action has been taken. When Prospect Road is widened, Utilities will install a bridge in this area. It also is recommended that fencing be installed along Prospect that will guide wildlife, particularly larger mammals, to appropriate underpasses.

Water Management

Many water management issues have arisen that go far beyond the scope of this management plan. It is therefore recommended that a study be conducted to look at the following issues, identifying pros and cons, alternatives, and impacts.

1. Augmentation requirements and options at Milne ponds
2. Improvement of the maintenance road/trail between the ponds. This area stays wet most of the summer. It may be desirable to install a culvert at the current seep level. But this should be studied in light of impacts either up or down stream of the culvert.
3. A decision regarding pond management to keep the ponds the way they are now or let the ponds blow out and capture the river. For historical purposes, it is noted that in '83, there was a suggestion that the ponds and riverbank be protected by strengthening the outward curve of the river so the ponds would be less likely to capture the river. At that time, the suggestion was to use a stair-step type of rip-rap using gabion baskets and to build up the dikes around the ponds to withstand a 100-year flood. However, current best management practices dealing with flood management, aesthetics, and ecology make this an unlikely strategy.
4. Appropriate ways to deal with serious erosion. For example, the riverbank was stabilized with rip-rap because of serious erosion (5 feet per day and threatening to cause loss of three ponds) in 1980. The study should recommend appropriate erosion management for the future.
5. Appropriate habitat goals, e.g., fishing, waterfowl, shorebird, etc.
6. The most appropriate way to use the pre-'81 water surface in these ponds, e.g., the water could be moved around to achieve various goals for the site, e.g., to eradicate Russian olive as mentioned under "Plant Community Management."
7. Whether there are aquifers feeding these ponds.
8. Possible impacts of having our water rights preempted up-stream (e.g., possibly drying up Riverbend Ponds). Determine whether there are

things the City can/should do to keep water in the ponds.

9. Cause, impacts, and remedies (if needed) of seepage that is occurring out of the irrigation canal along Summit View.

In March 1988, Anheuser Busch's wastewater line through the site broke, allowing about 2,000 gallons of water and neutralized cleaning solution to seep into the natural area. No fish kill was anticipated, and none occurred, but as a precaution, signs were posted warning people not to fish in the area until the water could be tested. Boxelder also has a sewer line through Riverbend Ponds. This easement runs across the maintenance road/trail that stays wet most of the summer. Because of the many easements on the site, it is imperative that all earth work be preceded by consulting the easement map. This includes such seemingly innocuous activity as installing perches (e.g., poles for Operation Osprey's project, which could have breached high pressure water lines or other utilities, if easements had not first been identified).

In '87, Beth Dillon of CDOW proposed sinking Christmas tree structures (composed of trees cemented in old tires, wired together and sunk with cement blocks) to improve fish habitat. The City will continue to work with the Division of Wildlife for fish habitat improvement.

One or more of the ponds are used periodically for dive rescue practice.

Recreation Management The site can be accessed from the south (Prospect entrance), the northeast (Cherly entrance), and the north (a roadway which intersects the new Timberline extension). The Timberline parking lot was improved in 1999 and seems to adequately meet current visitor needs. In 2000, the northeast parking lot was moved slightly and reconfigured to provide more parking spaces and reduce impact on the prairie gentian population.

The south (Prospect) entrance received major improvements in 1999. Fencing was installed along the roadway. All but one entrance off Prospect was closed. The remaining entrance was graded.

Several factors should be incorporated into the Prospect road widening project (in ~2003): (1) appropriate safety considerations for left in/out for both Riverbend Ponds and Cottonwood Hollow, (2) formal, safe entrances to both of these natural areas, and (3) positioning of these entrances so they do not conflict with each other.

Drinking fountains and two restrooms will be installed on the site. The likely locations are at the parking lot near Timberline and at the Prospect parking lot. It will be determined which type of restroom facility is most appropriate (solar composting, traditional outhouse, portable [serviced] toilet, or a facility connected to the water, wastewater, and electric utilities).

Because of the new Timberline extension, as well as general population growth, recreational activity on the site is likely to increase significantly. To minimize, to the extent possible, this increased activity's impact on the natural features of the site, recreation will be restricted to the trail system, except for persons leaving the trails to access the ponds.

During the 1980s, neighbors repeatedly reported problems including noise disturbance, trespassing on private property, and motorcycle riders and other motorized vehicles racing on the site and running people off the paths. Residents were fearful of being hit in their own yards if violators lost control of their vehicles. Police felt the problem was poor marking of the area and lack of fencing. In November 1988, the Parks Department completed a fencing project on the site. The fencing helped, but there still are occasional reports of these activities. The rangers will monitor the site for such violations.

Fishing is a primary recreation on the site (see "Wildlife Management" for species stocked). It is an especially popular fishing site for children. Electric trolling motors are permitted so persons with disabilities can access the ponds for fishing. Otherwise, only non-motorized boats are permitted. There is some bow fishing for carp. However, this is illegal because, by City Code, it constitutes discharging of a firearm (even if the arrow is attached to the bow, as it often is in bow fishing). Police have advised that bow fishing is allowed at Archery Range Natural Area, but nowhere else within the city. Therefore, regulations against bow fishing will be enforced on Riverbend Ponds.

Another activity that occurs on the site in violation of City Code is ice fishing. Ice fishing, as well as ice skating and other activities on the ice, are considered unsafe unless the ice is monitored. Since these ponds are not monitored, and no comments were received from the public relative to this issue during the public comment period, the City will enforce the regulation against these ice-related activities. However, this decision may be reconsidered depending on the nature of future user requests.

An accessible fishing pier was installed near the Timberline entrance in 1999.

The extensive trail network is natural surface except for a boardwalk that was constructed in 1992 at the northeast entrance. The boardwalk cost \$3,122, which was partially funded (\$2,000) through a Wildlife Habitat Mitigation Fund grant. The boardwalk, which floats (even though it is on concrete pilings and rebarred into the ground), goes through the prairie gentian site and through areas that tend to remain wet most of the time. The boardwalk has proven very popular with parents taking children to the site in strollers and in bicycle trailers. The natural surface trails are used by hikers, runners, horse-

back riders, and by people walking their dogs. Staff recommends that these trails have crusher fines applied to make them accessible to persons with disabilities. In 1999, crusher fines and a section of boardwalk were applied to the trail from the Timberline parking lot to the accessible fishing pier. Additional work is being done to make the trail more easily accessible to persons in wheelchairs. Other trail work on the site may not be done until final recommendations are made relative to the draft “Strategy for Gravel Lands Along the Poudre River” and the site assessments discussed under the “Water Management” subheading above, in order to avoid wasting resources on trails that may be eliminated in possible site redesign. Trail placement and design will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process. It is assumed the entire site is appropriate for accessibility by persons needing accessible trails. However, if some trails are too steep, or have other features making it unreasonable to provide this accessibility, those trails will not have crusher fines applied.

Dog owners not only run their dogs off-leash but also let the dogs swim in the ponds, activities that are not allowed by City Code. The leash law will continue to be enforced in this area, and dog owners will continue to be advised to use the City’s dog park for off-leash activities.

Boy Scouts built a blind along the boardwalk at the Cherly entrance. It was good for watching birds and waterfowl, but was heavily vandalized and therefore removed in 1996.

Historically, groups have requested to use the site for various recreational activities. In 1978, the Cheyenne Retriever Club received permission to hold field trials on the site. Their activities included shooting live birds (including pigeons and pheasants) and using shackled ducks for water work. In 1980, a group from Wyoming requested permission to have a treasure hunt on the site. The request was denied because of the precedent it would likely set. There are currently no group activities regularly occurring on the site.

Interpretive Education

Master Naturalists find the site ideal for guided walks. The site’s interpretive nature study trail also makes it ideal for self-guided interpretation. The trail starts at the boardwalk at the Cherly entrance and goes three-quarters of the way around Big Pond. It consists of 12 numbered posts corresponding to a brochure that provides basic information about the various habitats of the site (wetland, wet meadow, pond, upland, river) and the associated vegetation and wildlife species. The brochure is available on site. They are restocked frequently, but because the brochures are so popular, visitors occasionally report that the brochure dispenser is empty.

Because of the diversity of habitat and of human visitors, this site will be considered for a pilot Braille interpretation project. This project may focus on

the wildlife sounds to listen for at the site. Additional trail features, e.g., railings that can guide sight challenged persons in following the trail, may be needed for the braille project. Members of the City's ADA advisory board should be consulted for their recommendations for this project.

Research

Recreational use will be researched to identify needed improvements and changes as well as recreational management issues. Research also will be conducted to compare current recreational usage to usage after Timberline extension is completed.

A volunteer has a current research project on the site to compare the success rates of various Russian olive removal techniques. Some of the research trees were removed by volunteers in summer '97, but stumps, as well as remaining trees, will continue to provide useful information.

A study is needed to determine why the prairie gentian (Colorado Rare Species) population is declining and how habitat for the plant should be improved.

Students and various agencies often use the site for research projects (e.g., kingfisher study, fishery studies, etc.). Permission for such research is usually granted, but anyone wanting to conduct research on the site should submit a written request to the City's Natural Resources Department, indicating the nature of the research, on-site activities that will occur in conjunction with the research, any equipment that will be used on site, and any other information relative to ecological, as well as recreational, impacts of the research. The City requests that a copy of the final report of all such research projects be sent to the City's Natural Resources Department.

Miscellaneous Management Issues

Over the years, various volunteer groups, including Youth Conservation Corps and Phi Gamma Delta Fraternity pledges, have done litter pick-up and barrier installation on the site. Re-Leaf has done plantings.

In October 1988, it was discovered that some of the adjacent homeowners were encroaching on the site for personal use including storage of firewood, debris, and construction materials; placement of dog kennels and playground equipment; planting gardens; and building a private fence that extended onto the public site. Homeowners received letters advising them of these encroachments and requesting removal. The situation is much improved, but some encroachment, particularly planting of trees, extending of lawns, dumping of grass clippings and other vegetative matter, and recreational uses (e.g., installing horseshoe pits) still occurs. Rangers investigate these violations and issue warnings or summonses as appropriate when violators are identified.

In 1992, Countryside Homeowners Association wondered if the City was going to finish fencing the boundary between the park and Countryside. They

were worried that a barrier fence may be installed and detract from aesthetics, or that they may be expected to finish the fence at their expense. The City has since completed this fencing.

Cottonwood Hollow Natural Area

Context

The 48-acre portion of the site previously known as W.R.E.N. was initially managed under a collaborative reclamation plan prepared by the City of Fort Collins; Western Mobile, Inc.; CSU; and the U.S. Geological Survey. The innovative plan received a “reclamation excellence” award from the Colorado Division of Minerals and Geology. The site, which was extensively mined for gravel, is being reclaimed to a combination of riparian, wet meadow, and native upland habitats. The City has now assumed operation of this sensitive natural area.

The long-term goal for the site was initially to minimize the amount of exposed water surface (thereby reducing augmentation requirements). However, based on observed natural functions of the site, as well as the acquisition of the southern pond, which has pre-'81 water (pre-'81 water has no augmentation requirement), the site goal now includes maximization of habitat value (within the context of the site).

Plant Community Management

The City has graded and seeded certain sections with native grasses and wildflowers.

Weeds, particularly thistle and kochia, are a problem on the site. But because of the forbs in the planted grass mix, it is highly undesirable to use a broad spectrum herbicide to control weeds indiscriminately. The desirable method of weed control would be to isolate patches of noxious weeds and treat just those patches, rather than spraying entire areas to eradicate weeds, and in the process, eradicate desirable vegetation (both voluntary and planted). Ideally, no spraying should occur in the basin; spraying should only occur from the maintenance road. To the extent possible, weeds should be controlled with mowing.

Saltcedar is a problem on the site. Some of the saltcedar were removed in fall 1997, but many remain.

Upland shrub plantings on the basin's side walls are planned.

Water Management

By carefully manipulating water level fluctuations, the City hopes to mimic riparian/wetland conditions and re-establish native cottonwoods and willows. Consideration may be given to moving some of the pre-'81 water from the south pond to the north basin area to meet augmentation requirements.

There currently is no way to accurately measure the amount of water flowing through the ponds. A different control structure may be installed to facilitate this measurement.

Recreation Management Parking for the site will be at the CSU Environmental Learning Center's parking lot on Prospect Road between Summit View and Timberline. The City has installed a bike rack at the parking lot.

Now that the site is opened to the public, a major safety issue exists: there is no safe way to travel by foot or bicycle between Riverbend Ponds and

Fig. 11 - Cottonwood Hollow, Prospect ponds map

Cottonwood Hollow, yet the temptation to do so is strong, and indeed, should be allowed. Staff feels that a trail on the east side of the river under the existing Prospect Road bridge (i.e., a trail much like the one on the west side of the river under the same bridge) should be investigated. If such a trail is impossible, or possibly in addition to such a trail, an underpass to provide safe pedestrian access under Prospect Road between these two natural areas should be installed. The possibility of tying this underpass in with the existing ditch on the east side of Cottonwood Hollow, and thereby improving the ditch flow from Riverbend Ponds to Cottonwood Hollow, should be considered. The process would include one or more box culverts. If no change is made in the ditch, it will be necessary to create some type of pedestrian access from the Environmental Learning Center parking lot, across the ditch, to the underpass. Trail placement and design will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process.

Human activity is limited to the eastern perimeter of the site. Birdwatching is a primary recreational activity. Trail use is pedestrian only. Biking, which is not allowed on CSU's adjacent Environmental Learning Center, also is not allowed on this site.

Also to be consistent with Environmental Learning Center regulations, as well as for protection of sensitive wildlife on this site, dogs are not allowed.

Because of the sensitivity of the site, fishing is not permitted at Cottonwood Hollow (but is permitted on Environmental Learning Center ponds).

Interpretive Education The educational focus on the site will be the goals, successes, failures, and changes of the reclamation process and the diverse birdlife of the site. Because the site will be evolving for several years, the interpretation features will need to evolve as well. Wildlife interpretive features were installed at the north end of the trail in 2000, with shorebird interpretation as a major highlight.

A feature about the marsh sounds of the site could someday be included.

Research The model reclamation project offers a unique opportunity to observe and document the results of a focused effort to reclaim gravel lands to benefit wildlife. The experience gained will have wide applicability elsewhere in Fort Collins and throughout Colorado.

U.S. Geological Survey may conduct (with help from the City) a study to determine feasibility, and if feasible, establishment, of a plan for maintaining shorebird habitat.

On-going wildlife observation research should be conducted to determine the

changes of wildlife use as the site evolves.

**Miscellaneous
Management
Issues**

Any earthmoving work on the site must ensure that it does not impact the utility easements on the site, e.g., A-B's and Boxelder's high pressure water lines along the ditch on the eastern edge of the site.

Prospect Ponds Natural Area

Context

This site is owned by Fort Collins Utilities. Portions of the site are currently managed by City of Fort Collins Natural Resources Department and will become subject to an MOU to be developed by the two departments.

**Plant
Community
Management**

Saltcedar needs to be removed from this urban natural area.

Thistle is prevalent on the site. Maintenance staff uses 2-4 D to control the thistle and other noxious weeds on portions of the site that are not adjacent to the water. Next to the water, Rodeo is used.

**Wildlife
Management**

The CDOW annually stocks the ponds with warmwater species (usually largemouth bass, crappie, and/or channel catfish). Signs advise that bass smaller than 15 inches must be returned to the water and that for larger bass, there is a five-fish limit.

Beaver are active in the ponds. Some of the trees have been wrapped in an effort to protect them from beaver. This seems to be working for some of the trees, but beaver felled two wrapped trees. At one time beaver trapping was tried, but without success.

**Recreation
Management**

Walking, running, biking, and skating on the paved Poudre River Trail, walking and biking on the natural surface trails, and fishing are the primary recreational uses of the site. There are two accessible fishing points along the trail between the two ponds. The accessibility of each, however, has deteriorated and needs to be repaired, e.g., barriers need to be reinstalled to prevent wheel chairs from rolling into the ponds.

Ice fishing, ice skating, and ice hockey games have been popular activities on the site over the years, but not always in a safe manner. For example, ice hockey backstops were often left on the ice, creating an incentive for children to go out onto what may be dangerously thin ice. These activities are considered unsafe unless the ice is monitored. The Natural Resources Department currently monitors the ice and allows ice hockey and ice skating to occur on the southern portion of the northern pond when ice conditions are safe.

Birdwatching, particularly for winter waterfowl, is an occasional activity at

this site.

Interpretive Education The Water Utilities have an interpretive sign at their demonstration wastewater treatment wetland adjacent to the south parking lot.

Interpretive signage about the winter waterfowl use of the site will be installed.

Vegetation near the Sharp Point Drive parking lot often includes impressive stands of milkweed. At some point in time, an interpretive feature about milkweed's critical role in the survival of the monarch butterfly would be desirable.

During trail reconstruction in fall 1996, leaves were allowed to fall onto the wet concrete extending from this site east to the bridge. The leaves left distinct impressions. Along the trail, interpretive features should be installed to provide interactive learning about the various trees represented by the leaf imprints, including identification of the trees, their roles in the riparian area, and their wildlife habitat values.

Master Naturalists frequently take groups to this site for guided nature walks. This is partly because of the site's easy access (the parking accommodates school buses) and the minimal amount of time needed to walk to the interpretation site from the parking lot. It also offers easy access to nearby sites (e.g., CSU's Environmental Learning Center).

Arapaho Bend Natural Area

Context

When this restorative natural area was purchased, not all of it was considered prime natural area. But the option was to purchase all or none of the site. Therefore, all of the site was purchased, with the understanding that some of it might be sold at a later date. Twenty-seven acres of upland grassland west of County Road 7 fall into this category, as do other portions of the site. A portion of the southeast portion of the site was sold to the Colorado Department of Transportation for a transfer station (i.e., park and ride). This site is being used for the transfer station instead of the old Kenney's Marine site (which is adjacent to the transfer station and is owned by the State Land Board) because the Kenney's Marine site would be more expensive for the Department of Transportation to purchase than the natural area, and it may have underground contamination.

Management decisions are dependent on decisions and recommendations of the draft "Strategy for Gravel Lands Along the Poudre River." Following are management strategies that may be implemented on the site and issues that should be considered in making management decisions.

**Plant
Management**

Noxious weeds need to be controlled. This must be done in ways appropriate for aquatic applications.

Fig. 12 - Arapaho Bend map

Community

typical
and
parking

A savanna was destroyed to accommodate the transportation transfer station. Trees were planted in parking lot islands. However, they are “street” trees, and not trees that are native to the site. “Street” trees are chosen for their reduced likelihood of dropping branches onto vehicles people and the reduced likelihood of their root structures impacting

lot surfaces. While it would be preferable to have native trees (i.e., native to the site) in the islands, there are no known natives that meet the criteria for “street” trees. The transfer station opened in summer 2000.

When appropriate, grassland restoration will begin on the north end of the site.

**Wildlife
Management**

Routine beaver management, i.e., wrapping of larger trees and allowing beaver to take smaller ones, will be carried out on the site.

If final site restoration results in one or more ponds being left open (i.e., not drained as suggested in the draft “Strategy for Gravel Lands Along the Poudre River ”), CDOW will be asked to stock the pond(s).

**Water
Management**

The Department of Transportation was required to do some wetland mitigation because the entrance into their transportation transfer station is too near the southern pond. The ideal would have been to clean up the southeast shoreline of the northeast pond and extend that pond an amount equal to their required mitigation. The agreed upon mitigation involved creating wetlandhabitat along the southeast shore of Beaver Pond.

**Recreation
Management**

If, after final site reclamation decisions are made, one or more fishing ponds remain on the site, an accessible fishing pier may be constructed.

After seeking input from the Natural Resources Advisory Board, natural surface trails were created on the site in 1999.

The transportation transfer station, which includes bicycle and automobile parking facilities and a drinking fountain, also serves the natural area. The former Strauss Cabin parking lot provides parking at the northwest corner of the site. An additional parking lot was built along County Road 7 mid-way between Harmony and Horsetooth to provide additional convenience for visitors.

It is anticipated that the paved Poudre River Trail will extend along the

eastern edge of the site and follow the river under I-25. A connection also is expected to be made, probably via a bike lane on County Road 7, to the _____ park-and-ride facility. Trail placement and design will be reviewed with the Natural Resources Advisory Board and the Parks and Recreation Board to obtain their input during the planning process.

An emergency call box was installed at the Strauss Cabin parking lot in 1999.

Interpretive Education There is a widely-held misconception that the historic Council Tree was on the site. Actually, it is believed to have been somewhere north of the Strauss Cabin. However, because of the widely-held assumption that it was on Arapaho Bend, site interpretation should provide some information about the Council Tree and the site where it actually is believed to have been.

If final reclamation of the site includes one or more ponds, the site may be ideal for interpretive features about the habits and functions of beaver. Interpretive features also should identify the bird life that visitors can expect to see on the site, discuss why the site is attractive to those species, and provide information about appropriate human activities to reduce negative impacts on the wildlife.

Miscellaneous Management Issues Much of the junk left on the site by the previous owner (e.g., old farm equipment, tires, playground equipment, and other items) was removed during a community-wide Poudre River clean-up in September 1996 and by staff in 1999. The public occasionally has used the site for dumping trash and debris. The site is now fenced, and with the transfer station and the natural area now open to the public, it is hoped that the site will be less attractive to those who have chosen it as a dump site.

The leases on all of the billboards on the site west of I-25 have expired, and the billboards have been removed. The lease on the billboard east of I-25 expires in 2005.

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POUDRE RIVER NATURAL AREAS MANAGEMENT PLAN

Appendix A

Plants Observed on Poudre River Natural Areas

Key: #96P1 (P1), North Shields Pond Natural Area (NS), Hickory Park Natural Area (HP), Salyer Natural Area (SA), Legacy Park Natural Area (LP), Lee Martinez Park Natural Area (LM), Old Fort Collins Heritage Park Natural Area (OF), Gustav Swanson Nature Area (SW), Udall Natural Area (UD), Williams Natural Area (WI), Springer Natural Area (SP), Bignall Natural Area (BI), Nix Natural Area (NX), Kingfisher Point Natural Area (KP), Cattail Chorus Natural Area (CC), Riverbend Ponds Natural Area (RI), Cottonwood Hollow Natural Area (CH), Prospect Ponds Natural Area (PP), Archery Range Natural Area (AR), Arapaho Bend Natural Area (AB).

Compiled from surveys by Paul Gertler (1974; LM), Alex Cringan (1992-96; SW), Mike Scott (1991; RI), Corps of Engineers Regulatory IV Training Class on Wetland Delineation (1993; RI, AR), Ellen Wheeling (1995-96; WM, NS, SA, LM, UD, WI, SP, BI, RI, PP, CH, AR, AB), and City staff (1983-97; casual observations all sites).

Notes: “N” = Native to the Fort Collins UGA (but not necessarily to the site); “I” = Introduced, not native to the Fort Collins UGA; “r” = removed from site when first discovered (for purple loosestrife). Nomenclature follows Weber (1990: “Colorado Flora: Eastern Slope”). Not all sites have been intensively surveyed, therefore, some species may be present on some sites and yet not be reflected on these tables.

TREES AND SHRUBS Species 	Sites																			
	P1	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Rocky Mountain maple (<i>Acer glabrum</i>) I																X				
Inland boxelder (<i>Acer negundo</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Silver maple (<i>Acer saccharinum</i>) I					X	X														
Thinleaf alder (<i>Alnus tenuifolia</i>) N	X			X		X		X								X				
Saskatoon serviceberry (<i>Amelanchier alnifolia</i>) N		X						X												
Utah serviceberry (<i>Amelanchier utahensis</i>) I		X																		
				X		X										X				

TREES AND SHRUBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
 Indigobush amorpha (<i>Amorpha fruticosa</i>) N																				
Silver sagebrush (<i>Artemisia cana</i>) N		X																		
Sand sagebrush (<i>Artemisia filifolia</i>) N								X												
Fringed sage (<i>Artemisia frigida</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Big sagebrush (<i>Artemisia tridentata</i>) I																X				
Four-winged saltbush (<i>Atriplex canescens</i>) N				X				X												
Western river birch (<i>Betula occidentalis</i>) N	X	X																		
New Jersey tea (<i>Caenothus herbaceus</i>) I								X												
Common hackberry (<i>Celtis occidentalis</i>) I																X				
Netleaf hackberry (<i>Celtis reticulata</i>) N								X												
True mountain mahogany (<i>Cercocarpus montanus</i>) N								X												
Rubber rabbitbrush (<i>Chrysothamnus nauseosus</i>) N		X		X		X		X			X	X	X	X	X	X				
Low rabbitbrush (<i>Chrysothamnus viscidiflorus</i>) N	X	X		X	X	X		X	X						X		X		X	X
Western hawthorn (<i>Crataegus macracantha</i> var. <i>occidentalis</i>) N								X												

TREES AND SHRUBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Russian olive (<i>Elaeagnus angustifolia</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New Mexico privet (<i>Forestiera neomexicanus</i>) I																X				
 Green ash (<i>Fraxinus pennsylvanica</i>) I						X		X	X	X	X	X		X		X	X	X	X	
Broom snakeweed (<i>Gutierrezia sarothrae</i>) N								X												X
Cliff jamesia (<i>Jamesia americana</i>) N								X												
Rocky Mountain juniper (<i>Juniperus scopulorum</i>) N					X															
Eastern red cedar (<i>Juniperus virginiana</i>) I													X			X	X			
Common honeysuckle (<i>Lonicera tatarica</i>) I				X	X	X						X						X		
Creeping barberry (<i>Mahonia repens</i>) N								X												
Common apple (<i>Malus pumila</i>) I						X														
Shrubby cinquefoil (<i>Pentaphylloides floribunda</i>) I								X												
Mountain ninebark (<i>Physocarpus monogynus</i>) N		X						X												
Common ninebark (<i>Physocarpus opulifolius</i>) N (uncommon)																		X		
Blue spruce (<i>Picea pungens</i>) I						X							X			X				

TREES AND SHRUBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Austrian pine (<i>Pinus nigra</i>) I																X				
Ponderosa pine (<i>Pinus ponderosa</i>) N					X											X				
Lanceleaf cottonwood (<i>Populus acuminata</i>) N	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
White poplar (<i>Populus alba</i>) I					X	X														
 Narrowleaf cottonwood (<i>Populus angustifolia</i>) N	X	X		X		X		X	X							X	X	X	X	X
Balsam poplar (<i>Populus balsamifera</i>) I						X														
Plains cottonwood (<i>Populus deltoides monolifera</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American plum (<i>Prunus americana</i>) N	X	X	X	X	X	X	X	X				X	X	X	X	X				
Sand cherry (<i>Prunus besseyi</i>) N		X						X								X				
Nanking cherry (<i>Prunus tomentosa</i>) I																X				
Common chokecherry (<i>Prunus virginiana melanocarpa</i>) N	X	X			X			X	X	X	X	X	X	X	X	X		X	X	X
Antelope bitterbrush (<i>Purshia tridentata</i>) N		X						X												
Bur oak (<i>Quercus macrocarpus</i>) I									X		X									
Common buckthorn (<i>Ramnus cathartica</i>) I						X														
Smooth sumac (<i>Rhus glabra cismontana</i>)								X												

TREES AND SHRUBS Species	Sites																			
	P1	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
N																				
Three-leaf sumac (<i>Rhus trilobata</i>) N		X			X			X			X	X				X				X
American black currant (<i>Ribes americanum</i>) N (Colorado Rare Plant)											X									
Golden currant (<i>Ribes aureum</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Wax currant (<i>Ribes cereum</i>) N		X						X												
Wolf's gooseberry (<i>Ribes wolfii</i>) I								X												
Black locust (<i>Robinia pseudoacacia</i>) I						X										X				
 Arkansas rose (<i>Rosa arkansana</i>) N																			X	
Woods rose (<i>Rosa woodsii</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red raspberry (<i>Rubus idaeus</i>) I								X												
Golden willow (<i>Salix alba</i> var. <i>vitellina</i>) I																X				
Peachleaf willow (<i>Salix amygdaloides</i>) N		X						X						X		X	X		X	X
Coyote willow (<i>Salix exigua</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bluestem willow (<i>Salix irrorata</i>) N		X																		
Crack willow (<i>Salix x rubens</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black greasewood (<i>Sarcobatus vermiculatus</i>) N																X				
Silver buffaloberry (<i>Shepherdia</i>)								X								X				

TREES AND SHRUBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
<i>argentea</i>) N																				
Prince's plume (<i>Stanleya pinnata</i>) N																X				
Red-osier dogwood (<i>Swida sericea</i>) N				X	X	X		X						X		X			X	
Common snowberry (<i>Symphoricarpos albus</i>) N					X			X												X
Western snowberry (<i>Symphoricarpos occidentalis</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mountain snowberry (<i>Symphoricarpos oreophilus</i>) N						X		X												
Lilac (<i>Syringa vulgaris</i>) I				X												X				
Saltcedar (<i>Tamarix pentandra</i>) I																X	X	X		X
 Western poison ivy (<i>Toxicodendron rydbergii</i>) N				X		X		X											X	X
American elm (<i>Ulmus americana</i>) I								X												
Siberian elm (<i>Ulmus pumila</i>) I		X			X				X	X	X	X		X		X	X	X	X	X
Small soapweed (<i>Yucca glauca</i>) N				X		X		X	X							X			X	
Total tree/shrub species/site (N/I)	13/ 2	23/ 4	9/ 2	18/ 4	16/ 6	18/ 11	9/ 2	37/ 7	12/ 5	8/ 4	12/ 5	12/ 5	10/ 4	12/ 5	12/ 2	23/ 16	10/ 6	11/ 6	16/ 4	16/ 4

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Macoun wild rye (<i>Agrohordeum macounii</i>) N																	X			
Crested wheatgrass (<i>Agropyron cristatum</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tall wheatgrass (<i>Agropyron elongatum</i>) I				X	X	X										X	X	X	X	X
Redtop (<i>Agrostis gigantea</i>) I				X				X												
Redtop bentgrass (<i>Agrostis stolonifera</i>) I				X		X			X										X	X
Shortawn foxtail (<i>Alopecurus aequalis</i>) N									X							X	X	X		
Big bluestem (<i>Andropogon gerardii</i>) N		X						X								X				
Sand bluestem (<i>Andropogon hallii</i>) N								X												
Purple threeawn (<i>Aristida purpurea</i>) N								X												
Wild oat (<i>Avena fatua</i>) I		X														X				
American sloughgrass (<i>Beckmannia syzigachne</i>) N									X											
Alkali bulrush (<i>Bolbochoenus paludosus</i>) N						X										X	X			
Sideoats grama (<i>Bouteloua curtipendula</i>) N		X		X		X		X								X				
Smooth brome (<i>Bromopsis inermis</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nodding brome (<i>Bromopsis lanatipes</i>) I								X												

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Japanese brome (<i>Bromus japonicus</i>) I		X		X	X	X			X	X	X	X				X	X	X	X	
Cheatgrass brome (<i>Bromus tectorum</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Buffalograss (<i>Buchloe dactyloides</i>) N		X						X								X				
Bluejoint reedgrass (<i>Calamagrostis canadensis</i>) I				X	X	X														X
Prairie sandreed (<i>Calamovilfa longifolia</i>) N		X						X												
Bebb's sedge (<i>Carex bebbii</i>) I		X																		
Woolly sedge (<i>Carex lanuginosa</i>) N		X		X		X						X				X				X
Nebraska sedge (<i>Carex nebrascensis</i>) N		X		X		X													X	X
Silver sedge (<i>Carex praegracilis</i>) N				X		X										X			X	
Mat sandbur (<i>Cenchrus longispinus</i>) N								X										X		X
Big mountain brome (<i>Ceratochloa marginata</i>) I								X												
Blue grama (<i>Chondrosum gracilis</i>) N		X		X		X		X								X				
Foxtail barley (<i>Critesion jubatum</i>) N		X		X	X	X		X	X							X	X	X	X	X
Little barley (<i>Critesion pusillum</i>) N																			X	
Bearded flatsedge (<i>Cyperus aristatus</i>) N																X				X
Orchardgrass (<i>Dactylis glomerata</i>) I		X		X	X	X					X	X	X			X		X		X
Tufted hairgrass (<i>Deschampsia</i>)																				

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
<i>caespitosa</i>) I								X		X	X									
Inland saltgrass (<i>Distichlis spicata stricta</i>) N																X	X	X	X	X
Barnyardgrass (<i>Echinochloa crus-galli</i>) I		X		X	X	X		X								X		X		X
Needle spikeseed (<i>Eleocharis acicularis</i>) N																				
Common spikeseed (<i>Eleocharis palustris</i>) N		X		X		X			X							X	X		X	X
Dwarf spikeseed (<i>Eleocharis parvula</i>) N																	X		X	
Canada wild rye (<i>Elymus canadensis</i>) N	X	X						X		X	X					X			X	X
Bottlebrush squirreltail (<i>Elymus elymoides</i>) N												X								
Slender wheatgrass (<i>Elymus trachycaulum</i>) N								X											X	X
Beardless Virginia wild rye (<i>Elymus virginicus</i>) N				X		X														
Montana wheatgrass (<i>Elytrigia albicans</i>) N																			X	X
Thickspike wheatgrass (<i>Elytrigia dasystachyum</i>) N		X						X												
Quackgrass (<i>Elytrigia repens</i>) I								X		X	X	X				X			X	X
Stinkgrass (<i>Eragrostis cilianensis</i>) I								X								X				

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Sand lovegrass (<i>Eragrostis trichodes</i>) I		X						X												
Tall fescue (<i>Festuca arundinacea</i>) I								X												
Red fescue (<i>Festuca rubra</i>) I																		X		
Mountain fescue (<i>Festuca saximontana</i>) I																		X		
American mannagrass (<i>Glyceria grandis</i>) N									X											X
Fowl mannagrass (<i>Glyceria striata stricta</i>) N		X		X		X														
Baltic rush (<i>Juncus arcticus ater</i>) N		X		X		X										X	X	X	X	X
Toad rush (<i>Juncus bufonius</i>) N																X				
Rush (<i>Juncus compressus</i>) I																				X
Colorado rush (<i>Juncus confusus</i>) N		X														X				
Dudley rush (<i>Juncus dudleyii</i>) N	X															X				X
Inland rush (<i>Juncus interior</i>) N				X		X						X					X		X	X
Longstyle rush (<i>Juncus longistylus</i>) N																X				
Jointed rush (<i>Juncus nodosus</i>) N				X		X										X			X	X
Torrey rush (<i>Juncus torreyi</i>) N																	X			X
Rice cutgrass (<i>Leersia oryzoides</i>) I																X				
Crested ryegrass (<i>Lolium perenne</i>) I								X												

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Alkali muhly (<i>Muhlenbergia asperifolia</i>) N																X			X	X
Green muhly (<i>Muhlenbergia racemosa</i>) N				X		X														
Common witchgrass (<i>Panicum capillare</i>) I																X	X	X		
Switchgrass (<i>Panicum virgatum</i>) N		X		X		X		X									X		X	X
Western wheatgrass (<i>Pascopyrum smithii</i>) N		X		X	X	X		X								X	X		X	X
Reed canarygrass (<i>Phalaroides arundinacea</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Timothy (<i>Phleum pratense</i>) I												X						X		X
Canada bluegrass (<i>Poa compressa</i>) N		X		X		X		X								X				
Wood bluegrass (<i>Poa nemoralis</i>) N		X		X		X														
Fowl bluegrass (<i>Poa palustris</i>) I		X		X	X	X				X	X					X				
Kentucky bluegrass (<i>Poa pratensis</i>) I		X						X		X						X			X	X
Sandberg bluegrass (<i>Poa secunda</i>) N								X												
Rabbitfoot polypogon (<i>Polypogon monspeliensis</i>) I		X		X	X	X										X	X	X	X	X
Beardless bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>) N																X				
Weeping alkaligrass (<i>Puccinellia distans</i>) I																	X			

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Tumble grass (<i>Schedonnardus paniculatus</i>) N																		X		
Little bluestem (<i>Schizachyrium scoparium</i>) N								X								X				
Hardstem bulrush (<i>Schoenoplectus lacustris acutus</i>) N	X	X													X	X			X	
American bulrush (<i>Schoenoplectus pungens</i>) N	X	X		X	X	X					X				X	X	X	X	X	X
Softstem bulrush (<i>Schoenoplectus lacustris creber</i>) N									X							X	X			
Panicled bulrush (<i>Scirpus microcarpus</i>) N		X		X		X														
Pale bulrush (<i>Scirpus pallidus</i>) N									X											
Foxtail (<i>Setaria geniculata</i>) I	X																	X		
Yellow bristlegrass (<i>Setaria glauca</i>) I				X	X	X										X				
Green bristlegrass (<i>Setaria viridis</i>) I								X		X	X	X					X	X	X	X
Yellow indiagrass (<i>Sorghastrum avenaceum</i>) N		X									X									
Prairie cordgrass (<i>Spartina pectinata</i>) N		X		X		X		X		X	X								X	X
Alkali sacaton (<i>Sporobolus airoides</i>) N																	X		X	
Tall dropseed (<i>Sporobolus asper</i>) N								X												
Sand dropseed (<i>Sporobolus cryptandrus</i>)	X	X						X	X							X	X	X	X	X

 GRASSES AND GRASSLIKE PLANTS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
N																				
Indian ricegrass (<i>Stipa hymenoides</i>) N		X						X												
Western needlegrass (<i>Stipa occidentalis nelsonii</i>) N																			X	X
Green needlegrass (<i>Stipa viridula</i>) N		X														X				
Sixweeks fescue (<i>Vulpia octoflora</i>) N																	X	X		
Total grasses/grasslike plants/site (N/I)	5/ 5	26/ 13	0/ 4	20/ 14	3/ 12	21/ 13	0/ 4	19/ 16	8/ 6	2/ 11	4/ 10	3/ 9	0/ 4	0/ 4	2/ 4	29/ 17	17/ 10	9/ 15	22/ 11	23/ 17

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Western yarrow (<i>Achillea lanulosa</i>) N						X		X				X				X		X	X	X
Common yarrow (<i>Achillea millefolium</i>) I		X						X											X	
Blue flax (<i>Adenolinum lewisii</i>) N		X		X		X		X		X						X	X	X	X	X
Gerardia (<i>Agalinis tenuifolia</i>) N																				
Roadside agrimony (<i>Agrimonia striata</i>) N				X		X														
Redroot amaranth (<i>Amaranthus retroflexus</i>) I		X		X		X		X								X			X	X
Ragweed (<i>Ambrosia elatior</i>) I															X	X				
Western ragweed (<i>Ambrosia psilostachya coronopifolia</i>) N				X	X	X			X					X	X	X		X	X	X
Giant ragweed (<i>Ambrosia trifida</i>) I		X		X	X	X		X	X								X			X
Meadow anemone (<i>Anemonisium canadense</i>) N				X								X				X				
Rose pussytoes (<i>Antennaria rosea</i>) N		X																		
Spreading dogbane (<i>Apocynum androsaemifolium</i>) N	X			X		X		X												
Hemp dogbane [not marijuana] (<i>Apocynum cannabinum</i>) N				X		X										X		X	X	X
Smaller burdock (<i>Arctium minus</i>) I				X	X	X												X	X	
Hedgehog pricklepoppy (<i>Argemone hispida</i>) N									X							X		X	X	X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Many-flowered pricklepoppy (<i>Argemone polyanthemos</i>) N								X												
Sagewort wormwood (<i>Artemisia campestris</i>) N																				
Prairie sage (<i>Artemisia ludoviciana</i>) N		X						X								X				
Swamp milkweed (<i>Asclepias incarnata</i>) N												X				X	X		X	X
Showy milkweed (<i>Asclepias speciosa</i>) N		X		X	X	X					X				X	X	X	X	X	X
Garden asparagus (<i>Asparagus officinalis</i>) I	X		X		X					X	X		X	X	X	X		X	X	X
Common catchweed (<i>Asperugo procumbens</i>) I		X						X	X	X	X	X	X	X	X		X	X		
Smooth aster (<i>Aster laevis</i>) N								X												
Siskiyou aster (<i>Aster hesperius</i>) N																				X
Mexican azolla (<i>Azolla mexicana</i>) N																X				
Ragleaf bahia (<i>Bahia dissecta</i>) N																X				
Erectpod wintercress (<i>Barbarea orthoceras</i>) I																			X	
Nodding beggarticks (<i>Bidens cernua</i>) I																X	X			X
Devils beggarticks (<i>Bidens frondosa</i>) N															X	X				
Aster (<i>Brachyactis ciliata angusta</i>) N																				X
White mustard (<i>Brassica hirta</i>) I						X														

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Low poppymallow (<i>Callirrhoe involucrata</i>) N		X																		
Nuttall mariposa lily (<i>Calochortus nuttalii</i>) I								X												
Creeping bellflower (<i>Campanula rapunculoides</i>) I														X	X	X				
Harebell (<i>Campanula rotundifolia</i>) N		X						X												
Shepherds purse (<i>Capsella bursa-pastoris</i>) I						X		X												
Pepperweed whitetop (<i>Cardaria draba</i>) I																X				
Musk bristlethistle (<i>Carduus nutans</i>) I				X	X	X						X				X	X	X	X	X
Russian centaurea (<i>Centaurea repens</i>) I																X				
Hornwort (<i>Ceratophyllum demersum</i>) N															X	X				
Ridgeseed euphorbia (<i>Chamaesyce glyptosperma</i>) N																X				
Missouri euphorbia (<i>Chamaesyce missurica</i>) N								X								X				
Lambsquarters goosefoot (<i>Chenopodium album</i>) I																X				
Pitseed goosefoot (<i>Chenopodium berlandieri</i>) N																			X	X
Jerusalem oak goosefoot (<i>Chenopodium</i>)																	X			

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
<i>botrys</i>) I																				
Oakleaf goosefoot (<i>Chenopodium glaucum</i>) I																	X			X
Blue mustard (<i>Chorispora tenella</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ox-eye daisy (<i>Chrysanthemum leucanthemum</i>) I														X		X				
Common chicory (<i>Cichoryum intybus</i>) I		X		X	X	X														
Common waterhemlock (<i>Cicuta douglasii</i>) N						X														
Canada thistle (<i>Cirsium arvense</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wavyleaf thistle (<i>Cirsium undulatum</i>) N																		X		
Bull thistle (<i>Cirsium vulgare</i>) I																				
Douglas clematis (<i>Clematis hirsutissima</i>) N	X							X												
Western virginsbower (<i>Clematis ligusticifolia</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rocky Mountain beeplant (<i>Cleome serrulata</i>) N								X												
Littleflower collinisa (<i>Collinsia parvaflora</i>) N																X				
Poisonhemlock (<i>Conium maculatum</i>) I				X		X		X								X				
European bindweed (<i>Convolvulus</i>																				

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
<i>arvensis</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Canadian horseweed (<i>Conyza canadensis</i>) I		X						X				X				X	X	X	X	X
Plains coreopsis (<i>Coreopsis tinctoria</i>) N		X																		
Golden corydalis (<i>Corydalis aurea</i>) N																X				
Slender hawksbeard (<i>Crepis capillaris</i>) I																X				
Common houndstongue (<i>Cynoglossum officinale</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Prairie clover (<i>Dalea cylindriceps</i>) N																				X
Purple prairie clover (<i>Dalea purpurea</i>) N		X						X												
Geyer larkspur (<i>Delphinium geeyeri</i>) N								X												
Richardson tansymustard (<i>Descurainia richardsonii</i>) N																X				
Flixweed tansymustard (<i>Descurainia sophia</i>) I		X		X		X			X	X	X	X				X	X	X	X	X
Venuscup teasel (<i>Dipsacus sylvestris</i>) I								X			X								X	X
Prairie dogweed (<i>Dyssodia papposa</i>) N								X												
Wild mock cucumber (<i>Echinocystis lobata</i>) N		X	X	X	X	X					X	X				X		X	X	X
Common waterpod (<i>Ellisia nyctelea</i>) N												X								

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Sticky willowweed (<i>Epilobium ciliatum</i>) N				X		X			X			X				X	X		X	X
Field horsetail (<i>Equisetum arvense</i>) N			X	X		X						X				X				X
Trailing fleabane (<i>Erigeron flagellaris</i>) N																X				
Oregon fleabane (<i>Erigeron speciosus</i>) N		X																		
Rush wild buckwheat (<i>Eriogonum effusum</i>) N																				
Sulphur eriogonum (<i>Eriogonum umbellatum</i>) N		X						X												
Crane's bill (<i>Erodium cicutarium</i>) I		X				X		X	X									X	X	X
Plains wallflower (<i>Erysimum asperum</i>) N		X						X												
Spotted Joe pye weed (<i>Eupatorium maculatum</i>) N				X		X														
Prairie gentian (<i>Eustoma grandiflorum</i>) N (Colorado Rare Plant)																X				
Bracted strawberry (<i>Fragaria vesca</i>) N											X									
Drug fumitory (<i>Fumaria officinalis</i>) I				X		X			X							X	X			
Common perennial gaillardia (<i>Gaillardia aristata</i>) N		X						X								X		X		
Catchweed bedstraw (<i>Galium aparine</i>) I				X	X	X				X	X	X				X	X			
Scarlet gaura (<i>Gaura coccinea</i>) N																			X	X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Smallflower gaura (<i>Gaura parviflora</i>) N		X		X	X	X		X								X		X	X	X
Aleppo avens (<i>Geum aleppicum</i>) N						X														
Common sea milkwort (<i>Glaux maritima</i>) N																X				
American licorice (<i>Glycyrrhiza lepidota</i>) N				X	X	X			X							X			X	X
Cottonbatting cudweed (<i>Gnaphalium stramineum</i>) N																X				X
Curlycup gumweed (<i>Grindelia squarrosa</i>) N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Babysbreath gypsophila (<i>Gypsophila paniculata</i>) I						X														
Many-flowered sticktight (<i>Hackelia floribunda</i>) I						X														
Shore buttercup (<i>Halerpestes cymbalaria</i>) N				X		X										X	X			X
Halogeton (<i>Halogeton glomeratus</i>) I									X											
Blister buttercup (<i>Hecatonia scelerata</i>) N																	X			
Common sunflower (<i>Helianthus annuus</i>) N																X	X			X
Sunflower (<i>Helianthus nuttallii</i>) N																X			X	X
Prairie sunflower (<i>Helianthus petiolaris</i>) N				X		X						X				X	X	X		X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Sunflower (<i>Helianthus pumilus</i>) N																X				X
Common parsnip (<i>Heracleum sphondylium montanum</i>) N				X		X														
Dames rocket (<i>Hesperis matronalis</i>) I				X	X	X		X		X	X			X		X				
Mountain golden aster (<i>Heterotheca fulcrata</i>) I								X												
Hairy goldaster (<i>Heterotheca villosa</i>) N		X						X								X			X	X
Scouringrush (<i>Hippochaete hyemalis</i>) N																X				
Smooth horsetail (<i>Hippochaete laevigata</i>) N				X		X										X		X	X	X
New Mexican hop (<i>Humulus lupulus</i>) N				X		X														
Wild iris (<i>Iris missouriensis</i>) N		X		X																
Poverty sumpweed (<i>Iva axillaris</i>) N																X				
Rag sumpweed (<i>Iva xanthifolia</i>) N								X												
Belvedere summercypress (<i>Kochia scoparia</i>) I		X		X		X		X	X					X	X	X	X			X
Prickly lettuce (<i>Lactuca serriola</i>) I		X		X		X		X				X				X		X		
Chicory lettuce (<i>Lactuca tatarica</i>) N																				X
Henbit deadnettle (<i>Lamium amplexicaule</i>) I		X		X		X														

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Blueburr stickseed (<i>Lappula redowskii</i>) N									X		X									
Common duckweed (<i>Lemna minor</i>) N			X												X	X	X		X	X
Common motherwort (<i>Leonurus cardiaca</i>) I				X		X						X				X	X	X	X	
Field pepperweed (<i>Lepidium campestre</i>) I																	X	X		
Clasping pepperweed (<i>Lepidium perfoliatum</i>) I																	X	X	X	X
Dotted gayfeather (<i>Liatris punctata</i>) N		X						X												X
Dalmation toadflax (<i>Linaria dalmatica</i>) I						X														
Butter-and-eggs toadflax (<i>Linaria vulgaris</i>) I				X		X														
Silvery lupine (<i>Lupinus argenteus</i>) N		X																		
Matrimony vine (<i>Lycium barbarum</i>) I					X															
American bugleweed (<i>Lycopus americanus</i>) N												X				X	X			
Bugleweed (<i>Lycopus asper</i>) N																			X	X
Fringed loosestrife (<i>Lysimachia ciliata</i>) N				X		X														
Purple loosestrife (<i>Lythrum salicaria</i>) I (r)								X												
Bigelow aster (<i>Machaeranthera bigelovii</i>) N																	X			
Hoary aster (<i>Machaeranthera canescens</i>)																				

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
N																				X
Tansyleaf aster (<i>Machaeranthera tanacetifolia</i>) N							X													
Starry false solomonseal (<i>Maianthemum amplexicaule stellatum</i>) N				X		X					X	X		X		X		X		
Running mallow (<i>Malva neglecta</i>) I		X		X		X		X								X	X	X		X
Common hoarhound (<i>Marrubium vulgare</i>) I																			X	X
Black medic (<i>Medicago lupulina</i>) I																X		X	X	X
Alfalfa (<i>Medicago sativa</i>) I							X		X	X	X					X			X	X
White sweetclover (<i>Melilotus alba</i>) I		X		X		X		X	X	X						X		X	X	X
Yellow sweetclover (<i>Melilotus officinalis</i>) I				X		X		X												X
Field mint (<i>Mentha arvensis</i>) N						X										X				X
Mintleaf beebalm (<i>Monarda fistulosa menthaefolia</i>) N		X						X						X	X	X				
Watercress (<i>Nasturtium officinale</i>) I						X			X										X	X
Catnip (<i>Nepeta cataria</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ten-petal mentzelia (<i>Nuttallia decapetala</i>) N								X												
Desert mentzelia (<i>Nuttallia multiflora</i>) N																				X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Tufted evening primrose (<i>Oenothera caespitosa</i>) N		X																		
Yellow evening primrose (<i>Oenothera strigosa</i>) N																X	X		X	X
Bigroot pricklypear (<i>Opuntia macrorhiza</i>) N								X												
Plains pricklypear (<i>Opuntia polyacantha</i>) N	X															X			X	X
Louisiana broomrape (<i>Orobanche ludoviciana</i>) N																				X
Umbrellawort (<i>Oxybaphus nyctagineus</i>) N		X		X		X										X				X
Virginia creeper (<i>Parthenocissus quinquefolia</i>) I				X	X	X							X	X		X	X		X	X
Garden parsnip (<i>Pastinaca sativa</i>) I																		X		
Sidebells penstemon (<i>Penstemon secundiflorus</i>) N								X												
Rocky Mountain penstemon (<i>Penstemon strictus</i>) I		X																		
Water lady's thumb (<i>Persicaria amphibia</i>) N																				
Swamp smartweed (<i>Persicaria coccinea</i>) N											X					X				
Curltop lady's thumb (<i>Persicaria</i>)																X	X			X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
<i>lapathifolia</i>) I																				
Pennsylvania smartweed (<i>Persicaria pensylvanica</i>) N												X					X	X		X
Virginia groundcherry (<i>Physalis virginiana</i>) N																		X		
Rippleseed plantain (<i>Plantago major</i>) I		X		X		X		X								X			X	X
False salsify (<i>Podospermum laciniatum</i>) I																			X	
Toothed euphorbia (<i>Poinsettia dentata</i>) N																		X	X	X
Clammyseed (<i>Polanisia dodecandra</i>) N																			X	
Prostrate knotweed (<i>Polygonum arenastrum</i>) I				X		X		X				X				X	X	X		X
Dullseed cornbind (<i>Polygonum convolvulus</i>) I																X				
Spotted lady's thumb (<i>Polygonum persicaria</i>) I												X				X		X		X
Bushy knotweed (<i>Polygonum ramosissimum</i>) I								X									X			
Common purslane (<i>Portulaca oleracea</i>) I								X								X			X	X
Leafy pondweed (<i>Potamogeton foliosus</i>) N																				
Norwegian cinquefoil (<i>Potentilla norvegica</i>) I																				X
Pennsylvania cinquefoil (<i>Potentilla</i>																				

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
<i>pensylvanica</i>) N																X	X			X
Common selfheal (<i>Prunella vulgaris</i>) I																X				
Purpleflower groundcherry (<i>Quincula lobata</i>) N																X				
Buttercup (<i>Ranunculus macounii</i>) N																X				
Upright prairie coneflower (<i>Ratibida columnifera</i>) N		X		X		X		X								X		X	X	X
Watercress (<i>Rorippa palustris hispida</i>) N				X		X			X			X				X	X	X	X	X
Black-eyed susan (<i>Rudbeckia hirta</i>) N				X		X		X												
Cutleaf coneflower (<i>Rudbeckia laciniata ampla</i>) N				X	X	X										X		X	X	
Curly dock (<i>Rumex crispus</i>) I	X	X		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X
Golden dock (<i>Rumex maritimus fueginus</i>) N									X			X						X		
Narrowleaf dock (<i>Rumex stenophyllus</i>) I																	X			X
Willowleaf dock (<i>Rumex triangulivalvis</i>) N																				
Widgeongrass (<i>Ruppia cirrhosa occidentalis</i>) N						X														
Common arrowhead (<i>Sagittaria latifolia</i>) N											X				X					
Tumbling Russian thistle (<i>Salsola iberica</i>)																				

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
I								X								X				
Bouncingbet (<i>Saponaria officinalis</i>) I								X						X		X				X
Broom groundsel (<i>Senecio spartioides</i>) N								X								X				
Forked silene (<i>Silene noctiflora</i>) I																X				
Tumble mustard (<i>Sisymbrium altissimum</i>) I									X	X	X						X	X	X	X
Carrion flower greenbrier (<i>Smilax lasioneuron</i>) N											X									
Hairy nightshade (<i>Solanum physalifolium</i> var. <i>nitidibaccatum</i>) I								X												
Buffalobur nightshade (<i>Solanum rostratum</i>) I																X				
Cutleaf nightshade (<i>Solanum triflorum</i>) I								X												
Canada goldenrod (<i>Solidago canadensis</i>) N	X															X		X		X
Giant goldenrod (<i>Solidago serotinoidea</i>) N		X		X	X	X														
Missouri goldenrod (<i>Solidago missouriensis</i>) N								X												
Field sowthistle (<i>Sonchus arvensis</i>) I																				X
Prickly sowthistle (<i>Sonchus asper</i>) I																X	X			
Burreed (<i>Sparganium eurycarpum</i>) N		X																		

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Sandspurry (<i>Spergularia media</i>) I																X	X		X	X
Scarlet globemallow (<i>Sphaeralcea coccinea</i>) N								X								X		X		
Daisy fleabane (<i>Stenactis strigosus</i>) N																				X
Common tansy (<i>Tanacetum vulgare</i>) I																X		X		
Common dandelion (<i>Taraxacum officinale</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Purple meadowrue (<i>Thalictrum dasycarpum</i>) N				X		X					X	X						X	X	X
Thelesperma (<i>Thelesperma megapotamicum</i>) N																X			X	
Spreading golden banner (<i>Thermopsis divaricarpa</i>) N		X																		
Prairie golden banner (<i>Thermopsis rhombifolia</i>) N			X																	
Field pennycress (<i>Thlaspi arvense</i>) I								X											X	
Leafy spurge (<i>Tithymalus esula</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Townsendia (<i>Townsendia grandiflora</i>) N								X												
Prairie spiderwort (<i>Tradescantia occidentalis</i>) N		X						X								X			X	X
Western salsify (<i>Tragopogon dubius major</i>) I				X		X		X	X	X	X	X				X		X	X	X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Puncturevine (<i>Tribulus terrestris</i>) I								X				X				X			X	X
Red clover (<i>Trifolium pratense</i>) I								X								X				
White clover (<i>Trifolium repens</i>) I				X		X														
Seaside arrowgrass (<i>Triglochin maritimum</i>) N																X			X	
Narrowleaf cattail (<i>Typha angustifolia</i>) N						X		X								X			X	X
Common cattail (<i>Typha latifolia</i>) N	X	X	X	X	X	X		X			X	X		X	X	X	X	X	X	X
Tall nettle (<i>Urtica dioica</i>) N		X		X		X		X								X		X		X
Flannel mullein (<i>Verbascum thapsus</i>) I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bigbract verbena (<i>Verbena bracteata</i>) I								X				X				X				X
Blue verbena (<i>Verbena hastata</i>) N		X		X		X						X				X		X	X	X
Hoary vervain (<i>Verbena stricta</i>) N								X												
Water speedwell (<i>Veronica anagallis-aquatica</i>) N				X		X			X							X	X		X	X
Hairy vetch (<i>Vicia villosa</i>) I										X	X									
Canada violet (<i>Viola scopulorum</i>) N																		X		
White prairie aster (<i>Virgulus falcatus</i>) N																				X
Riverbank grape (<i>Vitis riparia</i>) N						X				X	X								X	X
Cocklebur (<i>Xanthium strumarium</i>) I																X	X			X

 WILDFLOWERS, VINES, AND OTHER FORBS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Total wildflower/vine/other forb species/site (N/I)	7/ 10	30/ 24	7/ 9	34/ 32	10/ 18	38/ 38	2/ 7	38/ 41	10/ 18	4/ 19	12/ 20	19/ 22	2/ 12	5/ 18	9/ 14	65/ 54	28/ 33	27/ 29	36/ 35	54/ 45

POUDRE RIVER NATURAL AREAS MANAGEMENT PLAN

Appendix B

Animals Observed on Poudre River Natural Areas

KEY: #96P1 (P1), North Shields Pond Natural Area (NS), Hickory Park Natural Area (HP), Salyer Natural Area (SA), Legacy Park Natural Area (LP), Lee Martinez Park Natural Area (LM), Old Fort Collins Heritage Park Natural Area (OF), Gustav Swanson Nature Area (SW), Udall Natural Area (UD), Williams Natural Area (WI), Springer Natural Area (SP), Bignall Natural Area (BI), Nix Natural Area (NX), Kingfisher Point Natural Area (KP), Cattail Chorus Natural Area (CC), Riverbend Ponds Natural Area (RI), Cottonwood Hollow Natural Area (CH), Prospect Ponds Natural Area (PP), Archery Range Natural Area (AR), Arapaho Bend Natural Area (AB).

Compiled from observations by Bonnie Barton (1988-90; birds: RI); CDOW (1978-90; fish: RI); Alex Cringan (1975-96; birds: LM, SW, UD, BI, RI, CH, PP, AB); Paul Gertler (1974-75; all but insects: WM, LM, PP); Steven Horak (1996; all but insects: NS); Dave Leatherman (1985-91; birds: RI); James R. Miller (1995; birds: AB); S.M. Morrison (1979; fish: LM, AB); Paul Opler (1985-91; birds: RI); Allen, Dave, and Jennifer Palmer (1985-91; birds: RI); Barb Patterson (1994-95; birds: CH); Rod Rieman (1991; birds and mammals: GS); Thomas Ryon (1995; small mammals: RI); Wayne Seaman (1995: Fish, PP); Mike Shoemaker (1985-91; birds: RI); and City staff (1983-97; casual observations in all categories: all sites).

Notes: U = unusual; N = Native; I = Introduced; CSC = Colorado Species of Concern; T = Federally threatened; E = Endangered. Not all sites have been intensively surveyed, therefore, some species may be present on some sites and yet not be reflected on these tables.

 BIRDS Species	Sites																			
	P1	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Pied-billed grebe		X													X	X	X	X		X
Horned grebe						X										X				X
Eared grebe															X	X				X
Western grebe															X	X				X
Clark's grebe															X	X				
American white pelican (CSC)															X	X	X			X
Double-crested cormorant															X	X	X	X		X
American bittern															X	X				

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Least bittern (U)																X				
 Great blue heron		X	X			X		X	X		X	X		X	X	X	X	X	X	X
Great egret (U)																X	X			
Snowy egret						X										X	X			X
Cattle egret (U)																X				
Green heron (U)						X		X							X	X				
Black-crowned night-heron						X	X	X			X				X	X	X	X		X
White-faced ibis																X				
Turkey vulture																X		X		X
Tundra swan (U)																X				
Greater white-fronted goose															X	X				
Snow goose		X													X	X		X		
Canada goose	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wood duck											X			X	X	X		X		
Green-winged teal						X		X						X	X	X	X	X		
Mallard	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Northern pintail															X	X	X	X		

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Blue-winged teal		X				X								X	X	X	X	X		
Cinnamon teal						X								X	X	X		X		
Northern shoveler						X									X	X	X	X		
Gadwall						X								X	X	X	X	X		
American wigeon		X				X		X			X			X	X	X	X	X		
Canvasback															X	X		X		
 Redhead															X	X	X	X		X
Ring-necked duck															X	X	X	X		
Lesser scaup															X	X		X		X
Common goldeneye											X			X	X	X	X	X		
Barrow's goldeneye (U) (CSC)																X				
Bufflehead															X	X	X	X		
Hooded merganser																X		X		
Common merganser		X				X		X				X		X	X	X	X	X		
Red-breasted merganser (U)																				X
Ruddy duck																X		X		
Osprey		X						X							X	X	X	X		

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Bald eagle (T)								X							X	X	X		X	
Northern harrier															X	X		X		
Sharp-shinned hawk															X	X				
Cooper's hawk																X				
Northern goshawk															X	X				
Broad-winged hawk						X														
Swainson's hawk								X										X		
Red-tailed hawk						X							X	X	X	X		X		X
Rough-legged hawk															X	X		X		
Golden eagle																X				
American kestrel						X		X				X	X	X	X	X	X	X		X
 Merlin						X										X		X		
Prairie falcon (E, U)																X				X
Peregrine falcon																X				
Ring-necked pheasant						X							X	X	X	X				
Northern bobwhite															X	X				
Black rail (U)																X				

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Virginia rail															X	X				
Sora						X										X				
American coot						X									X	X	X	X		X
Killdeer		X	X	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		
Greater yellowlegs						X		X						X	X	X	X	X		
Lesser yellowlegs						X		X						X	X	X				
Solitary sandpiper						X										X		X		
Willet						X										X	X			
Spotted sandpiper						X										X	X			X
Whimbrel (U)																X				
Marbled godwit (U)															X	X				
Semipalmated sandpiper						X														
Western sandpiper						X										X				
Least sandpiper															X			X		
 Baird's sandpiper						X											X			

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Long-billed dowitcher																X	X			
Common snipe						X		X			X	X		X	X	X		X		
Wilson's phalarope																	X			
Franklin's gull						X										X	X	X		
Bonaparte's gull																X				
Ring-billed gull						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			
Black tern																X				
Rock dove		X				X		X				X	X	X	X	X	X	X		
White-winged dove (U)																X				
Mourning dove	X	X				X		X			X	X	X	X	X	X	X	X		X
Barn owl												X				X				
Eastern screech-owl						X		X				X		X	X	X				
Great horned owl		X				X						X	X	X	X	X		X		
Long-eared owl (U)																X				
Short-eared owl (U)																X				
Common nighthawk								X				X	X	X	X	X		X		

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
 Common poorwill																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	X	X	X
Red-headed woodpecker						X										X		X		
Red-naped sapsucker																X				
Downy woodpecker	X					X		X				X	X	X	X	X	X	X		X
Hairy woodpecker						X									X	X		X		
Northern flicker	X	X	X	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		
Willow flycatcher						X										X				
Cordilleran Flycatcher																X				
Say's phoebe															X	X				
Western kingbird														X	X	X	X	X		X
Eastern kingbird														X	X	X	X	X		X
Horned lark													X	X		X				X

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Tree swallow												X		X	X	X	X	X		
Violet-green swallow						X						X		X	X	X		X		
Northern rough-winged swallow						X						X		X	X	X				
Bank swallow												X		X	X	X		X		
Cliff swallow								X								X	X	X		
 Barn swallow						X		X				X	X	X	X	X	X	X		
Steller's jay																	X			
Blue jay		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	X	X	X
American crow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Common raven																X				
Black-capped chickadee	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mountain chickadee						X						X			X	X	X			
Red-breasted nuthatch															X	X				
White-breasted nuthatch						X									X	X				
Brown creeper								X						X	X	X		X		
Rock wren																X				

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
House wren						X		X				X	X	X	X	X		X		X
Marsh wren (U)																X				
American dipper											X									
Golden-crowned kinglet																X				
Ruby-crowned kinglet															X	X		X		
Blue-gray gnatcatcher																X				
Mountain bluebird																X		X		
Townsend's solitaire																X				
Veery (U)															X	X				
Gray-cheeked thrush (U)						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	X	X	X
Gray catbird						X										X		X		
Northern mockingbird (U)															X	X				
Sage thrasher																X				
Brown thrasher (U)																X				

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
American pipit						X										X				
Bohemian waxwing															X	X				
Northern shrike															X	X				
Loggerhead shrike																X		X		
European starling	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Solitary vireo															X	X		X		
Warbling vireo															X	X				X
Red-eyed vireo (U)																X		X		
Blue-winged warbler (U)															X	X				
Tennessee warbler (U)						X									X	X		X		
Orange-crowned warbler						X										X		X		
Virginia's warbler						X									X	X				
Northern parula (U)						X														
Yellow warbler			X			X						X		X	X	X		X		X
Magnolia warbler (U)						X										X		X		
 Black-throated blue warbler (U)																		X		
Yellow-rumped warbler						X		X			X	X	X	X	X	X	X	X		

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Townsend's warbler															X	X		X		
Palm warbler (U)																X				
Blackpoll warbler															X	X				
Black-and-white warbler (U)						X														
American redstart						X										X				
Swainson's warbler (U)																X				
Northern waterthrush						X										X				
Mourning warbler (U)																X				
MacGillivray's warbler															X	X				
Common yellowthroat						X									X	X	X			
Wilson's warbler												X	X	X	X	X		X		
Yellow-breasted chat						X										X				
Western tanager						X								X	X	X				
Black-headed grosbeak (U)																X				
Blue grosbeak (U)												X			X	X				
Lazuli bunting												X				X				X
Indigo bunting												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				

BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
 Chipping sparrow																				
Clay-colored sparrow						X										X				
Brewer's sparrow		X														X				
Vesper sparrow		X													X	X				
Lark sparrow						X									X	X				
Black-throated sparrow (U)															X	X				
Lark bunting (U)						X														
Savannah sparrow		X														X				
Song sparrow		X	X	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				
White-throated sparrow														X	X	X				
Golden-crowned sparrow (U)																X				
White-crowned sparrow						X								X	X	X		X		
Harris' sparrow (U)																X				
Dark-eyed junco						X		X					X	X	X	X	X		X	X
Red-winged blackbird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

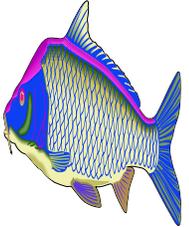
BIRDS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Western meadowlark						X							X	X	X	X	X	X		X
Yellow-headed blackbird															X	X	X	X		
Rusty blackbird (U)		X														X				
Brewer's blackbird		X				X									X	X		X		
Great-tailed grackle (U)																X				
 Common grackle		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brown-headed cowbird															X	X	X	X		
Orchard oriole (U)																X				
Bullock's oriole						X		X						X	X	X	X	X		X
House finch						X		X				X	X	X	X	X		X		
Pine siskin								X					X				X			
American goldfinch						X						X	X	X	X	X	X			X
Evening grosbeak						X										X				
House sparrow		X				X		X				X	X	X	X	X	X	X		
TOTAL/SITE TOTAL BIRD SPECIES: 216	12	30	15	13	13	95	9	46	15	13	27	44	35	61	123	201	67	94	16	46

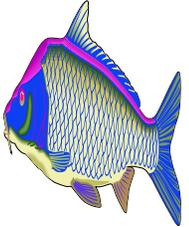
 MAMMALS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Masked shrew						X														
Big brown bat								X								X				
Eastern cottontail						X		X			X	X	X	X	X	X			X	
Thirteen-lined ground squirrel						X														
Rock squirrel		X												X		X				
Fox squirrel	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plains pocket gopher								X								X				
Beaver								X							X	X	X	X	X	X
Western harvest mouse																X				
Deer mouse						X										X				
Prairie vole																X				
Meadow vole						X		X						X	X	X				
Muskrat		X				X		X						X	X	X		X	X	X
House mouse																X				
Coyote																X				
Red fox	X					X							X	X	X	X	X			
Raccoon	X					X										X	X		X	
Short-tailed weasel (U)						X														

 MAMMALS Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Striped skunk								X						X	X	X			X	
Bobcat (U)						X														
Elk (U)																	X			
Mule deer	X	X	X					X						X	X	X	X		X	
White-tailed deer																X	X	X	X	
TOTAL/SITE TOTAL MAMMAL SPECIES: 23	4	4	2	1	1	11	1	9	1	1	2	2	3	8	8	18	7	4	8	3

 AND AMPHIBIANS REPTILES Species	Sites																			
	PI	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Tiger salamander																X				
Woodhouse's toad																X				
Boreal chorus frog		X				X								X	X	X				
Bullfrog		X						X								X				
Northern leopard frog (CSC)																X				
Common snapping turtle		X						X							X					

AND AMPHIBIANS REPTILES Species	Sites																			
	P1	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Western painted turtle		X				X		X							X	X		X		X
Northern water snake																	X			
Bullsnake														X	X	X				
Western plains garter snake								X				X	X	X	X	X				
TOTAL/SITE TTL. AMPHIBIAN/REPTILE SPECIES: 10	0	4	0	0	0	2	0	4	0	0	0	1	1	3	5	8	1	1	0	1

 FISHES Species	Sites																			
	P1	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Gizzard shad; N																X				X
Rainbow trout; I						X										X				
Mountain whitefish; I						X														
Brown trout; I						X		X								X				
Common carp; I						X		X						X	X	X			X	X
Brassy minnow; N																				
Golden shiner; I						X														
Common shiner; N (CSC)																				X
Sand shiner; N		X				X										X				X
Fathead minnow; N		X				X					X					X				X
Longnose dace; N						X					X					X				X
Creek chub; N						X										X				X
Longnose sucker; N						X					X					X				X
White sucker; N						X		X			X					X		X		X
Black bullhead; N		X				X										X				X
Channel catfish; N		X														X		X		
Plains topminnow; N (CSC)						X										X				X

 FISHES Species	Sites																			
	P1	NS	HP	SA	LP	LM	OF	SW	UD	WI	SP	BI	NX	KP	CC	RI	CH	PP	AR	AB
Plains killifish; N																X				X
Green sunfish; N						X										X		X		X
Pumpkinseed; I						X														X
Bluegill; I		X														X		X		
Hybrid sunfishes; I																X		X		
Smallmouth bass; I																X				
Largemouth bass; I		X				X										X		X		X
White crappie; I																X		X	X	
Black crappie; I		X														X		X		
Johnny darter; N						X										X				X
Yellow perch; I						X										X		X		X
Walleye; N																		X		
TOTAL/SITE TOTAL FISH SPECIES: 29	0	6	0	0	0	18	0	3	0	0	4	0	0	1	1	23	0	10	2	17

POUDRE RIVER NATURAL AREAS MANAGEMENT PLAN

Attachment C

List of Butterflies Observed within the Poudre River Corridor LaPorte to Harmony Road

(Compiled from observations by Kevin Cook [local naturalist], Scott Ellis [ENSR], and Dr. Paul Opler [National Biological Service], 1987-93.)

Swallowtail Family (Papilionidae)

Two-tailed swallowtail (*Papilio multicaudata*)
 Black swallowtail (*Papilio polyxenes*)
 Western tiger swallowtail (*Papilio rutulus*)

White and Sulphur Family (Pieridae)

Caper white (*Appias drusilla*)
 Orange sulphur (*Colias eurytheme*)
 Clouded sulphur (*Colias philodice*)
 Large marble (*Euchloe ausonides*)
 Mexican yellow (*Eurema mexicana*)
 Large orange sulfur (*Phoebis agarithe*)
 Cloudless sulfur (*Phoebis sennae*)
 Cabbage white (*Pieris rapae*)
 Western white (*Pontia occidentalis*)
 Checkered white (*Pontia protodice*)
 Dwarf yellow (*Nathalis iole*)

Gossamer Wing Family (Lycaenidae)

Edwards' blue (*Hemiargus isolus*)
 Marine blue (*Leptotes marina*)
 Melissa blue (*Lycaeides melissa*)
 Purplish copper (*Lycaena helloides*)
 Bronze copper (*Lycaena hylus*)
 Ruddy copper (*Lycaena rubidus*)
 Great copper (*Lycaena xanthoides*)
 Striped hairstreak (*Satyrium liparops*)
 Gray hairstreak (*Strymon melinus*)

Snout Family (Libytheidae)

Eastern snout (*Libytheana bachmanii*)
 American snout (*Libytheana carinenta*)

Brushfoot Family (Nymphalidae)

Gulf fritillary (*Agraulis vanillae*)
 Hackberry emperor (*Asterocampa celtis*)
 Common wood nymph (*Cercyonis pegala*)
 Gorgone checkerspot (*Chlosyne gorgone*)
 Ringlet (*Coenonympha tullia*)
 Long dash (*Polites mystic*)

Queen (*Danaeus gilippus*)
 Monarch (*Danaus plexippus*)
 Variegated fritillary (*Euptoieta claudia*)
 Buckeye (*Junonia coenia*)
 Viceroy (*Limenitis archippus*)
 Weidemeyer's admiral (*Limenitis*)
 Mourning cloak (*Nymphalis antiopa*)
 Milbert's tortoiseshell (*Nymphalis milberti*)
 Compton's tortoiseshell (*Nymphalis vau-*
album)
 Field crescent (*Phyciodes campestris*)
 Pearl crescent (*Phyciodes tharos*)
 Comma (*Polygonia comma*)
 Question mark (*Polygonia interrogationis*)
 Satyr anglewing (*Polygonia satryus*)
 Zephyr anglewing (*Polygonia zephyrus*)
 Smokey-eyed brown (CSC) (*Satyroides eurydice*)
 Aphrodite fritillary (*Speyeria aphrodite*)
 Callippe fritillary (*Speyeria callippe*)
 Edward's fritillary (*Speyeria edwardsii*)
 West Coast lady (*Vanessa annabella*)
 Red admiral (*Vanessa atalanta*)
 Painted lady (*Vanessa cardui*)
 American lady (*Vanessa virginiensis*)

Skipper Family (Hesperioidae)

Sachem (*Atalopedes campestris*)
 Silver-spotted skipper (*Epargyreus clarus*)
 Afranius duskywing (*Erynnis afranius*)
 Martial duskywing (*Erynnis martialis*)
 Persius duskywing (*Erynnis persius*)
 Two-spotted skipper (CSC) (*Euphyes bimacula*)
 Dun skipper (*Euphyes vestris*)
 Nevada skipper (*Hesperia nevada*)
 Ottoe skipper (*Hesperia ottoe*)
 Garita skipperling (*Oarisma garita*)
 Common sootywing (*Pholisora catullus*)
 Russet skipperling (*Piruna pirus*)
 Golden skipper (*Poanes taxiles*)
 Peck's skipper (*Polites coras*)
 Crossline skipper (*Polites origines*)

Sandhill skipper (*Polites sabuleti*)

Tawny-edged skipper (*Polites themistocles*)

Common checkered-skipper (*Pyrgus communis*)

POUDRE RIVER NATURAL AREAS MANAGEMENT PLAN

Attachment D

Aquatic Insects Collected from the Cache la Poudre River Lyons Park to CSU's Environmental Learning Center

(Provided by Dr. Boris Konratieff, Colorado State University, Entomology Department, May 1996.)

Platyhelminthes (Flatworms):

Dugesia dorocephala (Woodworth)

Nematoda

Annelida:

Hirudinea (Leeches):

Erpobdella punctata (Leidy)

Placobdella ornata (Verrill)

Helobdella elongata (Castle)

Helobdella fusca Castle

Helobdella stagnalis (L.)

Oligochaeta (Aquatic worms)

Arthropoda:

Crustacea:

Amphipoda (Scuds):

Crangonyx sp.

Hyalella azteca (Saussure)

Decapoda (Crayfish):

Orconectes virilis (Hagen)

Isopoda (Aquatic sowbugs):

Caecidotea communis (Say)

Acarina (Aquatic mites)

Insecta:

Collembola (Springtails):

Isotoma sp.

Plecoptera (Stoneflies):

Capnia confusa Claassen

Capnia decepta (Banks)

Claassenia sabulosa (Banks)

Cultus aestivalis (Needham and Claassen)

Hesperoperla pacifica (Banks)

Isoperla fulva Claassen

Isoperla phalerata (Smith)

Isoperla quinquepunctata (Banks)

Pteronarcys californica Newport

Skwala americana (Klapalek)

Triznaka signata (Banks)

Zapada cinctipes (Banks)

Ephemeroptera (Mayflies):

Acentrella insignificans (McD.)

Acentrella turbida (McD.)

Ameletus subnotatus Eaton

Ameletus validus (McD.)

Baetis flavistriga McD.

Baetis tricaudatus Dodds

Callibaetis ferruginea hageni Eaton

Caenis amica Hagen

Choroterpes inornata Eaton

Epeorus longimanus Eaton

Ephemerella inermis Eaton

Ephemerella infrequens McD.

Heptagenia diabasia (Burks)

Heptagenia elegantula (Eaton)

Heptagenia solitaria McD.

Hexagenia limbata Serville

Leptophlebia cupida (Say)

Nixe simplicioides (McD.)

Paraleptophlebia heteronea (McD.)

Paraleptophlebia debilis (Walker)

Rhithrogena hageni Eaton

Serratella micheneri (Traver)

Serratella tibialis (McD.)

Siphonurus occidentalis Eaton

Timpanoga hecuba (Eaton)

Tricorythodes minutus Traver

Odonata (Dragonflies and Damselflies):

Argia sp.

Amphiagrion abbreviatum (Selys)

Ophiogomphus s. severus Hagen

Hemiptera (True bugs):

Hesperocorixa laevigata (Uhler)

Rhagovelia distincta Champion

Sigara alternata (Say)

Sigara grossolineata Hungerford

Trichocorixa calva (Say)

Trichoptera (Caddisflies):

Agraylea multipunctata Curtis
Agapetus boulderensis Milne
Brachycentrus americanus (Banks)
Brachycentrus occidentalis Banks
Cheumatopsyche pettiti Banks
Culoptila thoracica (Ross)
Glossosoma parvulum Banks
Glossosoma ventrale Banks
Helicopsyche borealis (Hagen)
Hesperophylax occidentalis (Banks)
Hydropsyche morosa Hagen
Hydropsyche occidentalis Banks
Hydroptila pecos Ross
Lepidostoma ormea Ross
Limnephilus lithus (Milne)
Nectopsyche stigmatica (Banks)
Oecetis inconspicua (Walker)
Polycentropus cinereus Hagen
Psychomyia flavida Hagen
Rhyacophila brunnea Banks
Rhyacophila coloradensis Banks

Lepidoptera (Butterflies and moths):

Petrophila avernalis (Grote)

Coleoptera (Beetles):

Agabus sp.
Berosus fraternus LeConte
Berosus stylifer Horn
Dubiraphia sp.
Haliplus sp.
Narpus concolor (LeConte)
Optioservus castanipennis (Fall)
Optioservus divergens (LeConte)
Oreodytes congruus (LeConte)
Zaitzevia parvula (Horn)

Diptera (Flies):

Atherix pachypus Bigot
Antocha sp.
Dicranota sp.
Deuterophlebia coloradensis Pennak
Hexatoma sp.
Tipula abluta Doane
Tipula sp.
Psychoda sp.
Simulium arcticum complex
Simulium vittatum complex
Brillia sp.

Cardiocladius sp.
Chironomus sp.
Corynoneura sp.
Cricotopus spp.
Cryptochironomus sp.
Diamesa sp.
Diplocladius sp.
Endochironomus sp.
Eukiefferiella sp.
Glyptotendipes sp.
Kiefferulus sp.
Lopescladius sp.
Microtendipes sp.
Orthocladius spp.
Parachironomus sp.
Paracladopelma sp.
Paratendipes sp.
Pentaneura sp.
Phaenopsectra sp.
Polypedilum spp.
Procladius spp.
Psectrocladius sp.
Pseudochironomus sp.
Stictochironomus sp.
Tanytarsus spp.
Thienemanniella sp.
Dasyhelea sp.
Palpomyia sp.
Stratiomys sp.
Ephydriidae
Limnophora sp.
Chelifera sp.
Hemerodromia sp.
Dolichopodidae

Mollusca:

Gastropoda (Snails):

Ferrissia sp.
Gyraulus sp.
Lymnaea sp.
Physella sp.

Pelecypoda (Clams):

Pisidium sp.
Sphaerium sp.

POUDRE RIVER NATURAL AREAS MANAGEMENT PLAN

Appendix E

Note: This appendix only reflects plantings for which there is survival information. Many other plantings have occurred, but survival information is unavailable.

Natural Area Planting Survival Rates					
Species	Number planted in '91 (one-year survival rate)	Number planted in '92 (one-year survival rate)	Number planted in '93 (one-year survival rate)		Number planted in '94 (one-year survival rate)
			Cuttings	Stock	
North Shields Pond Natural Area					
Common chokecherry					50 (12%)
Wild plum					50 (2%)
Sand cherry					50 (62%)
Wood's rose					50 (88%)
Golden currant					50 (40%)
Riverbend Ponds Natural Area					
Plains and lanceleaf cottonwood	33 (48%)	75 (27%)	100 (11%)	25 (40%)	
Willow	34 (24%)				
Coyote willow		248 (31%)	100 (8%)		
Rocky Mtn. Juniper	14 (60%)				
Sand cherry		200 (74%)		34 (23%)	
Caragana	35 (80%)				
Plum	29 (71%)	250 (68%)		20 (60%)	
Chokecherry	29 (71%)	150 (61%)		30 (60%)	
Sumac	51 (63%)				
Hackberry	12 (67%)				
Ash	19 (63%)				
Honey locust	20 (75%)				
Rocky Mountain maple	3 (0%)				
Big W. Sagebrush	3 (100%)				
Prairie sagebrush		77 (36%)			

Natural Area Planting Survival Rates

Species	Number planted in '91 (one-year survival rate)	Number planted in '92 (one-year survival rate)	Number planted in '93 (one-year survival rate)		Number planted in '94 (one-year survival rate)
			Cuttings	Stock	
Fringed sagebrush		46 (100%)		38 (1%)	
N. Mexico privet	7 (57%)				
Red-twigged dogwood	4 (0%)				
Red-osier dogwood				8 (0%)	
Buffaloberry	4 (75%)	50 (54%)			
Wood's rose	4 (25%)			50 (56%)	
Yellow currant		100 (59%)	50 (0%)		
Thinleaf alder		5 (40%)			
Rabbitbrush		382 (24%)			
Yucca		95 (2%)			
Prince's plume		73 (0%)			
Western snowberry				50 (46%)	

Poudre River Natural Areas 5-Year Site Management Implementation Plan

ACTION ITEM (High Priority* Items are Italicized)	WHO HELPS PLAN	WHO DOES WORK	EST. ADDITIONAL ** COSTS						Comments (For detailed discussion, see applicable text sections of this document.)
				'98	'99	'00	'01	'02	
GENERAL SITE MAINTENANCE (maintenance applicable to all or most of the Poudre River Natural Areas)									
<i>Survey for archaeological materials before disturbing areas for construction of trails, etc.</i>	NR/Parks staff/depts. that own or jointly own property	CSU faculty/ students; Colo. Archaeol. Soc. volunteers; Contract	\$5,000-10,000	X	X	X	X	X	Costs will vary depending on amount of land disturbed and availability of volunteers (which include "Adopt A Natural Area" and other adoption programs).
Remove litter/trash.	NR staff/depts. that own or jointly own property	NR staff; volunteers	No additional costs	X	X	X	X	X	What is frequency of routine litter/trash removal?
Limit structures in natural areas.	NR staff/depts. that own or jointly own property	NR staff		X	X	X	X	X	No new or existing buildings allowed on natural areas unless they meet site goals.
Install bicycle parking facilities on appropriate sites.	NR/Parks staff/depts. that own or jointly own property	NR staff	\$500	X	X	X	X	X	Possible sites: Archery Range, Arapaho Bend, Nix, Riverbend Ponds, Prospect Ponds, North Shields Pond, Kingfisher Point.
<i>Remove barbed-wire fencing or replace with rail or fabric</i>	NR staff/depts. that own or	NR staff; volunteers	Cost per mile: Smooth wire - \$500; western	X	X	X	X	X	Removal/replacement occurs gradually as time and budgets allow.

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				'98	'99	'00	'01	'02	
<i>fencing.</i>	jointly own property		rail - \$12,800; buck-and-pole - \$18,000; horse fabric - \$37,000						
<i>Use Integrated Pest Management (IPM) for annual control of state and county noxious weeds and for other vegetation control.</i>	NR staff/ depts. that own or jointly own property	NR staff/ depts. that own or jointly own property	No additional costs	X	X	X	X	X	Standard action item for City natural areas and parks. Herbicides are used to control noxious and other weeds that threaten native plant communities and those covered by state and local regulations..
Remove non-invasive exotics.	NR staff/ depts. that own or jointly own property	NR staff/ depts. that own or jointly own property; volunteers	No additional costs	X	X	X	X	X	Very low priority item
<i>Remove invasive non-native grasses.</i>	NR staff/ depts. that own or jointly own property	NR staff	\$1,000/acre	X	X	X	X	X	Includes removal of smooth brome, cheatgrass, others. Controlled fire also may be used.
<i>Remove Russian olive, Siberian elm, and saltcedar.</i>	NR staff/ depts. that own or jointly own property	NR staff; volunteers; contract	\$1,000/year	X	X	X	X	X	Time-frame for eradication depends on volunteer efforts; ongoing maintenance needed to remove plants that establish from off-site seed sources.
<i>Leave snags in place unless they create a hazard.</i>	NR/Parks/ Forestry staff/depts. that own or jointly own	NR staff/ depts. that own or jointly own	No additional costs anticipated	X	X	X	X	X	Snags are removed only if they threaten human safety, transportation paths, or river flows.

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				'98	'99	'00	'01	'02	
	property	property							
During earthwork activities, use disturbed soils containing native seeds/plants for revegetation projects or stockpile for future use.	NR/Parks staff/depts. that own or jointly own property	NR/Parks staff; contract; volunteers	No additional costs	X	X	X	X	X	Disturbed soils containing native seeds and plants will be used to revegetate weed-dominated areas or stockpiled as seed banks for future revegetation projects.
Use controlled fires as management tool as appropriate.	NR staff/depts. that own or jointly own property	NR staff; contract; PFA	No additional costs	X	X	X	X	X	Fire may be used as a research tool to determine if it is beneficial or harmful to native shortgrass prairies.
Install boundary markers	NR staff/depts. that own or jointly own property	Engineering staff	\$50,000	X	X	X	X	X	Project began in '97 to mark all natural area boundaries. As new sites are acquired, their boundaries will be marked.
Provide general educational materials and programs.	NR staff/depts. that own or jointly own property	NR staff; volunteers	No additional costs	X	X	X	X	X	Brochures, videos, and Master Naturalist-led events will be made available.
Inform visitors of watercraft regulations and safety issues as appropriate.	NR/Parks staff/depts. that own or jointly own property	NR/Parks staff	No additional costs	X	X	X	X	X	State regulations apply to use of watercraft on the river. An advance warning of the City's drop structure will be posted.
Provide information about major floods.	NR/Storm-water staff	NR/Storm-water staff	\$1,000/site		X	X	X	X	Signs at appropriate sites will provide information about extent/impact of major floods.

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				'98	'99	'00	'01	'02	
REGULATORY ISSUES									
<i>Inform visitors/neighbors of regulations governing these natural areas.</i>	NR staff/ depts. that own or jointly own property	NR staff; contract	\$45/sign; 10 signs/year	X	X	X	X	X	Replacement of vandalized signs will likely be needed on a on-going basis.
<i>Include regulations governing these natural areas in applicable brochures.</i>	NR staff/ depts. that own or jointly own property	NR staff; volunteers	\$500 for dedi- cated brochure	X	X	X	X	X	Regulations will be included in site brochures or presented in a dedicated brochure.
Enforce regulations as appropriate.	NR staff; Ranger	Ranger	No additional costs	X	X	X	X	X	Rangers will use soft approach, informing visi- tors of regulations and how human actions affect natural areas. But when needed, citations will be issued. Felonies are enforced by Police.
Simplify reporting mechanisms for regulations/management needs.	NR/Parks staff	NR staff	No additional costs anticipated	X					At present, public must call any of a wide range of agencies depending on problem. The goal is to have one number for all non- emergency calls.
<i>Review all easement requests to ensure they are required for the public good, site impacts are minimized, unavoidable impacts mitigated.</i>		NR/Parks staff/depts. that own or jointly own property; boards; City Council	No additional costs anticipated	X	X	X	X	X	Ongoing review of utility easement requests; unknown if any will be requested.
<i>Review lease requests to assure they are granted only if they do</i>		NR/Parks staff/depts.	No additional costs anticipated	X	X	X	X	X	Includes agricultural leases that continue until sites are managed as natural areas and

ACTION ITEM (High Priority* Items are Italicized)	WHO HELPS PLAN	WHO DOES WORK	EST. ADDITIONAL ** COSTS						Comments (For detailed discussion, see applicable text sections of this document.)
				'98	'99	'00	'01	'02	
<i>not conflict with site management goals.</i>		that own or jointly own property							buildings leased to avoid deterioration until they are converted to natural area purposes.
<i>Comply with Art In Public Places regulations.</i>	NR/Parks staff/depts. that own or jointly own property	APP board approved artists	\$25-\$50/hr. plus art features	X	X	X	X	X	Required on all construction projects of ≥\$50,000. Parking lots and trails are likely Poudre River natural area projects that must comply. Costs vary per project.
<i>Comply with American's With Disabilities Act.</i>	NR/Parks staff/depts. that own or jointly own property	NR/Parks staff/depts. that own or jointly own property	Costs will vary widely	X	X	X	X	X	Most of these natural areas will be accessible to persons with disabilities, but some trails may not be. Communications/interpretation features will meet ADA regulations where appropriate.
FLOODPLAIN ISSUES									
As appropriate, protect and interpret resource values of natural floodplains.	NR/Parks/ Stormwater staff	NR/Stormwater staff	Costs determined on a site-by-site basis	X	X	X	X	X	At appropriate sites, water, biological, and societal resources of natural floodplains will be protected and interpreted.
Site #96P1									
Conduct experimental burn for short grass management; burn junk wood on site.	NR/ PFA staff	PFA staff	No costs	X					Burning attempts failed in '97; will be tried again in '98 if conditions warrant.
<i>Ensure that site is used only for purposes allowed in purchase agreement.</i>	NR/Parks staff	NR/Parks staff	No costs anticipated	X	X	X	X	X	Only open space, park, trails, and recreational uses allowed. No gravel mining allowed.
Construct paved trail across site.	NR/Parks/ Stormwater staff	Parks staff	Costs borne by trails		X				This segment of the Poudre River trail system will include a bridge across the river.

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				'98	'99	'00	'01	'02	
Install interpretive features after entire natural area configuration for this area is completed.	NR staff	NR staff/ contract	Implementation costs unknown	X	X				Likely to include features about unique role of rivers in arid settings. May interpret the river's cutting down and moving north.
Conduct plant and wildlife surveys.	NR staff	NR staff/ contract	\$500	X					Formal surveys have not been conducted.
Remove rubble that has been dumped on the site.	NR/Parks staff	NR staff	No additional costs	X					Includes old plumbing fixtures and other rubble from old buildings.
Replace perimeter barbed wire fencing with horse fabric and post and rail.		NR staff	Cost/mile: horse fabric- \$37,000; post & rail- \$12,800	X					Perimeter fencing done in '97. Interior fencing will be removed.
<i>Keep site clear of vagrant activity</i>	NR/Parks/ Police staff	NR staff; Ranger; Police		X	X	X	X		Ranger will monitor site for evidence of vagrants; maintenance staff will remove bottles, clothing, etc. left by vagrants.
North Shields Pond Natural Area									
Continue planting buffalo and blue gramma grasses, remove Siberian elm, replace crack willow with river birch and other native trees/shrubs.	NR staff	NR staff		X	X	X	X		These are on-going activities needed to restore native character of site. They will occur as time and budget allow.
Continue to involve volunteers in plantings; maintain the new plants until established.	NR staff	NR staff; volunteers	cost of plants to be determined	X	X	X	X	X	In the past few years, staff and volunteers have planted over 1500 shrubs and trees.
<i>Remove large dead tree branches if they threaten</i>	NR/ Forestry	Forestry	No additional costs	X	X	X	X	X	Some large cottonwood branches may have to be removed.

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				'98	'99	'00	'01	'02	
<i>human safety.</i>	staff								
Stock pond for fishing.		CDOW	No additional costs	X	X	X	X	X	Stocked with large mouth bass, crappie, channel catfish.
Install bat boxes.		NR staff	No additional costs	X					
Evaluate and implement fish habitat enhancement as appropriate.	NR/Parks staff; CDOW	NR/Parks staff; CDOW	No costs anticipated	X	X	X	X	X	Past enhancement included sinking Christmas trees. This will be continued if appropriate.
Remove camper shell.		NR staff		X					The camper shell has been in the pond for many years but became visible as water level dropped.
Complete natural surface trail around the site.	NR staff	NR staff	\$10,000/mile		X				Improve and define trail for safe access around site. May add boardwalks in wet areas. If advisable, develop detailed trail construction plan to ensure proper alignment, cut and fill, etc.
Allow progression from pond to wetland to continue; provide interpretation on this process.	NR/Parks staff	NR staff	Interpretation costs: \$2,000	X	X	X	X	X	Parks staff management actions should allow progression to occur; Natural Resources will design interpretive feature.
Continue installing "steps" to ponds; close eroding areas	NR staff	NR staff	No additional costs	X					The constructed "steps" replace eroded trails.
Provide interpretive feature about birds that frequent this site and about pond ecology.	NR staff	NR staff	\$1,500			X			Interpretive feature will be geared to children. Children may also help in creating the features.
Allow CDOW to conduct algae experiment.	NR staff/ CDOW	CDOW	No cost to City	X	X	X	X	X	CDOW has expressed interest in experimenting with blue dye to limit algae growth. The dye does not kill algae.

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				'98	'99	'00	'01	'02	
<i>Monitor site for vagrant encampments.</i>		NR staff; Ranger; Police	No additional costs anticipated.	X	X	X	X	X	Site should be frequently monitored; encamp- ments should be removed when discovered.
Replace site sign.	NR staff	NR staff	\$500	X					Current sign is in poor condition.
Install restroom.	NR staff	NR staff	\$25,000-75,000				X		Cost determined on type of restroom.
Evaluate condition of fish habi- tation to determine if the site is a valid fishery.	NR/Parks staff/ CDOW	CDOW	Costs to be determined	X	X				Evaluate deepening the east end of the pond and advise on other habitat improvements. Develop detailed construction plan for major changes.
Hickory Park Natural Area									
Treat Russian olive stumps with herbicide.		NR staff	No additional costs	X					Tree stumps are resprouting because they were not treated with herbicide.
Eradicate spurge with herbicide.		NR staff	No additional costs	X					There is a considerable amount of spurge on the site.
Leave downed cottonwoods in place to provide wildlife habitat.	NR staff	NR staff	No costs	X	X	X	X	X	There are several downed trees at the north end of the natural area.
Evaluate fencing.	NR/Parks staff	NR staff	\$12,000			X			Where possible replace barbed wire fence with less damaging material. Some barbed wire may remain to separate site from cattle grazing area.
Replace existing fence at Hickory Street informal entrance.	NR/Parks staff	NR staff	\$500	X					Current fence, designed to keep vehicles out of site, is to be replaced with "v" shape entrance to allow pedestrian only access.
In cooperation with Parks, install an interpretive trail.	NR/Parks staff	NR/Parks staff;	\$10,000/mile; cost sharing with			X			Trail will be in a buffer between the park and the natural area. If appropriate, a trail

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				'98	'99	'00	'01	'02	
		contract	Parks to be determined						construction plan will be developed.
If needed, install trail spurs to interpretive sites.	NR/Parks staff	NR staff; volunteers	\$5,000			X			Depending on the location of the trail between the natural area and the park, trail spurs may be needed to access interpretation points.
Provide interpretive features.	NR staff	NR staff	\$2,000				X		Interpretive topics to include wildlife, history of the oxbow, and water diversion.
Conduct formal plant survey.	NR staff	Contract	\$300	X					
Remove trash from the site.		NR staff	No addt'l costs	X	X				An old shed, wire, etc. need to be removed.
Salyer Natural Area									
Eradicate spurge.		NR staff	No addt'l costs	X	X	X	X	X	The site contains a large amount of spurge.
Remove metal fence posts.		NR staff	No addt'l costs			X			Old wooden posts will be left on site.
Provide interpretive feature(s).	NR staff	NR staff	\$2,000				X		Interpretive topic: native plants of the site, with wild iris as the focus.
Replace barbed wire fence with smooth wire or western rail.	NR staff	NR staff	Per mile: smooth wire - \$500; western rail - \$12,800			X	X		Fence to be replaced is along site's northern boundary.
Install new site sign.	NR staff	NR staff	\$500	X					Previous sign was ruined by vandals.
Remove structural remnants.		NR staff	No addt'l costs				X		These include metal items, an old couch, house foundation, rip-rap.
Legacy Park Natural Area									
Remove some brush from pre-	NR staff	NR staff	No addt'l costs		X				Brush from undesirable species will be

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				'98	'99	'00	'01	'02	
vious site clean-up.									removed; other brush will be left as wildlife habitat.
Remove Russian Olive.		NR staff	Costs covered in general maintenance	X	X	X	X	X	
Mark a handicapped parking space next to the river.	NR/Parks staff	NR/Parks staff	No additional costs	X					Handicapped persons enjoy watching the river from their cars at this site.
Construct trail through natural area.	NR/Parks/ Forestry staff	NR staff	\$10,000/mile		X				Area will be evaluated to see if trail can be installed without requiring removal of "hazard" trees. Trail construction plan will be developed.
Put one-person benches in natural area.	NR staff	NR staff; volunteers	\$0-800		X				Benches must not exceed one-person capacity, to avoid vagrants sleeping on them.
Provide interpretative features.	NR staff	NR staff; contractor	\$1,000		X				Interpretation will discuss the tradeoffs associated with wildlife habitat removal to discourage vagrants.
Remove trash from the site.		NR staff	No addt'l costs		X				Old cars, etc. need to be removed.
Gustav Swanson Natural Area									
Control weeds, remove undesirable plant species, and mow vegetation as appropriate.		NR staff	No addt'l costs	X	X	X	X	X	Control according to site maintenance manual and as needed to control weeds and other exotics. Weeds on the .39-acre portion next to College Ave. will be removed, and appropriate native grasses, forbs, and shrubs will be planted.
Trim plants to facilitate visitor use.		NR staff	No addt'l costs	X	X	X	X	X	Plants must at times be trimmed to keep signs visible.

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				'98	'99	'00	'01	'02	
Burn grasses on site if deemed appropriate.	NR staff; PFA	PFA	No add't'l costs	X	X	X	X	X	Burning may improve the health of grasses and control weeds.
Continue herbicide use as needed.		NR staff	No add't'l costs	X	X	X	X	X	Herbicides required to control leafy spurge, thistle, and other weeds and exotics.
<i>Monitor site annually for purple loosestrife.</i>		NR staff	No add't'l costs	X	X	X	X	X	Plant was found and removed from the site in '95 and '97.
Continue crack willow removal.		NR staff	No add't'l costs	X	X	X	X	X	This is an on-going effort.
Stabilize and replant bank by storage units.		NR staff; volunteers	No additional costs		X				Volunteers planted grasses in this area in fall '97.
Continue beaver control.		NR staff	No add't'l costs	X	X	X	X	X	Trees are wrapped to control beaver damage.
Evaluate continuing trail past Coy ponds to College Ave. and connecting to Poudre Trail.	NR staff	NR staff	\$10,000				X		This would provide a second access to the site. A detailed trail construction plan will be developed if trail is to be built.
Allow visitors to move freely throughout the site.			No cost impacts	X	X	X	X	X	Visitors are not required to remain on trails.
Evaluate desirability of replacing handicapped fishing pier.	NR/Parks/ Recreation staff	NR/ Recreation staff	\$2,000	X					If pier is replaced, it must be a break away design and placed higher above the river to avoid frequently washing out.
Maintain portable toilet.		NR staff; contract	\$1,000/yr	X	X	X	X	X	Facility is heavily used by site visitors, clients of nearby homeless facility, and trail users.
<i>Continue removing vagrants and their campsites from the site.</i>		Police/ Ranger/NR staff	No additional costs	X	X	X	X	X	Frequent monitoring by law enforcement is needed to accomplish this.

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				'98	'99	'00	'01	'02	
Realign and widen entrance bridge.	NR staff	NR staff; contract	\$50,000			X			Needed to allow Police to monitor the site by car and for maintenance vehicle access.
Augment existing interpretation system.	NR staff	NR staff	\$2,000			X			Introduce features for visually impaired persons.
Replace interpretive sign at entrance.	NR staff	NR staff; contractor	\$500	X					Sign erroneously states that no herbicides are used. That statement needs to be corrected.
Replace shortgrass prairie sign.	NR staff	NR staff	\$500		X				Some species are no longer in the locations indicated on the sign.
Replace sign that was on fishing pier.		NR staff	No additional costs	X					If pier is not replaced, interpretive sign will be placed at another appropriate place on the site.
Continue routine maintenance.		NR staff	No additional costs	X	X	X	X	X	Includes litter control, trash container emptying, sweeping, asphalt and base repair, mowing, weed control, and sign/structure maintenance.
Remove shed.		NR staff	No additional costs	X					Shed is no longer of any use, and it requires frequent graffiti clean-up.
Udall Natural Area									
Implement phase 1 of master plan (includes constructed wet- lands, water quality treatment facility, storm sewer outfall, revegetation, and initial inter- pretive piece).	NR/Storm- water staff	Storm- water staff; contractor	\$84,700 + interpretive piece	?	?	?	?	?	Costs (to be shared by Stormwater and Natural Resources) were taken from master plan, but may change considerably.
Implement phase 2 of master plan (includes public access items).	NR/Storm- water staff	Storm- water/NR staff;	\$88,000	?	?	?	?	?	Costs (to be paid by Natural Resources) were taken from master plan, but may change considerably.

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				'98	'99	'00	'01	'02	
		contractor							
Implement phase 3 of master plan (includes interpretive program, landscaping).	NR/Storm-water staff	Storm-water/NR staff; contractor	\$63,000	?	?	?	?	?	Costs (to be paid by Natural Resources) were taken from master plan, but may change considerably.
Monitor health of historic burr oak.		Forestry staff	\$500	X	X	X	X	X	The tree was in declining health, but was stabilized in '95. Costs are currently being covered by Stormwater. In the future, natural areas program may need to contribute funding.
Wrap trees to protect from beaver damage.		NR staff	No additional costs	X	X	X	X	X	This is standard beaver management.
Williams Natural Area									
<i>Ensure that trees/shrubs do not block view of billboards.</i>		NR staff	No additional costs	X	X	X	X	X	The City is legally enjoined from allowing view of the billboards to be blocked.
Plant low shrubs along trail leading to new bridge.	NR/Parks staff	NR staff	\$3,000			X	X		Shrubs will help identify trail location for snow removal and provide visual buffer.
Construct pedestrian/bicycle bridge to Springer site.	NR/Parks staff	Contractor	Costs borne by trails			X	X		Natural Resources and Forestry depts. will review alignment to reduce tree impacts.
Provide interpretive features.	NR staff	NR staff	\$2,000		X				Topics: waterfowl, migratory songbirds, water-birds, butterflies.
<i>Workers on site must be aware of telephone cable.</i>		Anyone working on site	No costs	X	X	X	X	X	Cable runs parallel to Mulberry between the trail and the roadway.
Springer Natural Area									
<i>Avoid disturbing the wetland.</i>	NR/Parks	NR/Parks	No cost impacts						These vegetation communities provide

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				'98	'99	'00	'01	'02	
<i>upland bank/bar, and cattail marsh vegetation communities.</i>	staff/depts. that own or jointly own property	staff/depts. that own or jointly own property	anticipated	X	X	X	X	X	important elements for wildlife.
Convert invading grasses and forbs to more valuable vegeta- tive cover.	NR staff/ depts. that own or jointly own property	NR staff/ depts. that own or jointly own property; volunteers	\$1,000/acre			X			Invading species have established on fill material.
<i>Protect the American Black Currant.</i>	NR staff	NR staff	No cost impacts anticipated	X	X	X	X	X	This plant population may also serve as a material source for enhancement plantings in other sites.
Be aware of Platte River Power Authority's tree topping activities.		NR staff	No cost impacts	X	X	X	X	X	This is part of PRPA's overhead line mainten- ance.
<i>Minimize disturbance to migra- tory songbirds, waterfowl, waterbirds, and butterflies.</i>	NR staff/ depts. that own or jointly own property	NR staff	No cost impacts	X	X	X	X	X	Migratory species are often more sensitive to disturbance than resident populations.
Continue to wrap larger trees to protect from beaver.		NR staff	No additional costs anticipated	X	X	X	X	X	This is standard beaver management.
Construct wetland in meadow.	Stormwater staff	Storm- water staff/ contract		?	?	?	?	?	
Enhance wetland stormwater treatment system.	Stormwater staff	Storm- water staff/	\$190,000	?	?	?	?	?	The site has a major storm sewer outfall, with additional facilities planned. Costs can be

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				'98	'99	'00	'01	'02	
		contract							expected to exceed estimate.
<i>Control vagrant activities.</i>		NR staff; Ranger; Police	No additional costs	X	X	X	X	X	If not controlled, vagrants erect elaborate encampments on the site.
Provide interpretive features.	NR/Storm- water staff	NR/Storm water staff; contract	\$2,000 plant/wildlife signs; \$3,000 wetland signs	X		X			Natural Resources and Stormwater to design; Parks to install. Topics: stormwater wetland treatment system; waterfowl, migratory song- birds, waterbirds, and butterflies of the site; American black currant.
Conduct research into the con- cept of stormwater treatment utilizing wetlands.	Stormwater staff	Storm- water staff; contract; students		?	?	?	?	?	
<i>Construction and planting acti- vity must consider utility lines.</i>		Anyone working on the site	No costs	X	X	X	X	X	Gas and fiber optics lines run along Mulberry.
Biggall Nature Area									
Move Police dog training facility to the Nix site.	NR staff; Police	NR staff; Police	No costs anticipated	X					No management action on the site can occur until the Police facility is moved.
Remove Russian olive.		NR staff	No addt'l costs	X	X				
Wrap large trees for beaver control.		NR staff	No addt'l cost	X	X	X	X	X	This is standard beaver management.
Repair and maintain screech owl boxes.		NR staff	No addt'l cost	X	X	X	X	X	
Avoid disturbing swallow nests	NR/Parks/	NR/Storm-	No costs	X	X	X	X	X	Riverbank restoration/repair should take

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				'98	'99	'00	'01	'02	
to the extent possible.	Stormwater staff	water staff	anticipated						swallow nests into consideration.
Repair bank erosion.	NR/Parks/ Stormwater staff	NR/Storm- water staff; contract	Costs to be determined				X		
Install restroom on site.	NR/Parks staff	NR/Parks staff	\$25,000 - 75,000				X		Cost depends on type of restroom installed.
Place picnic table on site.		NR staff	No additional cost		X				
Investigate feasibility of using existing deck as a wildlife observation facility.	NR staff	NR staff	Cost will be part of investigation ; could be substantial	X	X				Before the house is razed, the possibility of keeping the deck and improving/modifying it as a public wildlife observation facility will be explored.
If necessary, install safety fenc- ing along the riverbank edge of the site.	NR staff	NR staff	\$10,000- 35,000/mile		X				May be needed to keep people from falling into the river. Cost depends on type of fence needed.
Install interpretive features.	NR staff	NR staff; contract	\$3,000				X		Themes: riverbank cutting, swallows nesting in the banks, screech owls.
Raze the buildings on the site.		NR staff; contract				X			Buildings are in generally bad condition and are not considered useful to the site.
Nix Natural Area									
Restore horse pasture to native meadow.	NR staff	NR staff; volunteers	\$1,000/acre			X			
Create native sod production area and native shrub starter	NR staff	NR staff				X			This function may need to be moved to another part of the site if the Horticulture Center

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area in field between houses and railroad tracks.									chooses this site.
Install greenhouse.	NR staff	NR staff				X			This will serve as native plant nursery.
Use the barn for seed storage.	NR staff	NR staff	No additional cost			X	X		This is for storage of seed to be used in restora- tion projects.
<i>Maintain ditch deliveries until they are deemed unnecessary.</i>	NR staff	NR staff		X	X	X	X	X	Deliveries will be maintained while the site is rented out. Water may be needed indefinitely for sod production and shrub starter functions, and it may be necessary to upgrade the system.
Maintain existing roadways on the site as trails.	NR staff	NR staff	No additional cost	X	X	X	X	X	These will provide two connecting points to the paved trail system.
Install interpretive features.	NR staff	NR staff; contract	\$3,000			X	X		Topics: site restoration, native plant nursery, demonstration backyard wildlife habitat.
<i>Continue current leasing arrangements until the City is ready to occupy the site.</i>	NR staff	NR staff	No additional cost	X	X				The goal is to have the buildings continuously occupied, as unoccupied buildings quickly become rundown and vandalized.
Arrange to move Police dog training facility to an appropriate portion of this site.	NR/Police staff	NR/Police staff	No costs anticipated	X	X				Police may use a room in either house for offices and put dog pens south of the build- ings. Cannot be done until tenants vacate property.
Remove barbed wire fencing; maintain non-barbed wire fenc- ing along the paved trail.		NR staff	No additional cost			X			Fencing along the trail will help to avoid site visitors using inappropriate portions of the site.
Kingfisher Point Natural Area									
Work with consultant to deter-	NR staff	NR staff;	All site costs	X					The lime deposits on the site provide unique

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mine appropriate restoration methods.		contract	will be identified in restoration contract						challenges which will be included in the consultant's scope of work.
Ensure that site fencing allows appropriate deer movement through the site.	NR/Parks staff; contract	NR/Parks staff	No additional costs	X					Deer will move through the site, but should be directed (with fencing) to use underpasses and culverts, and not to cross Timberline.
Mine gravel from site if appropriate.	NR staff; consultant	Contract	Costs to be identified through gravel study	X	X				"Strategy for Gravel Lands Along the Poudre River" may recommend mining as a reclamation strategy.
If appropriate, construct a pedestrian-only (no bikes) trail loop.	NR/Parks staff; contract	NR/Parks staff; contract	\$10,000	X	X				This would provide access for those who want a slower-paced or short distance recreational experience. Siting will be part of the contractor's scope of work on this site.
Relocate paved trail.	NR/Parks staff; contract	Contract	Costs covered by trails	X					Trail (currently too close to the river) will be pulled back to reduce negative river impacts, but will continue to provide mountain views.
Make the site inaccessible to all-terrain vehicles.	NR/Parks staff; contract	NR staff; contract	Method, and therefore costs, unknown	X					Vehicles currently drive into the river from private property north of the river. They need to be kept from getting onto the natural area.
Install interpretive features.	NR staff	NR staff; contract	\$5,000			X	X		Topics: history of the site; the mountain range visible from the site
Avoid using the site as a lime dumping area for nearby projects unless the lime is beneficial to the site.	NR/Parks staff; contract	NR staff; contract	No additional costs anticipated	X	X	X	X	X	If the site is mined for gravel, the lime deposits, including those from adjacent sites, may be appropriate for backfill. This possibility will be a part of site research.
Cattail Chorus Natural Area									

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Remove Russian olive.		NR staff	No addt'l cost	X	X	X	X	X	
<i>Place wildlife habitat features as the highest priority in managing the site.</i>	NR staff	NR staff	No additional cost	X	X	X	X	X	
Ensure that fencing is high enough off the ground to allow movement of snapping turtles.	NR staff	NR staff	No additional cost	X					Snapping turtles are present near the Spring Creek confluence.
If necessary, improve the culvert at Spring Creek.	Stormwater staff	Storm- water staff	Costs unknown			X			May be needed to adequately handle backflow. A detailed construction plan will be prepared.
Be aware that Timberline Pit may be drained through this site.	Gravel Study Team	Contractor	No costs anticipated	X					One consideration of the "Strategy for Gravel Lands Along the Poudre River" is to drain this gravel pit through this natural area.
Install bike rack at natural surface trail leading to wildlife observation point.	NR staff	NR staff; volunteers	\$500	X					This is a pedestrian-only trail. Bike racks will be placed at trail entrance for cyclists who want to spend time on the wildlife observation trail.
<i>Gate existing maintenance road.</i>	NR staff	NR staff	\$300	X					If site visitors used the road as a trail, there would be excessive disturbance to the wildlife.
Replace fencing along perimeter of site.	NR staff	NR staff	\$500/mile	X					Needed to keep people from entering the sensitive natural area and disturbing wildlife.
Remove barbed wire from existing fencing.		NR staff	No additional cost	X					Fencing needs to remain, but barbed wire will be removed.
Sign the natural surface trail along the river.	NR staff	NR staff	\$45	X					The trail was a detour during construction of the paved trail, but is still open to public use. A sign is needed to make it clear that it is a public trail.

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Consider requiring develop- ment west of the site to provide an easement for parking and pedestrian access to Cattail Chorus.	NR staff	NR staff	Costs unknown	X					Any access from this area will lead visitors to the existing Spring Creek Trail.
Install interpretive features.	NR staff; contract	NR staff; contract	\$2,500	X					Topics: wildlife of the area; the Spring Creek confluence.
Conduct formal plant survey.	NR staff	Contractor	\$440	X					
Riverbend Ponds Natural Area									
Investigate continuously flood- ing the Russian olive to eradi- cate them.	NR/Parks/ Stormwater staff	NR/ Storm- water staff	Costs unknown	X	X				If feasible, this would be done using pre-81 water.
Eradicate salt cedar.		NR staff	No additional costs anticipated	X	X				
Remove osprey hack towers, along with related bridge and fencing.		CDOW, volunteers	No additional costs	X					Osprey have not been seen returning to the site to nest. Poles will be left in place as perch sites.
Consider future wildlife intro- duction projects on a case-by- case basis.	NR staff	NR staff	No additional cost	X	X	X	X	X	We will work with the Division of Wildlife on their requests for introductions.
If compatible with final recom- mendations of "Strategy for Gravel Lands Along the Poudre River," regrade ponds to improve fish and shorebird habitat.	NR/Parks staff; Gravel Study Team	NR staff; contractor	Costs unknown				X		Detailed regrading plans will be developed.

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Continue current beaver control.		NR staff	No additional costs	X	X	X	X	X	Control includes wrapping larger trees and removing lodges only when they impede water flow from one pond to another.
Repair screech owl boxes.		NR staff, volunteers	No additional costs	X					
Remove large, unsightly pile of old downed wood near west entrance.	NR/Parks staff	NR staff; volunteers	No additional costs			X			Foxes and rabbits are probably using this habitat. A smaller, more aesthetically pleasing brush pile will be built to provide habitat.
Continue stocking of ponds.		CDOV	No additional cost	X	X	X	X	X	Ponds are stocked with such warm water species as large mouth bass, crappie, and channel catfish. Pond #3 is stocked with rainbow trout.
Install small bridge on Prospect between the river and Summitview.		Storm-water; contract							This bridge is for stormwater purposes, but also will provide a place for wildlife to cross under Prospect, and hopefully reduce road kill. Will be built when Prospect is widened, sometime after 2005.
Install fencing to funnel mammals to safe crossing of Prospect under stormwater's new bridge.	NR staff	NR staff	\$30,000- \$40,000/mile						This will hopefully reduce road kill of larger mammals.
Conduct water management study.	NR/Storm-water staff; contract	Contract	Estimated costs - \$50,000	X	X				Many water management issues, that go far beyond the scope of this current management plan, need to be dealt with.
<i>Take Anheuser Busch and Boxelder waste lines into consideration in making alterations to the area.</i>	Anyone working on site	Anyone working on site	No additional costs	X	X	X	X	X	Lines run under trail area that may be modified to correct water overtopping problem. The lines should be highlighted on site maps.

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Continue to work with CDOW for fish habitat improvement.	NR/Parks staff; CDOW	NR staff; CDOW	No additional costs	X	X	X	X	X	Improvement in the past has included sinking Christmas tree structures.
Continue to allow dive rescue access to the ponds.			No additional costs	X	X	X	X	X	Ponds are used for rescue practice.
Assess Riverbend Ponds parking lot adequacy and trail access to Kingfisher Point.	NR/Parks staff	NR staff	No additional costs	X	X				This will be necessary if this parking lot is to become the prime access point for Kingfisher Point Natural Area.
Reconfigure northeast parking lot if additional parking is needed.	NR staff	NR staff			X	X	X		Parking lot meets current needs, but may be reconfigured if demand grows.
Grade and stripe the north and northeast parking lots.	NR staff	NR staff		X					Identification of parking spaces can improve efficient use of the parking lots.
<i>Make Phase I improvements to Prospect entrance.</i>	NR/Parks staff	NR staff	Costs to be determined	X					Interim improvements (until Prospect is widened) include closing all but one of the informal entrances, improving that entrance, and removing weeds from around the entrance signs. A detailed construction plan will be prepared.
Make Phase II improvements to Prospect entrance.	NR/Parks staff	Transportation; contractor	Costs to be determined						To be made in conjunction with Prospect widening - includes safety considerations for left in/out for Riverbend Ponds and Cottonwood Hollow, formal entrances to these natural areas, and entrance positioning to avoid traffic conflicts. A detailed construction plan will be prepared.
Provide safe pedestrian under-	NR/Parks	NR staff;	Costs to be			?			If possible, a trail will be built on the east side

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pass between Riverbend Ponds and Cottonwood Hollow.	staff	contractor	determined						of the river under the existing bridge and/or an underpass may be constructed under Prospect. A detailed construction plan will be prepared.
Install two restrooms and drinking fountains.	NR/Parks staff	NR staff; contractor	\$50,000-150,000			X	X		Costs dependent on type of restrooms.
Enforce bow fishing regulation.		Ranger; Police	No additional cost	X	X	X	X	X	Police have advised bow fishers that this activity is only allowed at Archery Range Natural Area.
Enforce ice fishing, skating, etc. regulation.		Ranger; Police	No additional cost	X	X	X	X	X	Ice is not groomed and is therefore unsafe.
Install handicapped fishing pier.	NR/Parks staff; CDOW	NR staff; contract; volunteers	Up to \$50,000				X		Cost will depend on sophistication of the pier and on volunteer involvement.
Make trails handicapped accessible as appropriate.	NR/Parks staff	NR/Parks staff	Costs to be determined			X	X		Crusher fines will be applied to trails for accessibility.
Enforce leash law.		Ranger	No additional costs	X	X	X	X	X	Dog owners will be informed of the City's dog run area for off-leash activities.
Keep brochure holders stocked.		Parks staff, Ranger	No additional costs	X	X	X	X	X	Brochures are for the self-guided nature walk.
Develop Braille interpretation system.	NR staff; contractor; volunteers; ADA board	NR staff; contractor; volunteers	\$5,000			X			The first step will be to investigate the feasibility of this project.
Research recreational use.	NR/Parks staff	NR staff; volunteers	No significant costs anticipated	X	X				Determine if changes/improvements are needed. Compare current use to use after Timberline is completed.

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Continue Russian olive research	Volunteer	Volunteer	No costs	X	X				Project researches various eradication methods.
Study prairie gentian decline.	NR staff	NR staff; volunteers	No significant costs anticipated	X	X				Goal is to improve habitat for this rare plant, whose population is declining.
Monitor various research projects.	NR staff	NR staff	No additional costs	X	X	X	X	X	Interact with students, etc. who are conducting their own research projects on the site. Get copies of completed research reports.
Cottonwood Hollow Natural Area									
Reevaluate reclamation goal for the site.	NR staff	NR staff	No additional costs	X					Original goal (minimize exposed water could change to maximizing habitat value based on the site's natural functions and on pre-'81 water purchased since original goal was set.
Control weeds in a manner appropriate for the site.	NR staff	NR staff		X	X	X	X	X	Noxious weeds must be controlled, but recent plantings include forbs that could be damaged by broadcast spraying. Mowing is the preferred control method.
Continue removal of tamarisk and salt cedar.	NR staff	NR staff	No additional costs	X	X				Tamarisk removal project began fall '97.
Conduct shrub plantings.	NR staff	NR staff/ volunteers		X	X				Shrubs will be planted on the basin's side walls.
Consider designing for shore-bird habitat.	NR staff	NR staff	Costs unknown	X					Original design did not include shorebird habitat. But since shorebirds are using the site, such habitat will be considered.
Keep site beaver-free.	NR staff	NR staff	No additional costs	X	X	X	X	X	Beaver would be a detriment to the desired establishment of cottonwoods on the site.

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Manage water levels.	NR staff	NR staff	No additional costs	X	X	X	X	X	Water level manipulation will help with cottonwood establishment.
Consider manipulation of pre-'81 water.	NR staff	NR staff	Costs unknown	X					Some pre-'82 water may be moved from the southern pond into the north basin to meet augmentation requirements.
Install new water control structure.	NR staff	NR staff; contractor	Costs unknown	X					Current structure does not allow accurate measurement of water flow.
Install bicycle rack at CSU's ELC Prospect parking lot.	NR staff; ELC	NR staff	\$500	X					CSU is allowing this to be the joint parking lot for both the ELC and Cottonwood Hollow.
Limit human activity to the eastern portion of the site.	NR staff	NR staff	No costs	X	X	X	X	X	The purpose is to limit human disturbance of the wildlife on the site.
Design and install interpretive features.	NR staff	NR staff; contractor	\$3,000 - \$5,000	X					Topics will include goals, successes, failures, and changes of the reclamation process; diverse birdlife and marsh sounds of the site.
Document reclamation results.	NR staff; project partners	NR staff, project partners	No additional costs	X		X			Site results could have wide-ranging applicability.
Study establishment of shorebird habitat.	NR staff, U.S. Geological Survey	NR staff, U.S. Geological Survey	Costs unknown	X		X			Will determine if establishment of shorebird habitat is feasible.
Conduct on-going wildlife research.	NR staff	NR staff; contractor, volunteers	No, or minimal, costs anticipated	X	X	X	X	X	The site should be observed to determine changes in wildlife use as the habitat changes.
<i>Be aware of easements when doing work on the site.</i>		Anyone working on	No additional costs	X	X	X	X	X	Any earthmoving must avoid impacting utility easements.

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				'98	'99	'00	'01	'02	
		the site							
Prospect Ponds Natural Area									
Remove salt cedar.	NR staff/ depts. that own or jointly own property	NR staff	No additional costs		X				
Control noxious weeds as appropriate.	NR staff/ depts. that own or jointly own property	NR staff	No additional costs	X	X	X	X	X	Proximity to water determines which herbicides are used.
Stock ponds.	CDOW	CDOW	No addt'l costs	X	X	X	X	X	Warm water species are stocked annually.
Continue beaver management.	NR staff	NR staff	No addt'l costs	X	X	X	X	X	Standard beaver control includes wrapping larger trees, but not smaller ones.
Maintain trail.	NR/Parks staff	NR/Parks staff	No addt'l costs	X	X	X	X	X	Paved trail is maintained by Parks; natural surface trail is self-maintained.
Make handicapped fishing areas accessible.	NR staff	NR staff	No addt'l costs	X					Handicapped fishing areas need restraints installed, vegetation and picnic tables removed.
Continue to post ice on the ponds as unsafe.	NR staff	NR staff	No additional costs	X	X	X	X	X	The ice is not groomed, therefore no recreational activities should occur on the ice.
Install interpretive signage about winter waterfowl.	NR staff/ depts. that own or jointly own property	NR staff; contractor	\$800			X			Winter waterfowl watching at the site can be quite rewarding.

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Install milkweed interpretive feature.	NR staff/ depts. that own or jointly own property	NR staff; contractor	\$500			X			The site is ideal for interpreting milkweed's importance in the life cycle of the monarch butterfly.
Install interpretive features about leaf imprints in trail.	NR/Parks /depts. that own or jointly own property staff	NR staff; contractor	\$500			X			Leaves that were allowed to imprint the concrete trail provide a unique interpretation opportunity.
Arapaho Bend Natural Area									
Control noxious weeds.	NR staff	NR staff	No additional costs	X	X	X	X	X	Methods appropriate for aquatic applications must be used.
To the extent possible, protect existing savanna.	Gravel mining operators; Park and Ride planners	Gravel mining operators; Park and Ride planners	Costs may or may not be involved	X					Decisions regarding mining and park and ride placement on the site will determine whether the savanna can be protected.
Restore grassland on the north end of the site.	NR staff	NR staff; contractor	\$1,000/acre					?	Cannot begin until decisions are made regarding gravel mining.
Control beaver.		NR staff	No additional costs	X	X	X	X	X	Routine control includes wrapping larger trees and allowing beaver to take smaller ones.
Stock fishing pond(s).	NR/Parks staff; CDOW	CDOW	No additional costs					?	Cannot be done until decisions are made regarding gravel mining and reclamation (i.e., if ponds are drained, stocking will be

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									irrelevant.)
Mine site if appropriate.	NR staff	Contractor	Costs unknown	?	?	?	?	?	Site may be mined in exchange for protecting heronry near CSU's ELC.
Work with Colo. Dept. of Transportation on wetland mitigation.	NR. staff; CDOT	CDOT; contractor	Costs borne by Park and Ride project	X					Preferred mitigation, from a resource perspective, would be to clean up the southeast shoreline of the northeast pond and extend the pond an amount equal to the required mitigation. Final decision must be made in tandem with "Strategy for Gravel Lands Along the Poudre River."
Install handicapped fishing pier if appropriate.	NR/Parks staff; gravel team; CDOW;	CDOW; contractor	Costs to be determined					?	Pier will be installed if one or more ponds remain after "Strategy for Gravel Lands Along the Poudre River" decisions are made. If all ponds are drained, the fishing pier is irrelevant.
Maintain natural surface roadways as hiking trails.	NR staff	NR staff	No additional costs.		?	?	?	?	Existing roadways (those that remain after gravel mining reclamation) will be turned into hiking trails. Additional trails also may be built.
Build parking lot at north end of site if appropriate.	NR staff	NR staff			?	?	?	?	Parking for automobiles and bikes will be available at the park and ride. If access is desired from County Road 7, a parking lot will be built at the north end of the site.
Allow paved trail to traverse the site.	NR/Parks staff	Parks staff; contractor	Costs to be borne by trails		X	X			The paved Poudre River trail will eventually extend across the site. A connection also will be made, probably as a bike lane along CR7, to the park and ride facility.
Provide information about the Council Tree.	NR staff; historians	NR staff; contractor	\$2,000				X		The Council Tree is erroneously believed to have been on the site. Because of the widely

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									held misconception, information about the tree and the site where it likely existed will be provided on site.
Provide interpretive features about wildlife of the site.	NR staff	NR staff; contractor	\$2,000				X		Interpretation will include birds of the site and beaver (if site reclamation includes ponds).
Clean up junk and trash from site.	NR staff	NR staff	No additional costs	X					Some junk remains from previous owner. Public occasionally dumps trash on the site.
Repair and maintain gates.	NR staff	NR staff	No additional costs	X	X	X	X		Keeping the site gated helps to keep the public from driving in and dumping loads of trash.
Remove billboards.	NR staff	Contractor		X					Leases on the billboards have expired. They are being rented on a month-to-month basis until the end of 1997, when they will be removed.
Deactivate electric fence.		NR staff	No anticipated costs	X	X				Electric fence may be activated while agricultural leases exist on site, but will be deactivated when site opens to the public.

*High priority items are those necessary to ensure protection of sensitive wildlife species, plant communities, geological features, and public safety.

**Additional costs are those not covered by current staff and general maintenance budgets.