City of Fort Collins

Fossil Creek Natural Areas Management Plan Update

Draft May 18, 2017

Natural Areas Included in this Plan:

Cathy Fromme Prairie
Hazaleus
Colina Mariposa
Redtail Grove
Two Creeks
Prairie Dog Meadow
Pelican Marsh
Fossil Creek Wetlands
Fossil Creek Reservoir
Eagle View
Flores del Sol
Soaring Vista

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Memorandum of Adoption

The City of Fort Collins Fossil Creek Natural Areas Management Plan Update was administratively adopted by the Natural Areas Director on *Month, Day*, 2017.

John Stokes, Natural Areas Director Date

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City of Fort Collins Natural Areas

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Photographic Note: All images were supplied by City of Fort Collins Natural Areas Department staff unless otherwise noted. Additional images were supplied by individual photographers, whom we thank for their generosity and support of the Natural Areas Department.

INTRODUCTION

The City of Fort Collins Natural Areas Department currently manages 48 natural areas ranging in size from the 1-acre Williams Natural Area to the 22,498-acre Soapstone Prairie Natural Area. Natural areas are grouped into one of three focus areas: Local, Community Separators, or Regional (Natural Areas Master Plan; City of Fort Collins 2014). Local natural areas conserved by the City consist of sites within one of four geographic locations: Cache la Poudre River Corridor, Foothills Corridor, Fossil Creek Corridor, or the Core Natural Areas, which fall outside the three major corridors (Map 1). Management plans for local natural areas are updated about every 10 years.

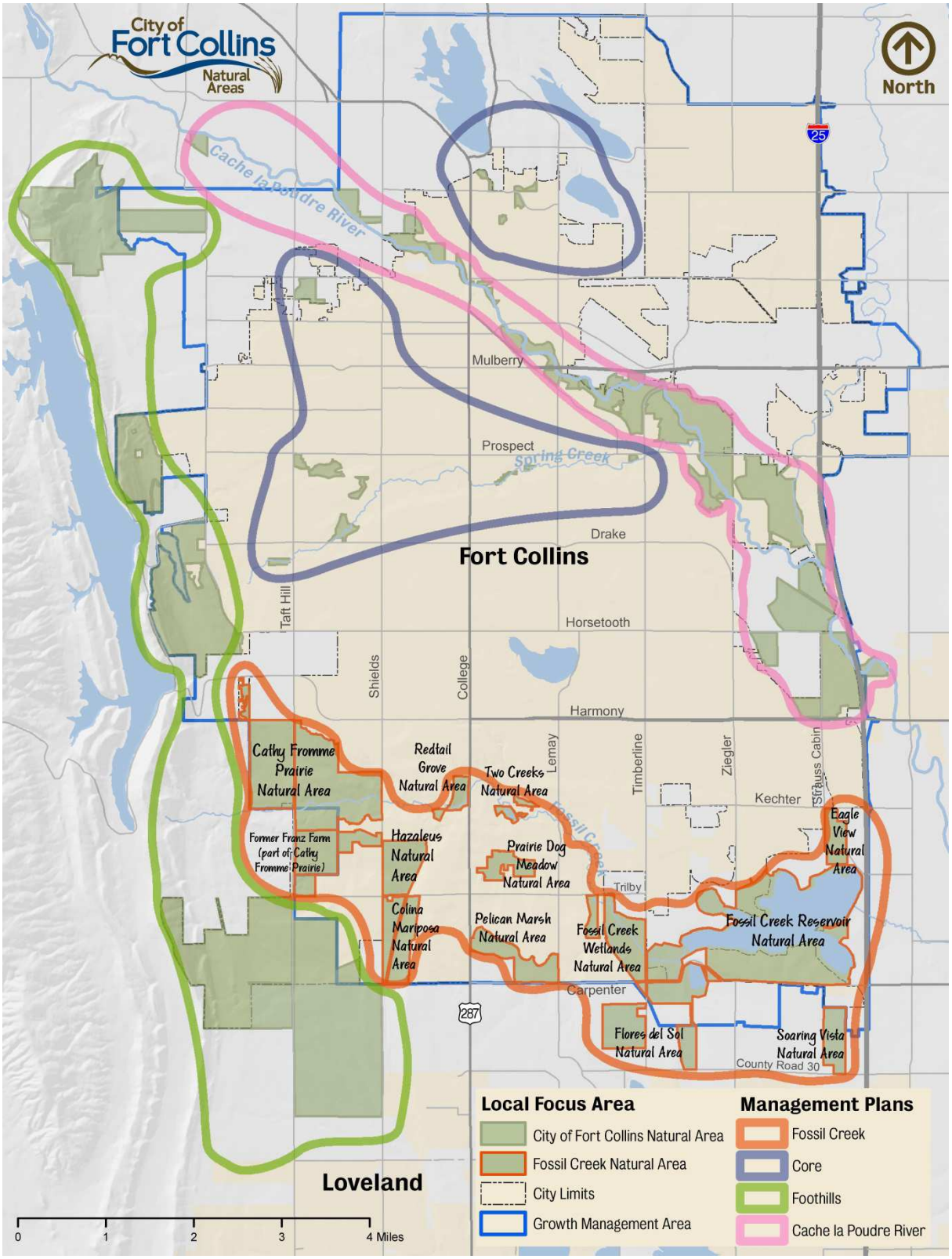
The Fossil Creek Natural Areas Management Plan was adopted in 2005. Over the last 12 years, the City has acquired additional acreage in this corridor, opened new sites for public use, and taken on more management responsibility for Fossil Creek Reservoir. This update will reflect those changes and build on past approaches to land and wildlife management in the Fossil Creek Corridor.

Scope

The Fossil Creek Natural Areas corridor currently includes 12 local natural areas south of Harmony Road extending from the base of the foothills southeast to I-25 (Map 1). All sites are in the Fossil Creek Stormwater Basin with the exception of Eagle View Natural Area at the northeast corner of Fossil Creek Reservoir. Most of Eagle View is in the Cache la Poudre Stormwater Basin, but included in the Fossil Creek Natural Areas Management Plan due to its proximity to the Reservoir and site characteristics.

Burns Tributary of Fossil Creek, Cathy Fromme Prairie Natural Area

Ten of the Fossil Creek natural areas were included in the 2005 Management Plan with all but two of these original ten sites now open to the public. Hazaleus and Eagle View have remained closed to the public due to lack of trails and other public access improvements. Two new regional trails will make Hazaleus and a newly acquired site accessible by late 2018. Hidden Cattails Natural Area, also included in the 2005 plan, was conveyed to Coventry Homeowners Association in 2005 and is no longer managed by the City. A conservation easement helps protect the natural areas values of this 2-acre site on Mail Creek. The City's management responsibility for Fossil Creek Reservoir Natural Area was expanded in 2010 to include the 470 acres that comprised the original Fossil Creek Reservoir Regional Open Space. Two sites, currently in agricultural use, are new to the Fossil Creek natural areas system: Flores del Sol and Soaring Vista.



Map 1. Fossil Creek Natural Areas in Relation to Other City Local Natural Areas

Purpose

The purpose of the Fossil Creek Natural Areas Management Plan Update is to:

> The mission of the Natural Areas Department is to conserve and enhance lands with natural resource, agricultural, and scenic values, while providing meaningful education and appropriate recreation opportunities.

- Update the overarching goals for managing Fossil Creek natural areas.
- Update site history and management of 12 Fossil Creek natural areas.
- Describe potential agricultural uses on select sites.
- State site management objectives for the next 10 years and actions needed to help achieve those objectives.
- Solicit input from the public on future management of the City's Fossil Creek natural areas.

Fossil Creek natural areas include sites well established in the City system for a decade or more, sites opened during the last 10 years, and sites that need public improvements to open to public use. The Plan proposes to have all 12 Fossil Creek natural areas open to the public in the next 10 years.

Public Input

An open house will be held on June 8, 2017 at the Harmony Library to provide the public an opportunity to review site plans and proposed actions of the Fossil Creek Natural Areas Management Plan Update. The open house was announced to the public through a press release, information on the City's website, natural area kiosk posters, social media posts, e-mails to stakeholders, the Natural Areas electronic newsletter, and direct mailings to households in proximity to the Fossil Creek Natural Areas.

Interpretive kiosk at Pelican Marsh Natural Area

The draft plan and an online comment form will also be available on the City website through June 30th, 2017. During June and July, the draft plan will be presented to two City of Fort Collins citizen boards (Parks and Recreation Board and Land Conservation & Stewardship Board) and the Larimer County Open Lands Advisory Board.

Note: This section will be updated in the Final Plan and include the # of people who participated and summary of comments received.

FOSSIL CREEK OVERVIEW

Cathy Fromme Prairie

The 12 Fossil Creek natural areas under consideration in this management plan vary in size from 30 acres to 1,438 acres and are all located south of Harmony Road (Map 1). The largest two sites, Cathy Fromme Prairie and Fossil Creek Reservoir, flank the western and eastern ends of the Fossil Creek drainage system in Fort Collins. Although all of these properties have an earlier history of active farming and/or grazing prior to City ownership, highly valued wildlife habitat and native grasses, wildflowers, and wetland plants can be found on most of the sites today. In general, the Fossil Creek natural areas are wide-open grassland sites with wetlands established along natural tributaries, low areas with high groundwater, and man-made ponds, reservoirs, and ditches. Prairie dogs have colonized all but the two most recently acquired agricultural sites, presenting management challenges but also providing unique wildlife viewing opportunities.

Fossils from the Cretaceous Period can be found embedded in Pierre Shale outcrops on several of the Fossil Creek natural areas. Pre-European settlement cultural artifacts have been found, documenting long use of these sites by humans. More recent historic cultural features include the remains of a historic brick factory from the early 1900s on Redtail Grove and remnants of a tram that extended at least 2.5 miles to the west across Cathy Fromme Prairie. Reservoirs and water conveyance ditches constructed in the 1880s are still operational today, serving the citizens of Fort Collins and providing open water habitat in an arid landscape. Nearly all the Fossil Creek natural areas serve a flood control and water quality improvement function in the urbanized landscape of south Fort Collins.

Fossilized mollusk from Fossil Creek area

As with nearly all local natural areas, Fossil Creek natural areas typically have more than one utility easement and road right-of-way (ROW) associated with each site. Most of these easements and ROW's were in place at the time of acquisition. For new utility easements (granted since 2012), best resource protection practices are applied to protect existing resources and mitigate impacts caused by utility work on a Fossil Creek natural area per the City of Fort Collins Natural Areas Easement Policy (City of Fort Collins 2012) and the General Resource Protection Standards for Natural Areas (City of Fort Collins 2013a).

Value

All combined, the 3,825 acres of Fossil Creek natural areas provide a network of protected lands surrounding more than a half dozen tributaries of Fossil Creek. Although not completely connected to one another, these natural areas provide a corridor for wildlife movement in south Fort Collins that is enhanced by 647 acres of adjacent conservation easements on private lands. A dozen homeowners associations' open spaces have been

certified as natural areas by the City of Fort Collins over the last 20 years, adding another 244 acres of undeveloped lands for wildlife in the corridor.

Rare plant survey at Cathy Fromme Prairie

The Fossil Creek Natural Areas provide unique opportunities for study, education, and recreation in an urban environment. Native shortgrass prairie habitat is only a short distance away for most Fort Collins residents. Rich in ecological, geological, archaeological, and historic features, these natural areas provide valuable, convenient research study sites for professionals and students of all ages. To date, over 60 studies have taken place on Fossil Creek sites since 1999 alone (see Appendix A).

Fossil Creek Natural Areas are ideal sites for educating students and the general public on the importance of shortgrass prairie habitat and the need to preserve this valuable resource into the future. These sites contain traces of the past, providing a historic context, and have become an important part of our community's identity. The two newest natural areas, Flores del Sol and Soaring Vista, have the potential to serve as pioneer demonstration sites that integrate wildlife habitat into agricultural lands, promote organic farming, and emphasize innovation and collaboration with the local food community.

The Fossil Creek natural areas and trails provide places to hike, bike, dog walk, ride horses, bird watch, create art, write, and simply enjoy quiet time. For some, these natural areas provide a place of spiritual contemplation. For all, Fossil Creek sites contribute to wellness by providing places to relax, exercise, or simply take in the expansive landscape preserved over the last 24 years by the Fort Collins community.

Management Zoning System

In 2011, the Natural Areas Department developed a new system of management zoning to more effectively protect natural resources and manage human use along the Poudre River (City of Fort Collins 2011). This system is being applied to other natural areas as new management plans are developed or updated (City of Fort Collins 2014).

The Management Zoning System, described on the next page, consists of five zones (designated 0 to 4) ranging from areas closed to public use to "focal areas" prescribed for intensive public use. A modifier is added to the zoning designation to describe whether on-trail only or off-trail use will be permitted.

In this plan, each Fossil Creek natural area has been assigned applicable management zones and trail modifiers, which are included in the Site-Specific Plans section of the document. The predominant management zoning for Fossil Creek natural areas is Zone 2A, Resource Protection, on-trail use only.

Trail Modifiers (Regulatory Zoning):

A – On-trail only

B – Off-trail use allowed

C – Closed, no trails available (Zone 1)

Management Zones:

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

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

- Areas closed for *conservation* or wildlife refuge
- Areas where no *formal access* is provided
- Areas closed due to *public safety concerns*
- Areas under *long-term restoration* (typically 10 years or more)
- Areas closed due to the presence of *cultural artifacts*
- Areas closed on *leased land* because public access is not allowed by the terms of the lease

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

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

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

Landscape and Vegetation

From the Foothills to the Plains, Fossil Creek sites spread across the landscape of south Fort Collins

Fossil Creek Natural Areas consist of gently rolling hills in various conditions from shortgrass prairie with over 75% native plants to active cropland. Native trees and tall shrubs are primarily restricted to a few stream drainages and reservoir shorelines. Wetlands occur in lowlands and along streams and lake edges. Remnant farmstead trees still survive on several sites. Rock outcrops with marine fossils support unique plant and animal communities.

Old farmstead buildings have been removed from most of the natural areas along Fossil Creek, but an old silo, pump house, and poultry building still remain within the corridor. A newer pole barn building has been retained on Soaring Vista for potential future agricultural uses. Wildlife viewing blinds, a ranger office and shop, and restroom facilities are among the structures installed on the natural areas.

Bell's twinpod, a Colorado Natural Heritage Program rare plant

To date, over 480 plant species have been identified from the 12 Fossil Creek sites with 72% of these native species (Appendix B). Four species are on the City of Fort Collins Species of Interest List: Bell's twinpod (*Physaria bellii*), tulip prickly pear (*Opuntia phaeacantha*), bearded flatsedge (*Cyperus squarrosus*), and fringed loosestrife (*Lysimachia ciliata*). The Species of Interest List includes plants that are tracked by the Colorado Natural Heritage Program, plants uncommon in Colorado and/or Larimer County, and plants once common but now threatened by development (City of Fort Collins 2016).

The Natural Areas Department engages in routine noxious weed control on all sites that it manages. Weed management actions are based on an Integrated Pest Management (IPM) philosophy: a combination of chemical, mechanical, cultural, and biological treatments. Herbicides are selected for use based on lowest environmental toxicity, selectivity to target species, and effectiveness. Fire has been, and will continue to be, used as a weed management tool on most Fossil Creek sites. In addition, limited conservation grazing by domestic animals (e.g., cattle, goats) is proposed for larger sites to simulate natural disturbance essential for long-term maintenance of native prairie sites. Conservation grazing is characterized by short-term, "flash" grazing, rotating through a portion of a site to impact specific target weed species.

Ten of the Fossil Creek natural areas fall into Restoration Zone 2 of the Natural Areas Department's 2016-2025 Restoration Plan (City of Fort Collins 2016). The other two sites (Flores del Sol and Soaring Vista) will remain primarily agricultural sites with integrated habitat buffers. Restoration Zone 2, Southern Grasslands (Southwest and Fossil Creek) are among the top three restoration priorities for the Natural Areas Department. Twenty-five

actions have been established to meet seven restoration goals for this zone. Goals include preparing for climate change, managing for native plant diversity and a suite of grassland wildlife, improving wetland and riparian habitat, and expanding monitoring programs.

Wildlife

Records of wildlife observations for several Fossil Creek natural areas date back nearly 30 years, but not all sites have been intensively surveyed. During that time, 279 species of birds, mammals, herptiles, and fishes have been recorded (Appendix C). Fossil Creek Wetlands and Fossil Creek Reservoir natural areas have been known for decades as a hotspot for birding. In 2008, Fossil Creek Reservoir and Duck Lake (both on Fossil Creek Reservoir Natural Area) were recognized by the National Audubon Society as Important Bird Areas at the state level.

Burrowing owl, a Colorado Threatened Species (Photo by Jack Hicks)

The combination of extensive grasslands, diverse wetlands, and the largest body of open water within the Fort Collins Growth Management Area contributes to the high use of these natural areas by birds and other wildlife. More than 20 species of raptors, 25 species of ducks, 48 species of wading birds, and a rich diversity of smaller grassland and riparian songbirds (passerines) have been observed in the Fossil Creek corridor. Over 60 species are considered "Unusual," either uncommon in Fort Collins or a casual visitor to the area; 35 are considered Fort Collins Species of Interest (Appendix C). Species of Interest are those that are considered of greatest conservation need by the Colorado Parks and Wildlife (2015) and/or tracked as species at risk by the Colorado Natural Heritage Program. Six of these species are state-wide Species of Concern (bald eagle, ferruginous hawk, peregrine falcon, greater sandhill crane, long-billed curlew, black-tailed prairie dog) and two are state threatened (burrowing owl and river otter).

A family of prairie dogs

Twenty-three species of mammals (with moose sightings among the list of "unusual"), 12 species of herptiles, and 14 fish species have been documented on Fossil Creek natural areas, thus far. The City of Fort Collins Natural Areas Department has developed Wildlife Conservation Guidelines to inform the development and implementation of system-wide and site-specific management strategies that advance grassland health, reflect community values, and that are pragmatic and fiscally responsible (City of Fort Collins 2017). The document outlines strategies that address various native wildlife species including birds, mammals, amphibians, reptiles, fish, and invertebrates. The Guidelines provide direction for control and management of non-native species and address conservation issues surrounding the reintroduction of native species (such as bison, black-footed ferret, and native fish). Native species reintroductions are not planned for the Fossil Creek natural areas.

In the Fossil Creek corridor, the most visible mammal is the prairie dog, which has colonized all but the two recently acquired agricultural sites. Urban prairie dog management issues are often difficult and complex. While prairie dogs are keystone species in intact prairie

ecosystems, prairie dogs in an urban setting can cause habitat degradation and negatively influence other conservation values. For example, prairie dogs can denude sites of vegetation, subjecting the prairie to severe wind-driven erosion and fugitive dust. They can also stimulate non-native plants such as bindweed. To promote sustainable grassland system health and function, the City's Natural Areas Department intent is to achieve a 10 to 20 percent prairie dog occupation of suitable habitat on the Fossil Creek natural areas (City of Fort Collins 2017). Wildlife in the State of Colorado is the legal jurisdiction of the state as administered by Colorado Parks and Wildlife. Any relocation of prairie dogs requires a State permit.

Wildlife monitoring efforts in the Fossil Creek corridor have primarily consisted of monitoring prairie dogs and their effects on vegetation. Although winter raptor use of colonies was monitored for a decade from 1991-2002, few breeding bird surveys have been conducted in the Fossil Creek corridor. Moving forward, the City of Fort Collins Natural Areas Department plans to conduct more breeding bird surveys on Fossil Creek sites, as well as step up efforts to survey invertebrates, small mammals, and reptiles.

Melissa blue (Plebejus melissa) butterfly (Photo by Paul Batchelder)

The Natural Areas Department considers wildlife disease an important component of wildlife management and addresses seven diseases in the Wildlife Conservation Guidelines (City of Fort Collins 2017). For the Fossil Creek natural areas, two diseases have been monitored annually over the last 10 years: plague and West Nile virus.

Plague has been recorded in prairie dog populations in the Fossil Creek drainage since 1997, but the disease can occur in numerous species of rodents, rabbits, domestic pets, and humans. Prairie dogs are particularly vulnerable and entire colonies can be eliminated in an outbreak. However, the colonies usually re-establish within several years as prairie dogs emigrate from healthy colonies up and down the drainage. The City works closely with Larimer County Department of Health and Environment to notify the public of a plague event and post necessary precautions on natural areas open for recreation.

Colorado Mosquito Control weekly monitoring of Fossil Creek sites

West Nile virus, carried by some species of mosquitoes, affects both wildlife (particularly birds) and human populations and can be fatal to some humans if not treated in time. Therefore, the City of Fort Collins contracts with a private firm to conduct a comprehensive larvicide program to kill mosquito larvae that could potentially carry the virus before they emerge from breeding areas. Colorado Mosquito Control (CMC) is the current contractor. CMC sets out traps for adult mosquitoes to monitor the disease. The company samples stagnant water and applies a larvicide to breeding sites within a one-mile radius of the city limits, which includes Fossil Creek natural areas. The larvicide is a natural non-toxic biological product that affects only mosquitoes and is not harmful to fish or other wildlife.

Recreation and Public Improvements

Two Fossil Creek sites are in the top five natural areas most frequently visited: Cathy Fromme Prairie and Fossil Creek Reservoir (National Research Center, Inc. 2016). Colina Mariposa, currently accessed only by a neighborhood trail, is one of the least visited natural areas in the City's system. While four of the Fossil Creek natural areas are not yet open to the public, new regional trails to be constructed in the next few years will open two of these sites (Hazaleus and Flores del Sol), and plans are to open the remaining two sites (Eagle View and Soaring Vista) within the next 10 years.

Bird watching at Fossil Creek Reservoir

Fossil Creek natural areas attract residents from the Fort Collins community at large, as well as adjacent neighborhoods. The Fossil Creek Trail is used daily by numerous walkers, runners, and cyclists. Pelican Marsh has become a frequently visited site since trail construction and development of the adjacent Water's Way Neighborhood Park. Fossil Creek Reservoir and Cathy Fromme Prairie are popular birding and wildlife watching sites, attracting visitors from northeast Colorado and beyond.

Trail development in the Fossil Creek Corridor has focused on protecting wetlands, native grasslands, and sensitive wildlife habitat. City of Fort Collins Park Planning and Development, in cooperation with Natural Areas, is responsible for constructing the Fossil Creek Trail. The City's Parks Department maintains the trail. Natural Areas cooperated with Larimer County to design and build the trails on Fossil Creek Reservoir, which are now maintained by Natural Areas. All three entities are cooperating with Loveland Parks and Recreation to design and construct two north-south regional trails that will connect Fort Collins with Loveland: the Long View Trail (east side of Shields Street) and the Colorado Front Range Trail (about 1/3 mile west of Timberline Road). Natural Areas maintains all natural surface trails on Fossil Creek sites as well as the paved trails at Pelican Marsh and Fossil Creek Reservoir.

Parking lots and restrooms are only available at the two largest Fossil Creek sites—Cathy Fromme Prairie and Fossil Creek Reservoir—but three other natural areas (Redtail Grove, Two Creeks, and Pelican Marsh) are within a short distance of public parking and accessible restroom facilities. Six of the eight natural areas open in the Fossil Creek corridor have wheelchair accessibility via paved trails.

Fossil Creek natural areas are open from 5 a.m.-11 p.m., with the exception of Fossil Creek Reservoir, which is open from dawn to dusk. Mini-kiosks mark the entrances to natural areas on designated trails managed by Natural Areas or Parks. Mini-kiosks provide a summary of key regulations that affect visitors to the site. Boundary markers are sometimes used at locations other than access points, depending on need. All Fossil Creek natural areas have a site sign.

Mini-kiosk at Fossil Creek Wetlands

More than half of the Fossil Creek natural areas have buck-n-rail fencing installed in the 1990s and early 2000s. Today, the standard natural areas fencing is a single-rail wood fence; Parks typically uses a two- or three-rail wood fence, when necessary, along the paved trail system. Several picnic tables and shelters are located on Fossil Creek Reservoir Natural Area; benches along trails are on four sites. Interpretive signs and wildlife viewing structures are located on three of the Fossil Creek Natural Areas.

Ranger Visitor Services

Natural Areas ranger checking brochures at Cathy Fromme Prairie

Natural Areas Rangers are charged with providing a safe, peaceful, and enjoyable environment for visitors and trail users while ensuring the protection of natural resources and public improvements. Natural Areas Rangers patrol all Fossil Creek natural areas, including the Fossil Creek Trail on Cathy Fromme Prairie, Redtail Grove, Two Creeks, and Fossil Creek Wetlands. Park Rangers patrol all adjacent City parks to the Fossil Creek sites as well as the Fossil Creek Trail. Fossil Creek Reservoir Natural Area is patrolled by Larimer County Natural Resources Rangers in exchange for their use of the office and shop building.

Ongoing challenges to patrol activities in Fossil Creek natural areas are primarily related to dogs-off leash, illegal camping, and off-trail use. Dogs on leash are allowed at all sites open to the public with the exception of Fossil Creek Reservoir. Timely graffiti removal can be challenging for both ranger and maintenance staff, but overall is not a large issue on Fossil Creek natural areas.

Education and Volunteers

The Natural Areas Education Program shares and promotes ecological, recreation, education, scientific, economic, cultural, spiritual, and wellness values of the Fossil Creek system. Natural Areas staff and volunteers provided 175 programs for 7,327 people at the Fossil Creek natural areas since 2013. The great majority of programs were hosted at Fossil Creek Reservoir Natural Area. This site is popular for Eagle Watches due to the bald eagles that roost there in the winter. In addition, the infrastructure and south Fort Collins location lend themselves to educational programming.

Skygazing Program at Fossil Creek Reservoir (Photo by Deborah Price)

Volunteer Master Naturalists and their volunteer assistants are community ambassadors trained to provide educational programs, as needed, for the Fossil Creek natural areas, or any other City natural area. Volunteer Ranger Assistants monitor natural areas and work with ranger staff to ensure visitors remain safe and enjoy their natural area experience. Adopt-a-Natural Area volunteers assist by conducting at least monthly litter pick up on a site. Through the years, groups or individual volunteers have also assisted in wildlife monitoring, plant inventories, prairie dog barrier plantings, and site clean-up on Fossil Creek natural areas.

MANAGEMENT GOALS

The following 14 overarching goals were established as the foundation upon which management decisions for natural areas in the Fossil Creek area are to be established:

- Conserve, enhance, and restore the ecological characteristics and values of natural areas in the Fossil Creek drainage.
- Maintain and improve habitat and movement corridors for diverse groups of wildlife.
- Seek opportunities to collaborate with others to restore and enhance streams of the Fossil Creek drainage.
- Where appropriate, establish disturbance regimes (such as prescribed burns and conservation grazing) that support ecological processes and enhance landscape conditions.
- Expand wildlife monitoring to include invertebrates, amphibians, reptiles, small mammals, and avian abundance to better understand habitat quality for future wildlife management.
- Continue to provide diverse and appropriate, recreational opportunities that minimize wildlife disturbance and site fragmentation.
- Open four closed natural areas to appropriate public use and provide additional wildlife viewing opportunities.
- Consider scenic and aesthetic values when planning new public improvements.
- Work with partners to provide access and connectivity to regional trails where appropriate.
- Explore ecological, social, and economic benefits of community agriculture on select Fossil Creek sites, including opportunities to connect with local food production.
- Protect and interpret cultural, archaeological, and unique geological features.
- Increase public awareness, recognition, understanding, and support for natural areas and their multiple values.
- Effectively reach a diverse and significant portion of the community through a range of education and outreach strategies focused on the Fossil Creek natural areas.
- Provide meaningful volunteer opportunities in Fossil Creek natural areas that connect - people to nature.

CATHY FROMME PRAIRIE NATURAL AREA

Cathy Fromme Prairie site sign

Cathy Fromme Prairie is a 2-mile long grassland extending from ½ mile west of Taft Hill Road east to Shields Street (Map 2). This 1,122-acre site was one of the first sites purchased specifically as a natural area by the City. The second largest Fossil Creek site, Cathy Fromme Prairie contributes to the Fort Collins-Loveland Separator and provides valuable wildlife habitat throughout the year. Two parking lots, each with a vault toilet, offer convenient access to the paved Fossil Creek Trail.

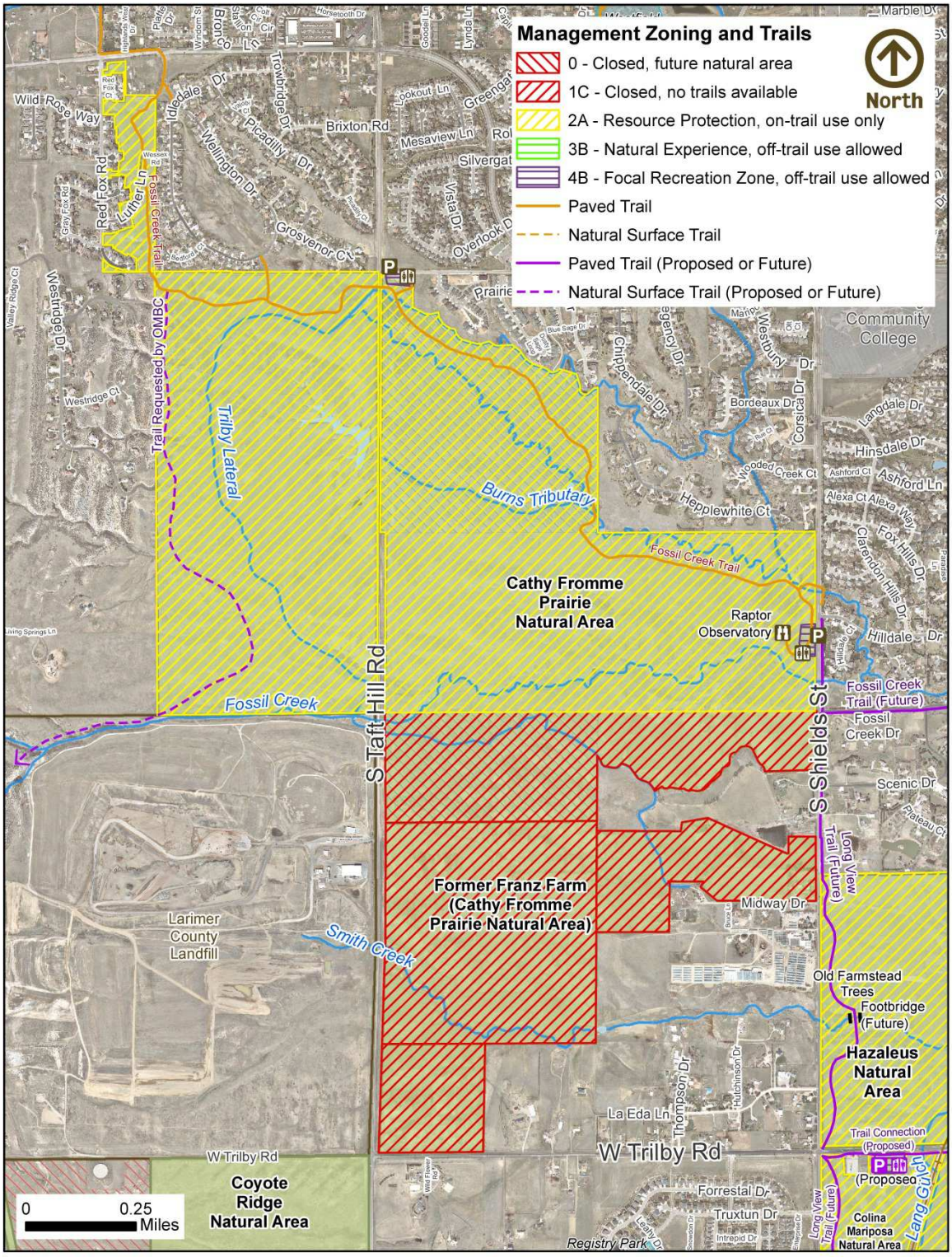
Cathy Fromme Prairie was named in 1993 by Fort Collins City Council to honor the former Councilmember Cathy Potter Fromme. An engraved memorial rock can be found at the first interpretive pod west from the Shields Street parking lot. The site was open for public use in 1998.


The globally rare Bell's twinpod

With its wide-open views and native plant communities, Cathy Fromme Prairie has always been a favorite spot for observing raptors, prairie dogs, and wildflowers. Over 130 species of vertebrates have been observed on the site over the last 28 years (Appendix C). With one of the richest assemblages of native prairie plants of the 12 sites in the Fossil Creek Natural Areas Plan (Appendix B), butterflies, bees, and other insects are often seen in abundance and high diversity, but not well-documented for this or other Fossil Creek sites. Two Species of Interest Plants (City of Fort Collins 2016) occur on the site: Bell's twinpod (*Physaria bellii)*, globally rare, and bearded flatsedge (*Cyperus squarrosus*), locally uncommon.

Popular for research and education (Appendix A), Cathy Fromme Prairie serves a vital role in the Fort Collins community as a unique outdoor classroom. For nearly two decades, the Raptor Observatory viewing structure and interpretive signs along the trail have helped to educate the public on the need and importance of preserving native grassland habitat for wildlife.


Prairie dog colony display at the Raptor Observatory.



Map 2. Cathy Fromme Prairie Natural Area

Site History

Like many of the Fossil Creek natural areas, evidence of early Native American occupation has been documented on Cathy Fromme Prairie. A scattering of late prehistoric cultural resources (ca. 1300-1600) was found in the 1990s by Colorado State University archaeologists. Occupation by native people could have occurred for 11,000 years or more.

Remnant base of the historic tram

Historic wagon ruts (ca. 1860—1870), also documented by archaeologists in the mid-1990s, indicate that the "Foothills Route" of the historic Overland Trail crossed the western half of Cathy Fromme Prairie. From 1903 to 1952, the entire site was part of an active brick production operation. Evidence of at least 20 bases of a tram that transported clay from the foothills east to a brick factory on what is now Redtail Grove Natural Area still exist on Cathy Fromme Prairie (Carroll 2014).

Cathy Fromme Prairie retains a high diversity of native plant species (Appendix B), in part due to its use prior to City ownership. Much of the site had been only lightly grazed by cattle and horses. Large areas of native shortgrass prairie were left unplowed. In the early 1990s prairie dog colonies spread across the landscape, making Cathy Fromme Prairie a key feeding area for bald eagles and other large raptors, particularly in the winter.

Bald eagle

Prairie dog sentinel (Photo by Steve Nelson)

When the City purchased the first two parcels of Cathy Fromme Prairie in 1993, 320 acres west of Taft Hill Road had already been subdivided into over 150 residential lots awaiting development. The City was able to continue acquiring lands to add to Cathy Fromme Prairie in ten separate transactions. Today the site encompasses 1,122 acres. Great Outdoors Colorado grants, donations by landowners, and contributions by Larimer County Open Lands have helped leverage the City's natural areas tax dollars to enable purchase of Cathy Fromme Prairie. The 160-acre parcel east of the landfill retains "The Franz Farm" name (per 1997 purchase agreement with Larimer County). In 2002, 42.7 acres were acquired on Midway Drive, with the intention to sell 7.7 acres (three residential lots) with low conservation value in the future (all lots were sold by 2017). In 2016, 20.6 acres (dedicated to the City in 1996 as part of Fox Hills Second Filing) were added to the northwest corner of Cathy Fromme Prairie. In 2017, 21 acres were purchased along Shields Street at the southeast corner of the natural area; purchase agreement provides for the previous owner to remain in the residential home, leasing back the property for up to 5 years.

By 2005 when the first Fossil Creek Natural Areas Management Plan was adopted, the Natural Areas Department had over a decade of experience managing Cathy Fromme Prairie. Most of the recreational features that visitors experience today were in place, including 2.5 miles of the Fossil Creek Trail and the Raptor Observatory (see Map 2). With plague reducing prairie dog populations in the Fossil Creek area beginning in 1997, protecting and preserving the extensive prairie dog colony was one of the main management objectives for the site in 2005. Use of prescribed burns (while continuing to control wildfires), grazing, and other tools were planned to mimic the natural disturbance needed to maintain the native grassland for all prairie wildlife species.

Raptor observatory, July 2016

Improvements to Cathy Fromme Prairie Natural Area since the 2005 Fossil Creek Natural Areas Management Plan include:

- 2006: Parking lot improvement (kiosk and accessible access to vault toilet installed at Fromme Prairie Way; accessible vault toilet installed at Shields Street).
- 2007: Parking lot improvements (landscaped island, benches at Fromme Prairie Way).
- 2008: Midway Drive improvements (removed old shed and some of the barbed wire fencing).
- 2011: Located historic tram bases and recorded geographic positions.
- 2013: Parking lot improvements (fencing, shrub plantings).
- 2013: Site sign replacement (included redesign).
- 2014: Parking lot improvements (expanded handicapped space at Shields lot; added wheel stops to both lots; removed call box).
- 2016: Memorandum of Understanding (MOU) developed among Natural Areas, Parks, and Utilities for management of 20.6 acres of Fox Hills Second Filing.

Fromme Prairie Way Parking Lot benches

Site Management

Cathy Fromme Prairie Natural Area has been designed and managed to:

Mid-summer on Cathy Fromme Prairie (Photo by Crystal Strouse)

- ✓ Protect wildlife and native plant communities.
- ✓ Preserve viewsheds and vistas.
- ✓ Serve as a community separator.
- ✓ Provide recreational and educational opportunities.

To protect the valuable resources of Cathy Fromme Prairie, the northern half of the site is classified Zone 2A (on-trail use only) and the southern half is classified 1C (closed, no trails available) (Map 2). The Fossil Creek Trail was constructed along the north boundary of the site to allow a greater expanse of habitat for wildlife without human disturbance. Trail counter data from 2016 indicate that 1,900-10,000 visitors use the trail system each month with lowest numbers in December and highest numbers in July. Over the next 10 years, the City does not envision any trail development east of the Larimer County Landfill on the former Franz Farm of Cathy Fromme Prairie (Map 2).

Fossil Creek Tributary

Ownership of Cathy Fromme Prairie is shared with the City owning 88% and Larimer County owning 12%. Natural Areas is the primary manager. City of Fort Collins Parks Department is responsible for maintaining the Fossil Creek Trail, but not the two trailhead parking lots. City of Fort Collins Stormwater Utility is responsible for maintaining drainages coming from City of Fort Collins maintained streets and also monitors streams to help ensure that stream flow is not blocked during a storm event. Stormwater also has a program to rehabilitate sections of streams throughout Fort Collins for water quality and habitat (including fish passage). Streams on Cathy Fromme Prairie are in fairly good shape and, thus, lower priority for rehabilitation. Stream restoration is not expected to occur in the next 10 years.

The Trilby Lateral is maintained by a private ditch company and not the City of Fort Collins. The ditch is cleaned of debris and occasionally burned in late winter/early spring to remove woody vegetation. Several utility easements occur on Cathy Fromme Prairie, including the South Fort Collins Loveland Water District buried waterline along the east side of Taft Hill Road and a South Fort Collins Sanitation District sewer line easement. The Larimer County Landfill has groundwater monitoring wells on the site, and has been monitoring water quality since 1979. The County spends about $50,000 a year for trash pickup 1 mile north and south of the landfill entrance and ¼ mile east along Taft Hill Road. On windy days, crews from a temporary employment company are hired to pick up trash. The Landfill has found that over

90% of trash along the road that gets blown on to Cathy Fromme Prairie comes from uncovered loads. Unfortunately, many vehicles only cover their loads right before the entrance (uncovered loads are twice the cost).

Parks staff is responsible for maintenance of the Fossil Creek Trail, including snow removal, mowing along both sides of the trail, fences along the trail, and maintaining underpasses and trail signage. Natural Areas staff is responsible for maintenance of the two trailhead parking lots, interpretive pods along the trails, the Raptor Observatory, non-trail side fences, and non-trail signage. Natural Areas is also responsible for vegetation and wildlife management of Cathy Fromme Prairie under principles established in the City of Fort Collins Natural Areas Department Restoration Plan (2016) and Wildlife Conservation Guidelines (2017).

The Fossil Creek Trail on Cathy Fromme Prairie is patrolled by both Natural Areas and Parks Rangers. Overall, infractions have been relatively few with dogs off leash and vandalism topping the list. A few incidences of off-trail use have occurred over the 18 years the site has been open for public use, particularly during heavy snows when cross-country skiers go off trail. Several small grass fires have been started from fireworks and other off-trail uses on Cathy Fromme Prairie through the years.

Master Naturalist Volunteer with budding naturalists

Volunteers have played an important role in site management of Cathy Fromme Prairie for over two decades. Colorado State University students and other Fort Collins community members participated in winter raptor surveys that helped guide trail placement on the site. Adopt-a-Natural Area volunteers have helped to pick up the s litter that blows in from adjacent construction sites and from vehicles headed to the landfill. Master Naturalists have lead groups of all ages on Cathy Fromme Prairie each year since the inception of this volunteer program.

Ten-year Site Management Objectives and Actions

While Cathy Fromme Prairie continues to be a diverse, native community for both plants and animals, care must be taken to preserve this community for the future. As the human population increases along the Front Range, local natural areas receive more use and the City receives more pressure to expand trail systems and parking lots. In the case of Cathy Fromme Prairie, extreme care must be taken to preserve the high values of this native prairie. The site has the largest native shortgrass prairie left within the City limits. Trails and roads are known to cause habitat fragmentation and edge effects that can negatively impact some plant and animal species (Jordan 2000, Miller and Knight 1995).

In 2017, the Overland Mountain Bike Club (OMBC) approached the City of Fort Collins and Larimer County requesting that a natural surface mountain bike/hiking trail be built along the western edge of Cathy Fromme Prairie to provide a connection from the Fossil Creek Trail south to Coyote Ridge. Because of the potential for wildlife disturbance, possible negative

impacts to native plant communities, presence of cultural resources, and landfill compatibility, this trail needs further discussion with Larimer County. However, the OMBC requested trail through Cathy Fromme Prairie is shown in this plan (Map 2) in order to obtain initial feedback from the public and adjoining landowners. The proposed trail extends beyond the scope of this plan (into Coyote Ridge Natural Area) and includes a trail on Larimer County Landfill property, outside Natural Areas and Larimer County Department of Natural Resources jurisdictions. The trail is not a regional trail identified at this time in either City or County master plans. The alignment on Cathy Fromme Prairie would go through the 3rd most floristically rich vegetation management unit in all of the urban natural areas, with 109 species of plants in that unit alone (78% of which are native). The alignment would also pass by the clump of mature cottonwoods that has provided raptor nesting, roosting, and hunting perches for decades.

Prairie dogs, while a key component of the native shortgrass prairie, can have a devastating impact to a prairie in the urban landscape. Confined by development, the landfill, and foothills habitat, Cathy Fromme Prairie provides very little opportunity for prairie dogs to expand their colonies. The prairie can easily become denuded and weedy under heavy grazing by a large, dense prairie dog colony, particularly during dry seasons. Unfortunately, managing Cathy Fromme Prairie has meant, and will continue to mean, managing and controlling the numbers of prairie dogs. Relocation of prairie dogs to Cathy Fromme Prairie has been permitted as recently as 2016, and can serve to replenish prairie dog colonies reduced by plague.

Moving into the next decade of site management for Cathy Fromme Prairie, the City's objectives for the site are to:

- Manage prairie dogs for multiple native plant community and wildlife values.
- Protect, re-establish, and maintain native prairie habitat.
- Promote wildlife viewing opportunities.
- Preserve scenic values.
- Protect cultural resources.
- Monitor and manage visitor capacity, particularly at trailhead parking lots.
- Help visitors understand the decline, vulnerability, and value of Colorado's shortgrass prairie ecosystem.

Grasshopper sparrow (Credit Aron Flanders/USFWS)

Although objectives remain similar to those established a decade ago, more focus has been placed on managing the native shortgrass prairie ecosystem and not just prairie dogs and raptors. Specific actions identified to help meet these objectives over the next 10 years include:

<u>Prairie Restoration</u>

- Continue active restoration of shortgrass prairie between Taft Hill Road and Shields Street.
- Continue Russian olive removal in tributaries.

- Explore ways to do herbicide weed control so that all terrain vehicle (ATV) tracks are not so visible from trails and roads (e.g., decrease herbicide use, use routes parallel to trails).
- Consider use of cattle, goats, or sheep on a limited basis for weed management purposes.
- Continue use of prescribed burns to aid in weed management and grassland restoration.

Buck-n-rail fence along Trilby

Scenic Views

- Remove buck-n-rail fencing along Taft Hill Road and Trilby over time and replace with single-rail fencing only where necessary (e.g., near gate entrances). Retain the western two-rail fence along Shields (installed by Parks).
- Remove old poles/fence posts, which tend to attract large raptors that feed on sensitive nesting prairie songbirds. Smaller songbirds can easily use the more delicate prairie vegetation for territorial displays.
- Continue strong efforts to remove trash and debris from the site. The landfill likely will not close during the next 10 years.

Interpretive sign at trail pod

Education

- Remove interior interpretive signs. Refocus kiosk panels on decline of grassland habitat and need for overall prairie ecosystem protection.
- Add benches if pods that formerly had signs do not have seating.
- Enlarge observatory capacity by creating a wide pod along the paved trail to accommodate larger school/community groups.

Parking Lot Improvements

- Encourage use of the Fromme Prairie Way lot to relieve parking pressures on the Shields lot. Construct new lot on Colina Mariposa Natural Area to relieve parking pressures from future Long View Trail users.
- Consider replacing pavers in the parking lots with either gravel or asphalt to reduce maintenance.

HAZALEUS NATURAL AREA

Hazaleus site sign

Hazaleus is a 168-acre grassland extending north from Trilby on the east side of Shields Street for about a half mile and east from Shields about a quarter mile (Map 3). The site supports Smith Creek and several wetland seeps that drain into the Lang Gulch tributary of Fossil Creek. Contributing to the Fort Collins-Loveland Separator, Hazaleus provides a critical wildlife habitat connection between natural areas to the south and those to the northwest and northeast. Construction of the Long View Trail will open this site for public use in 2018.

At the request of the sellers and in recognition of the bargain sale (20% reduction from fair market value), this natural area was named Hazaleus. Melvin Hazaleus taught courses in Animal Husbandry at CSU from 1940-43 and again after serving in World War II from 1947 until his untimely death in 1961 at age 47. His wife, Margaret, was also a faculty member and founded the CSU Women's Studies Program.

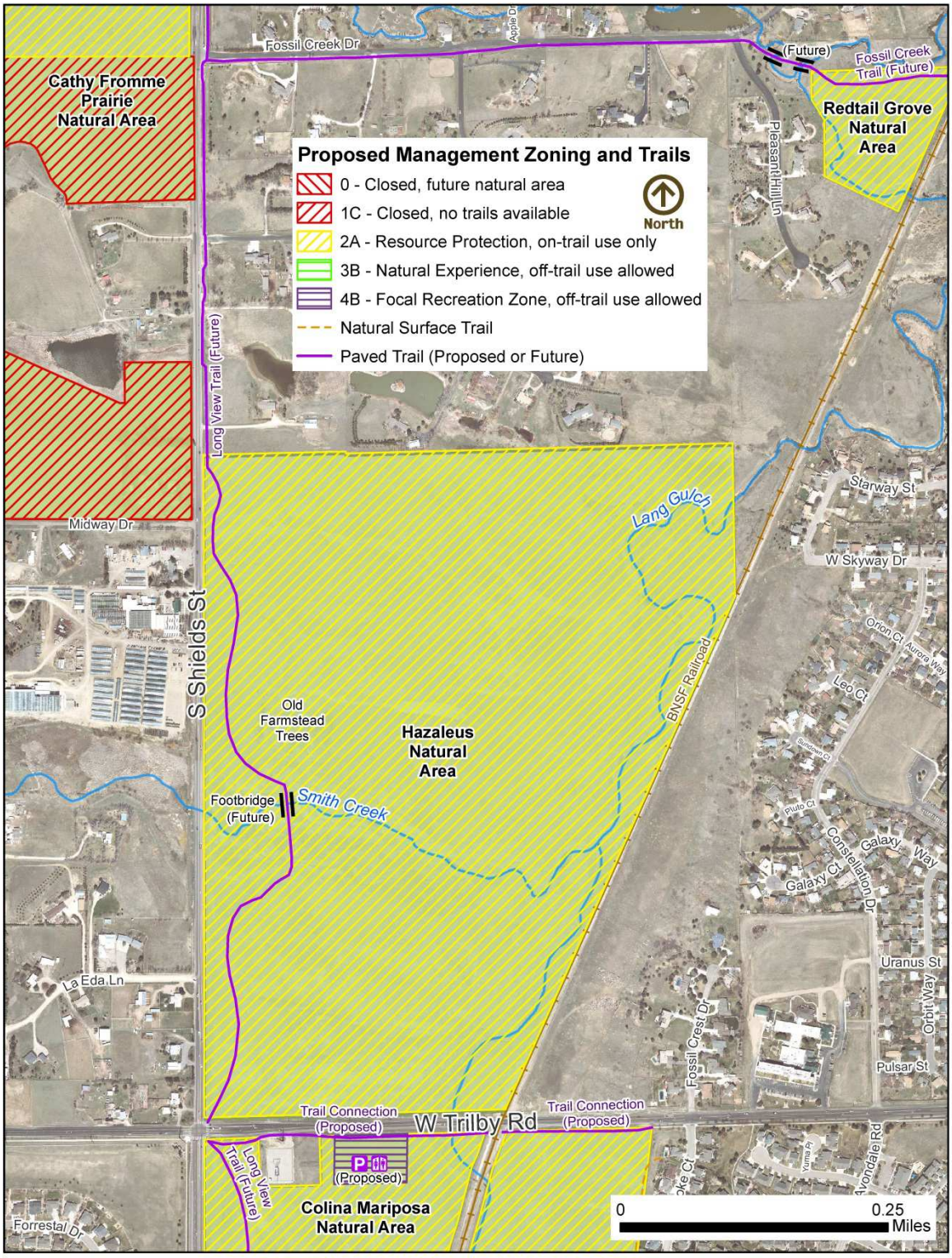
Old farmstead trees on Hazaleus

While only 42 species of birds have been observed on Hazaleus, thus far, eight species have been birds of prey (Appendix C). The old farmstead trees, located on a hill top, provide a good vantage for raptors to hunt small mammals and other prey in the grassland and wetland areas. The trees have also been used for nesting by both Swainson's and red-tailed hawks in the past 15 years, although in recent years the trees became more decadent and red-tailed hawk nesting moved north onto private property. But then again in 2017, a pair of red-tailed hawks started building on an old nest in one of the farmstead trees and appeared to be incubating eggs as of April.

Red-tailed hawk feeding on a garter snake (Photo by Norm Keally)

Indian blanketflower on Hazaleus

Plant diversity on Hazaleus is mid-range for the Fossil Creek natural areas with 155 species identified and 103 (66%) of these native (Appendix B). Grassland restoration efforts on the site will continue to improve native plant diversity. Few tall woody plants grow beyond the old farmstead location.



Map 3. Hazaleus Natural Area

Site History

The 1-square mile land section containing Hazaleus Natural Area was transferred by the Federal government to the Union Pacific Railroad in 1897. This section was later subdivided and sold off to private interests. The parcel containing the natural area sold in 1914. By the mid-1930s a farm house and outbuildings had been built on the site. Melvin and Margaret Hazaleus purchased the property in the fall of 1950, but only lived on the site for 6 years. Melvin Hazleus, assistant professor and research associate at the CSU Agricultural Experiment Station, used the site for swine and other livestock research. The site was owned by the Hazaleus family until 1984.

Red fox

The City of Fort Collins purchased the site in 1999 for approximately with the intent to eventually sell 50 acres in the northwest corner of the property to the Fort Collins Housing Authority. However, after further evaluation of natural resources, concern from neighbors, and desire to maintain wildlife corridors, the City decided to preserve the entire 168 acres as a natural area. The lease for agricultural use continued on the property through 2001. The farm buildings were demolished in 2004.

In 2005 when the first Fossil Creek Natural Areas Management Plan was adopted, a regional trail was planned for the site and the site was expected to be opened by 2010. However, funding for the regional trail from Fort Collins to Loveland was not obtained until 2015 with the aid of $2 million in Colorado Department of Transportation and Great Outdoors Colorado grants. The future trail is expected to be constructed in 2017 and the site opened to the public in 2018.

Improvements to Hazaleus Natural Area since the 2005 Fossil Creek Natural Areas Management Plan include:

Furrows established to prevent further loss of soils on Hazaleus in 2009

- 2007: Site sign installed along South Shields Street.
- 2009: Start of grassland restoration and prairie dog removal to alleviate dust storms that caused reduced visibility on Shields Street and increased particulate pollution; bare soils were precipitated by a period of drought, overgrazing by prairie dogs, and dry winter winds.
- 2013: Xcel Energy, Inc., gas line installation and subsequent dedication of funds to future site restoration and future regional trail.
- 2013: Exotic smooth brome grass eradication began on 70 acres on the north side of the site.
- 2015: Site disked and native grass and forb seeds planted.
- 2015: Removal of invasive, exotic Siberian elms on site.
- 2016: Smith Creek culvert under Shields Street repaired by Stormwater Utility.

Site Management

Hazaleus Natural Area is being managed to:

Hazaleus ongoing restoration, June 2016

- ✓ Protect wildlife movement corridors.
- ✓ Restore native grassland habitat.
- ✓ Preserve viewsheds and vistas.
- ✓ Serve as a community separator.
- ✓ Support the future Long View Trail.

To help restoration efforts and protect wetland and wildlife habitat, Hazaleus will be classified as Zone 2A (on-trail use only) once the Long View Trail is constructed and opened for use (Map 3). Currently, the site is classified 1C (closed, no trails available). The Long View Trail alignment is along Shields Street to better serve commuters and to protect Hazaleus wildlife and stream habitats. The trail will be 10 feet wide colored concrete with a detached crusher fines gravel path along segments that pass through City natural areas. The trail is expected to be open for public use in 2018.

The City is 100% owner of Hazaleus. The Natural Areas Department is the primary manager of the site; Parks will be responsible for maintaining the Long View Trail through Hazaleus after construction. Park Planning and Development, working with Natural Areas, is responsible for Long View Trail construction within city limits. Stormwater Utility is responsible for maintaining drainages coming from, and under, Shields and Trilby. Both Smith Creek and Lang Gulch are in good condition and Stormwater has no stream restoration plans for Hazaleus in the next 10 years.

Smith Creek cattail marsh on Hazaleus

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Hazaleus Natural Area, the City's proposed objectives for the site are:

- ❖ Focus restoration on establishing a healthy grassland suite of native plants and wildlife.
- ❖ Maintain movement corridors for wildlife.
- ❖ Provide public access to the site.
- ❖ Enhance scenic views.

Specific actions identified to help meet these objectives over the next 10 years include:

Restoration

- Retain farmstead trees, including dead trees for raptor roosts and hunting perches.
- Remove and control Russian olives, as needed.
- Continue efforts to establish a healthy grassland through native seeding, weed control, and limiting prairie dog colonization during the restoration process.
- Employ grazing and/or fire for disturbance (likely, in 5 to 10 years).
- Protect ground nesting songbirds and fox dens from recreation and other human impacts.
- Seek opportunities to monitor/survey small mammals and invertebrates during and after restoration efforts.

Wetland sedges of Hazaleus seeps

Movement Corridors

- Limit disturbance to wetland seeps and Lang Gulch.

Public Access

- Construct Long View Trail along Shields Street to connect Fort Collins and Loveland.

Scenic Views

- Remove buck-n-rail fencing along Shields and Trilby over time and replace with single-rail fencing only where necessary (e.g., near gate entrances).

COLINA MARIPOSA NATURAL AREA

Colina Mariposa site sign

Colina Mariposa is a 192-acre site extending south from Trilby on the east side of Shields for about a mile and east from Trilby nearly a half mile (Map 4). The site supports the Lang Gulch tributary of Fossil Creek. Contributing to the Fort Collins-Loveland Separator, Colina Mariposa contains two distinct habitats. On the west is a low grassland area with salt meadows. On the east is a dry, rocky hillside with a variety of native grasses, wildflowers, and cacti. Public access is currently limited to a neighborhood trail along the east boundary of the natural area. Construction of the Long View Trail along Shields will increase recreational use of the site in 2018.

The public was solicited for name suggestions for this natural area. To recognize the high diversity of butterflies known to occur on the east ridge, Natural Areas staff selected the name Colina Mariposa, Spanish for "Butterfly Hill," from the list of suggestions.

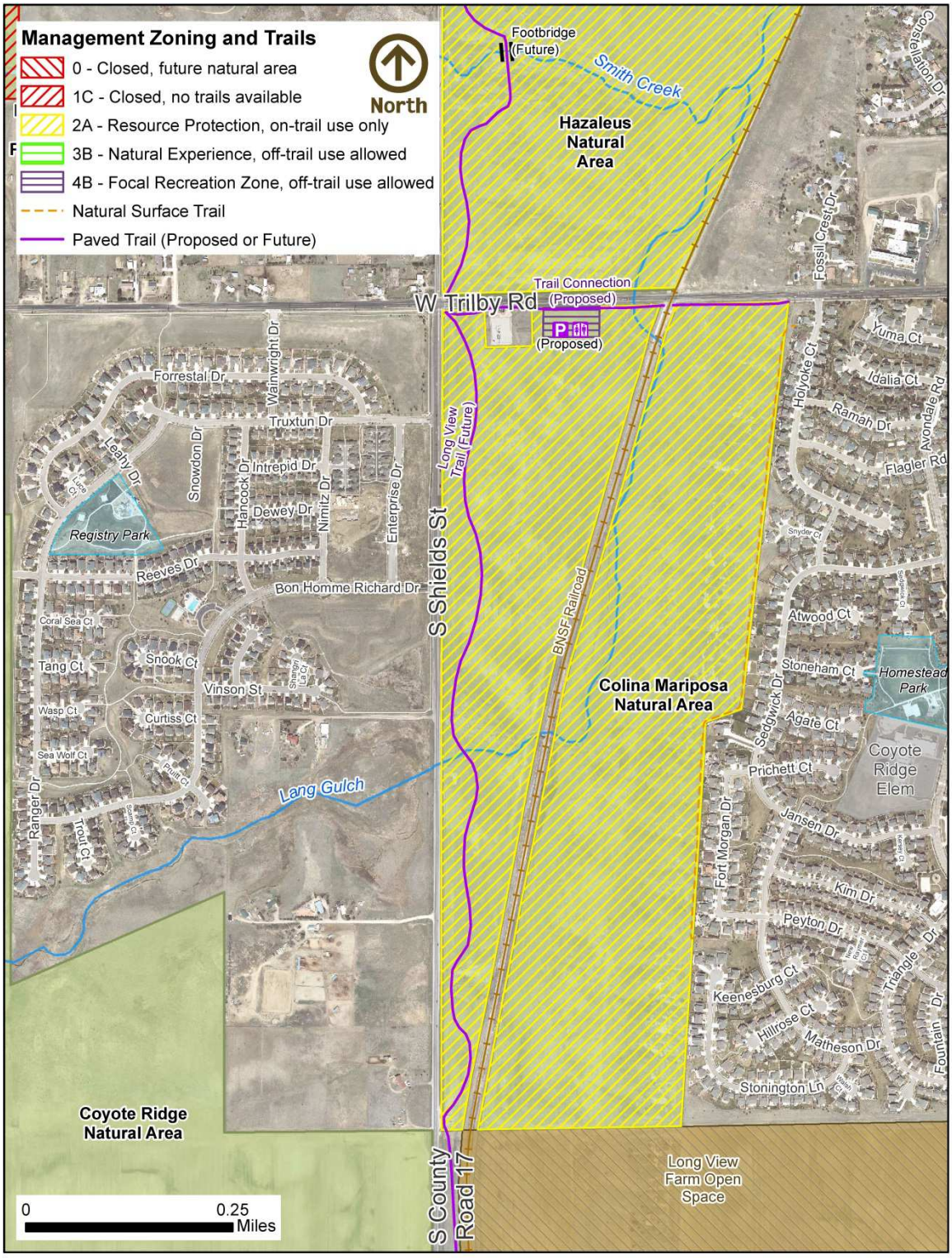
Short-horned lizard, one of the five reptile species recorded from Colina Mariposa (Photo by Ellen Heath)

Like Hazaleus, hawks and other raptors are frequently observed hunting over Colina Mariposa, but overall wildlife diversity does not appear to be very high on this site. Only 43 bird, mammal, and herptile species have been recorded for Colina Mariposa (Appendix C). The hillside habitat supports both the prairie and short-horned lizard. Prairie dogs inhabit lower hillside and flat areas; high ground water limits the habitat they can colonize on this natural area.

Although nearly 3/4^{ths} of the plant species on Colina Mariposa are native, diversity is less than half of that found on Cathy Fromme Prairie (Appendix B). Low salt flats are prominent on the site throughout the year and support wetland-dependent wildflowers in spring.

October salt flats

Yellow prairie groundsel and sidebells penstemon in June (Photo by Crystal Strouse)



Map 4. Colina Mariposa Natural Area

Site History

Very little is known about the history of this property prior to City ownership. The Colorado and Southern Railroad tracks (now Burlington Northern Santa Fe [BNSF]) were in place by the late 1800s. A small, root cellar-like structure was discovered on the site prior to City ownership, but no indication of a home site remained. Although the site may have been hayed and was likely grazed at some time, aerial photos from the early 1980s do not indicate any agricultural use of the site.

Burlington Northern Sante Fe train on Colina Mariposa

By the mid-1990s, the property was owned by development interests. In 1998, DALCO Properties, LLC, donated 150 acres to the City for use as a natural area. The City purchased another 41 acres at the same time. Two years later, DALCO added another 0.8 acres at no cost to the City.

In 2005, when the first Fossil Creek Natural Areas Management Plan was adopted, a neighborhood natural surface trail had already been in use on the east side of Colina Mariposa. A regional trail on the west side along Shields was planned for the site. Construction of the paved Long View Trail is expected to start in fall 2017 and open to the public in 2018.

Hillside outcrop

Over the last 10 years, graffiti and other vandalism on the site have not been a major problem with the exception of some removal of hillside rocks for landscaping in the neighborhood. Many of these rocks contain fossils. Hillside rocks and outcrops also provide important habitat for reptiles and other small animals on the site. Removal of rocks, fossils, plants, and animals is not permitted from a natural area unless a permit (e.g., for research) is obtained from the City.

Improvements to Colina Mariposa Natural Area since the 2005 Fossil Creek Natural Areas Management Plan include:

- 2007: Installed site sign along South Shields Street.
- 2007: Removed old barbed wire fence along railroad tracks.
- 2008: Platte River Power Authority buried transmission lines and removed utility poles along Shields Street.
- 2013: Xcel Energy, Inc., installed gas line and dedicated funds to future site restoration and a regional trail.

Site Management

Colina Mariposa Natural Area is being managed to:

- ✓ Protect hillside habitat and rock outcrops.
- ✓ Preserve wildlife movement corridors.
- ✓ Protect sensitive wetlands.
- ✓ Preserve view sheds and vistas.
- ✓ Serve as a community separator.
- ✓ Support a future regional trail.

Lowland wetland on Colina Mariposa

To help protect wetland and wildlife habitat, Colina Mariposa is classified Zone 2A (Map 4). The Long View Trail alignment is along Shields Street to better serve commuters and to protect wildlife, stream, and wetland habitats. The trail will be 10 feet wide colored concrete with a detached crusher path along segments through City natural areas. The trail is expected to open for public use in 2018.

The City is the 100% owner of Colina Mariposa. The Natural Areas Department is the primary manager of the site; however, Parks will be responsible for maintaining the Long View Trail on this site after construction. Park Planning and Development, working with Natural Areas, is responsible for trail construction on the site. Stormwater Utility is responsible for maintaining drainages coming from, and under, Shields and Trilby. Lang Gulch is in good condition and Stormwater has no stream restoration plans for Colina Mariposa in the next 10 years. There are several flood hazards association with Lang Gulch and overtopping of Shields, Trilby, and the BNSF Railroad in a 100-year event. Because no homes are affected, improvement projects to relieve the flood hazards are low priority and will not likely occur within the next 10 years.

Lang Gulch cattail marsh

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Colina Mariposa Natural Area, the City's proposed objectives for the site are to:

- ❖ Protect unique hillside geologic and natural features.
- ❖ Maintain good neighborhood relations.
- ❖ Improve public access to the site.
- ❖ Enhance scenic views.

Specific actions identified to help meet these objectives over the next 10 years include:

<u>Hillside Protection:</u>

- ➢ Retain buck-n-rail fencing on east side to help reduce illegal access and damage to hillside habitat.
- ➢ Improve and standardize signage along east neighborhood.
- ➢ Conduct butterfly and breeding bird surveys.

Neighborhood Relations

- Continue to mow fire buffer along east neighborhood trail.
- Continue to control prairie dogs at northern, western, and southern boundaries to decrease neighbor conflicts.

Public Access

- Construct Long View Trail along Shields Street to connect Fort Collins and Loveland.
- Consider adding parking lot off Trilby between power substation and railroad tracks.

Trail alignment survey

Scenic Views

- Remove buck-n-rail fencing along Shields and Trilby over time and replace with single-rail fencing only where necessary (e.g., near gate entrances).
- Provide interpretive signage only at parking lot.

REDTAIL GROVE NATURAL AREA

Redtail Grove site sign

Redtail Grove is a 51-acre site extending along Fossil Creek from Fossil Creek Drive east to College Avenue (Map 5). The BNSF Railroad track separates the west parcel of the natural area from the east parcel. Lang Gulch tributary enters Fossil Creek on the west side of the site. Providing a key wildlife movement corridor for Fossil Creek, Redtail Grove is a unique property containing historic remnants of a brick factory and fossil-bearing rock outcrops. Public access is currently limited to the Mason Street Trail that joins the Fossil Creek Trail on the site near College Avenue. Parking is available at the South Transfer Station north of the site. Construction of a railroad underpass is underway, which will provide access to the west parcel and on to Cathy Fromme Prairie via an extension of the Fossil Creek Trail. The underpass was completed in spring 2017, but will not open for use until the Fossil Creek Trail extension is completed in 2018.

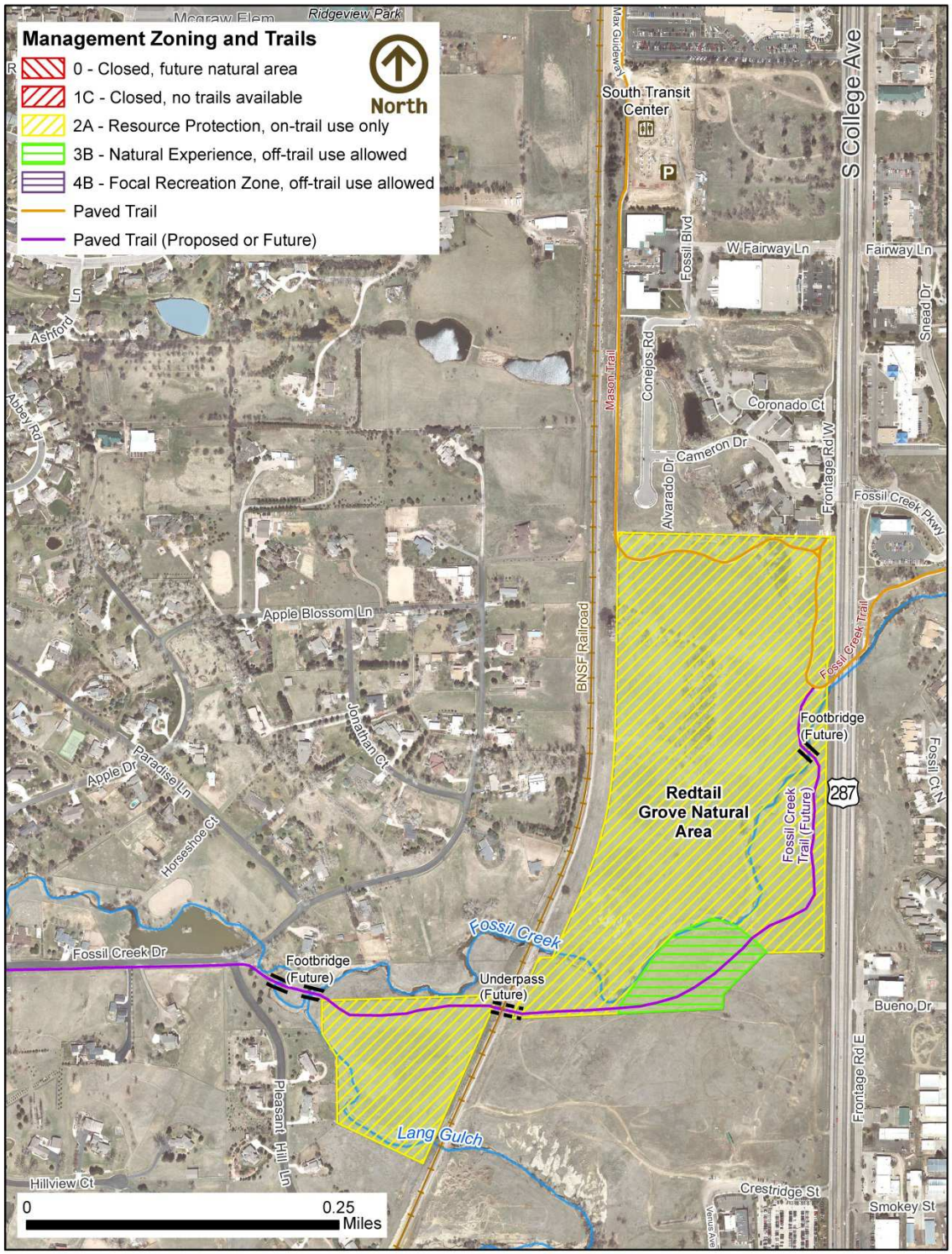
The public was solicited to name this natural area. Redtail Grove was selected by staff due to the dominant cottonwood grove visible from College Avenue. In the 1990s, a pair of red-tailed hawks nested in a lone tree along Fossil Creek. However, after several years of nest failure in that tree, the site was mainly used for hunting and roosting by red-tailed hawks. The hawks are commonly seen perched on trees in the cottonwood grove.


Mule deer buck browsing on Redtail Grove (Photo by Dave Trevino)

Even though Redtail Grove is adjacent to busy College Avenue, nearly 100 species of birds, mammals, herptiles, and fish have been observed on the site (Appendix C). The cottonwood grove, in particular, provides important habitat for songbirds, woodpeckers, and raptors. Redtail Grove provides a refuge that helps facilitate movement of mid-size to large mammals between natural areas to the west and to the east.

Almost 200 species of plants have been documented on Redtail Grove (Appendix B). Seventy-one percent of these plants are native species. Two native species are on the City of Fort Collins Species of Interest List (City of Fort Collins 2016): tulip prickly pear (*Opuntia phaeacantha*) and fringed loosestrife (*Lysimachia ciliata*), both common elsewhere but not on the east slope of Colorado.


Tulip prickly pear (Photo by Thomas L. Muller, Lady Bird Johnson Wildflower Center)



Map 5. Redtail Grove Natural Area

Site History

The west parcel of Redtail Grove has a rich history of use for brick production from 1903-1950 (Carroll 2014). Remains of one tram base, bricks, building foundations, and a kiln are still present on the site. The tram carried clay from west of Cathy Fromme Prairie more than two miles to the brick factory, strategically built next to the Colorado and Southern Railroad tracks (now Burlington Northern Santa Fe [BNSF]). The history of the east parcels is largely unknown but a foundation for a small building is present on this parcel. The east parcels were used for cattle grazing in the early 1990s prior to City ownership.

Master Naturalist Brian Carroll surveying the remains of the brick factory

The City purchased the first 38-acre parcel east of the railroad tracks from a developer in 1996. In 1999, another developer donated the 5 acres along Fossil Creek adjacent to this first parcel. In 2010, the City purchased the 8 acres west of the railroad track.

In 2005, when the first Fossil Creek Natural Areas Management Plan was adopted, Redtail Grove was not yet open to the public. Over the last 10 years, Redtail Grove has grown in size and complexity. Of all the Fossil Creek sites Redtail Grove has had the most graffiti, illegal camping, and trespassing issues.

Open land to the south of Redtail Grove along College Avenue is under City development review for multi-family residential development, a church, and future commercial uses along College. Access to the Fossil Creek Trail will be provided from this development. Trail counter data from 2016 indicate that there are approximately 800-1,900 visitors to Redtail Grove each month with lowest numbers in December and highest numbers in May.

Improvements to Redtail Grove Natural Area since the 2005 Fossil Creek Natural Areas Management Plan include:

- 2006: Park Planning and Development completed the Mason Street Trail Connection and Fossil Creek Trail College Avenue underpass.
- 2006: Artist Mario Miguel Echevarria created "Squid Jam & Jelly Preserve" under College Avenue. This Art in Public Places Project (APP) serves dual roles as a decorative retaining wall and a visual flood warning system for trail users.
- 2006: Site sign and regulatory mini-kiosks installed.
- 2016: Start of railroad trail underpass project.
- 2017: Russian olives removed.

Mario Echevarria's Trail underpass APP Project

Site Management

Redtail Grove Natural Area is being managed to:

- ✓ Preserve wildlife movement corridor.
- ✓ Protect rock outcrops and fossils.
- ✓ Preserve view sheds and vistas.
- ✓ Protect remnants of the historic brick factory.
- ✓ Provide trail connections.

Mini-kiosk on Redtail Grove

To help protect paleontological and historic features, as well as wildlife use of the site, most of Redtail Grove is classified Zone 2A (Map 5). Once the Fossil Creek trail is constructed, a portion of the site along Fossil Creek will be classified 2B (Natural Experience) to allow an area for off-trail exploration (see Map 5).

The City owns 100% of Redtail Grove. The Natural Areas Department is the primary manager of the site; however, Parks is responsible for maintaining the Fossil Creek Trail and Streets is responsible for maintaining the Mason Trail. Stormwater Utility is responsible for maintaining drainages coming from and under College Avenue. Stormwater has targeted both Lang Gulch and Fossil Creek on Redtail Grove for future stream rehabilitation, but this is not likely to occur in the next 10 years because of the number of higher priority stream reaches needing rehabilitation. There is a flood hazard of Fossil Creek overtopping the BNSF Railroad track in a 100-year event, but modifications to existing culverts are not required until upstream improvements significantly alter the timing of the peak discharge.

Smooth brome is dominant on Redtail Grove beyond the rock outcrop areas. However, Natural Areas has not targeted this site for grassland restoration in the next 10 years. There are also no plans for the use of cattle grazing on the site for vegetation management, but goats and/or sheep may be a possibility over the next 10 years.

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Redtail Grove Natural Area, the City's proposed objectives for the site are:

- ❖ Protect unique natural and historic features.
- ❖ Improve public access to the site.
- ❖ Provide opportunities for nature play.
- ❖ Enhance scenic views.

Specific actions identified to help meet these objectives over the next 10 years include:

Cottonwood grove

Natural and Historic Features

- Continue to keep fossil beds, associated rare plant communities, and the cottonwood grove inaccessible to the general public.
- Retain historic brick factory remnants on the site.
- Interpret value and need to protect historic remnants to the public.
- Work with APP and Park Planning and Development to incorporate brick factory themed art along the new section of Fossil Creek trail.
- Continue to remove and control Russian olives; explore developing partnership with landowners to the north for removal on private land.
- Retain large, downed trees along Mason Trail for wildlife habitat and cover unless they become a frequent site for transient camps.

Public Access

- Support Park Planning and Development's efforts to complete railroad underpass and Fossil Creek Trail Project by 2018.

Nature Play

- Explore opportunities to enhance nature play in the Natural Experience Zone, including possibly adding steps down to the creek.

Scenic Views

- Remove buck-n-rail fencing along College over time and replace with single-rail fencing only where necessary (e.g., near gate entrances).
- Control prairie dogs that invade the natural area to limit erosion and resulting dust storms that affect visibility on College Avenue, creating safety concerns.

TWO CREEKS NATURAL AREA

Two Creeks site sign

Two Creeks is a 30-acre site on the west side of Fossil Creek Community Park (Map 6). Fossil Creek Parkway separates the west parcel from the east parcels. As the name implies, the site contains two creeks: Mail Creek and Fossil Creek. Public parking is available at Fossil Creek Community Park. Paved trails provide access to the site on the east side of Fossil Creek Parkway.

Although not a very large site, Two Creeks Natural Area is connected to other public and privately owned natural areas that add to the value of the site. Fossil Creek Community Park provides 17.5 acres of natural habitat along the creeks to the east of Two Creeks. Two certified natural areas maintained by homeowners associations add another 17 acres of natural habitat along the creeks to the west and south of Two Creeks. Over the last 10 years, Fossil Creek Meadows and Huntington Hills HOAs have committed time and money to remove Russian olives and plant native shrubs on their certified natural areas adjacent to Two Creeks. Other neighbors have participated in cleanup projects directly on Two Creeks.

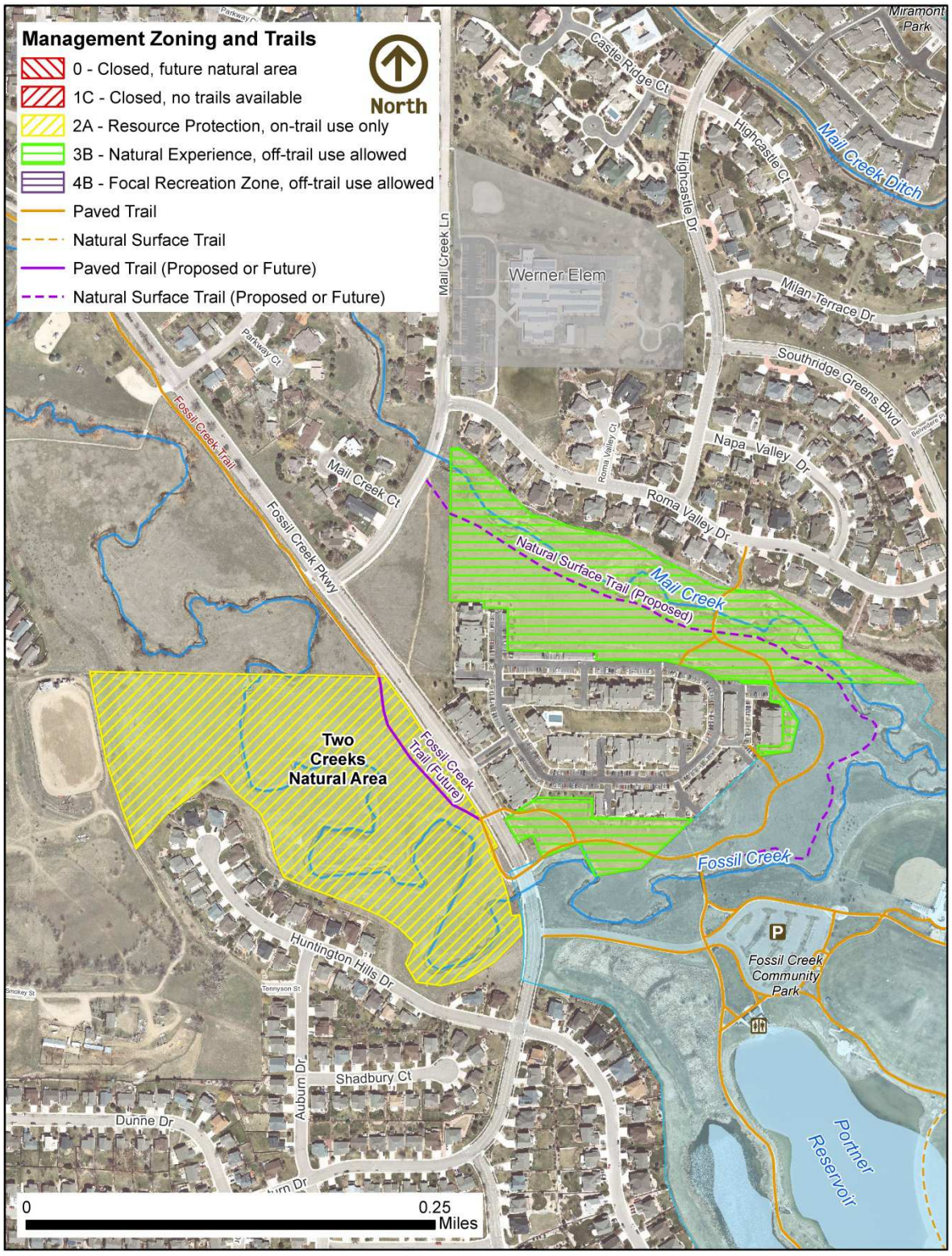
Volunteer site clean-up along Mail Creek

About 50 species of birds, mammals, herptiles, and fishes have been documented on Two Creeks Natural Area (Appendix C). The list includes some rather unusual animals for the Fossil Creek sites, including a one-time occurrence of young black bear. The rare two-spotted skipper butterfly was documented on the site in the 1990s, but not confirmed since that time. One notable nesting bird is the cliff swallow. The Fossil Creek trail underpass provides an ideal spot for this species to nest. Although not welcomed by all who use the trail, the swallows provide natural insect control for the site and many find their short nesting season fascinating to observe. Like all migratory birds, cliff swallows and their nests when in use are protected by Federal, State, and local laws.

Cliff Swallow nests on trail underpass ceiling

Along with low wildlife species richness, only 65 species of plants have been observed on Two Creeks, thus far (Appendix B). Less than half are native species. While the upland habitat of the site is dominated by non-native grasses and weedy forbs, the creek habitat is bit more diverse, providing microhabitats for various aquatic insects and small fishes.

Giant goldenrod and willows along Mail Creek



Map 6. Two Creeks Natural Area

Site History

Although the history of Two Creeks is not known, it was likely used for hay production and perhaps grazing prior to the 1990s. The site is dominated by exotic smooth brome grass and was fenced with barbed wire prior to City ownership. No evidence of a former building has been found on the site.

The City purchased the site in 1999 in two separate transactions from the developers of Huntington Hills and Fossil Creek Condos. The cost included a donation of $15,000. Fossil Creek Condos was required to design and install two interpretive signs on their property as part of the development approval. The signs are maintained by the homeowners association and not the City. In 2003, the paved trail system on the site was completed and the adjacent Fossil Creek Community Park opened to the public.

Fossil Creek Condos interpretive sign

Only a few improvements have been made to Two Creeks Natural Area since the 2005 Fossil Creek Natural Areas Management Plan:

- 2005: Site sign and regulatory mini-kiosks installed.
- 2005: Fourteen acres west of Fossil Creek Parkway seeded with native grasses.
- 2011: The City granted a Maintenance Agreement to the Fossil Creek Condominium Association so that a portion of their landscape easement on Two Creeks could be used as a small garden that includes bird feeders and wildflowers for pollinators and seed-eating birds.

Fossil Creek Condos Garden

Site Management

Two Creeks Natural Area is being managed to:

- ✓ Preserve wildlife movement corridors.
- ✓ Provide trail connections to Fossil Creek Community Park.
- ✓ Preserve habitat for butterflies, including the rare two-spotted skipper.
- ✓ Protect nesting colonies of swallows.
- ✓ Provide trail connections.

To provide a refuge for more sensitive wildlife using the corridor, the west half of Two Creeks is classified Zone 2A (Resource Protection; on-trail use only) (Map 6). Two Creeks east of Fossil Creek Parkway will be classified 2B (Natural Experience) to allow an area for off-trail exploration (see Map 6). This part of Two Creeks is adjacent to the active Fossil Creek Community Park and also near Werner Elementary School.

The City is the 100% owner of Two Creeks. The Natural Areas Department is the primary manager of the site; however, Parks is responsible for maintaining the Fossil Creek Trail. Stormwater Utility is responsible for maintaining storm flows in drainages coming from and under Fossil Creek Parkway and Mail Creek Lane. Stormwater has targeted both Mail Creek and Fossil Creek for future stream rehabilitation. Mail Creek is a high priority stream for rehabilitation. Design for the Mail Creek section in Two Creeks could begin as early as 2021. Fossil Creek rehabilitation is not yet prioritized, so not likely to occur in the next 10 years because of higher priority stream reaches needing rehabilitation

High bank of Mail Creek

Exotic smooth brome grass is predominant on Two Creeks. Natural Areas has targeted this site for grassland restoration in the next 10 years. Because of the small size of the habitat and land uses, Two Creeks is not a site where prairie dogs would be allowed to reestablish after grassland restoration. Due to the small site size, there are no plans for cattle grazing for vegetation management; however, grazing by goats and/or sheep may be a possibility in the future. Use of prescribed fire for grassland management would also be limited due to the site size and surrounding neighborhoods, but small burns could be conducted to create disturbance in grasslands or to assist with restoration.

Mail Creek social trail

Over the years, a social (undesignated and unmaintained) trail has developed along the south side of Mail Creek. Efforts to keep people off this undesignated trail through fencing and signage have not been successful. Flood events and erosion have caused loss of banks and even some of this trail. To address safety concerns, Natural Areas is proposing to designate, manage, and improve this trail.

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Two Creeks Natural Area, the City's proposed objectives for the site are to:

- Enhance wildlife habitat.
- Improve trail system.
- Provide areas for nature exploration.

Specific actions identified to help meet these objectives over the next 10 years include:

<u>Enhance Wildlife Habitat</u>

- Conduct surveys to determine presence and habitat needs for the rare two-spotted skipper and salamanders.
- Continue treatment of Russian olives, including removal of shrubs.
- Continue upland grassland restoration efforts.
- Provide design assistance for Stormwater's rehabilitation project on Mail Creek.

Improve Trail System

- Work with Park Planning and Development to complete the last 575-foot section of Fossil Creek Trail along Fossil Creek Parkway.
- Designate and maintain the Mail Creek social trail, moving the trail in some places further away from bank edges for safety.
- Work with Parks to improve and maintain the social trail on the west side of Mail Creek and Fossil Creek on the Community Park property.

Inspecting Mail Creek social trail for hazards

Nature Exploration

- Explore opportunities to enhance nature play in the Natural Experience Zone, including providing safe access down to Mail Creek.

PRAIRIE DOG MEADOW NATURAL AREA

along Skyway Drive

Prairie Dog Meadow is an 84-acre site southwest of Fossil Creek Community Park (Map 7). The site is mostly salt meadow and cattail marsh, but was once a part of a larger grassland site that supported one of the largest prairie dog colonies in Fort Collins. The colony was a hunting ground for a large number of hawks and eagles especially during the winter months. As pastures and grasslands to the north and northeast were developed into residential lots, the prairie dog colony was reduced and confined to small upland areas of Prairie Dog Meadow. Currently, public access to this wetland site is restricted to a small spur trail and bench on the north end of Kyle Avenue. A parking lot, shared with Larimer Humane Society, is available at the spur trail. Situated at the headwaters of Stone Creek, extensive wetlands and high groundwater limit trail development on the site.


Prairie Dog Meadow wetlands

Prairie Dog Meadow, surrounded by development but difficult to access, provides an island of protected wetland habitat in the urban environment. Eighty-three species of birds, mammals, and herptiles have been documented on this small site (Appendix C). Coyotes and red fox have been frequent visitors throughout the year, along with a variety of owls and hawks. Migratory wading birds are seen in spring or late summer, especially during wet years.

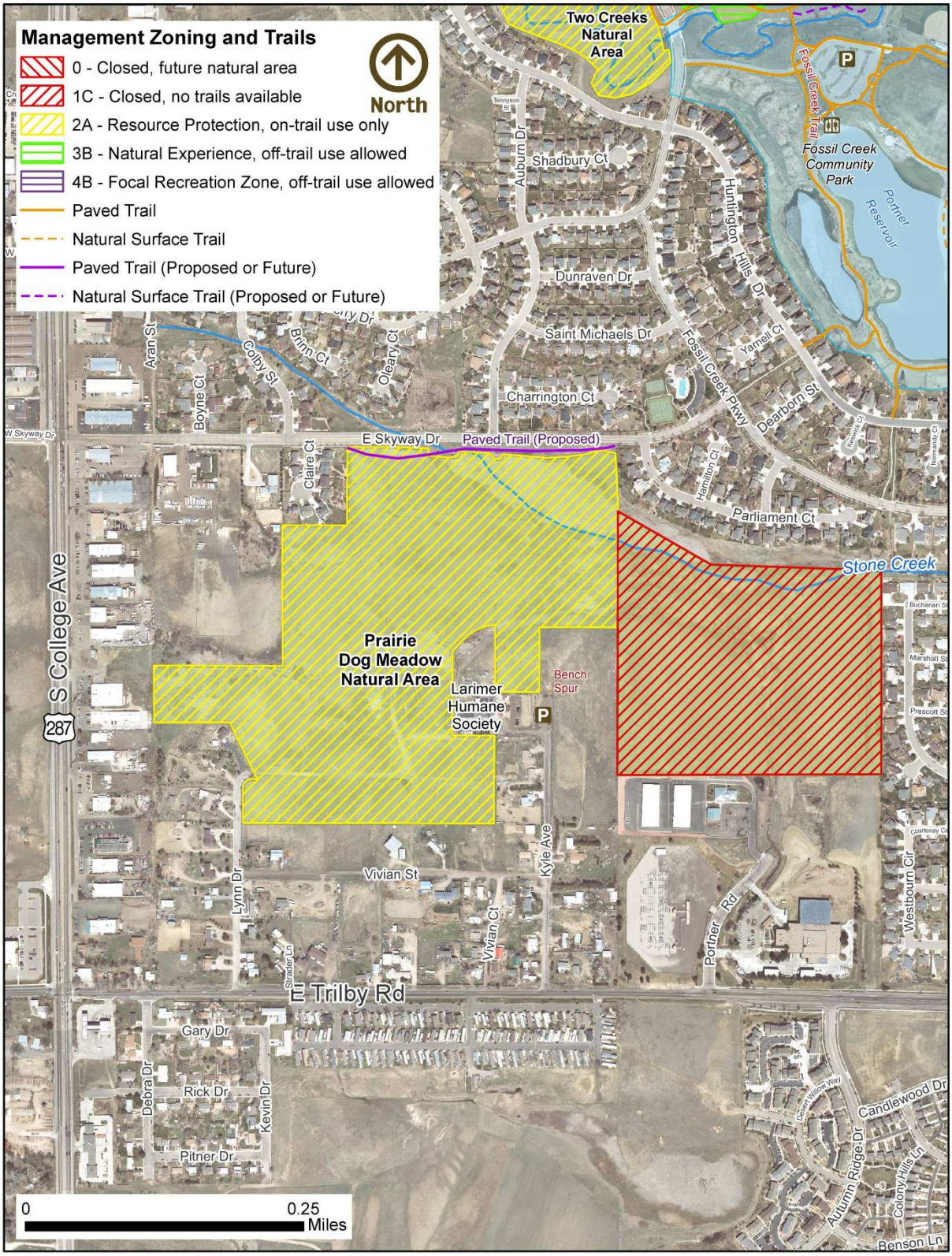

Greater yellowlegs (Photo by Norm Keally)

Although less than 100 acres in size, 160 species of plants have been documented on Prairie Dog Meadow thus far, 65% of which are native species (Appendix B). The alkaline flats on the site support salt-loving natives such as sand spurry, fourwing saltbush, saline saltbush, and inland saltgrass.


*Salt meadow alkaline flats (*Photo by Crystal Strouse)


*Prairie dog on mound (*Photo by Jennifer Roberts)

Because of the extensive wetland habitat and surrounding development, the site no longer can support a large population of prairie dogs. While the animals can forage in wetlands, this habitat does not supply their preferred food plants and is unsuitable for building the tunnel system they need to survive. Prairie dogs are restricted to upland habitat on the fringe where they often come in conflict with neighbors.



Map 7. Prairie Dog Meadow Natural Area

Site History

Prairie Dog Meadow looking northwest from trail spur; Humane Society outbuildings in center left

As with many of the other Fossil Creek natural areas, very little is known about the history of the Prairie Dog Meadow site prior to City ownership. With its extensive wetlands, it probably received little use as cropland, but hay production and grazing likely occurred on the site before adjacent residential development started. The natural area wraps around the current Larimer Humane Society shelter building, which was built in 1972. A new shelter facility is being built in Loveland. The future of the older shelter on Kyle Avenue is currently unknown.

The City purchased 82.2 acres of the site in three transactions from 1994-2003 and received a donation of 1.5 acres. From 1994-2004, numerous efforts were made to try to control the movement of prairie dogs onto adjacent residential property (Brittany Knolls), including installing a vinyl barrier fence, planting over 7,500 native shrubs for a barrier, seeding in tall grasses, planting shrub clumps for predator cover, installing raptor perches, fumigation, and relocation. Unfortunately, the prairie dog colony had no area to expand into on this wetland site. As a result, dense concentrations of prairie dogs and dryer years led to a denuded grassland and associated dust problems that negatively affected air quality and impacted neighboring homes.

Since the 2005 Fossil Creek Natural Areas Management Plan, prairie dog management continued on the site and a few improvements were made:

- 2006: New site sign installed.
- 2007: Improved Larimer Humane Society overflow parking lot at the north end of Kyle Avenue for joint natural area use.
- 2007: Constructed spur trail to viewing area with bench off parking lot.
- 2007: Site sign installed on the north side of the site.

Viewing area off Kyle Avenue parking lot

Site Management

Today, Prairie Dog Meadow Natural Area is being managed to:

- ✓ Protect the wetland.
- ✓ Preserve the wildlife movement corridor.
- ✓ Restore uplands.

Although opportunities for trails on this site are extremely limited due to the wetland and high groundwater habitat, the western half of Prairie Dog Meadow is classified Zone 2A

(Resource Protection; on-trail use only) (Map 7). The eastern half is classified 1C (Closed; no trails available) while this area is under grassland restoration to recover from past overgrazing by prairie dogs (see Map 7).

The City is the 100% owner of Prairie Dog Meadow. The Natural Areas Department is the primary manager of the site. Stormwater Utility is responsible for maintaining Stone Creek to carry flows in storm events. Stone Creek is in good shape and Stormwater does not have any plans for stream improvements on this site.

The eastern grassland has been under restoration for nearly 10 years. The restoration has been successful and native grasses are thriving, providing small mammal prey base for predators such as coyotes and hawks. However, the number of prairie dogs will need to continue to be controlled on site to maintain higher quality grassland and mitigate neighborhood conflicts.

Coyote den on Prairie Dog Meadow (Photo by Norm Keally)

Due to the site's small size, there are no plans for cattle grazing for vegetation management; however, grazing by goats and/or sheep on a limited basis may be a possibility in the future. Mowing along eastern edge of the site will continue, as needed to create fire breaks. Use of prescribed fire for grassland management cannot be used because of the small site size, area occupied by prairie dogs, and adjacency to residential neighborhoods.

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Prairie Dog Meadow Natural Area, the City's proposed objectives for the site are to:

- Enhance wetland habitat.
- Continue grassland restoration.
- Provide additional trail access.

Specific actions identified to help meet these objectives over the next 10 years include:

<u>Wetland Enhancement</u>

- Pursue vacating internal road ROW's.
- Consider removing raised roadbeds/old ditch- berms.
- Continue removal and treatment of invasive Russian olives.

<u>Grassland Restoration</u>

- Continue grassland restoration.
- Keep prairie dog population from increasing to point of impacting health and vigor of restored grassland.

<u>Additional Trails</u>

- Add a paved trail/sidewalk on the north side of the property (see Map 7).

- Explore opportunities to purchase Larimer Humane Society parcel for possible public access at current shelter property (3.5 acres).

Prairie Dog Meadow, looking south from Skyway, early June 2016

PELICAN MARSH NATURAL AREA

Pelican Marsh site sign

Pelican Marsh is a 156-acre natural area between College Avenue and Lemay, north of Carpenter (Map 8). The site includes an irrigation reservoir, the 42-acre Robert Benson Lake. Pelican Marsh is adjacent to Water's Way Park. Parking and restroom facilities for Pelican Marsh visitors are located at the park. About 0.7 miles of paved trail exist on the site, providing access to a viewing area for the lake and a trail south across a grassland under restoration. A crusher trail along Carpenter connects the paved trail to the sidewalk on the west side of Lemay.


American white pelican taking off from the water (Photo by Dawn Wilson)

Since the 1980s, the reservoir has been a local haven for American white pelicans, a bird once extremely rare in the State and listed as a Colorado Species of Concern as late as the early 1990s (City of Fort Collins 1992). Today, white pelicans are commonly seen on many lakes and reservoirs throughout Fort Collins from spring through early fall. Pelicans nest colonially at only three known locations in Colorado—the closest is at Riverside Reservoir in Weld County.

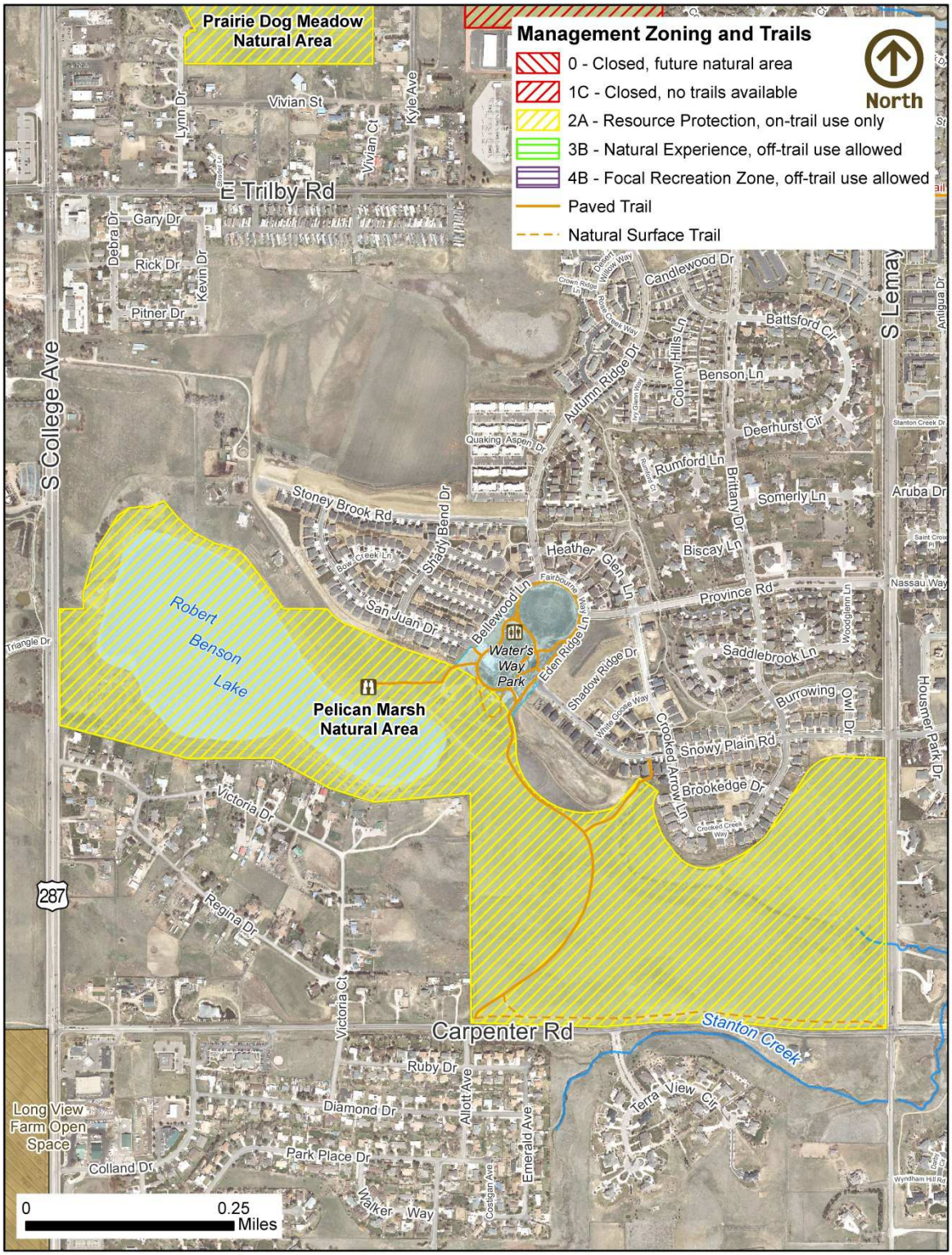
In addition to the pelicans, Robert Benson Lake provides habitat for a variety of ducks and other wetland birds, hawks, owls, and grassland birds as well as urban songbirds. To date, 70 bird species have been recorded from the site (Appendix C). The reservoir is very shallow, making it ideal feeding habitat for various waterbirds, but not very good habitat for game fish. Although fish surveys have been limited, only common carp have been reported within the waters of the reservoir.


Western meadowlark (Photo by Dave Leatherman)

Pelican Marsh has supported a coyote den in the past and coyotes still frequent the site. The prairie dog population has had its ups and downs through the years due to plague and control for grassland restoration. Suitable prairie dog habitat is limited on Pelican Marsh once buffers from neighbors are taken into account. Thirteen-lined ground squirrels appear to have increased in areas undergoing grassland restoration where prairie dogs have been prevented from re-establishing.

Larger than nearby Prairie Dog Meadow, Pelican Marsh's plant diversity is nearly 20% less and only 60% of the plant species are native (Appendix B). Over the last 10 years, wetland plant diversity at the reservoir had been enhanced through plantings as part of the wetland mitigation required for dam replacement.


Looking northwest from dam on Robert Benson Lake (Photo by Crystal Strouse)



Map 8. Pelican Marsh Natural Area

Site History

Robert Benson Lake on Pelican Marsh Natural Area was created with the construction of Fairport Dam in 1882. The original dam was built by Aaron S. Benson, a prominent Loveland businessman. Robert Benson was his grandson who farmed in this location. Water from the reservoir was used to grow crops such as sugar beets and corn, as well as hay. At the turn of the 20th century, the water helped nourish the largest cherry orchard west of the Mississippi. No historic building sites have been found on the land encompassed by Pelican Marsh Natural Area, but an old farm house was adjacent to the site on what is now part of the Provincetowne subdivision.

Water's Way Park

The City of Fort Collins Natural Areas purchased Pelican Marsh in 2002. In 2007, the State of Colorado required the City to drain Benson Reservoir because the condition of the dam's outlet structure had deteriorated to an unsafe condition. The dam, then more than 125 years old, was replaced in 2009. Material from the historic dam was used by artist Robert Tully to create the Art in Public Places piece "Old Release" to honor the history of Fairport Dam.

Dam replacement required loss of 0.8 acres of wetland habitat that was mitigated by creating 0.74 acres of wetland habitat and enhancing the riparian habitat by planting 163 cottonwood trees and 30 coyote willow bundles. Prior to dam replacement, invasive Russian olives were removed from the shoreline of the reservoir and stumps treated for re-sprouting.

Since the 2005 Fossil Creek Natural Areas Management Plan, the dam was rebuilt, Water's Way Park was constructed, and public improvements were installed on Pelican Marsh Natural Area, including:

- 2006: Single rail fencing on south and east boundary.
- 2011: Paved trail from Water's Way Park to Carpenter; paved spur trail from park to lake viewing pad.
- 2012: Paved trail from Snowy Plain Road to main trail; three benches at lake viewing pad; crusher trail along Carpenter; informational kiosk along paved trail.
- 2013: Two interpretive signs (kiosk and lake viewing area).
- 2014: Updated site sign.
- 2016: Bench by kiosk.

Paved trail through Pelican Marsh's grassland

Site Management

Pelican Marsh Natural Area is being managed to:

- ✓ Preserve the high waterbird use on Robert Benson Lake.
- ✓ Restore grassland.
- ✓ Provide opportunities for wildlife watching.
- ✓ Ensure dam safety.
- ✓ Provide irrigation water for Water's Way Park.

Because of the high use of the Robert Benson Lake by waterbirds, and the grassland restoration efforts to enhance upland wildlife use of the site, Pelican Marsh Natural Area is classified as Zone 2A (Resource Protection; on-trail use only) (Map 8). No future trails are planned for the next 10 years.

The City is the 100% owner of Pelican Marsh Natural Area. The Natural Areas Department is the primary manager of the site. Stormwater Utility uses Robert Benson Reservoir for Stormwater detention and is responsible for maintaining storm water flows downstream of the dam in a flood event. Pelican Marsh is at the headwater of the north branch of Stanton Creek. Stormwater does not have any plans for stream improvements on this site. Parks maintains a pump station on Pelican Marsh to draw water from the lake to irrigate Water's Way Park. Parks is part owner of the water in Robert Benson Lake and helps maintain the lake by inspecting and servicing the control gate at the dam. Fairport Dam is inspected every two years by an engineer with the State of Colorado. No problems have occurred with the new dam, but further downstream, there have been some issues with water from the outlet swale going into Waterleaf HOA Detention Pond; repairs were made by Parks and Natural Areas in 2016.

Grassland restoration of the eastern half of the Pelican Marsh will continue into the future. The City plans to maintain a small colony of prairie dogs on the site. The grassland restoration has been successful and the taller native grasses have attracted small mammals, grassland birds, and hawks. Flash grazing by domestic animals (cattle, goats, or sheep) could be used in the future for vegetation management. Small prescribed fires may also be used in the future.

Small prairie dog colony on Pelican Marsh, July 2016

No new trails are planned for the site. A safe pedestrian crossing across Carpenter Road (SH 392) has been requested by neighbors since trails were first constructed. Cottonwood Plains Elementary School (Thompson School District) is ½ mile south of the southwest corner of Pelican Marsh. City Traffic Operations staff conducted a speed study of Carpenter Road related to crossing design requirements. The appropriate crossing treatment would be a crosswalk with a pedestrian hybrid beacon (a traffic signal activated by pedestrians to stop traffic) at a cost of about $100,000 (2012 dollars). However, the Colorado Department of Transportation who has jurisdiction over Carpenter Road would not allow or fund the crossing because of the high speeds and lack of pedestrian use. For the foreseeable future, Carpenter Road can only be safely crossed at Lemay where there is a signal light.

Since the construction of Water's Way Park, vandalism of natural areas and park structures has been a recurring problem. In addition to graffiti, damage to play structures, benches, and informational kiosks has occurred annually. For unknown reasons, the frequency of these illegal activities has been higher at this site than some of the other neighborhood parks and natural areas.

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Pelican Marsh Natural Area, the City's proposed objectives for the site are to:

- Enhance wildlife use.
- Continue grassland restoration efforts.
- Maintain dam in good condition.
- Improve trail access along Carpenter.
- Provide outdoor educational opportunities for the neighborhood.

Specific actions identified to help meet these objectives over the next 10 years include:

Wildlife

- Continue to limit access to lake to preserve the high waterbird use.
- Provide buffers of unmowed grasses around coyote and fox dens during vegetation management efforts.
- Continue removal and treatment of invasive Russian olives.

Grassland Restoration

- Consider flash grazing and/or small prescribed burns to simulate natural grassland disturbance.
- Consider possible haying of site (perhaps to supply Soapstone Prairie Bison Herd).
- Keep prairie dog population from increasing to point of impacting health and vigor of restored grassland.

Dam Maintenance

- Continue to regularly inspect dam and maintain head gate.
- Continue to remove woody vegetation that establishes on the dam or at the toe of the slope.
- Keep outlet of the dam free of debris.

Trail Improvement

- Pave existing crusher trail along Carpenter.
- Repair erosion in southwest corner by trail.
- Support City, County, and State efforts to provide a safe pedestrian crossing at Allot Avenue should Carpenter Road traffic situation change in the future.

Outdoor Education

- Add educational events.

- Provide Service Learning volunteer opportunities.
- Encourage neighborhood ownership and investment in natural area and park to help decrease vandalism.

Volunteers planting willow stakes on the shore of Robert Benson Lake in 2010 (Photo by Crystal Strouse)

FOSSIL CREEK WETLANDS NATURAL AREA

Fossil Creek Wetlands site sign

Fossil Creek Wetlands is a 229-acre natural area west of Timberline between Trilby and Carpenter, straddling the Union Pacific Railroad (Map 9). The site supports an extensive wetland, prairie dog colonies, rock outcrops, and a prehistoric Native American archaeological site. The Fossil Creek Trail runs north and south along the western edge of the site and connects to the Power Trail on the north side of Trilby. The portion of the site east of the railroad track is currently not open to the public.


Black-necked stilt (Photo by Norm Keally)

The eastern portion of Fossil Creek Wetlands is part of the Fossil Creek "Important Bird Area," designated by the National Audubon Society in 2001. To date, 148 species of birds have been documented on Fossil Creek Wetlands (Appendix C). Of the Fossil Creek sites, it is second only to the adjacent Fossil Creek Reservoir Natural Area in bird diversity. A variety of wetland birds frequent the site from early spring to late fall until open water freezes. In winter, large birds of prey rule the open habitat. Throughout the year, Fossil Creek Wetlands provides habitat for prairie dogs, small mammals, amphibians, and reptiles—important food for raptors of all sizes.

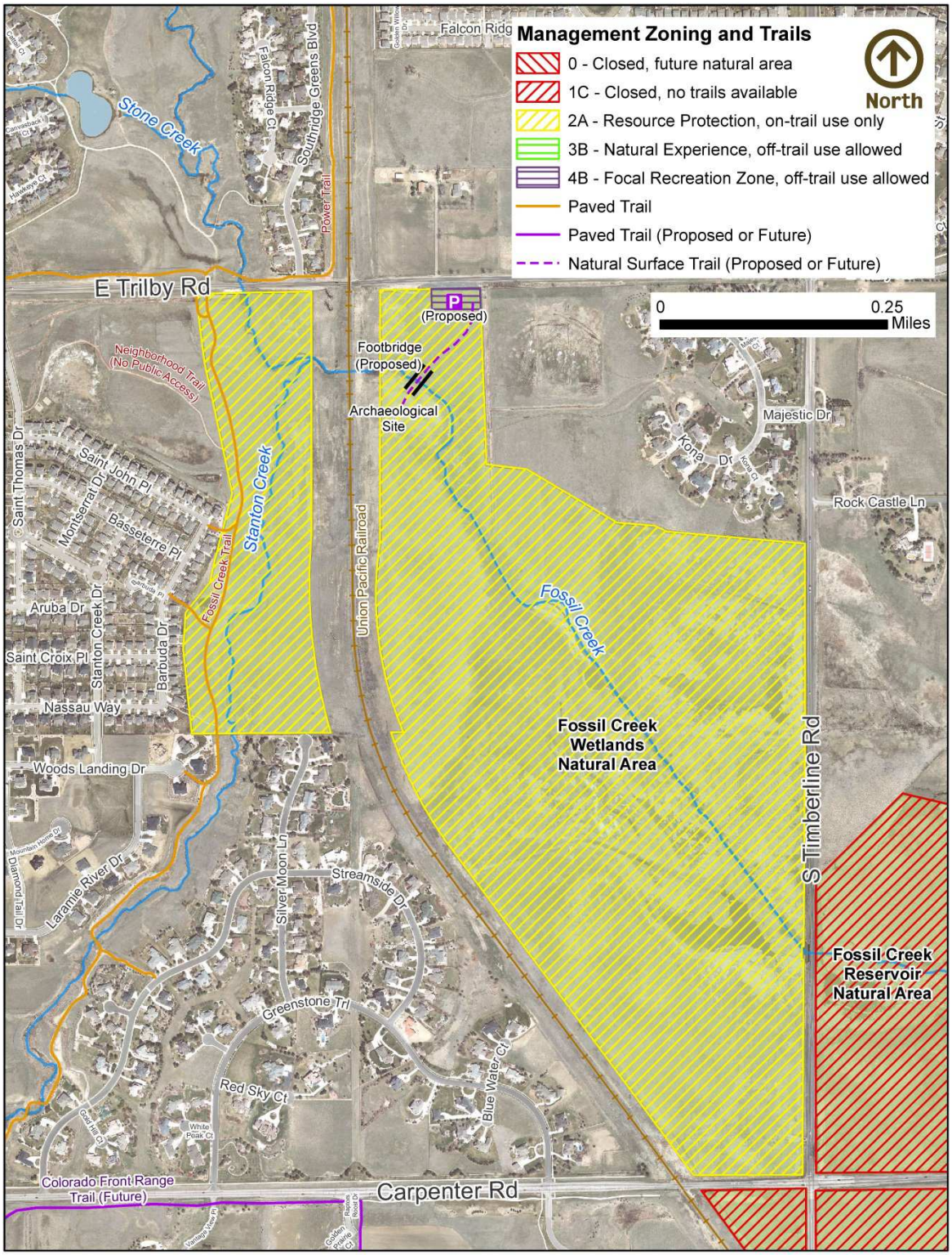

Winter rough-legged hawk eating a small rodent (Photo by Francoise Smith)


Open water and wetlands in late spring

Among the mammals, the most unusual occurrence was a moose that showed up on the site briefly following a forest fire event in the foothills but it is not uncommon to see mule deer in the open wetland habitat and the site is known to support badgers (Appendix C). Both snapping and painted turtles inhabit the open water. Three native small fishes have been found to occur in Fossil Creek proper: sand shiner, fathead minnow, and creek chub.

On first glance at the landscape, one may not expect plant diversity to be particularly high on Fossil Creek Wetlands, but nearly 200 species have been recorded from this site, thus far, with 70% of these native to Colorado (Appendix B). Flowering plants bloom throughout the growing season providing food for birds, butterflies, bees, and other pollinators.


Bumble bee on showy milkweed



Map 9. Fossil Creek Wetlands Natural Area

Site History

Evidence of prehistoric Native American occupation of Fossil Creek Wetlands dating to the Early Ceramic period of Northern Colorado (AD 150-1100) has been discovered on the site by Dr. Jason M. LaBelle (LaBelle 2015) and his students (Center for Mountain and Plains Archaeology, Department of Anthropology, Colorado State University). Arrow points, chipped stone tools, pieces of broken pottery, discarded animal bones, and plant grinding implements have been discovered during archaeological digs on the site. Soil is replaced at the end of the field season from areas dug out during the excavation.

Dr. LaBelle's students at the archaeological dig on Fossil Creek Wetlands, 2016

By the 1880s the Union Pacific railroad line through Fossil Creek Wetlands Natural Area was in place; unfortunately, little is known about the historic use of the wetlands. No remains of historic building sites have been found on the land now encompassed by the natural area. In the decade prior to City ownership, the site was used for hay production and limited grazing by cattle and horses.

The City of Fort Collins Natural Areas purchased Fossil Creek Wetlands in three separate land transactions in 1995. The adjacent Paragon Estates Development holds water rights and an easement to operate an irrigation pump station (small metal building) on the west side of the railroad tracks near Trilby. Paragon Estates is responsible for maintenance of the structure.

In the early years of City ownership, Natural Areas staff tried various management techniques to contain prairie dog colonies to the site and limit their movement onto private property. Installation of artificial and vegetative barriers, raptor poles, and predator shrub clumps had little effect on reducing movement or colony size. The site remained closed to the public until 2004 when a short, temporary natural surface trail was constructed off Barbuda Drive. The trail was primarily used by the adjacent Stanton Creek neighborhood. Public use of the site has increased dramatically since the Fossil Creek Trail connection was completed in 2014 on the west side of the site. The majority of the natural area (east of the Union Pacific RR track) has remained closed to the public to protect the wetland habitat and wildlife use.

Ferruginous hawk on raptor pole with a bat house at Fossil Creek Wetlands

Looking south near Trilby, Fossil Creek Trail

In addition to the completion of the Fossil Creek Trail, improvements to Fossil Creek Wetlands since the previous management plan included:

- 2006: Removed unnecessary barbed wire fencing.

- 2006: Installed additional site sign on north side.
- 2010: Prehistoric Native American artifacts found on site and CSU archaeological dig began.
- 2016: Public tours of CSU archaeological dig led by City of Fort Collins Natural Areas staff and Master Naturalists.

Examples of artifacts found on Fossil Creek Wetlands

Site Management

Fossil Creek Wetlands Natural Area is being managed to:

- ✓ Protect waterbird use of the wetlands, especially during critical migration and nesting periods.
- ✓ Restore grassland to enhance wildlife use.
- ✓ Provide recreational opportunities.
- ✓ Protect archaeological resources.
- ✓ Provide educational opportunities for public.

Because of the high use of the wetlands by waterbirds and the grassland restoration efforts to enhance upland wildlife use of the site, Fossil Creek Wetlands Natural Area is currently classified as Zone 2A (Resource Protection; on-trail use only) (Map 9). In this plan, a short spur trail to the archaeological site is proposed to be open only for special events.

Erosion along Stanton Creek

The City is the 100% owner of Fossil Creek Wetlands Natural Area. The Natural Areas Department is the primary manager of the site. Parks maintains the Fossil Creek Trail. Stormwater Utility is responsible for maintaining storm water flows through Fossil Creek Natural Area in a flood event. Stormwater has identified several stretches of stream on this site for future rehabilitation and improvements. Fish passage issues were identified for this section of Fossil Creek, ranking as high priority (#5) for rehabilitation, which would likely occur in the next 5 years. Improvements to Stanton Creek also are needed to increase channel stability and habitat quality. Those improvements are ranked #13 in Stormwater's overall stream rehabilitation plan and would not likely occur in the next 10 years due to funding.

Thick stand of native grass on the east side of Fossil Creek Wetlands

Grassland restoration of the eastern portion of Fossil Creek Wetlands will continue into the future. Plans are to allow prairie dogs to remain on site, maintaining buffers along residential areas and controlling density to avoid severe soil erosion and resulting negative air quality impacts. Small (<5 acres) prescribed fires have been used for vegetation management in the last 5 years, and may be used again in the future. Flash grazing by domestic animals (cattle, goats, or sheep) could also be used for vegetation management.

Although the addition of the Fossil Creek Trail to this site has substantially increased public recreational use, it did not greatly enhance wildlife viewing opportunities. Most of the wildlife that the public is interested in observing is on the east side of the railroad track in the large wetland habitat. Balancing the need to protect sensitive wetland birds with the desire to bird watch will continue to be a challenge for management of Fossil Creek Wetlands Natural Area. While a spur trail off the informal Trilby parking area might provide some opportunity for bird watching, best viewing opportunities are still off Timberline adjacent to the open water and wetland. Creating a pull-off at that location would not only be very expensive, but also potentially create a safety hazard because of the busy Timberline traffic at that location. City of Fort Collins Transportation has no plans to widen Timberline from Trilby to Carpenter.

Anthropologist Dr. Jason M. LaBelle currently has a 3-year agreement with the City of Fort Collins that allows his students to conduct an archaeological dig on the west side of the railroad tracks near Trilby (Map 9). Students are only on the site during the summer months. In 2016, the City provide limited, public tours of the dig under the guidance of staff and Master Naturalists as part of the summer Tracks & Trails Program. Unfortunately, public access from Trilby would have involved an unsafe crossing across Fossil Creek, so public access had to be from a less desirable maintenance access off Timberline near Carpenter.

Dr. LaBelle explaining the dig to tour participants


A fall site cleanup with help of Audubon Society volunteers

Incidents of graffiti and vandalism on Fossil Creek Wetlands are low, but dumping of old mattresses, couches, and other large, unwanted belongings has occurred at the pull-off area south of Trilby. Volunteers help periodically with removing wind-blown debris in the open landscape of Fossil Creek Wetlands.

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Fossil Creek Wetlands, the City's objectives for the site are to:

- Protect high wildlife use of the site.
- Continue grassland restoration efforts.
- Improve creek habitat.
- Support CSU's efforts to continue the local archaeological dig site for public education.


A yellow-headed blackbird stakes out his territory on Fossil Creek Wetlands

Specific actions identified to help meet these objectives over the next 10 years include:

Wildlife

- Monitor secretive wetland birds, small mammals, amphibians, and small fishes to better determine use by less visible animal groups.

Grassland Restoration

- Continue use of small prescribed burns to simulate natural grassland disturbance and consider adding flash grazing for vegetation management.
- Keep prairie dog population from increasing to point of impacting health and vigor of restored grassland or sensitive grassland and wetland bird habitat.

Creek Habitat

- Continue removal and treatment of invasive Russian olives.
- Work with Stormwater Utility to alter the diversion structure to improve fish movement in Fossil Creek.

Archaeological Site

- Extend research agreement to allow CSU to continue exploring dig site.
- Install spur trail and bridge for limited, special group access to site for archaeological dig off Trilby.
- Provide opportunities for public tours.

FOSSIL CREEK RESERVOIR NATURAL AREA

Fossil Creek Reservoir entrance sign

Fossil Creek Reservoir is a 1,438-acre natural area that includes the reservoir, Duck Lake, and surrounding upland parcels (Map 10). The site is co-owned and managed by the City of Fort Collins and Larimer County. The 810-acre reservoir is owned and managed by North Poudre Irrigation Company; surface recreational rights are leased by the City of Fort Collins. Protection of the lands around Fossil Creek Reservoir has been a cooperative project between the City and County since the mid-1990s (Larimer County and City of Fort Collins 1998).

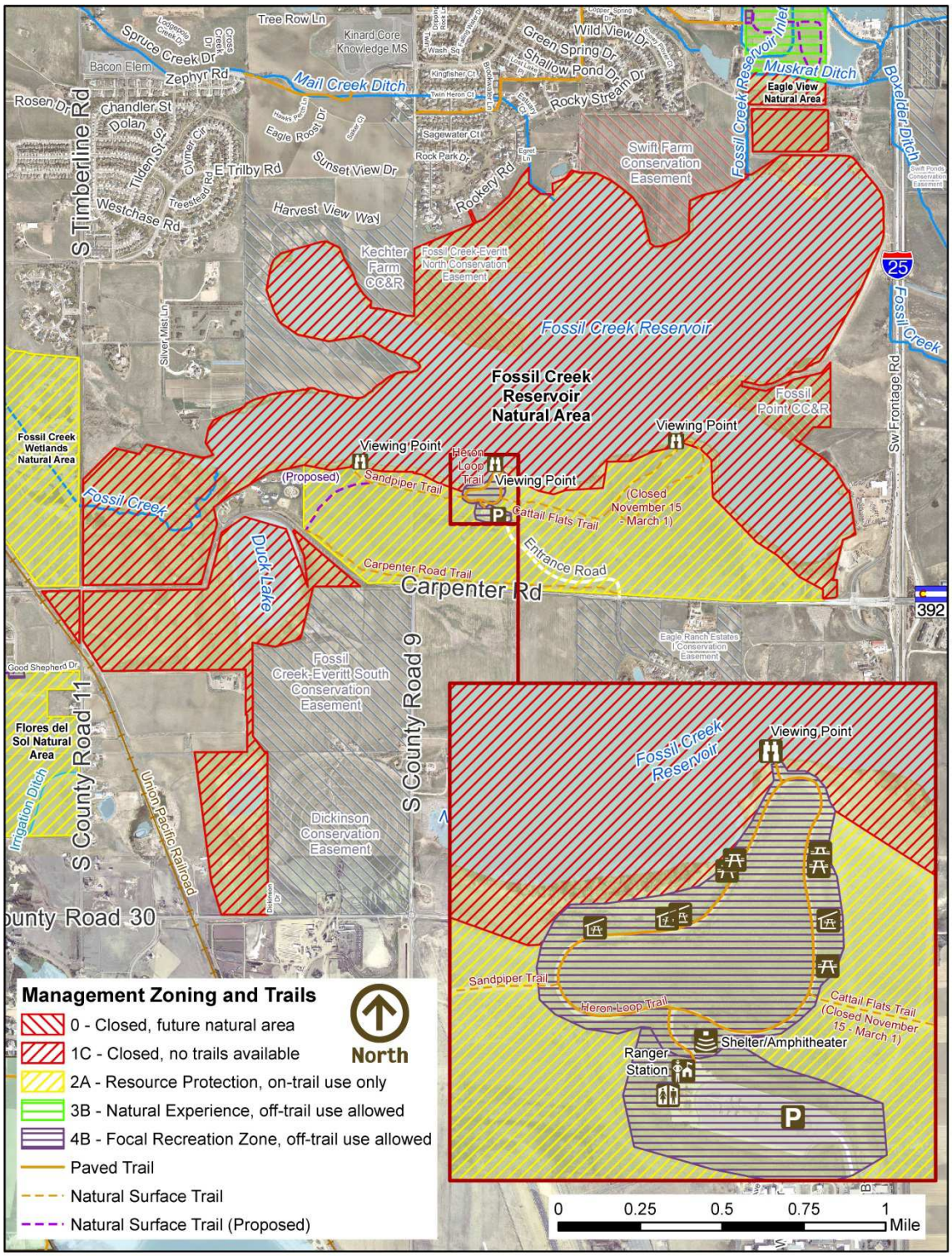
Three age classes of bald eagles perched on a Fossil Creek Reservoir cottonwood (Photo by Dawn Wilson)

One of the major habitat values of the Fossil Creek Reservoir in the 1990s was that the large cottonwoods on the edge of the water provided winter night roosts for the bald eagle, at that time a Federally Threatened Species. Colorado Parks and Wildlife had established a ¼-mile buffer for no recreational use from November 15 to March 15 around all bald eagle winter roosts in Colorado, which helped guide trail location and seasonal closures (Larimer County and City of Fort Collins 2003). In addition, presence of a great blue heron nest colony (or heronry), and abundant use of the reservoir and associated wetlands by migratory waterfowl, wading birds, and other waterbird groups were factors affecting design of public improvements on what is today known as Fossil Creek Reservoir Natural Area. The south side of the reservoir was developed for public use, including wildlife observation, education, hiking, and picnicking, and opened to the public in 2004.

Along with Fossil Creek Wetlands Natural Area, Fossil Creek Reservoir and Duck Lake are part of the Fossil Creek "Important Bird Area," designated by the National Audubon Society in 2001. To date, 179 species of birds have been documented on Fossil Creek Reservoir Natural Area (Appendix C). Almost any time of the year, waterbirds can be seen gathered together on the reservoir—whether it be spring or fall migration, late summer molt, or winter ice cover. Birds of prey and coyotes are frequently seen hunting the site. In all, over 200 species of wildlife have been observed on the reservoir and surrounding protected land on this natural area (Appendix C)

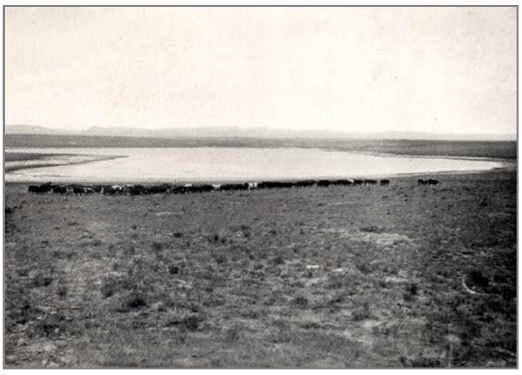
American white pelicans and double-crested cormorants gather in early spring (Photo by Norm Keally)

Comparatively, species diversity for plants is fairly low on Fossil Creek Reservoir, with only 65 species recorded to date, and only 58% of these native to Colorado (Appendix B).



Map 10. Fossil Creek Reservoir Natural Area

Site History



Cattle at Fossil Creek Reservoir, early 1900s (Photo Credit: Fort Collins Museum of Discovery H21726)

In 1901, the North Poudre Irrigation Company (NPIC) was formed by a group of Greeley and Fort Collins developers. The next year, construction of Fossil Creek Reservoir began and became, at the time, the largest water storage project in northern Colorado. Along with other reservoirs in the region, Fossil Creek Reservoir permitted NPIC to expand the number of acres that could be irrigated, supporting the development of local farm communities. As recently as the early 1970s, almost all the company's stockholders made their living with agriculture. Major upgrades to the reservoir took place in the 1980s to optimize storage space and improve operations. Because of development and population growth in north central Colorado over the last 45 years, about 75% of NPIC-delivered water is now used by municipal water entities and only 25% is used for agriculture.

A heronry with nests of great blue herons existed on Fossil Creek Reservoir as early as the 1930s (Vos et al. 1985). Although the original stand of cottonwoods became decadent over time, great blue herons have continued to maintain a heronry on the shore of the reservoir at several other locations. In April 2017, great blue herons, great egrets, and cormorants were occupying a heronry on the southeast side of the reservoir.

Beginning in 1959, the reservoir was closed to goose hunting by the State of Colorado Wildlife Commission to provide a winter refuge for geese. The closure was in place to "hold" geese on the reservoir to reduce goose conflicts in surrounding urban areas. In the early 1970s, NPIC started leasing the recreational use of the reservoir to a private boating club for water skiing, fishing, and camping along the shore. That lease continued until 2001 when the City of Fort Collins began leasing the recreational rights.

Canada geese resting on ice (Photo by Norm Keally)

Crop and dryland farming, haying, and grazing continued to dominate the landscape around Fossil Creek Reservoir until the early 2000s when residential development projects started to spring up on the north side of the reservoir. The ¼-mile buffer from the reservoir had already been established to help protect the wildlife use of Fossil Creek Reservoir (Larimer County and City of Fort Collins 1998).

The City of Fort Collins purchased the first parcel of Fossil Creek Reservoir Natural Area in 1998. Ten additional parcels were acquired by the City and Larimer County from 2001 to 2017; 549.8 acres were purchased. Another 78.2 acres were donated and 810 acres of the reservoir's recreational rights are leased annually from NPIC by the City of Fort Collins to protect and enhance wildlife use on and near the Fossil Creek Reservoir. The site's most

recent addition of 40 acres in May 2017 includes a portion of Mud Lake north of County Road 30. The modular home on the site will eventually be moved but plans are to retain the pole barn for the time being. In addition, over 600 acres of privately owned lands adjacent to Fossil Creek Reservoir Natural Area are protected in conservation easements or restricted covenants (CC&R) that prevent future development.

Larimer County began grassland restoration efforts on parcels south of the reservoir in 2001 with the assistance of the Natural Resources Conservation Service (Larimer County 2006). A prairie dog barrier along the east side of the restoration area was installed and raptor perches added to encourage foraging in and around the colony.

In 2003, Larimer County and City of Fort Collins completed the resource management and implementation plan for the Fossil Creek Reservoir Regional Open Space (Larimer County and City of Fort Collins 2003). The Regional Open Space was on the south side of Fossil Creek Reservoir and included Duck Lake south of County Road 32 (Carpenter Road). Soon after adoption of the plan, construction of improvements to provide public access on Phase I (north of Carpenter) began. The City and County jointly funded the construction. As the site manager, Larimer County opened the open space to the public in 2004. Amenities include a parking lot, restrooms, ranger office, trails, picnic areas, wildlife viewing blinds, and an outdoor amphitheater for group events.

Dr. Michael White of Wisconsin scouting for birds from one of the wildlife viewing blinds

Ranger office, shop, and restroom facility

In 2010, soon after the County Open Space was incorporated into the Fort Collins Growth Management Area (GMA), the City took over site management as agreed to in the original Intergovernmental Agreement. The Larimer County Rangers office remained housed on the site.

The City's Fossil Creek Reservoir Natural Area property and the Fossil Creek Reservoir Regional Open Space property were combined into one site in 2010, co-owned and managed by City of Fort Collins Natural Areas Department and Larimer County Natural Resources Department. County rangers patrol the Fossil Creek Reservoir area and perform light maintenance duties in exchange for use of the office building and small shop. The City of Fort Collins is responsible for maintaining the building, parking lot, trails, picnic areas, interpretive signage, and wildlife viewing structures, and performing resource management activities.

Due to this natural area's high wildlife value, dogs, bikes, and horses are not allowed on the trails with the exception of Carpenter Road Trail, which will become a portion of the paved Fossil Creek trail in the future (City of Fort Collins 2013b). Fishing and boating are not allowed on the reservoir or Duck Lake. Fossil Creek Reservoir Natural Area offers expansive views, hiking, picnicking, and unique

Trail through picnic area; Long's Peak in the background

wildlife watching any time of the year. Adequate parking is available on the site; if needed, the side of the entrance road can be used for overflow parking during large special events. Visitor Counts from 2016 indicate that from approximately 1,000-5,500 pedestrians use the trail system each month with the lowest numbers in December and the highest numbers in July.

Master Naturalist Jack Hicks sets up eagle watch scopes

Fossil Creek Reservoir Natural Area is one of the most popular and unique local sites to hold educational events. Master Naturalists have given presentations ranging from watching eagles on Christmas morning to stargazing on a warm mid-summer night. People of all ages enjoy the many activities offered throughout the year on Fossil Creek Reservoir Natural Area.

In the 2005 Fossil Creek Natural Areas Management Plan, the portion of the site previously known as Fossil Creek Reservoir Regional Open Space and managed by Larimer County (LACO) was not included in the City's management plan. Today, these sites are combined into a 1,398-acre natural area. Changes to Fossil Creek Reservoir Natural Area since the 2005 Fossil Creek Natural Areas Management Plan included:

- 2005-2013: Northern Colorado Birding Fair (changed to NoCo Nature Festival in 2013) was held at Fossil Creek Reservoir Regional Open Space.
- 2005: Removal of saltcedars and Russian olives around the reservoir.
- 2007-2008: Another 60 acres of smooth brome came under native grassland restoration.
- 2010: LACO repaired and improved the large wildlife observation pier, which had been damaged by previous winter wind and ice loading on the supports.
- 2010: All parcels were brought into Fossil Creek Reservoir Natural Area and the "Regional Open Space" parcels were renamed "Natural Area"; City of Fort Collins became the primary manager of the site.
- 2010; 2014, 2017: Pollution Prevention (P2) inspections of shop facility.
- 2011-2012: Improved water efficiency of landscape irrigation around office building (switched to drip system; installed rain sensors).
- 2012: All interpretive signage replaced due to wear and fading.
- 2012; 2016: Blacktop entrance road and parking lot crack sealed.
- 2013: East trail partially closed during bald eagles' first nesting attempt on north side of reservoir; the pair successfully fledged two young in 2014-2015 and one in 2016.
- 2013: Removed some unnecessary barbed wire fencing along the reservoir.
- 2014: Repairs made to east blind.
- 2017: Wildfire burned about 100 acres of cattail marsh on the east of Timberline Road in February.

Site Management

Fossil Creek Reservoir Natural Area is being managed to:

- ✓ Protect waterfowl, shorebird, and other waterbird use of the reservoir, Duck Lake, and wetlands during critical migration, wintering, and nesting periods.
- ✓ Ensure continued use of the site by colonial nesting birds (e.g., herons and cormorants).
- ✓ Provide a protected area for large raptors, especially wintering and nesting bald eagles.
- ✓ Continue grassland restoration to enhance wildlife use.
- ✓ Provide wildlife viewing and other passive recreational opportunities.
- ✓ Promote public educational opportunities on the site.

Master Naturalists with Nature Nuggets exploring Fossil Creek Reservoir's insect life

Because of the importance of providing a refuge for wetland birds, raptors, and other wildlife on and around Fossil Creek Reservoir, much of the site is Zone 2A (Resource Protection; on-trail use only) and Zone 1C (no public access) (Map 10). The portion of the site encircled by the paved trail is proposed as Zone 2B Natural Experience to permit some off-trail nature play area on this highly visited site.

The City of Fort Collins owns 25% of Fossil Creek Reservoir Natural Area and leases the recreational rights to another 58% from North Poudre Irrigation Company. Larimer County owns 17% of the entire site. The Natural Areas Department is the primary manager of the site; Larimer County rangers patrol the site and do light maintenance.

Prescribed burn at Fossil Creek Reservoir, April 2014

Grassland restoration efforts that started over 15 years ago continue on Fossil Creek Reservoir. Prescribed fire and in the future, possibly flash grazing, will be tools used to simulate disturbance for vegetation management. Prairie dogs have been kept from expanding to grasslands undergoing restoration through the use of a barrier and control methods. The prairie dog colony has not yet experienced a plague event since the site was open to the public. Over the next 10 years, plans are to remove the vinyl barrier on the east side near Carpenter Road and allow prairie dogs to occupy some of the restored grassland area on a trial basis.

Adequate opportunities to observe, and learn about, wildlife on Fossil Creek Reservoir are provided by the existing trail system, wildlife viewing features, and on-site programs. While easy access to Duck Lake for bird watching has long been a desire in the birding community, the lake is situated at an extreme curve in CO 392 (Carpenter Road), making access difficult and dangerous. CO 392 has become very busy over the last 10 years with the increase in

residential development in southeast Fort Collins. The property to the east of Duck Lake is protected through a conservation easement but in private ownership. Access from the west (Timberline) is limited by extensive wetlands. At this time, visitor access to Duck Lake is not being proposed because of the potential negative impacts to wetlands and bird use of the lake.

Incidents of graffiti and vandalism on Fossil Creek Reservoir Natural Area are extremely low, most likely due to the on-site presence of Larimer County Rangers. Wind-blown construction debris and littering are also unusual on this site. Typical violations are for occasional fishing, canoeing, biking, horseback riding, and hunting on the north side of the reservoir. Compliance with the "No Dogs" policy at Fossil Creek Reservoir is very high.

Historic silo and outbuildings

In March 2017, debris was removed from the site of two small, historic out buildings associated with a silo on the southwest corner of Carpenter and Timberline. No evidence of vandalism or illegal camping on the site was found and the buildings were secured. Although historic, dating back to the early 1900s, the buildings do not meet the criteria for Local Landmark preservation.

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Fossil Creek Reservoir, the City's and County's objectives for the site are to:

- Protect high wildlife use of the site.
- Expand grassland restoration efforts.
- Enhance wetland and shoreline vegetation.
- Improve the trail system.

Twilight at Fossil Creek Reservoir
(Photo by Charles Sturgill)

Specific actions identified to help meet these objectives over the next 10 years include:

<u>Wildlife</u>

- Continue to limit access to the reservoir, wetland, and Duck Lake habitat to protect use by migratory, wintering, and nesting waterfowl, shorebirds, and other waterbirds.
- Continue seasonal closing of Cattail Flats Trail (East Trail) to limit disturbance of winter roosting bald eagles.
- Maintain a prairie dog colony on south side of reservoir to provide alternate prey base for raptors, particularly in winter.
- Continue to remove unnecessary barbed wire fencing on the site.

Grassland Restoration

- Continue use of prescribed burns to simulate natural grassland disturbance and consider adding flash grazing by cattle. *(Note: prescribed burns are not used in areas containing prairie dogs.)*
- Keep prairie dog population from increasing to point of impacting health and vigor of restored grasslands.
- Continue efforts to restore native grassland on various parcels.

Wetland and Shoreline Vegetation

- Continue removal and treatment of invasive Russian olives and saltcedar.

Trails

- Resurface crusher/gravel Carpenter Trail along CO 392.
- Connect Carpenter Trail to Sandpiper Trail.
- Install pedestrian gate where the new connector trail would meet Carpenter Trail to post regulations that include pedestrian trail use only (no dogs, bikes, or horses).

EAGLE VIEW NATURAL AREA

Eagle View is a 90-acre natural area at the northeast corner of Fossil Creek Reservoir, south of Kechter Road and east of Strauss Cabin Road (Map 11). The steep Fossil Creek Reservoir Inlet ditch is a prominent feature on this former agricultural site, providing open water for wildlife nearly year-round. The southern portion of the site is within the protected ¼-mile buffer for Fossil Creek Reservoir at a critical location where bald eagles gather and winter roost. Eagle View is not yet open for public use.

Eagle View entrance sign

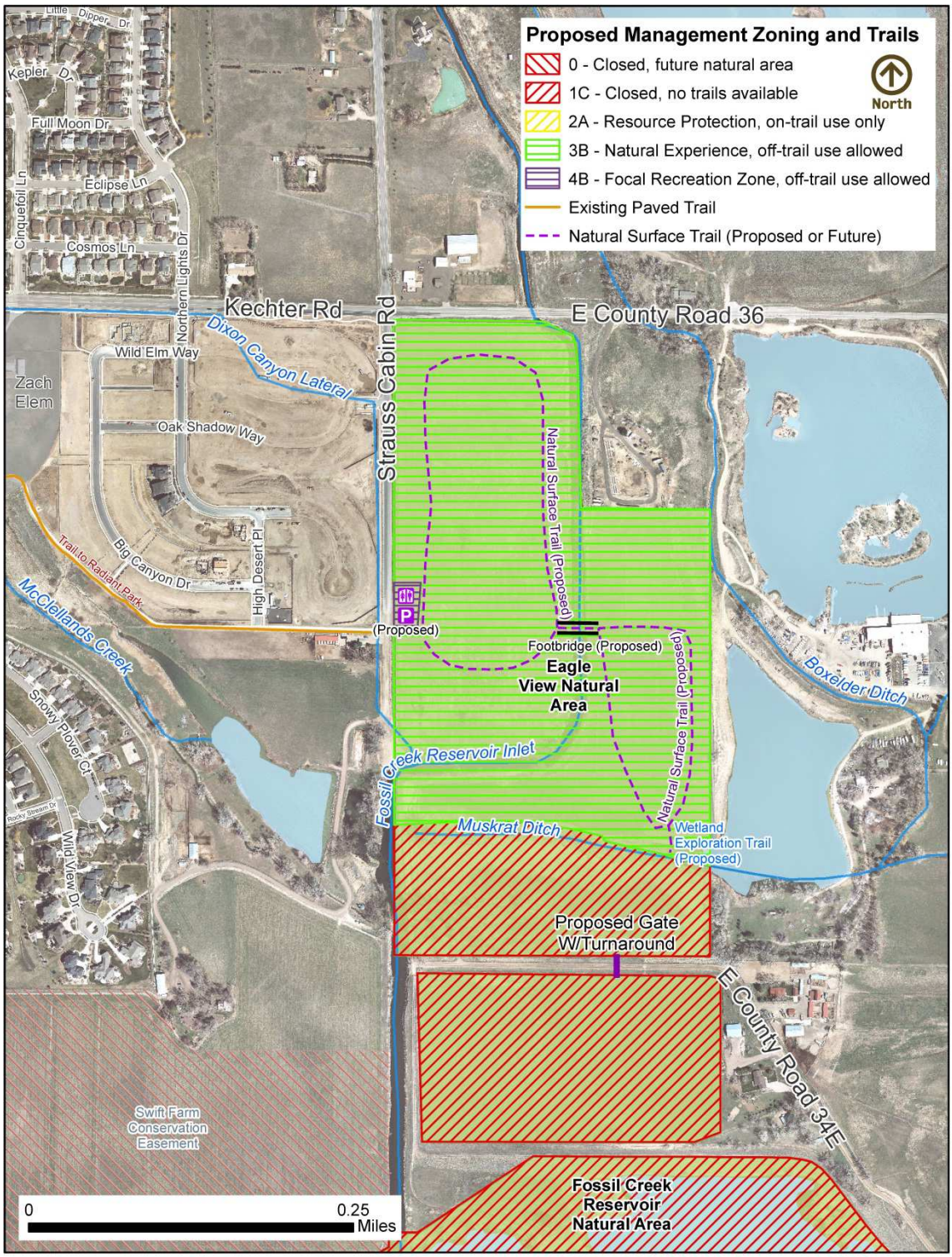
Fossil Creek Reservoir Inlet Ditch near Strauss Cabin Road

In 2005, Eagle View management objectives included restoring the site and altering the Fossil Creek Reservoir Inlet ditch to create more natural stream contours. Unfortunately, a potential project working with a development company to reshape the landscape in exchange for removing fill material for their project did not come to fruition. Without this partnership, re-contouring the Inlet Ditch and former agricultural fields would cost in the millions of dollars. While this opportunity may come again someday, in the meantime, Natural Areas plans to move forward with a site development plan to offer recreational trails and amenities on the north side of the site within the next 10 years (see Map 11).

As the name implies, Eagle View was purchased to provide a buffer next to Fossil Creek Reservoir to help protect bald eagles and other raptors. Not intensively surveyed yet, only 53 species of birds have been observed on Eagle View; 20% of these have been birds of prey (Appendix C). Open fields, proximity to Fossil Creek Reservoir, and lack of human use make this site attractive to hawks as well as the eagles. Larger trees along ditches and at the former farmstead provide convenient hunting perches. Grebes, ducks, coots, and great blue herons concentrate in the sheltered Inlet Ditch.

Immature bald eagle on Eagle View (Photo by Norm Keally)

As expected from a predominantly agricultural site, plant diversity on Eagle View is low with less than 50 species documented, thus far, and only about 50% of these native to Colorado (Appendix B). Wetlands on the site occur in patches along old ditches that used to convey irrigation water with the largest patches along Muskrat Ditch (Map 11).



Map 11. Eagle View Natural Area

Site History

Haying on Eagle View in 2006

Prior to City purchase, Eagle View Natural Area had been in agricultural use (e.g., grazing, haying) since at least the 1940s by the Brown family. Two small houses and six outbuildings occupied the southwest corner of the parcel north of County Road 34E. The City purchased the 90-acre site in 2002, along with water rights for irrigation. The City has leased a portion of the site for haying and has done some grassland seeding since 2005. The houses and outbuildings were determined not to meet the criteria for local landmark designation and were removed in 2004 as part of site restoration.

Strauss Cabin Road closure

In the spring of 2005, the wing wall of the Strauss Cabin Road bridge across the Fossil Creek Inlet Ditch failed and Larimer County removed the bridge. Strauss Cabin Road now dead ends at the old bridge and the County vacated their rights-of-way for the Strauss Cabin Road south of the bridge. The City is currently working with Larimer County to annex County Road 34E through Eagle View to control vehicle access on the property.

In the 2005 Fossil Creek Natural Areas Management Plan, opening Eagle View Natural Area for public use was envisioned by 2008 if a partnership could be found with a local developer for major site re-contouring followed by native habitat restoration. Unfortunately, that opportunity never came to fruition. Thus, only a few improvements have been made to Eagle View Natural Area in the last 10 years:

- 2007: Installed new site sign
- 2007: Completed single rail fence along Strauss Cabin Road.
- 2007: Completed design drawings and construction specifications for re-contouring site, including the Fossil Creek Reservoir Inlet Ditch, but unable to partner with developer who needed soil material in exchange for the grading work.
- 2005-2016: Grassland and cover crop seeding for weed control.
- 2013: Replaced gate at north end of southern 34E access (ATV's were accessing the property).
- 2015: Removed Russian olives from wetland drainages and controlled resprouting.

Site Management

Eagle View Natural Area is being managed to:

- ✓ Provide a buffer for Fossil Creek Reservoir.
- ✓ Provide a protected feeding area for raptors.
- ✓ Control the spread of weeds to help with future grassland restoration efforts.

While currently the entire site is Zone 1C (no public access), proposed management zoning for the north half will be Zone 2B Natural Experience and off-trail use will be permitted with a designated wetland exploration area (Map 11). The City of Fort Collins owns 100% of Eagle View Natural Area. The Natural Areas Department is the manager of the site. A paved trail has been proposed for Eagle View by Park Planning and Development, but is unlikely to be installed in the next 10 years due to higher City priorities for the paved recreational trail system. Park Planning and Development will work closely with Natural Areas in the future to align the trail on this site, and in the Fossil Creek Reservoir area in general.

With hopes to pursue a major land re-contouring of the site in the future, the site did not undergo grassland restoration over the last 10 years. However, weed control and planting of cover crops, with limited use of native seed mixes, have occurred on the site. Likewise, wetland restoration has been limited to only removal of Russian olives.

Incidents of graffiti and vandalism on Eagle View Natural Area are extremely low, but trash has accumulated on the site, especially along the inlet ditch, due to past agricultural use, past efforts to stabilize steep banks, and general accumulation of trash and natural debris flowing downstream.

Bank debris accumulation along the Inlet Ditch

Ten-year Site Management Objectives and Actions

Moving into the next decade of site management for Eagle View, the City's objectives for the site are to:

- Protect and enhance wildlife use on the adjacent Fossil Creek Reservoir.
- Begin grassland restoration efforts.
- Pursue wetland habitat restoration.
- Provide trails and other recreational amenities.
- Promote on-site educational opportunities.

Natural Areas Education staff assessing opportunities for nature exploration on Eagle View

Specific actions identified to help meet these objectives over the next 10 years include:

<u>Wildlife</u>

- Continue to restrict access within ¼ mile of the reservoir to preserve the buffer.
- Close 34E for public use, but retain road for site and reservoir maintenance (including North Poudre Irrigation Company).
- Look for opportunities to remove additional barbed wire fencing on the site.
- Pursue opportunities to work with partners (e.g., Ducks Unlimited) to restore duck nesting on the 20 acres adjacent to Fossil Creek Reservoir.

Grassland Restoration

- Consider use of prescribed burns to simulate natural grassland disturbance and consider adding flash grazing. (*Note: prescribed burns are not used in areas containing prairie dogs.)*
- Keep prairie dog population from increasing to point of impacting health and vigor of grasslands undergoing restoration.

Wetland Restoration

- Continue removal and treatment of invasive Russian olives.
- Continue looking for future opportunities to create more natural site contours along the Fossil Creek Reservoir Inlet Ditch.
- Consider adding plantings to existing wetlands to diversify habitat.

Recreation

- Add a small parking lot off Strauss Cabin Road and a natural surface trail system.
- In addition to hiking and running, allow use of trail by bikes, horses, and dogs on leash to serve the neighboring community.

Education

- Provide a wetland exploration area off the southern loop of the trail.
- Once opened to the public, promote site as a destination for nearby school field trips.

Eagle View Natural Area fencing along Strauss Cabin Road

FLORES DEL SOL NATURAL AREA

Flores del Sol site sign

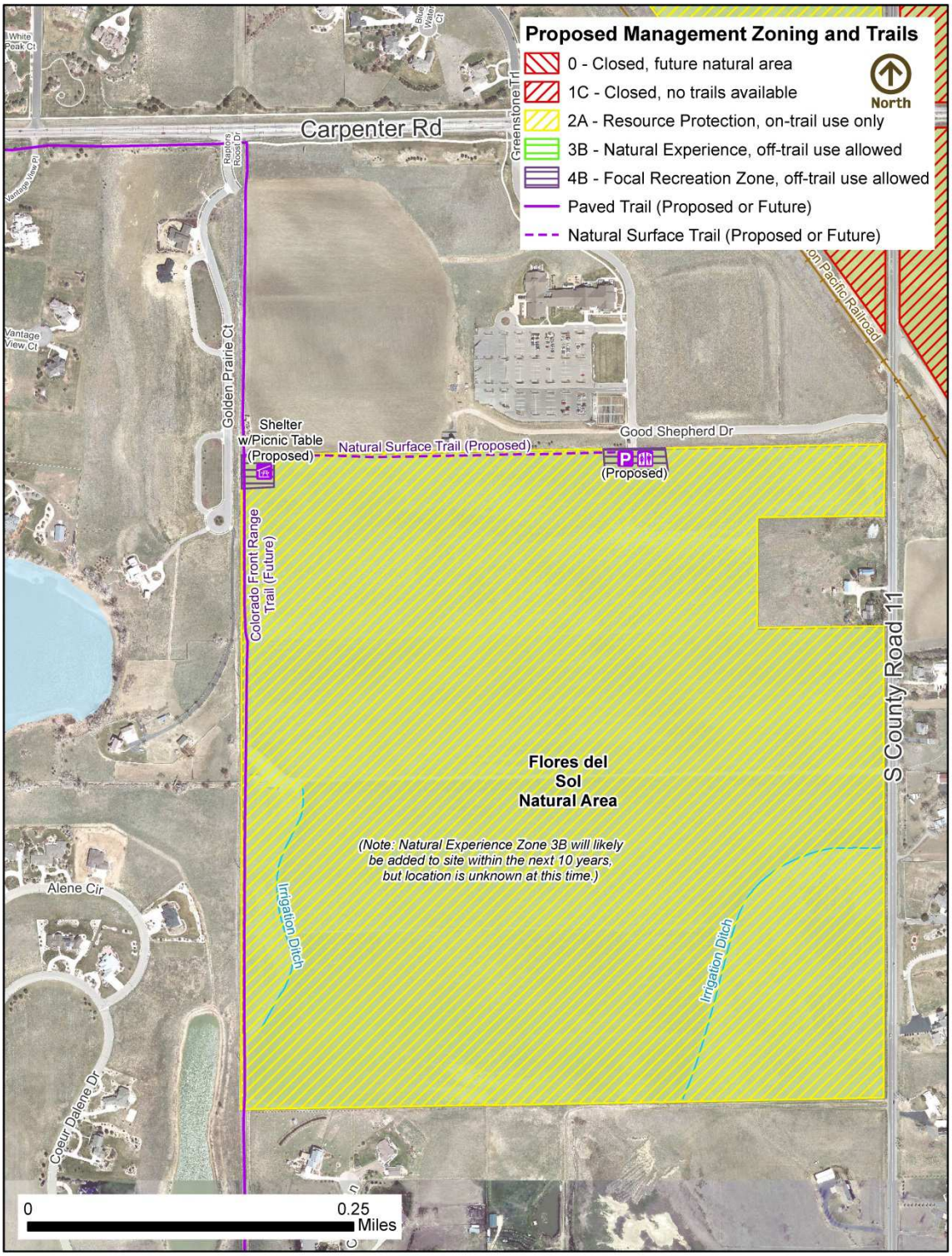
A 2016 acquisition, Flores del Sol is a 152-acre agricultural property on the west side of Timberline Road, about ¼ mile south of Carpenter Road (Map 12). Several small irrigation ditches are the only prominent features on this relatively flat piece of ground. Construction of a section of the Colorado Front Range Trail will begin in 2017, providing public access to the site in the near future. Funded by a partnership between Larimer County, the cities of Fort Collins and Loveland, Great Outdoors Colorado, and the Colorado Department of Transportation, this 2.2-mile section of the trail will link Loveland to Fort Collins via a paved multi-use trail.

Variegated fritillary feeding on a blanketflower

The site was named Flores del Sol because of the Natural Areas Department's vision to establish native wildflowers and grass buffers around agricultural fields to enhance the site for native pollinators (e.g., bees, moths, birds) and other wildlife. While the site will likely be used for community agriculture, research, and education, native bufferes will help increase site biodiversity.

Because the site is so new to the Natural Areas System, only a few casual observations of wildlife have been noted thus far. However, with its history of agricultural use neither animal nor plant diversity is anticipated to be very high. To date, only 17 species of birds, mammals, and reptiles have been recorded for the site (Appendix C). Documented plant diversity is also extremely low with only 16 species reported to date on the site (Appendix B).

Funnel weaver spider at home in the alfalfa field



Map 12. Flores del Sol Natural Area

Site History

Flores del Sol has been in agricultural use (e.g., irrigated row crops, hay) since at least 1972 and most likely dating back to the early 1900s when right of way easements were granted to the Fairport Reservoir and Ditch Company. The lease on the northern half of the property for goose hunting ended February 2017.

The City purchased Flores del Sol in several different land transactions in 2016. Other than installation of boundary markers and a site sign, no improvements have been made to the site.

Site Management

Flores del Sol is being managed to:

- ✓ Contribute to the community separator between Loveland and Fort Collins.
- ✓ Continue in its current agricultural use until a community agriculture plan for the site is developed.

Alfalfa growing along a ditch, 2016

Currently, the City has a service agreement lease with a local farmer to continue irrigating smooth brome/alfalfa and haying on the property. Hay cutting can begin no earlier than July 10th (to avoid nesting ground birds). The agreement is a 1-year lease renewable up to 5 years.

At this time, the entire site is Zone 1C (no public access). Proposed management zoning for the site is Zone 2A Resource Protection (on-trail use only) (Map 12) once the site is open to the public. Once a community agriculture partnership is established on the site, Natural Experience Zone 3B areas will be designated to enable the public to explore and learn about the history, culture, and potential benefits of conservation agriculture on the site.

The City of Fort Collins owns 100% of Flores del Sol. The Natural Areas Department is the manager of the site. The Colorado Front Range Trail is currently proposed to be maintained by Larimer County. Maintenance responsibilities, however, could change after completion of the trail as the cities of Loveland and Fort Collins and Larimer County further discuss maintenance of this trail and the future Long View Trail (see Hazaleus and Colina Mariposa). With three entities responsible for building both these trails, efficiencies could be gained in splitting responsibilities differently between the two trails. Parks, and not Natural Areas, would be the department responsible for maintaining either of the trails that fall under City of Fort Collins maintenance.

Boundary marker along Timberline Road (Co. Rd 11)

Flores del Sol Natural Area is a very clean site with no incidents of graffiti, vandalism, or trash accumulation in the first year of ownership by the City. Although the site is not fenced on all sides, trespassing has not been an issue to date.

Ten-year Site Management Objectives and Actions

Moving into the first decade of site management for Flores del Sol, the City's objectives for the site are to:

- ❖ Provide recreational amenities and open the site to the public.
- ❖ Promote research, educational opportunities, and community building around conservation agriculture, resource protection, and local food access. Enhance the site for pollinators and other wildlife.

A tall mix of native wildflowers and grasses to attract pollinators

Specific actions identified to help meet these objectives over the next 10 years include:

Recreation

- ➢ Continue to work with Larimer County and Loveland to construct the paved, multi-purpose Colorado Front Range Trail on the west side of the site; expected completion is early 2018.
- ➢ Add a small, 10- to 15-vehicle parking lot on the north side of the site off Good Shephard Road and a natural surface crusher fines trail connection west to the Colorado Front Range Trail. Trail connection may be paved in future years.
- ➢ Add a pack-in/pack-out picnic shelter and trail rest stop at the northwest corner of the natural area.

Irrigation ditches carry water for agricultural use

Agriculture

- ➢ Explore possibilities for collaboration with agriculture partner who will focus on innovation and collaboration in the local food market, promote organic farming techniques, and integrate wildlife habitat into agricultural lands.

Pollinator and Wildlife Enhancement

- ➢ Plant pollinator buffers around fields maintained for crops; buffers would consist of native grasses and forbs (e.g., wildflowers), and possibly shrubs.
- ➢ To help fund and promote pollinator buffers, seek partnerships with other conservation groups and organizations (e.g., Pheasants Forever, Noosa).

Education

- ➢ Add an interpretive sign along trail and/or at parking lot to promote agriculture/habitat partnership on site.
- ➢ Promote agriculture/habitat education partnerships.

SOARING VISTA NATURAL AREA

A 2015 acquisition, Soaring Vista is a 113-acre agricultural property on the north side of County Road 30 about ¼ mile west of I-25 (Map 13). The site is primarily flat agricultural fields. An 8-acre cattail marsh and salt meadow provide wildlife habitat in the northwest corner of the property. The site contains a relatively new pole barn, a center maintenance road, and irrigation feeder ditches used for agricultural purposes. The site will remain closed for public use until a trail system and other public amenities are completed.

Soaring Vista site sign after installation (Photo by Anastasia Patterson)

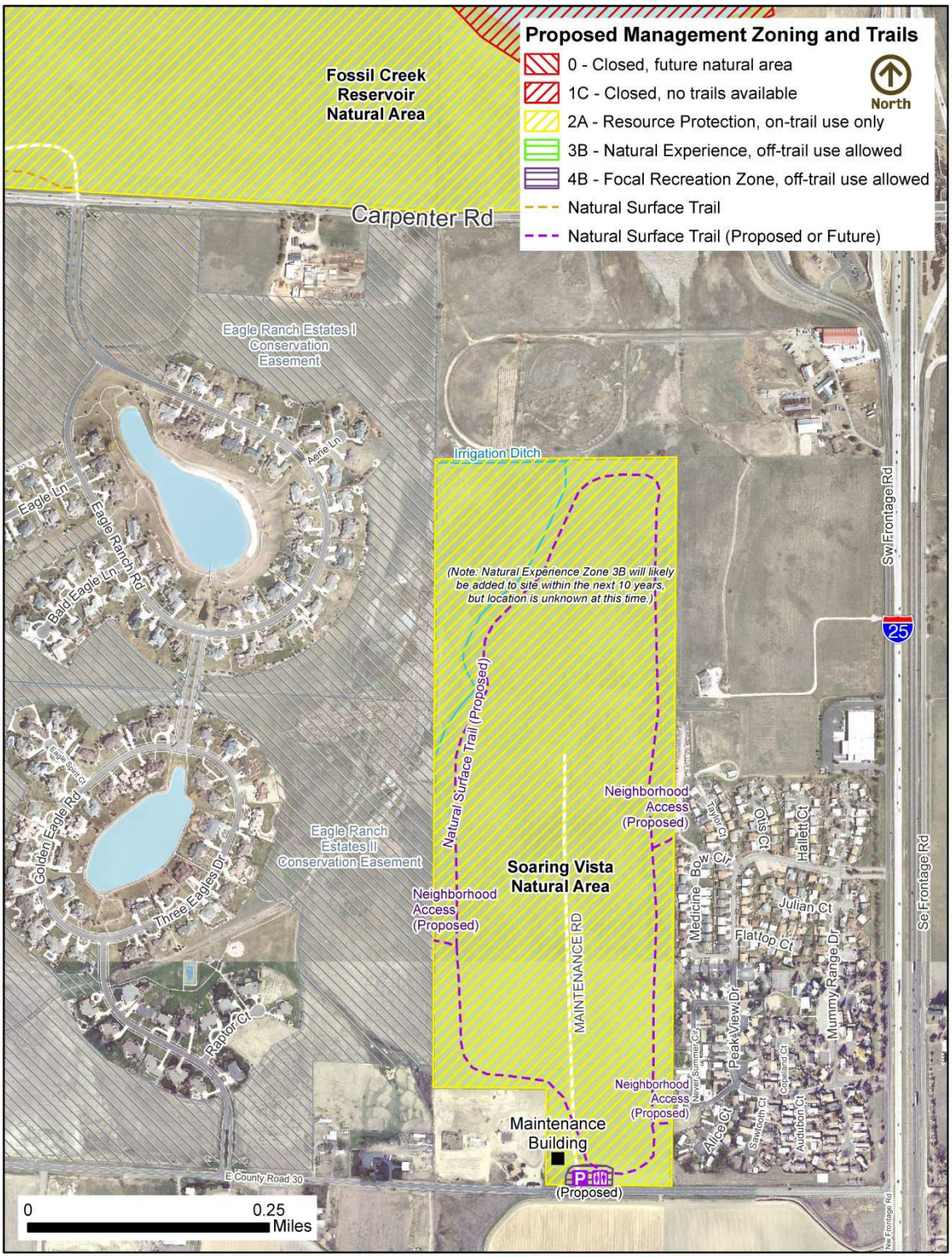
Mountain views from Soaring Vista

The site was named Soaring Vista because of the expansive views of the Colorado Front Range to the west and the common sight of turkey vultures and hawks soaring overhead. Similar to Flores del Sol, the vision for this site is to establish native wildflower and grass buffers around agricultural fields to enhance the site for native pollinators (e.g., bees, moths, birds) and other wildlife. While the site will likely continue to be used for community agriculture, research, and education, native plant buffers will help increase site biodiversity.

As with Flores del Sol, only a few casual observations of wildlife have been noted on Soaring Vista. Although this can be attributed to the newness of the site to the Natural Areas system, the current level of agricultural use does not usually support high plant and animal diversity. To date, only 18 species of birds, mammals, and reptiles have been recorded on Soaring Vista (Appendix C). Documented plant species richness is a little higher than Flores del Sol because of Soaring Vista's wetland with 25 species reported (Appendix B).

Inland saltgrass and foxtail barley, native wetland grasses on Soaring Vista

Cattail marsh on Soaring Vista



Map 13. Soaring Vista Natural Area

Site History

Soaring Vista has been in agricultural use (e.g., irrigated row crops, hay, dryland wheat) since at least 1937 and possibly going as far back as the early 1900s. For many years, a farmstead with a residence and various outbuildings was located on the property. Those buildings were removed in 2006 prior to City ownership. Only a 2,400-square foot metal pole barn remains. The City purchased Soaring Vista in 2015; City of Loveland contributed money toward the purchase, but does not hold title to the property.

Pole barn with older farmstead trees on the southwest corner of Soaring Vista

Site Management

Soaring Vista is being managed to:

- ✓ Contribute to the community separator between Loveland and Fort Collins.
- ✓ Continue in its current agricultural use until a community agriculture partnership plan for the site is developed.

The City of Fort Collins owns 100% of Soaring Vista. The Natural Areas Department is the only manager of the site. The site is irrigated and was planted in cover crops in 2016.

Irrigation feeder ditches

At this time, the entire site is Zone 1C (no public access). Proposed management zoning for the site is Zone 2A Resource Protection (on-trail use only) (Map 13) once the site is open to the public. Once a community agriculture partnership is established on the site, Natural Experience Zone 3B areas will be designated to enable the public to explore and learn about the history, culture, and potential benefits of conservation agriculture on the site.

Soaring Vista Natural Area is a very clean site with no incidents of graffiti, vandalism, or trash accumulation in the first few years of ownership by the City. Trespassing has not been an issue on this site, to date.

Along with Flores del Sol, Soaring Vista is a good site to explore options for a community farm. In 2016, City Natural Areas Land Management staff began reaching out to other City departments and members of the local agriculture community to gauge interest and capacity to establish a community farm on the site. The conversation continues and the public will have opportunities to comment on specific plans in the future.

Possible options might include:

- Large or small scale farm fields
- Hoop houses

- Orchards
- Bee hives
- Limited, small farmers market (e.g., weekly on-site sale of seasonal vegetables)
- Small animal livestock (e.g., chicken and goats)
- Native plant greenhouse

Ten-year Site Management Objectives and Actions

Continuing into the first decade of site management for Soaring Vista, the City's objectives for this site are to:

- Explore and possibly implement a community farm approach to agricultural use.
- Provide recreational amenities and open site to the public.
- Protect the northwest wetland.
- Enhance site for pollinators and other wildlife.
- Promote on-site educational opportunities.

Specific actions identified to help meet these objectives over the next 10 years include:

Agriculture

- Collaborate with a qualified farmer or another agency to establish a community farm on the site with goals of producing local.
- Hold a public open house prior to finalizing partnership(s) so neighbors and community can provide input on farm details.

Recreation

- Develop a natural surface loop trail near perimeter of site around fields used for agriculture.
- Provide trail connections to adjacent neighborhoods (Mountain Range Shadows to the east; Eagle Ranch Estates to the west) if desired by neighborhoods
- Add a small, 10- to 15-vehicle gravel parking lot east of the pole barn (maintenance building) on the south end of the site.

Wetland

- Keep trail and agricultural uses outside of the northwest wetland.

Pollinator and Wildlife Enhancement

- Plant pollinator buffers around agricultural fields; buffers would consist of native grasses and forbs (e.g., wildflowers), and possibly shrubs.
- To help fund and promote pollinator buffers, seek partnerships with other conservation groups and organizations (e.g., Pheasants Forever, Noosa).

Education

- Add an interpretive sign along trail and/or at parking lot to promote agriculture/habitat partnership on site.
- Promote agriculture/habitat educational partnerships.

SUMMARY

The City of Fort Collins has been conserving natural areas in the Fossil Creek Corridor south of Harmony Road since 1993. This 2017 update to the Fossil Creek Natural Areas Management Plan reflects additional acreage acquired, site improvements, and changes in site management since 2005.

Burns Tributary of Fossil Creek winding through Cathy Fromme Prairie Natural Area

The City of Fort Collins Natural Areas Department currently manages 12 natural areas in the Fossil Creek Corridor. These open prairie sites vary in ecological quality from the highly diverse Cathy Fromme Prairie, which supports nearly 300 native plant species, to Flores del Sol, a property in agricultural crops for over 100 years. Ranging in size from the 30-acre Two Creeks Natural Area to the 1,398-acre Fossil Creek Reservoir Natural Area, these lands provide habitat for over 280 species of birds, mammals, herptiles, and fish during critical breeding, migratory, and wintering periods. Rich in ecological, geological, archaeological, and historic features, Fossil Creek natural areas provide unique recreational and outdoor learning opportunities for the citizens of Fort Collins and beyond.

The following overarching goals established by the Fossil Creek Natural Areas Management Team were reviewed by the public and provide a foundation upon which management decisions are made for natural areas in the Fossil Creek Area:

- Conserve, enhance, and restore the ecological characteristics and values of natural areas in the Fossil Creek drainage.
- Maintain and improve habitat and movement corridors for diverse groups of wildlife.
- Seek opportunities to collaborate with others to restore and enhance streams of the Fossil Creek drainage.
- Where appropriate, establish disturbance regimes (such as prescribed burns and conservation grazing) that support ecological processes and enhance landscape conditions.
- Expand wildlife monitoring to include invertebrates, amphibians, reptiles, small mammals, and avian abundance to better understand habitat quality for future wildlife management.

Coyote searching for winter prey

- Continue to provide diverse and appropriate, recreational opportunities that minimize wildlife disturbance and site fragmentation.
- Open four closed natural areas to appropriate public use and provide additional wildlife viewing opportunities.
- Consider scenic and aesthetic values when planning new public improvements.
- Work with partners to provide access and connectivity to regional trails where appropriate.

- ❖ Explore ecological, social, and economic benefits of community agriculture on select Fossil Creek sites, including opportunities to connect with local food production.
- ❖ Protect and interpret cultural, archaeological, and unique geological features.
- ❖ Increase public awareness, recognition, understanding, and support for natural areas and their multiple values.
- ❖ Effectively reach a diverse and significant portion of the community through a range of education and outreach strategies focused on the Fossil Creek natural areas.
- ❖ Provide meaningful volunteer opportunities in Fossil Creek natural areas that connect - people to nature.

Milkweed and sedges along one of the Fossil Creek tributaries

For each of the 12 Fossil Creek Natural Areas, the plan documents site history and current management. Ten-year site management objectives are presented. Some of the actions to meet those objectives are listed. Input was solicited from the public on future management for all Fossil Creek Natural Areas. While protection of native plant communities and wildlife habitat remains a high priority, recreational trails exist or are planned for all sites. Continued agricultural use is proposed for the two newest sites with a focus on local food production along with the addition of pollinator habitat enhancement.

The predominant management zoning for Fossil Creek Natural Areas is 2A, Resource Protection (on-trail use only). Some sites have parcels with no trails that were classified as 1C, Closed, due to their sensitivity or stage of restoration. Four natural areas are currently closed to the public until trails can be built for public access; two of these sites (Hazaleus and Flores del Sol) are expected to be open in 2018.

Fossil Creek natural areas and trails provide places to hike, bike, dog walk, ride horses, bird watch, create art, write, and simply enjoy quiet time. For some, these natural areas provide a place of spiritual contemplation. For all, Fossil Creek sites contribute to wellness by providing places to relax, exercise, or simply take in the expansive landscape preserved over the last 24 years by the people of Fort Collins and Larimer County. The Fossil Creek Natural Areas Management Plan will help guide the City of Fort Collins in making management decisions based on the need to protect valuable site resources, while providing opportunities for the public to experience and enjoy some of the most unique and diverse sites in the City's natural areas system.

Old cottonwood on Redtail Grove

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Appendix A. Research and Educational Studies on Fossil Creek Natural Areas (Based on Permits Issued 1999-May 2017)

Who	Topic	Natural Area[a]									
		CFP	HAZ	CMN	RTG	TWC	PDM	PMN	FCW	FCR	EVN
US Army Corps of Engineers	Wetland Survey Training	2000; 2013									
US Bureau of Land Management	Native Seed and Plant Collection for National Herbarium	2013	2013	2013	2013	2013	2013	2013	2013	1013	2013
USDHHS Centers for Disease Control and Prevention	Persistence of Plague Bacteria in Natural Soils	2009-2011; 2014									
USDHHS Centers for Disease Control and Prevention	Culex Mosquito Research								2011	2011	
USDA National Wildlife Research Center	Mesocarnivore Study	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
USDA National Wildlife Research Center	Prairie Dog Artificial Barrier Research						2001				
USDA National Wildlife Research Center	Prairie Dog Burrow Research	2002									
USDA National Wildlife Research Center	Prairie Dog Contraceptives Research								2002		
USDA National Wildlife Research Center	Patterns of Wildlife Occurrence	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
USDA National Wildlife Research Center	Raccoon Genetic Study		2014-2016			2014	2014		2014	2014	2014
USDA National Wildlife Research Center	Raptor Research	1999							1999		
USDA Natural Resources Conservation Service	Switchgrass Study	2009									

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Who	Topic	Natural Area[a]									
		CFP	HAZ	CMN	RTG	TWC	PDM	PMN	FCW	FCR	EVN
US Geological Survey	Chytrid Fungus in Frogs Research	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
Smithsonian Migratory Bird Center	Migratory Bird Connectivity Study							2016	2016		
Colorado Division of Parks and Wildlife	Sylvatic Plague Research	2007									
Colorado State University Natural Heritage Program	Wetland Sampling	1999; 2011							1999		
Colorado State University Natural Heritage Program	Botanical Surveys			2000					1999		
Colorado State University Anthropology Department	Archaeological Surveys	2010	2010-2011	2010-2011	2010-2011	2010	2010; 2014	2010	2010; 2014-2016	2010	2010
Colorado State University Ecology Class	General Ecology Study	1999									
Colorado State University Bioagricultural Sciences & Pest Management Department	Leafy Spurge and Dalmatian Flax Study						2014	2014			
Colorado State University Biology Department	Bell's Twinpod Study	2000-2002									
Colorado State University Biology Department	Plague Research	2002									
Colorado State University Biology Department	Greenhouse Gas Research	2004							2004		
Colorado State University Biology Department	Soil Studies	2005									
Colorado State University Biology Department	Plant Studies	2013									
Colorado State University Biology Department	Frog Research	2005		2005	2005	2005	2005	2005	2005		

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Who	Topic	Natural Area[a]									
		CFP	HAZ	CMN	RTG	TWC	PDM	PMN	FCW	FCR	EVN
Colorado State University Biology Department	Fire Research	2006									
Colorado State University Entomology Department	Insect and Arthropod Studies	2014-2016	2015	2016	2014	2014-2016	2014-2015	2016	2014	2015-2016	2016
Colorado State University Fish, Wildlife and Conservation Department	Effect of Noise on Prairie Dog Behavior	2012; 2016		2012			2016		2012; 2016	2012; 2016	
Colorado State University Forestry Department	Carbon, Nitrogen, and Water Research	2000		2000					2000		
Colorado State University Forest and Stewardship	Fire Ecology Class								2017		
Colorado State University Rangeland Ecosystem Science	Knapweed Research on Native Rangelands	2001									
Colorado State University Wildlife Department	Raptor Survey Training	1999-2000									
Colorado State University Graduate Students	Stream Surveys	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Colorado State University Graduate Student	Plant Ecological Research	2004									
Colorado State University Ecology Graduate Student	Soil Study	2009									
Colorado State University Graduate Student	Selenium Study	2015									
Colorado State University Student	Aquatic Insect Sampling	2012			2012	2016					
Colorado State University Student	Landscape Research	2000									
Colorado State University Student	Prairie Dog Colony Vegetation Evaluation	2001								2001	
Colorado State University Students	Prairie Dog Research	2002; 2007-2008		2007							

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Who	Topic	Natural Area[a]									
		CFP	HAZ	CMN	RTG	TWC	PDM	PMN	FCW	FCR	EVN
Colorado State University Students	Local Biodiversity	2011									
Colorado State University Biology Department	Amphibian Occurrence Research	2010-2011			2010	2015		2011	2010-2011	2011	
Colorado State University Student	Chorus Frog Prey Study	2013									
Colorado State University Student	Overwintering Mosquito Research	2005								2005	
Northern Arizona University Department of Chemistry	Soil Research Comparison Sites	2002									
University of Colorado Museum of Natural History	Insect Response to Climate Change	2014									
University of Colorado Biology Department	Amphibian Biodiversity and Disease Research	2007									
University of Minnesota, Duluth, Biology Department	Plant Evolution Study	2014		2014				2014			
University of Northern Colorado Biological Sciences	Bird Study							2016	2014-2016		
University of Colorado Student	Soil Erosion in Prairie Dog Colonies	2011		2011							
University of Denver Graduate Students	Webworm Research	2011; 2016	2011								

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Who	Topic	Natural Area[a]									
		CFP	HAZ	CMN	RTG	TWC	PDM	PMN	FCW	FCR	EVN
Front Range Community College	Habitat/Wildlife Observation	2005; 2010-2016									
Front Range Community College	Ecosystem Analysis	2007									
Front Range Community College	Invasive Plant Survey	2010-2011									
Front Range Community College	Plant Biomass Study	2011									
Front Range Community College	Wildlife Management Study	2013									
Front Range Community College Student	Plants and Water Source Study								2010		
Larimer County Planning Department	Wetland Training								1999		
Remote Sensing Research, Inc.	GPS Prairie Dog Mapping Techniques	1999									
Rocky Mountain High School	Ecological Research	2002									
Rocky Mountain High School	Shortgrass Steppe Ecosystem Study	2007	2007								
Rocky Mountain Bird Observatory	Screech Owl Monitoring		2014								

[a]Natural Area = Cathy Fromme Prairie (CFP), Hazaleus (HAZ), Colina Mariposa (CMN), Redtail Grove (RTG), Two Creeks (TWC), Prairie Dog Meadow (PDM), Pelican Marsh (PMN), Fossil Creek Wetlands (FCW), Fossil Creek Reservoir (FCR), and Eagle View (EVN).

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Natural Areas: Cathy Fromme Prairie (CFP), Hazaleus (HAZ), Colina Mariposa (CMN), Redtail Grove (RTG), Two Creeks (TCN), Prairie Dog Meadow (PDM), Pelican Marsh (PMN), Fossil Creek Wetlands (FCW), Fossil Creek Reservoir (FCR), Eagle View (EVN), Flores del Sol (FDS), and Soaring Vista (SVN)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
FERNS AND FERN ALLIES														
Family - Equisetaceae														
Equisetum arvense	Field horsetail	N	X											
Equisetum laevigatum	Smooth horsetail	N	X			X							X	
GYMNOSPERMS														
Family - Cupressaceae														
Juniperus sp.	Juniper	E	X											
Juniperus virginiana	Eastern redcedar	N	X									X		
Family - Pinaceae														
Picea pungens	Blue spruce	N										X		
Pinus ponderosa var. *scopulorum*	Ponderosa pine	N		X										
ANGIOSPERMS														
Family - Aceraceae														
Acer negundo var. *interius*	Boxelder	N	X			X	X		X	X	X	X		
Family - Agavaceae														
Yucca glauca	Yucca	N	X	X	X	X	X	X	X	X	X	X		
Family - Amaranthaceae														
Amaranthus retroflexus	Redroot pigweed	E				X			X				X	
Family - Anacardiaceae														
Rhus trilobata var. *trilobata*	Skunkbrush	N	X		X	X		X	X	X	X			
Toxicodendron rydbergii	Poison ivy	N	X			X								
Family - Apiaceae														
Cicuta douglasii	Water hemlock	N	X			X								
Harbouria trachypleura	Whisk-broom parsley	N	X		X									
Lomatium orientale	Salt and pepper	N								X				

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Musineon divaricatum	Leafy wildparsley	N	X											
Family - Apocynaceae														
Apocynum androsaemifolium	Speading dogbane	N				X				X				
Apocynum cannabinum	Indianhemp	N	X		X	X	X			X				
Family - Asclepiadaceae														
Asclepias engelmanniana	Engelmann's milkweed	N			X									
Asclepias incarnata	Marsh milkweed	N	X	X		X		X	X	X				
Asclepias pumila	Plains milkweed	N	X	X	X	X		X			X			
Asclepias speciosa	Showy milkweed	N	X	X	X	X	X	X	X	X	X			X
Asclepias viridiflora	Green milkweed	N	X		X	X								
Family - Asteraceae														
Achillea millefolium var. *occidentalis*	Western yarrow	N	X											
Acroptilon repens	Russian knapweed	E		X				X		X				
Ambrosia artemisiifolia var. *elatior*	Annual ragweed	E	X											
Ambrosia psilostachya	Cuman ragweed	N	X	X	X	X		X		X				
Ambrosia trifida	Giant ragweed	E		X		X		X						
Antennaria rosea	Rosy pussytoes	N	X			X								
Arctium minus	Burdock	E	X											
Artemisia campestris ssp. *borealis* var. *scouleriana*	Field sagewort	N	X	X	X	X		X		X				
Artemisia cana ssp. *cana*	Silver sagebrush	N	X							X				
Artemisia dracunculus	Wild tarragon	N	X	X	X	X				X				
Artemisia filifolia	Sand sagebrush	N			X									
Artemisia frigida	Fringed sage	N	X	X	X	X	X	X	X	X	X	X		
Artemisia ludoviciana	Cudweed sagewort	N	X	X	X	X		X	X	X	X			
Bidens cernua	Nodding beggartick	E	X			X								

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Brickellia eupatorioides	False boneset	N	X	X		X				X				
Carduus nutans	Musk thistle	E	X	X	X	X		X		X				X
Centaurea diffusa	Diffuse knapweed	E	X	X	X	X		X			X			
Chrysothamnus viscidiflorus	Yellow rabbitbrush	N	X	X	X	X		X	X	X	X			
Cirsium arvense	Canada thistle	E	X	X	X	X	X	X	X	X	X	X	X	X
Cirsium flodmanii	Flodman's thistle	N	X											
Cirsium ochrocentrum	Yellow spine thistle	N	X	X	X									
Cirsium undulatum	Wavy-leaf thistle	N	X	X	X	X								
Cirsium vulgare	Bull thistle	E	X	X		X		X	X					
Conyza canadensis	Horseweed	E	X		X	X		X	X	X			X	
Cyclachaena xanthiifolia	Marshelder	N	X	X	X									
Dyssodia papposa	Fetid marigold	N	X		X		X	X	X	X	X			
Ericameria nauseosa	Rubber rabbitbrush	N	X	X	X	X	X	X	X	X	X	X		
Erigeron divergens	Spreading fleabane	N	X											
Erigeron flagellaris	Fanleaf fleabane	N	X											
Erigeron pumilus	Shaggy fleabane	N	X							X				
Gaillardia aristata	Indian blanketflower	N	X	X				X						
Grindelia squarrosa	Curlycup gumweed	N	X	X	X	X	X	X	X	X	X	X		
Gutierrezia sarothrae	Broom snakeweed	N	X	X	X	X	X	X	X	X				
Helianthus annuus	Annual sunflower	N	X	X	X	X	X	X	X	X	X			
Helianthus nuttallii	Nuttall's sunflower	N	X		X		X							
Helianthus petiolaris	Sunflower	N	X	X	X	X		X		X				
Helianthus pumilus	Prairie sunflower	N	X	X	X	X								
Heterotheca villosa	Hairy goldenaster	N	X	X	X	X		X		X				

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Hymenopappus filifolius	Fineleaf hymenopappus	N	X											
Hymenopappus tenuifolius	Chalk Hill hymenopappus	N	X											
Iva axillaris	Povertyweed	N	X	X	X			X	X	X				
Lactuca ludoviciana	Biannual lettuce	N	X											
Lactuca serriola	Prickly lettuce	E	X	X	X	X	X	X	X	X	X	X	X	X
Lactuca tatarica var. *pulchella*	Blue lettuce	N	X							X				
Liatris punctata	Dotted gayfeather	N	X	X	X					X				
Lygodesmia juncea	Skeletonweed	N	X	X	X					X				
Machaeranthera pinnatifida	Lacy tansyaster	N	X		X	X				X				
Machaeranthera tanacetifolia	Tansyleaf tansyaster	N			X									
Matricaria discoidea	Pineapple weed	E			X									
Nothocalais cuspidata	Wavy-leaf false dandelion	N	X							X				
Oligoneuron rigidum var. *humile*	Stiff goldenrod	N	X											
Onopordum acanthium	Scotch thistle	E		X										
Packera fendleri	Fendler's ragwort	N	X											
Packera plattensis	Prairie groundsel	N	X											
Picradeniopsis oppositifolia	Opposite leaf bahia	N	X				X	X		X				
Ratibida columnifera	Prairie coneflower	N	X	X	X	X	X	X						
Scorzonera laciniata	False salsify	E	X											
Senecio integerrimus	Lambstongue ragwort	N	X											
Senecio spartioides	Broomlike ragwort	N	X		X	X		X						
Solidago canadensis	Canada goldenrod	N	X			X		X	X					

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Solidago gigantea	Giant goldenrod	N	X				X		X					
Solidago missouriensis	Prairie goldenrod	N	X		X	X				X	X			
Solidago mollis	Velvety goldenrod	N	X											
Sonchus arvensis	Perennial sow-thistle	E	X											
Sonchus asper	Spiny sowthistle	E	X						X					
Sonchus oleraceus	Common sowthistle	E			X					X				
Stephanomeria pauciflora	Brownplume wirelettuce	N								X				
Symphyotrichum ascendens	Western aster	N	X											
Symphyotrichum ciliatum	Rayless alkali aster	N	X					X	X	X				X
Symphyotrichum ericoides	White aster	N	X	X	X	X		X	X	X				X
Symphyotrichum falcatum var. *falcatum*	White prairie aster	N	X	X	X	X	X	X	X	X	X	X		X
Symphyotrichum lanceolatum ssp. *hesperium*	White panicle aster	N								X				
Symphyotrichum porteri	Smooth white aster	N				X								
Taraxacum officinale	Dandelion	E	X	X	X	X	X	X	X	X	X	X		X
Thelesperma filifolium	Stiff greenthread	N	X		X									
Thelesperma megapotamicum	Hopi tea greenthread	N	X	X	X	X				X				
Townsendia exscapa	Stemless Townsend daisy	N	X											
Townsendia grandiflora	Largeflower daisy	N			X	X								
Townsendia hookeri	Easter daisy	N	X											
Tragopogon dubius	Yellow salsify	E	X	X	X	X		X	X	X		X	X	
Verbesina encelioides ssp. *exauriculata*	Golden crownbeard	E	X											

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Xanthium strumarium	Cocklebur	E	X											
Family - Boraginaceae														
Asperugo procumbens	German-madwort	E						X						
Cryptantha minima	Little cryptantha	N	X											
Cryptantha virgata	Miner's candle	N	X											
Cynoglossum officinale	Houndstongue	E	X	X		X				X				
Lappula occidentalis	Flatspine stickseed	E	X							X				
Lithospermum incisium	Narrow-leaf puccoon	N	X			X				X				
Mertensia lanceolata	Prairie bluebells	N	X											
Onosmodium bejariense var. *occidentale*	Western marbleseed	N	X											
Family - Betulaceae														
Betula occidentalis	Water birch	N	X											
Family -Brassicaceae														
Alyssum alyssoides	Alyssum	E	X											
Alyssum simplex	Alyssum	E	X			X		X		X				X
Arabis hirsuta var. *pycnocarpa*	Hairy rockcress	N	X											
Camelina microcarpa	False flax	E	X				X							
Cardaria chalepensis	Lenspod whitetop	E	X					X		X				
Cardaria draba	Whitetop	E	X							X	X	X		
Capsella bursa-pastoris	Shepherd's purse	E	X	X										
Chorispora tenella	Blue mustard	E	X				X			X				
Conringia orientalis	Hare's ear mustard	E	X	X										
Descurainia pinnata ssp. *brachycarpa*	Western tansymustard	E	X	X		X	X							
Descurainia sophia	Flixweed	E	X	X	X	X	X	X		X				
Draba reptans	Whitlow wort	N	X		X									
Erysimum asperum	Western wallflower	N	X											

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Erysimum capitatum	Wallflower	N	X											
Lepidium campestre	Field pepperweed	E								X				
Lepidium perfoliatum	Clasping pepperweed	E								X				
Lesquerella ludoviciana	Foothill bladderpod	N	X											
Lesquerella montana	Mountain bladderpod	N	X			X								
Nasturtium officinale	Watercress	E	X			X		X						
Physaria bellii	Bell's twinpod	N	X											
Rorippa teres	Southern marsh yellowcress	N									X			
Sisymbrium altissimum	Tumble mustard	N	X							X				
Stanleya pinnata	Prince's plume	N	X	X				X						
Thlaspi arvense	Field pennycress	E	X	X		X			X	X				
Family - Cactaceae														
Escobaria missouriensis	Missouri nipple cactus	N	X		X	X								
Escobaria vivipara var. *vivipara*	Spinystar	N	X			X								
Opuntia macrorhiza	Twistspine prickly pear	N	X	X	X	X	X	X		X				
Opuntia phaeacantha	Tulip prickly pear	N				X								
Opuntia polyacantha	Prickly pear cactus	N	X	X	X	X	X	X	X	X	X	X		
Pediocactus simpsonii var. *minor*	Mountain ball cactus	N	X							X				
Family - Capparaceae														
Cleome serrulata	Rocky Mountain beeplant	N	X	X				X						
Polanisia dodecandra	Clammyweed	N			X	X								
Family - Caprifoliaceae														
Lonicera sp.	Honeysuckle	E				X								

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Lonicera tatarica	Tatarian honeysuckle	E				X								
Symphoricarpos albus	Common snowberry	N	X			X		X	X					
Symphoricarpos occidentalis	Western snowberry	N	X			X		X	X					
Paronychia jamesii	James' nailwort	N	X		X	X								
Spergularia maritima	Sand spurry	N	X	X	X			X	X	X				
Spergularia rubra	Red sandspurry	E	X											
Family- Ceratophyllaceae														
Ceratophyllum demersum	Coon's tail	N	X							X				
Family - Chenopodiaceae														
Atriplex canescens	Fourwing saltbush	N	X	X		X	X	X		X				
Atriplex rosea	Tumbling saltweed	E	X					X		X				
Atriplex subspicata	Saline saltbush	N		X	X			X	X	X		X		X
Bassia hyssopifolia	Ironweed	E	X											
Bassia scoparia	Kochia	E	X	X	X		X	X	X	X	X	X	X	X
Chenopodium album	Lambsquarters	E	X		X									
Chenopodium berlandieri	Pitseed goosefoot	N									X			
Chenopodium rubrum	Red goosefoot	N		X										
Halogeton glomeratus	Halogeton	E	X		X			X						
Krascheninnikovia lanata	Winterfat	N	X	X	X	X	X			X				
Monolepis nuttalliana	Nuttall's povertyweed	N	X	X						X				
Salsola tragus	Russian-thistle	E	X	X	X	X		X	X	X	X			
Sarcobatus vermiculatus	Greasewood	N	X											
Suaeda calceoliformis	Pursh seepweed	N	X		X			X	X	X				X
Family - Clusiaceae														
Hypericum perforatum	St. Johnwort	E	X											

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Family - Commelinaceae														
Tradescantia occidentalis	Spiderwort	N	X			X				X				
Family - Convolvulaceae														
Convolvulus arvensis	Field bindweed	E	X	X	X	X	X	X	X	X	X	X	X	X
Cuscuta cuspidata	Cusp dodder	N									X			
Evolvulus nuttallianus	Shaggy dwarf morning glory	N	X	X	X					X				
Family - Cornaceae														
Cornus sericea ssp. *sericea*	Red-twig dogwood	N	X					X	X					
Family - Cyperaceae														
Carex aquatilis	Water sedge	N	X											
Carex emoryi	Emory's sedge	N	X	X										
Carex filifolia	Threadleaf sedge	N	X			X								
Carex geyeri	Geyer's sedge	N	X											
Carex hystericina	Porcupine sedge	N		X		X								
Carex inops ssp. *heliophila*	Sun sedge	N								X				
Carex lenticularis var. *lipocarpa*	Kellogg's sedge	N	X											
Carex nebrascensis	Nebraska sedge	N	X	X		X					X			
Carex occidentalis	Western sedge	N	X											
Carex pellita	Woolly sedge	N	X	X	X	X	X			X				
Carex praegracilis	Clustered sedge	N	X	X	X	X		X	X	X		X		
Carex siccata	Dryspike sedge	N	X											
Carex xerantica	Whitescale sedge	N	X											
Cyperus squarrosus	Bearded flatsedge	N	X											
Eleocharis erythropoda	Bald spikerush	N	X											
Eleocharis palustris	Spike-rush	N	X	X	X	X		X	X	X				
Schoenoplectus acutus	Hardstem bulrush	N	X	X					X	X				

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Schoenoplectus americanus	Olney's three-square bulrush	N	X			X		X						
Schoenoplectus fluviatilis	River bulrush	N									X			
Schoenoplectus maritimus	Alkali bulrush	N	X	X	X				X	X				
Schoenoplectus pungens	Common threesquare	N	X	X	X	X		X	X	X		X		
Schoenoplectus tabernaemontani	Softstem bulrush	N		X						X		X		
Scirpus microcarpus	Panicled bulrush	N	X											
Scirpus pallidus	Cloaked bulrush	N	X						X					
Family- Dipsacaceae														
Dipsacus fullonum	Fuller's teasel	E					X							
Family - Elaeagnaceae														
Elaeagnus angustifolia	Russian olive	E	X	X	X	X	X	X	X	X	X	X		X
Shepherdia argentea	Silver buffaloberry	N	X											
Family - Euphorbiaceae														
Chamaesyce glyptosperma	Ribseed sandmat	N	X											
Chamaesyce maculata	Spotted sandmat	E	X		X									
Chamaesyce missurica	Prairie sandmat	N	X											
Chamaesyce serpyllifolia	Thyme-leaved spurge	E	X											
Croton texensis	Texas croton	N	X											
Euphorbia brachycera	Horned spurge	N	X		X									
Euphorbia cyparissias	Cypress spurge	E	X											
Euphorbia dentata	Toothed spurge	E				X				X				
Euphorbia esula	Leafy spurge	E	X	X	X	X		X		X		X		
Euphorbia marginata	Snow on the mountain	N	X	X	X	X		X						
Euphorbia spathulata	Warty spurge	N	X											
Tragia ramosa	Branched noseburn	N	X			X								

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Family - Fabaceae														
Amorpha fruticosa	Lead plant	N	X				X							
Astragalus agrestis	Purple milkvetch	N	X											
Astragalus bisulcatus	Two-grooved milkvetch	N	X	X	X	X	X	X						
Astragalus canadensis var. *canadensis*	Canadian milkvetch	N	X											
Astragalus crassicarpus	Ground plum	N	X			X								
Astragalus drummondii	Drummond's milkvetch	N	X			X								
Astragalus flexuosus	Flexile milkvetch	N	X											
Astragalus missouriensis	Missouri milkvetch	N	X											
Astragalus mollissimus	Woolly locoweed	N	X											
Astragalus shortianus	Short's milkvetch	N	X											
Astragalus tenellus	Looseflower milkvetch	N	X											
Astragalus tridactylicus	Foothill milkvetch	N	X		X									
Astragalus wingatanus	Fort Wingate milkvetch	N	X											
Dalea candida var. *oligophylla*	White prairie clover	N	X		X					X				
Dalea purpurea	Purple prairie clover	N	X		X	X								
Glycyrrhiza lepidota	Wild licorice	N	X	X	X	X	X	X	X	X				
Lathyrus latifolius	Perennial sweetpea	E										X		
Lotus corniculatus	Bird's-foot trefoil	E								X				
Medicago lupulina	Black medic	E	X	X		X		X		X				
Medicago sativa	Alfalfa	E	X	X	X	X	X	X	X	X	X	X	X	
Melilotus officinalis	White sweet clover	E	X		X			X	X	X				
Melilotus officinalis	Yellow sweet clover	E	X	X	X	X	X	X	X	X	X	X		

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Oxytropis lambertii	Locoweed	N	X											
Oxytropis sericea	White locoweed	N	X											
Psoralidium tenuiflorum	Slimflower scurfpea	N	X	X	X	X	X	X		X				
Sophora nuttalliana	Silky sophora	N	X											
Thermopsis divaricarpa	Golden banner	N			X									
Trifolium pratense	Red clover	E		X		X		X						
Trifolium repens	White clover	E		X										
Vicia americana	American vetch	N	X	X	X									
Family - Geraniaceae														
Erodium cicutarium	Storksbill	E	X							X				
Geranium caespitosum var. *caespitosum*	Common wild geranium	N	X											
Family - Grossulariaceae														
Ribes aureum	Golden currant	N	X	X		X		X	X	X	X			
Ribes cereum	Wax currant	N	X											
Family - Iridaceae														
Sisyrinchium angustifolium	Narrowleaf blue-eyed grass	N	X											
Sisyrinchium montanum	Blue-eyed grass	N	X											
Family - Juncaceae														
Juncus arcticus ssp. *littoralis*	Arctic rush	N	X	X		X		X	X	X	X			X
Juncus bufonius	Toad rush	N							X					
Juncus compressus	Roundfruit rush	E	X						X	X	X			
Juncus effusus	Common rush	E	X											
Juncus gerardii	Saltmeadow rush	E							X					
Juncus interior	Inland rush	N	X					X		X				
Juncus nodosus	Knotted rush	N	X											
Juncus torreyi	Torrey's rush	N	X			X			X					
Family - Juncaginaceae														
Triglochin maritima	Seaside arrowgrass	N	X	X	X			X		X				

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Triglochin palustris	Marsh arrowgrass	N		X										
Family - Lamiaceae														
Hedeoma drummondii	Drummond's false pennyroyal	N				X								
Hedeoma hispida	Rough false pennyroyal	N	X											
Lycopus americanus	American water horehound	N	X			X		X						
Marrubium vulgare	Common horehound	E	X											
Mentha arvensis	Field mint	N	X			X		X	X	X				
Monarda pectinata	Pony beebalm	N	X		X					X				
Nepeta cataria	Catnip	E	X											
Prunella vulgaris	Heal-all	N	X											
Salvia reflexa	Lanceleaf sage	E	X					X		X	X			
Scutellaria brittonii	Skullcap	N	X							X				
Scutellaria galericulata	Marsh skullcap	N	X											
Stachys pilosa var. *pilosa*	Marsh betony	N	X					X	X	X				
Teucrium canadense var. *occidentale*	Western germander	N	X					X						
Family - Lemnaceae														
Spirodela polyrrhiza	Common duckmeat	N							X	X				
Family - Liliaceae														
Allium cernuum	Nodding onion	N			X									
Allium textile	Wild onion	N	X		X	X								
Asparagus officinalis	Asparagus	E	X	X	X	X		X	X	X				
Calochortus gunnisonii	Mariposa lily	N	X											
Leucocrinum montanum	Sandlily	N	X		X			X		X				
Maianthemum stellatum	False Solomon's seal	N	X			X								

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Zigadenus venenosus var. *venenosus*	Meadow deathcamas	N	X		X	X				X				
Family - Linaceae														
Linum lewisii var. *lewisii*	Blue flax	N	X	X	X	X				X	X			
Linum perenne	Blue flax	E	X		X	X								
Linum pratense	Meadow flax	N	X		X									
Family - Loasaceae														
Mentzelia decapetala	Ten petal mentzelia	N	X		X	X				X				
Mentzelia nuda	Bractless blazingstar	N	X		X	X				X				
Family - Malvaceae														
Callirhoe involucrata	Purple poppymallow	N	X											
Hibiscus trionum	Flower of an hour	E									X			
Malva neglecta	Common mallow	E	X			X				X			X	
Sphaeralcea coccinea	Scarlet globemallow	N	X	X	X			X		X				
Family - Moraceae														
Morus alba	White mulberry	E				X								
Family - Nyctaginaceae														
Abronia fragrans	Snowball sand verbena	N								X				
Mirabilis linearis	Narrow leaf four o' clock	N	X			X		X						
Mirabilis linearis	Narrowleaf four o'clock	N	X											
Mirabilis nyctaginea	Heartleaf four o'clock	N						X						
Family- Oleaceae														
Fraxinus pennsylvanica	Green ash	E				X		X	X			X		
Ligustrum vulgare	European privet	E	X											
Syringa vulgaris	Lilac	E										X		

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Family - Onagraceae														
Epilobium ciliatum	Northern willow-herb	N	X			X		X						
Epilobium hirsutum	Hairy epilobium	E			X				X					
Gaura coccinea	Scarlet gaura	N	X	X	X	X		X						
Gaura parviflora	Velvetweed	N	X	X	X	X		X	X	X				
Oenothera albicaulis	Whitest evening primrose	N	X							X				
Oenothera caespitosa ssp. *caespitosa*	Tufted evening primrose	N	X											
Oenothera cinerea	High-plains beeblossom	N				X								
Oenothera coronopifolia	Crown-leaf evening primrose	N	X											
Oenothera elata ssp. *hirsutissima*	Hooker's evening primrose	N	X											
Oenothera flava	Yellow evening primrose	N	X	X		X		X						
Oenothera howardii	Howard's evening primrose	N	X	X		X		X						
Oenothera villosa	Hairy evening primrose	N	X											
Oenothera villosa ssp. *strigosa*	Hairy evening primrose	N	X	X	X	X		X	X	X				
Family - Orobanchaceae														
Orobanche fasciculata	Clustered broomrape	N	X											
Orobanche ludoviciana ssp. *multiflora*	Manyflower broomrape	N	X	X	X									
Family - Oxalidaceae														
Oxalis dillenii	Slender yellow woodsorrel	N	X											

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Family - Papaveraceae														
Argemone hispida	Rough pricklypoppy	N	X		X	X				X				
Argemone polyanthemos	Prickly poppy	N	X	X	X	X			X	X	X			
Family - Plantaginaceae														
Plantago major	Common plantain	E		X					X	X				
Plantago patagonica	Woolly plantain	N	X	X	X					X				
Family - Poaceae														
Achnatherum hymenoides	Indian ricegrass	N	X	X	X	X		X	X	X				
Achnatherum nelsonii	Columbia needlegrass	N	X							X				
Achnatherum occidentale	Western needlegrass	N	X							X				
Achnatherum robustum	Sleepygrass	N	X											
Agropyron cristatum	Crested wheatgrass	E	X	X	X	X	X	X	X	X	X	X		
Agrostis gigantea	Redtop	E	X	X		X								
Agrostis scabra	Rough bentgrass	N	X											
Agrostis stolonifera	Redtop bent	E	X			X								
Alopecurus pratensis	Meadow foxtail	E						X						
Andropogon gerardii	Big bluestem	N	X			X								
Aristida oligantha	Prairie threeawn	N	X											
Aristida purpurea	Purple threeawn	N	X	X	X	X		X		X	X			
Aristida purpurea var. *fendleriana*	Fendler's threeawn	N	X			X				X				
Aristida purpurea var. *longiseta*	Fendler threeawn	N	X											
Avena fatua	Wild oat	E					X	X	X	X				
Bouteloua curtipendula	Sideoats grama	N	X	X		X		X	X	X				
Bouteloua dactyloides	Buffalograss	N	X	X	X	X	X	X	X	X	X			
Bouteloua gracilis	Blue grama	N	X	X	X	X	X	X	X	X				
Bouteloua hirsuta	Hairy grama	N	X											

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Bromus arvensis	Field brome	E	X	X	X	X		X		X				
Bromus inermis ssp. *inermis* var. *inermis*	Smooth brome	E	X	X	X	X	X	X	X	X	X	X	X	X
Bromus racemosus	Bald brome	E	X											
Bromus tectorum	Cheatgrass	E	X		X	X	X	X	X	X	X	X	X	X
Calamovilfa longifolia	Prairie sandreed	N	X											
Crypsis alopecuroides	Foxtail pricklegrass	E									X			
Dactylis glomerata	Orchardgrass	E	X	X		X			X	X				
Distichlis spicata	Inland saltgrass	N	X	X	X			X	X	X	X		X	X
Echinochloa crus-galli	Barnyardgrass	E		X		X		X	X			X		
Elymus canadensis	Canada wildrye	N	X	X	X			X	X	X	X			
Elymus elymoides	Bottlebrush squirreltail	N	X	X	X	X			X	X				
Elymus lanceolatus	Thickspike wheatgrass	N	X			X								
Elymus repens	Quackgrass	E	X	X						X	X			
Elymus trachycaulus	Slender wheatgrass	N	X			X		X	X	X				
Eragrostis cilianensis	Stinkgrass	E	X											
Eragrostis pilosa	Indian lovegrass	E									X			
Festuca idahoensis	Idaho fescue	N	X											
Festuca rubra ssp. *rubra*	Red fescue	N		X										
Glyceria striata	Fowl mannagrass	N	X							X				
Hesperostipa comata	Needle-n-thread	N	X	X	X	X	X		X	X				
Hierochloe hirta	Northern sweetgrass	N	X											
Hordeum jubatum ssp. *jubatum*	Foxtail barley	N	X	X	X	X	X	X	X	X	X	X		X
Hordeum pusillum	Little barley	N	X											
Koeleria macrantha	Prairie junegrass	N	X			X								
Leersia oryzoides	Rice cut-grass	N	X			X								
Leymus ambiguus	Colorado wildrye	N	X	X	X		X	X	X	X				

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Leymus cinereus	Great Basin wildrye	N	X	X	X		X			X				
Muhlenbergia asperifolia	Scratchgrass	N	X			X		X		X				
Muhlenbergia torreyi	Ring muhly	N	X											
Nassella viridula	Green needlegrass	N	X	X	X	X	X	X	X	X				
Panicum capillare	Witchgrass	E	X	X	X	X		X	X	X			X	
Panicum virgatum	Switchgrass	N	X	X	X	X	X	X	X	X				
Pascopyrum smithii	Western wheatgrass	N	X	X	X	X	X	X	X	X	X	X		
Phalaris arundinacea	Reed canarygrass	E	X	X	X	X	X	X	X	X	X	X		X
Phleum pratense	Timothy	E	X	X	X	X				X				
Poa annua	Annual bluegrass	E	X											
Poa arida	Plains bluegrass	N	X					X						
Poa fendleriana ssp. *longiligula*	Muttongrass	N	X											
Poa palustris	Fowl bluegrass	N	X											
Poa pratensis	Kentucky bluegrass	E	X	X						X				
Poa secunda	Sandberg bluegrass	N	X	X		X		X		X		X		
Polypogon monspeliensis	Rabbitfoot grass	E		X	X	X		X	X	X				
Psathyrostachys juncea	Russian wildrye	E	X											
Pseudoroegneria spicata	Bluebunch wheatgrass	N	X			X		X						
Puccinellia nuttalliana	Nuttall's alkaligrass	N	X					X		X	X			
Schedonnardus paniculatus	Tumblegrass	N	X	X	X			X		X				
Schedonorus arundinaceus	Tall fescue	E	X					X						
Schedonorus pratensis	Meadow fescue	E	X											

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Schizachyrium scoparium	Little bluestem	N	X		X	X		X	X					
Secale cereale	Cereal rye	E			X									
Setaria italica	Foxtail millet	E			X									
Setaria parviflora	Marsh bristlegrass	E						X						
Setaria pumila	Yellow foxtail	E	X		X	X			X					
Setaria viridis	Green bristlegrass	E						X		X				
Sorghastrum nutans	Yellow Indiangrass	N	X			X		X						
Spartina pectinata	Prairie cordgrass	N	X							X				
Sporobolus airoides	Alkali sacaton	N	X	X	X	X		X	X	X		X		
Sporobolus compositus	Composite dropseed	N			X			X	X	X				
Sporobolus cryptandrus	Sand dropseed	N	X	X	X					X		X		
Thinopyrum intermedium	Intermediate wheatgrass	E	X	X	X			X	X	X				
Thinopyrum ponticum	Tall wheatgrass	E				X		X						X
Triticum aestivum	Common wheat	E	X	X				X		X		X		
Vulpia octoflora	Sixweeks fescue	N		X		X								
Family - Polemoniaceae														
Ipomopsis spicata	Spiked ipomopsis	N	X			X								
Family - Polygonaceae														
Eriogonum alatum	Winged eriogonum	N	X		X									
Eriogonum effusum	Spreading buckwheat	N	X	X	X	X				X				
Eriogonum umbellatum	Sulphur flower	N	X		X	X								
Polygonum amphibium var. *emersum*	Longroot smartweed	N						X			X			
Polygonum aviculare	Prostrate knotweed	E	X					X		X				

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Polygonum convolvulus var. *convolvulus*	Black bindweed	E	X	X							X			
Polygonum lapathifolium	Curlytop knotweed	E		X	X	X			X	X				
Polygonum pensylvanicum	Pennsylvania smartweed	N				X								
Polygonum persicaria	Spotted ladysthumb	E		X				X						
Polygonum ramosissimum	Bushy knotweed	N	X							X				
Rumex altissimus	Pale dock	N							X					
Rumex crispus	Curly dock	E	X	X	X	X	X	X	X	X		X		X
Rumex maritimus	Golden dock	N			X			X	X	X		X		
Rumex stenophyllus	Narrowleaf dock	E								X				
Stenogonum salsuginosum	Salty buckwheat	N	X											
Family - Potamogetonaceae														
Potamogeton pusillus	Small pondweed	N							X	X				
Family - Primulaceae														
Androsace occidentalis	Western rockjasmine	N	X											
Lysimachia ciliata	Fringed loosestrife	N				X								
Family - Ranunculaceae														
Anemone canadensis	Canadian anemone	N	X											
Clematis ligusticifolia	Western virgin's bower	N	X		X	X	X		X	X	X	X		
Delphinium carolinianum ssp. *virescens*	Carolina larkspur	N	X											
Delphinium geyeri	Larkspur	N	X							X				
Delphinium nuttallianum	Two lobe larkspur	N	X											
Ranunculus cymbalaria	Alkali buttercup	N	X					X	X	X				

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Ranunculus macounii	Macoun's buttercup	N	X			X								
Thalictrum dasycarpum	Purple meadowrue	N	X		X	X	X			X				
Trollius laxus ssp. *albiflorus*	American globeflower	N	X											
Family - Rhamnaceae														
Rhamnus cathartica	Common buckthorn	E	X			X								
Family - Rosaceae														
Amelanchier alnifolia	Saskatoon serviceberry	N						X						
Cercocarpus montanus	Mountain mahogany	N	X		X									
Malus pumila	Common apple	E				X						X		
Potentilla gracilis	Slender cinquefoil	N						X						
Potentilla plattensis	Platte River cinquefoil	N		X										
Prunus americana	Wild plum	N	X			X		X	X		X			
Prunus pumila var. *besseyi*	Sandcherry	N	X			X		X	X					
Prunus virginiana var. *canada red*	Canada red chokecherry	E	X											
Prunus virginiana var. *melanocarpa*	Chokecherry	N	X			X		X	X	X				
Rosa arkansana	Wild rose	N	X			X				X				
Rosa eglanteria	Sweetbriar rose	E						X						
Rosa woodsii	Wood's rose	N	X	X	X	X	X	X	X	X	X	X		
Family - Rubiaceae														
Galium aparine	Stickywilly	N	X											
Family - Salicaceae														
Populus X acuminata	Lanceleaf cottonwood	N	X			X		X	X	X	X	X		

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Populus angustifolia	Narrowleaf cottonwood	N	X						X					
Populus deltoides ssp. *monilifera*	Plains cottonwood	N	X	X		X	X	X	X	X	X	X		X
Salix amygdaloides	Peach-leaf willow	N	X			X	X		X	X				
Salix exigua	Coyote willow	N	X	X	X	X	X	X	X	X	X	X		
Salix fragilis	Crack willow	E	X			X	X		X			X		
Salix interior	Sandbar willow	N				X		X						
Family - Santalaceae														
Comandra umbellata	Pale bastard toadflax	N	X	X	X	X	X	X		X				
Family - Scrophulariaceae														
Castilleja sessiliflora	Prairie paintbrush	N	X											
Linaria dalmatica ssp. *dalmatica*	Dalmatian toadflax	E	X	X		X		X						
Penstemon angustifolius	Broadbeard beardtongue	N	X	X		X		X		X				
Penstemon barbatus ssp. *torreyi*	Torrey's penstemon	N	X											
Penstemon grandiflorus	Large beardtongue	N	X											
Penstemon secundiflorus	Sidebells penstemon	N	X		X	X								
Penstemon strictus	Rocky Mountain penstemon	N	X											
Penstemon unilateralis	Oneside penstemon	N	X											
Penstemon virens	Front Range penstemon	N	X											
Verbascum thapsus	Common mullein	E	X	X	X	X		X	X	X	X		X	
Veronica anagallis-aquatica	Water speedwell	N		X										
Veronica peregrina ssp. *xalapensis*	Hairy purslane speedwell	N	X											

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Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Family - Sparganiaceae														
Physalis virginiana	Virginia groundcherry	N	X	X	X	X				X				
Quincula lobata	Chinese lantern	N	X	X				X		X				
Solanum rostratum	Buffalobur	E	X	X				X	X	X				
Solanum triflorum	Cutleaf nightshade	N	X							X				
Family - Solanaceae														
Sparganium eurycarpum	Broadfruit bur-reed	N				X								
Family- Tamaricaceae														
Tamarix chinensis	Five-stamen tamarisk	E				X	X	X	X	X	X			
Family - Typhaceae														
Typha angustifolia	Narrowleaf cattail	N	X	X	X		X	X	X	X				X
Typha latifolia	Broad-leaved cattail	N	X	X	X	X	X	X	X	X	X	X		X
Family - Ulmaceae														
Celtis laevigata var. *reticulata*	Netleaf hackberry	N			X									
Ulmus americana	American elm	E	X	X										
Ulmus pumila	Siberian elm	E	X	X	X	X	X	X	X	X	X	X		
Family - Urticaceae														
Urtica dioca ssp. *gracilis*	Stinging nettle	N	X											
Family - Verbenaceae														
Phyla cuneifolia	Fogfruit	N	X											
Verbena bracteata	Big bract verbena	E	X	X	X	X		X		X				
Verbena hastata	Swamp verbena	N	X			X	X		X	X				
Family - Violaceae														
Viola nuttallii	Nuttall's viola	N	X		X	X		X		X				

Appendix B. Plants Documented[a] on Fossil Creek Natural Areas (as of July 16, 2016)

Scientific Name	Common Name	Origin[b]	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Family - Vitaceae														
Parthenocissus quinquefolia	Virginia creeper	E				X								
Parthenocissus vitacea	Woodbine	N	X											
Vitis riparia	Riverbank grape	N				X								
Family - Zannichelliaceae														
Zannichellia palustris	Horned pondweed	N	X						X					
Total No. of Plant Species: 480; 346 N (72%)			**390; 298 N (76%)**	**155; 103 N (66%)**	**160; 119 N (74%)**	**199; 141 N (71%)**	**65; 32 N (49%)**	**160; 104 N (65%)**	**129; 78 N (60%)**	**197; 138 N (70%)**	**65; 38 N (58%)**	**49; 25 N (51%)**	**16; 3 N (19%)**	**25; 12 N (48%)**

[a] *Compiled from surveys by Crystal Strouse (2001-16), Ted Boss (1988-94), Geneva Chong (1995), Helen Fields (1995), Sharon Irwin (1993-94), Shaunda Kennedy (1993-94), Micki McNaughton (1993-94), Lisa Schell (1995), Rick Shory (2001), Tom Stohlgren (1995), Cindy Villa (1995), Ellen Wheeling (1993-95), COE Wetland Delineation Class (1994), and Natural Areas Department Staff (1990-16). Nomenclature follows USDA Plants National Database. USDA, NRCS. 2016. The PLANTS Database (http://plants.usda.gov, 8 July 2016). National Plant Data Team, Greensboro, NC 27401-4901 USA.*

[b] *Origin: N = Native to Colorado (not necessarily to Fort Collins or the site); E = Exotic (not native to Colorado).*

Appendix C. Animals Observed on Fossil Creek Natural Areas (1988 through May 2017)

Natural Area: Cathy Fromme Prairie (CFP), Hazaleus (HAZ), Colina Mariposa (CMN), Redtail Grove (RTG), Two Creeks (TCN), Prairie Dog Meadow (PDM), Pelican Marsh (PMN), Fossil Creek Wetlands (FCW), Fossil Creek Reservoir (FCR), Eagle View (EVN), Flores del Sol (FDS), and Soaring Vista (SVN).

Species: CTS = Colorado Threatened Species; CSC = Colorado Species of Concern; FCSI= Species of Interest for Fort Collins (City of Fort Collins, 2016); U = unusual or uncommon occurrence; I = Introduced (to North America for Birds; to Fort Collins for other species).

Occurrence: X = recorded on site.

Source: Compiled from observations by researchers, volunteers, and Natural Areas staff (1988-2016); includes accounts from Colorado Field Ornithologists' reports. Not all sites have been intensively surveyed (especially FDS and SVN); therefore, species may occur on a site and not yet be reflected in these tables.

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Greater white-fronted goose									X			
Bar-headed goose (I,U)									X			
Snow goose								X	X			
Cackling goose									X			
Canada goose	X	X	X	X	X	X	X	X	X	X	X	X
Brant (U)									X			
Tundra swan (U)									X			
Trumpeter swan (U)									X			
Wood duck								X	X			
Gadwall	X							X	X			
Eurasian wigeon (U)									X			
American wigeon	X					X	X	X	X	X		

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
American black duck (U)									X			
Mallard	X	X	X	X	X	X	X	X	X	X	X	X
Blue-winged teal	X						X	X	X			
Cinnamon teal	X							X	X			
Northern shoveler	X						X	X	X			
Northern pintail	X							X	X			
Green-winged teal	X						X	X	X			
Canvasback								X	X			
Redhead	X						X	X	X			
Ring-necked duck	X						X	X	X			
Greater scaup (U)									X			
Lesser scaup	X						X	X	X			
Surf scoter (U)									X			
Long-tailed duck (U)									X			
Bufflehead	X							X	X			
Common goldeneye	X							X	X			
Barrow's goldeneye (FCSI, U)									X			
Hooded merganser								X	X			
Common merganser								X	X			
Red-breasted merganser (U)									X			
Ruddy duck	X							X	X			
Northern bobwhite (FCSI[1], U)									X			
Chukar (I,U)			X									

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Ring-necked pheasant (I)	X					X	X	X	X	X		
Red-throated loon (U)									X			
Common Loon (U)									X			
Pied-billed grebe	X						X	X	X	X		
Horned grebe								X	X			
Red-necked grebe (U)									X			
Eared grebe	X							X	X			
Western grebe	X							X	X			
Clark's grebe								X	X			
American white pelican (FCSI)	X						X	X	X			
Brown pelican (U)									X			
Double-crested cormorant							X	X	X			
American bittern (SI, U)								X				
Great blue heron	X	X	X	X	X	X	X	X	X	X		
Great egret (U)								X				
Snowy egret (FCSI)	X							X	X			
Cattle egret (U)	X							X				
Green heron (U)								X				
Black-crowned night-heron				X		X	X	X	X	X		
Glossy ibis (U)								X				
White-faced ibis (FCSI)								X	X			
Turkey vulture	X	X	X	X		X	X	X	X	X		X
Osprey									X			

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Bald eagle (CSC, FCSI)	X	X	X	X	X	X	X	X	X	X		
Northern harrier (FCSI)	X	X	X	X	X	X	X	X	X	X		
Sharp-shinned hawk	X			X	X	X	X	X	X	X		
Cooper's hawk						X						
Northern goshawk (FCSI)	X											
Swainson's hawk (FCSI)	X	X		X		X	X	X	X	X		
Red-tailed hawk	X	X	X	X	X	X	X	X	X	X	X	X
Ferruginous hawk (CSC, FCSI)	X	X	X	X	X	X	X	X	X	X		
Rough-legged hawk	X	X		X		X		X	X	X		
Golden eagle	X			X		X	X	X	X	X		
American kestrel	X	X	X	X	X	X	X	X	X	X	X	
Merlin	X							X				
Peregrine falcon (CSC, FCSI)									X			
Prairie falcon (FCSI)	X		X	X		X	X	X	X			
Virginia rail							X	X	X			
Sora								X	X			
American coot	X						X	X	X	X		
Greater sandhill crane (CSC, FCSI)									X			
Black-bellied plover (U)								X				
Semipalmated plover (U)								X	X			
Killdeer	X	X	X	X	X	X	X	X	X	X	X	X
Black-necked stilt (FCSI, U)						X		X				

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
American avocet	X					X	X	X	X			
Greater yellowlegs	X					X		X	X			
Lesser yellowlegs	X					X		X	X			
Solitary sandpiper								X	X			
Willet (FCSI)								X				
Spotted sandpiper	X					X	X	X	X			
Whimbrel (U)								X				
Long-billed curlew (CSC, FCSI, U)								X				
Hudsonian godwit (U)								X	X			
Marbled godwit (U)								X				
Red knot (U)								X				
Sanderling (U)									X			
Semipalmated sandpiper								X	X			
Western sandpiper	X							X	X			
Least sandpiper								X	X			
Baird's sandpiper								X	X			
Pectoral sandpiper								X				
Dunlin (U)								X	X			
Stilt sandpiper								X	X			
Short-billed dowitcher (U)								X				
Long-billed dowitcher								X	X			
Wilson’s snipe	X							X	X			

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Wilson's phalarope (FCSI)								X	X			
Red-necked phalarope (U)									X			
Red phalarope (U)									X			
Pomarine jaeger (U)									X			
Long-tailed jaeger (U)									X			
Laughing gull (U)									X			
Franklin's gull	X							X	X			
Bonaparte's gull								X	X			
Mew gull (U)									X			
Ring-billed gull	X	X	X	X	X	X	X	X	X	X		
California gull							X	X	X			
Herring gull	X							X	X			
Thayer’s gull (U)									X			
Glaucous gull (U)									X			
Kelp gull (U)									X			
Sabine's gull (U)									X			
Caspian tern (U)									X			
Common tern (U)									X			
Arctic tern (U)									X			
Forster's tern (FCSI)	X							X	X			
Black tern (FCSI)								X				
Rock pigeon (I)	X	X	X	X	X	X	X	X	X	X		
Eurasian collared-dove (I)	X	X		X					X		X	X

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Mourning dove	X	X	X	X	X	X	X	X	X	X	X	X
Yellow-billed cuckoo									X			
Barn owl						X		X				
Eastern screech-owl								X				
Great horned owl	X					X	X	X	X	X		
Burrowing owl (CTS, FCSI, U)	X		X			X	X	X				
Long-eared owl (U)								X				
Short-eared owl (FCSI, U)						X	X	X				
Northern saw-whet owl (U)				X								
Common nighthawk	X	X	X	X	X	X	X	X	X	X		
White-throated swift									X			
Broad-tailed hummingbird	X			X		X		X	X			
Rufous hummingbird (FCSI)								X				
Belted kingfisher				X			X	X	X	X		
Yellow-bellied sapsucker (U)				X								
Downy woodpecker	X	X		X	X	X	X	X	X	X		
Hairy woodpecker									X			
Northern flicker	X	X		X	X	X	X	X	X	X		
Olive-sided flycatcher (FCSI)				X								
Western wood-pewee									X			
Willow flycatcher (FCSI)	X			X				X				
Say's phoebe	X							X	X			
Cassin’s kingbird (U)									X			

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Western kingbird	X	X	X	X		X	X	X	X	X	X	
Eastern kingbird	X			X		X		X	X			
Loggerhead shrike (FCSI)								X	X			
Northern shrike	X							X	X			
Warbling vireo									X			
Steller's jay				X								
Blue jay	X	X		X	X	X	X	X	X	X		
Woodhouse's scrub jay (U)				X								
Black-billed magpie	X	X	X	X	X	X	X	X	X	X		
American crow	X	X	X	X	X	X	X	X	X	X		
Common raven	X			X		X	X	X	X			
Horned lark	X	X	X	X		X	X	X	X	X	X	X
Tree swallow								X	X			
Violet-green swallow								X	X			
Northern rough-winged swallow								X	X			
Bank swallow								X	X			
Cliff swallow	X			X	X	X		X	X			
Barn swallow	X	X	X	X	X	X	X	X	X	X	X	X
Black-capped chickadee	X	X		X	X	X	X	X	X	X		
Mountain chickadee	X			X								
Brown creeper	X			X								
Rock wren (U)									X			
House wren	X	X		X		X	X	X	X	X		

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Marsh wren (U)								X				
Ruby-crowned kinglet				X					X			
Eastern bluebird (U)								X				
Western bluebird	X								X			
Mountain bluebird	X			X		X		X	X			
Townsend's solitaire				X								
Veery (FCSI, U)									X			
Swainson’s thrush									X			
Hermit thrush									X			
American robin	X	X	X	X	X	X	X	X	X	X		X
Gray catbird	X							X				
Brown thrasher (U)				X								
European starling (I)	X	X	X	X	X	X	X	X	X	X		
American pipit						X			X			
Bohemian waxwing									X			
Cedar waxwing				X								
Orange-crowned warbler							X					
Yellow warbler	X			X	X	X	X	X	X	X		
Yellow-rumped warbler	X	X		X	X	X	X	X	X	X		
Common yellowthroat		X		X		X	X	X	X			
Wilson's warbler	X			X	X	X		X	X	X		
Western tanager	X			X		X		X				
Green-tailed towhee				X								

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
American tree sparrow	X			X		X	X	X	X	X		
Chipping sparrow	X			X		X		X	X			
Field sparrow									X			
Clay-colored sparrow	X								X			
Brewer's sparrow (FCSI)	X								X			
Vesper sparrow	X								X			
Lark sparrow	X	X	X			X	X	X	X	X		
Lark bunting (FCSI, U)	X							X	X			
Savannah sparrow				X					X			
Grasshopper sparrow (FCSI, U)	X							X				
Song sparrow	X	X		X	X	X	X	X	X	X		
Lincoln's sparrow				X					X			
Swamp sparrow (U)									X			
White-crowned sparrow	X	X	X	X		X	X	X	X	X		
Dark-eyed junco	X	X	X	X	X	X	X	X	X	X		
Northern cardinal (U)				X								
Rose-breasted grosbeak (U)				X								
Black-headed grosbeak (U)				X					X			
Blue grosbeak (U)	X								X			
Lazuli bunting (FCSI)				X								
Red-winged blackbird	X	X	X	X	X	X	X	X	X	X	X	X
Western meadowlark	X	X	X	X	X	X	X	X	X	X	X	X
Yellow-headed blackbird						X	X	X	X			

BIRDS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVN
Brewer's blackbird	X			X		X		X				
Common grackle	X	X	X	X	X	X	X	X	X	X		
Great-tailed grackle (U)								X				
Brown-headed cowbird				X		X	X	X	X	X		
Orchard oriole (U)									X			
Bullock's oriole	X	X		X			X		X	X		
House finch	X	X	X	X	X	X	X	X	X	X		
Common redpoll (U)				X								
Pine siskin				X					X			
Lesser goldfinch				X								
American goldfinch	X	X		X	X	X	X	X	X	X		X
Evening grosbeak				X				X				
House sparrow (I)	X	X	X	X	X	X	X	X	X	X	X	X
TOTAL BIRDS (230)	**102**	**42**	**32**	**81**	**35**	**70**	**70**	**148**	**179**	**53**	**13**	**14**

[1]There is uncertainty if bobwhites seen in the area are native because, historically, reintroductions occurred across the state.

MAMMALS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVS
Eastern cottontail	X	X	X	X	X	X	X	X	X	X	X	X
Black-tailed jackrabbit	X					X		X	X			
Thirteen-lined ground squirrel	X					X	X	X	X			
Black-tailed prairie dog (CSC, FCSI)	X	X	X		X	X	X	X	X	X		
Fox squirrel	X	X		X	X	X	X	X	X	X		
Prairie vole	X								X			
Meadow vole	X						X		X			
Muskrat	X			X	X	X	X	X	X	X		
House mouse (I)	X											
Porcupine (U)	X											
Coyote	X	X	X	X	X	X	X	X	X	X	X	X
Red fox	X	X	X	X	X	X	X	X	X	X		
Black Bear (U)					X							
Raccoon	X	X	X	X	X	X	X	X	X	X	X	X
Mink	X											
Badger	X						X	X				
Striped skunk	X			X		X		X				
River otter (CST, FCSI, U)	X											
Mountain lion (U)	X											
Bobcat (U)	X											

MAMMALS	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVS
Elk (U)	X											
Mule deer	X	X		X	X	X	X	X	X	X		
Moose (U)	X							X				
TOTAL MAMMALS (23)	**22**	**7**	**5**	**8**	**9**	**11**	**11**	**13**	**12**	**8**	**3**	**3**

AMPHIBIANS AND REPTILES	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVS
Tiger salamander					X			X	X			
Woodhouse's toad								X	X			
Chorus frog	X	X	X	X		X	X	X	X			
Snapping turtle								X	X			
Painted turtle (FCSI)								X	X			
Short-horned lizard (FCSI)	X	X	X									
Prairie lizard	X		X									
Racer	X											
Northern water snake									X			
Bullsnake	X	X	X				X	X	X			
Plains garter snake	X	X	X	X	X	X	X	X	X	X	X	X
Prairie rattlesnake	X	X	X					X				
TOTAL HERPTILES (12)	**7**	**5**	**6**	**2**	**2**	**2**	**3**	**8**	**8**	**1**	**1**	**1**

FISHES	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVS
Stoneroller				X	X							
Common Carp (I)							X		X			
Sand shiner				X	X			X	X			
Fathead minnow				X	X			X	X			
Longnose dace					X							
Creek chub				X	X			X	X			
Longnose sucker				X	X							
White sucker				X	X							
Channel catfish									X			
Pumpkinseed									X			
Bluegill									X			
Hybrid sunfishes									X			
Smallmouth bass (I)									X			
Largemouth bass (I)				X					X			
TOTAL FISHES (14)	**0**	**0**	**0**	**7**	**7**	**0**	**1**	**3**	**10**	**0**	**0**	**0**

TOTAL	CFP	HAZ	CMN	RTG	TCN	PDM	PMN	FCW	FCR	EVN	FDS	SVS
NO. OF SPECIES (279)	**131**	**54**	**43**	**98**	**53**	**83**	**85**	**172**	**209**	**62**	**17**	**18**