EAST BIG THOMPSON RIVER NATURAL AREA

MANAGEMENT PLAN

December 2020

CITY OF LOVELAND OPEN SPACE AND TRAILS

City of Loveland

CITY OF LOVELAND OPEN LANDS & TRAILS

LOGANSIMPSON

APPROVAL

This document has been reviewed and approved by:

CITY OF LOVELAND

By : _____

Elizabeth Kayl

Parks and Recreation Director

By: _____

Joseph J. Bernosky, P.E.

Water and Power Director

COLORADO OPEN LANDS

By: _____

Anthony Caligiuri

President

ACKNOWLEDGMENTS

We would like to thank the many citizens, staff, and partners who provided extensive input for the development of the East Big Thompson River Natural Area Management Plan.

OPEN LANDS ADVISORY COMMISSION

Adam Beeco

Gale Bernhardt

Jim Edmiston

Mike Hinterberg

Ross Livingston

Jim Roode

Cindy Ticer

Jean Whittaker

William Zawacki

Daylan Figgs, Larimer County Liaison

Kathi Wright, City Council Liaison

Rob Molloy, City Council Alternate

Jacki Marsh, Mayor

CITY OF LOVELAND PARKS & RECREATION DEPARTMENT STAFF

Elizabeth Kayl, Parks & Recreation Department Director

Marilyn Hilgenberg, Open Lands & Trails Manager

Bryan Harding, Parks & Recreation Planning Manager

Debbie Eley, Open Lands & Trails Resource Specialist

Brian Hayes, Open Lands & Trails Land Agent

Jonathan Huey, Open Lands & Trails Crew Supervisor

Kelly Zuniga, Parks & Recreation Planner

Cindy Ticer, Open Lands & Trails Resource Technician

CITY OF LOVELAND WATER AND POWER DEPARTMENT STAFF

Larry Howard, Water Resources Manager

Ryan Van Pelt, Water Resource Engineer

Roger Berg, Water Utilities Manager

CITY OF LOVELAND CITY ATTORNEY'S OFFICE STAFF

Derek Turner, Assistant City Attorney

LOGAN SIMPSON

Jana McKenzie
Amanda Castelli
Jeremy Call
Julie Capp
Andrew Grinstead
Elizabeth Sharkey
Maria Michieli-Best
Kevin Small

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1. INTRODUCTION

1.1 PURPOSE AND OBJECTIVES OF THE PLAN

The purpose of the "East Big Thompson River Natural Area Management Plan" (EBTRNA Management Plan) is to document the existing conditions of the natural, cultural, and visual resources, and make specific recommendations for wildlife/habitat protection and restoration, cultural/historic resources preservation, agricultural management, and visitor use management. Management recommendations are presented in conjunction with proposed actions to provide a framework for plan implementation. These actions will be executed as funding and organizational capacity allows.

The objectives of this plan focus on balancing outdoor recreation use with the protection, enhancement, and management of natural, cultural, agricultural, and visual resources. Emphasis is placed on supporting habitat values that sustain the function and connectivity of the regional landscape while providing a diversity of high quality visitor experiences.

The objectives of the EBTRNA Management Plan include:

- Protect, maintain, and enhance healthy native ecosystems.
- Identify preferred locations for trailheads, trails, and other passive recreational amenities that offer diverse, enjoyable, safe, and environmentally sustainable recreational opportunities for visitors to experience the natural, cultural and visual resources of the Big Thompson corridor.
- Accommodate private property owners' use of their properties according to the agreements in the Conservation Easements (CEs), including continued agricultural use and access to private areas within the properties, while protecting the conservation values of these CE properties.
- Specify actions that can be implemented over time.

1.2 SCOPE AND ORGANIZATION OF THE PLAN

This document contains inventory maps, provides a summary of resources that currently exist, and includes a preferred plan map, descriptions of proposed improvements, management recommendations, implementation actions, and a budgetary cost estimate.

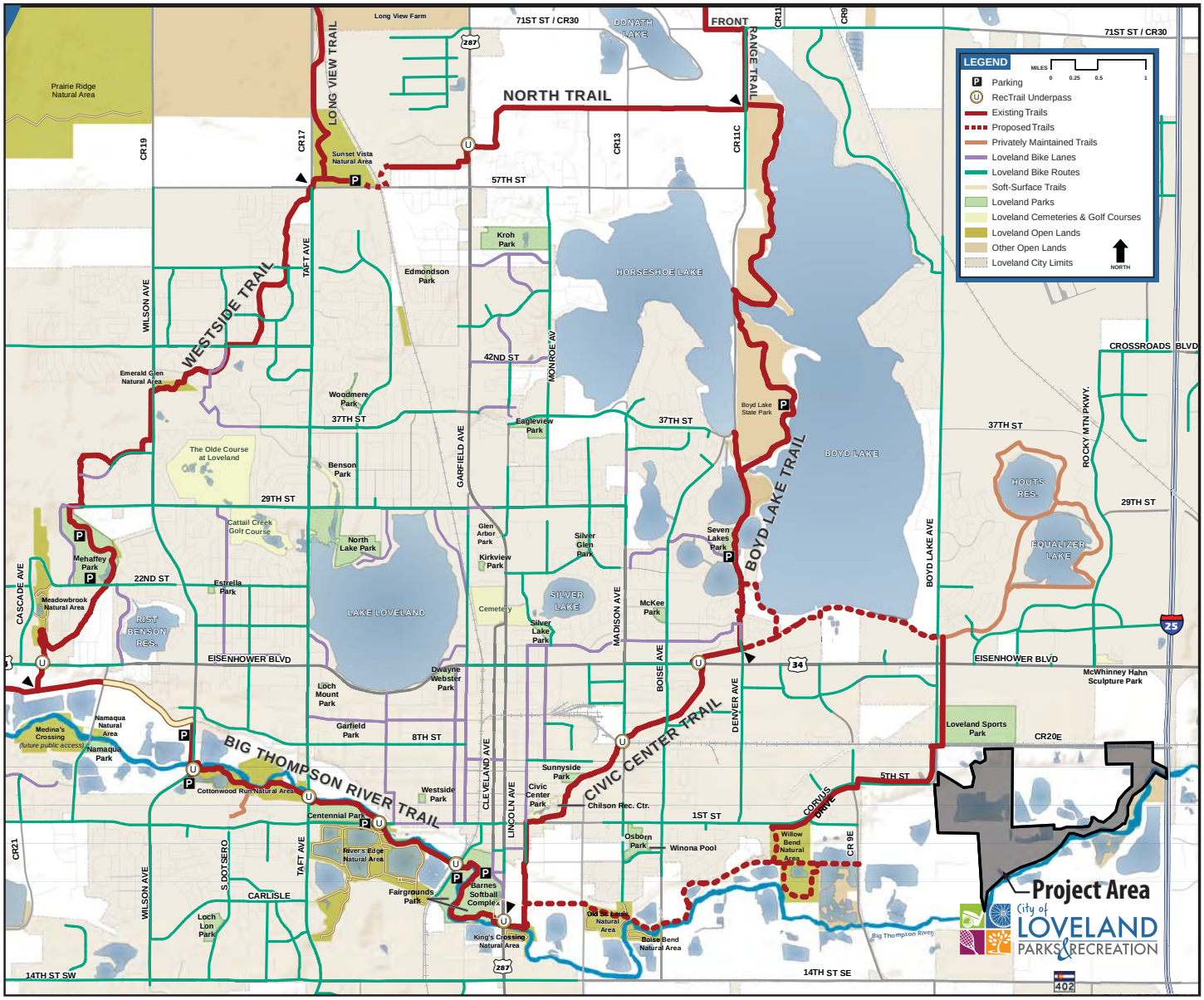
1.3 REGIONAL AND AREA CONTEXT

The "East Big Thompson River Natural Area" (EBTRNA) is southeast of the core of the existing City of Loveland (COL), and generally located between the Big Thompson River, Larimer County Road 20E, Boyd Lake Avenue, and Interstate 25. It consists of approximately 271 acres of land that have been conserved through purchase, CEs, or both.

The EBTRNA is an important addition to the system of COL Natural Areas located along the Big Thompson River. The city's existing and proposed trail system provides pedestrian and bicyclist access to the northwest corner of the site. Map A - Regional Context shows the location of EBTRNA relative to trails, bicycle facilities, and other public open lands and parks in the Loveland region. Map B - Area Context shows existing and proposed trail connections and land ownership in more detail in the immediate area of the project site.

Loveland Sports Park is located to the north of the project area, and provides nearby parking that could be used as a trailhead until other trailhead facilities are developed at EBTRNA. Extending Boyd Lake Avenue to the south is identified in the city's long range transportation master plan. The COL has acquired land for the right-of-way for the road along the western edge of the future Loveland Great Western Reservoir. The right-of-way has not been acquired south of that point, and a bridge over the Big Thompson River would have to be constructed to complete the roadway connection to State Highway 402. A shared-use path can be included within the right-of-way for the road.

Map A - Regional Context



East Big Thompson River Natural Area Management Plan

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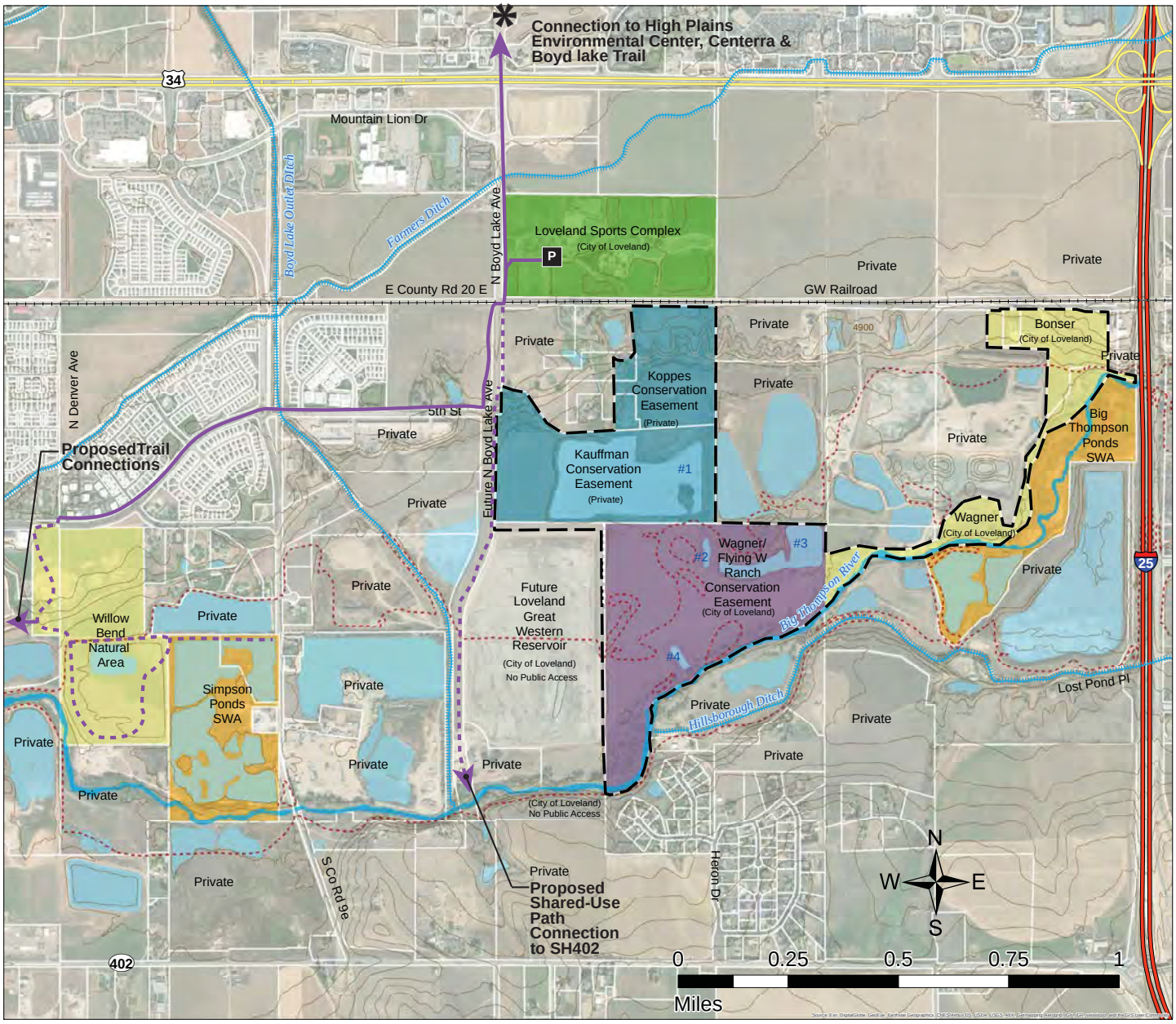
Map B - Area Context



East Big Thompson River Natural Area Management Plan

Legend

August 24, 2020

- Contour - 10 ft
- Railroad
- Canal
- River
- ExistingTrail
- Proposed Trail Connection
- Project Boundary
- Parcel Boundary
- Open Water
- Conservation Easement (Owner)
- City of Loveland Natural Area
- City of Loveland Natural Area w/ Conservation Easement
- State Wildlife Area
- City of Loveland Park
- 100 Year Floodplain

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1.4 PROJECT AREA OVERVIEW

The EBTRNA project area includes four separate parcels that total approximately 271 acres (see Map C – Project Area). Two parcels are privately-owned with CEs held by the COL. Two other properties are owned by the COL. A large portion of the city-owned parcel in the middle of the EBTRNA (Wagner/Flying W Ranch) has a CE, which is held by Colorado Open Lands, a state-wide land trust.

The topography ranges from lands on top of a bluff, to steep slopes along the face of the bluff, and relatively level ground between the bluff and the Big Thompson River. Occasional seeps of ground water emanate from the base of the bluffs, feeding wetlands below. Along the river there are large stands of deciduous trees and wetlands, which provide habitat for many different wildlife species, including raptors, waterbirds, waterfowl, songbirds, mammals, reptiles, amphibians, fish and invertebrates/pollinators. Much of the land was historically used as pastures for grazing, and there are portions that are still cultivated for hay. A portion of the land has been excavated to mine gravel, and mining is currently underway on a larger private parcel adjacent to the project area. As a result of mining, there are several ponds in the project area, some of which have been there for many years and have relatively stable water levels, allowing for riparian and wetland vegetation to establish at the edges of the ponds.

During large storm events, the Big Thompson River flows outside its low-flow channel and floods the riparian areas, and sometimes the fields, scouring some areas and depositing sediments in others. During the major flood in 2013 the river established a new low flow channel alignment in the eastern portion of the study area, shifting south and cutting through the Big Thompson Ponds State Wildlife Area. While the property boundaries were originally established based on the centerline of the river, much of the southeast property boundary of the project area (Wagner property) is now north of the main channel, without direct access to the river.

1.5 LAND USE HISTORY

This area was first used for agriculture, including grazing and cultivation of crops. Since the 1970s gravel mining has changed the character of the landscape, resulting in ponds with permanent pools of water that comes from ground water sources. Additional plowing and leveling of the land erased evidence of an old river oxbow, and most of the other features that existed prior to settlement in the middle of the 1800s.

The farmland to the north and west of the site has been gradually transitioning to urban land uses, including large amounts of residential development. South of the project area the land has been mostly developed into large tracts or residential lots, with little agricultural land remaining.

The preservation of open space and establishing a non-motorized trail along the Big Thompson River has been a priority for Larimer County and the COL for more than 25 years. Through collective efforts, progress has been made in creating a connected system of protected lands and parkland along the corridor. Many current planning documents show open space and trails through this area and immediately upstream, including:

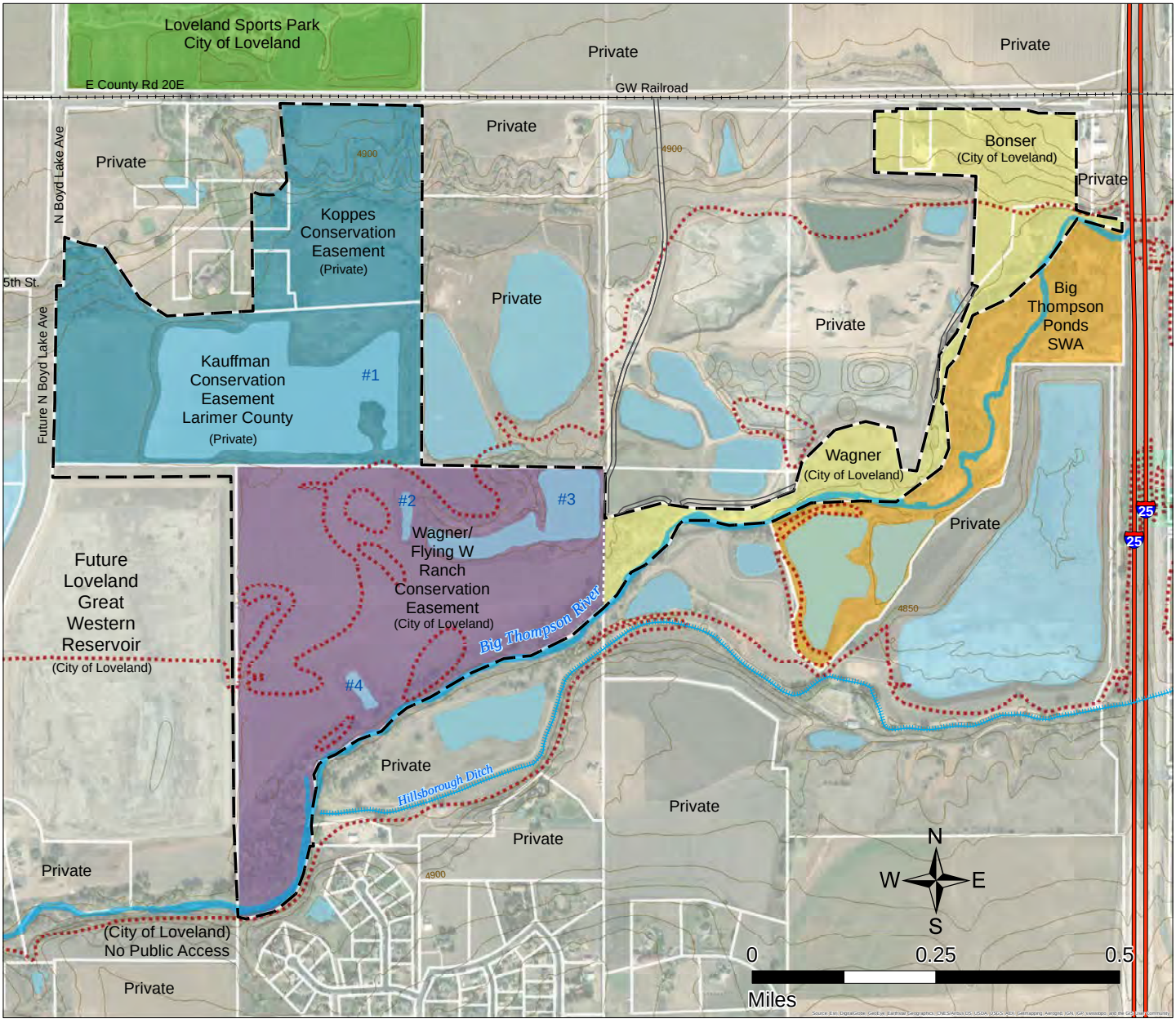
- Larimer County's 2013 Our Lands--Our Future: Recreation and Conservation Choices for Northern Colorado
- Loveland's 2014 Parks and Recreation Master Plan
- 2014 Big Thompson River Restoration Master Plan
- 2016 Create Loveland - City of Loveland Comprehensive Master Plan
- 2018 Big Thompson River Corridor Master Plan

The first two properties in the project area that were protected are the Koppes and Kauffman properties. The Koppes conservation easement was acquired in 2004 and is held by the COL. The Kauffman CE was donated to Larimer County in 2001, and it will be transferred to COL in 2020. The western portion of the Wagner/Flying W Ranch, consisting of 114 acres, was encumbered by a Conservation Easement donation that is held by Colorado Open Lands (formerly Legacy Land Trust). In 2019 the COL purchased the entire Wagner property, including 26 acres that are not in a conservation easement, and the Bonser property, completing the current assembly of land that is within the project area. These are referred to as the Wagner parcel and Bonser parcel through the remainder of this document.

While within the Urban Growth Management Area for the COL, the property has not been annexed into the city, and is currently zoned "FA-Farming" under Larimer County's Land Use Code. Because of the Intergovernmental Agreement for Growth Management between COL and Larimer County, the property will be subject to city or county development standards. The "Create Loveland" Comprehensive Plan Future Land Use Plan[1] indicates the majority of the property as "Parks, Open Lands, and Environmentally Sensitive Places", with the exception of the Bonser parcel, which is categorized as "Regional Activity Center."

1 https://www.cityofloveland.org/home/showdocument?id=11531

Map C - Project Area



East Big Thompson River Natural Area Management Plan

Legend

- Contour - 10 ft
- Railroad
- Canal
- River
- Access Easement
- Project Boundary
- Parcel Boundary
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- Conservation Easement (Owner)
- City of Loveland Natural Area
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- City of Loveland Park

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1.6 STAKEHOLDER AND AGENCY INVOLVEMENT

Landowners, Colorado Parks and Wildlife (CPW), Colorado Open Lands, Loveland Department of Water and Power, Loveland Parks and Recreation Open Lands & Trails Division, Loveland Parks & Recreation Planning Division, Open Lands Advisory Commission, and the public were consulted through the process of developing this management plan. The core team, which consisted of staff from Open Lands and Trails, Water and Power, and Logan Simpson Design, met bi-weekly via virtual web technology throughout the project to review progress, discuss meetings and events, and develop the plan.

- June 4, 2020. A site reconnaissance field trip was conducted in May, with COL, CPW and Colorado Open Lands staff members.
- June 6, 2020. A programming workshop was conducted at COL offices with the core team and Parks Planning staff. This workshop identified the initial recommendations to be presented to stakeholders.
- June 17, 2020. COL consulted with Colorado Open Lands regarding initial recommendations. Trail alignments were adjusted, and areas with no public access were identified based on those discussions.
- July 2, 2020. COL staff contacted adjacent landowners by letter and by phone to discuss the planning process and listen to ideas or concerns.
- July 12, 2020. COL core staff team presented initial recommendations to the Open Lands Advisory Commission.
- July 8, 2020. COL core staff team toured EBTRNA with the Open Lands Advisory Commission.
- July 20, 2020. The project core team conducted an open house in a picnic shelter at Loveland Sports Park from 4 to 7 pm. Approximately 25 members of the community, including several adjacent landowners, attended and provided comments. These comments are in Appendix A.
- July 20 to August 10, 2020. COL posted meeting materials on the website and encouraged feedback from the community. No comments were received.
- October 14, 2020 the final draft plan will be provided to Colorado Open Lands for review.

Field trip with stakeholders, June 4, 2020

Public Meeting, Loveland Sports Park, July 20, 2020

- October 14, 2020 the final draft plan will be presented to the Open Lands Advisory Commission for recommendation.
- October 15, 2020 to October 30, 2020 the final draft plan will be online for citizen comments.
- November 2020 final approval by the Open Lands Advisory Commission, sign off by the Parks and Recreation Director, Water and Power Director and Colorado Open Lands.

2. EXISTING CONDITIONS

2.1 PROPERTY OWNERSHIP AND EASEMENTS

The EBTRNA is surrounded by private lands, Big Thompson Ponds State Wildlife Area (SWA), and a COL property that will become a water storage reservoir (Loveland Great Western Reservoir), as shown on Map B. All of the parcels within the project area have been conserved for open space purposes via fee title ownership or CE, as described in the previous section. Additionally, there are access easements for trails and maintenance across several of the private properties with conservation easements. The COL also has an exclusive easement for the purposes of using irrigation water stored in the small pond on the Koppes property, which is not shown due to lack of public access and exclusive use for irrigation.

Table 1. Summary of Property Ownership, CEs, and Easements

Parcel/Easement	Size	Form of Protection Land or CE Owner	Summary of Allowed/Prohibited Uses
Kauffman CE	71 ac.	Private owner with CE held by COL	Continued private agriculture and fishing lease. Public trailhead, parking and trails. List of prohibited uses below.
Koppes CE	37 ac.	Private owner with CE held by COL	Continued private agriculture. Public trailhead, parking and trails.
Koppes Pond Easement	N/A	Private owner with easement held by COL	Use of irrigation water by COL for irrigation if needed. No public access.
Wagner/Flying W Ranch CE	114 ac.	Owned by COL, and CE held by Colorado Open Lands	Continued agriculture. Public trails.
Wagner Parcel	26 ac.	Fee title ownership by COL	No restrictions.
Bonser Parcel	22 ac.	Fee title ownership by COL	No restrictions.
Coulson Property (gravel mine) Access Easement	N/A	Easement owned by COL	Unlimited, exclusive, perpetual easement and right-of-way. Grantee continues the right for vehicular access over the easement and trail, and can install utilities.
Coulson Property (gravel mine) Parcels A, B, C and D Trail Easements	A - 0.143 ac. B - 0.368 ac. C - 0.138 ac. D - 0.280 ac.	Easements owned by COL	Recreational trail (hard or soft surface) for pedestrian, bicycle, or similar recreational uses, including equipment and structures associated with the COL recreational trail system. Grantee continues the right for vehicular access over the easement and trail, and can install utilities.

Kauffman Conservation Easement, view south from access road

Kauffman Conservation Easement

This 71-acre CE held by the COL is over private property that consists of wetlands, an agricultural field, and a gravel pond that is used for a private fishing club. As the Grantee of the CE, the COL has the right to:

- Preserve and protect the conservation values of the property;
- Monitor the Grantor's compliance with the terms of the agreement;
- Prevent any use that is inconsistent with the purpose of the easement and require restoration of areas that are damaged by the inconsistent use; and,
- Construct and maintain a parking area, trailhead and trail, including a trail that loops around the pond.

The Grantors (property owners) shall ensure the water levels in the pond are maintained to protect conservation values. The Grantors may continue to use the property, have vehicular access, and continue to lease the pond for the purposes of a private fishing club. The Grantors may also repair and replace utilities and features, and construct new fences if needed for management of livestock or separation of ownership and uses.

The property may be used for educational programs and interpretation, scientific research, and landscape restoration to improve habitat. Prohibited uses include:

- Hunting;
- Construction of buildings and structures (except as associated with the parking, trailhead and trail);
- Timber harvesting;
- Mining;
- Paving or road construction without permission of the Grantee;
- Dumping trash;
- Parking, storage or stockpiling materials (except as necessary for temporary storage of agriculture-related activities);
- Above-ground utilities;
- Commercial or industrial activities, or park-like recreational facilities (e.g. courts, swimming pools, golf course, ballfields, etc.);
- Public access by motor vehicles;
- Alteration of natural land forms and features by grading;
- Lighting, billboards, advertising, or other private signage (except "no trespassing" and/or "no dumping"; and
- Subdivision of the parcel.

Koppes CE – view south from the top of the bluff

Koppes Conservation Easement and Pond Easement

This 37-acre CE encompasses several different parcels of private property. The land includes areas on the top of the bluff, steep slopes, and a lower area with wetlands and pasture. The land is under a CE "to preserve the natural, scenic, open space, wildlife habitat, agricultural, and passive recreational values" of the property. The intent was to continue agriculture on the property. It also allows for a parking area approximately 20,000 SF in size, which could accommodate 40 to 60 parking spaces. A trailhead and trail are also allowed. The trail alignment must be agreed upon by the landowner, and access controlled so that grazing of livestock could still occur on the property. A Pond Easement is also granted to the COL for the small pond immediately to the west of the CE, which is available for the COL to use for irrigation. The public is not allowed access to the pond.

Wagner/Flying W Ranch Parcel and Conservation Easement

The COL purchased this 140-acre property from Cindy Wagner in 2019, with a CE held by Colorado Open Lands on the western 114 acres of the property. The purpose of the CE is to preserve conservation values of the riparian vegetation and wildlife habitat along the Big Thompson River, the pond areas, and native and non-native grassland that exists. The CE permits continued agricultural uses and construction of improvements related to agricultural and farm uses. Colorado Open Lands, the CE holder, will allow for public trail to be constructed that does not have detrimental effects on the Conservation Values of the property. The COL currently leases out a large portion of this CE property for crop production on a year-to-year basis.

The remaining 26 acres of the Wagner parcel do not have any use restrictions. This portion is a linear property that runs the length of the Big Thompson River east of the CE portion, with a willow and cottonwood gallery along the river.

Southern portion of the Wagner/Flying W Ranch CE

Big Thompson River at the southern edge of the Wagner parcel

Bonser Parcel – view southwest from CR20E

Bonser Parcel

The 22-acre Bonser parcel was purchased by the COL in 2019, and does not have any use restrictions. The site includes several structures: brick house, insulated metal storage building, old large wood barn, and a garage with attached overhang/sheltered area. A small wood-frame house was recently removed.

The dates of construction are unknown, and the condition of the structures has not been thoroughly assessed. The house, metal building and old barn area are currently leased to a tenant on a year-to-year basis. There are concrete remnants from past agricultural uses, including a long feeding trough and footings for a round silo or other structure.

A natural spring known as the Bonser Spring - Case #05CW025 emanates southeast of the house, and the water creates small wetlands areas. The COL owns the water rights associated with this spring. Short fences surround some of the former pastures, and the COL has allowed grazing of the lower portion of the parcel and the Wagner parcel.

Coulson Access Easements

Access Easement. The access easement runs from CR20E through the private parcel to the south boundary of the private property, near pond #3 on the Wagner/Flying W Ranch parcel. The width and length are legally described on the easement documents. The intent of this easement is for COL maintenance vehicle access, or development of a recreational trail.

Trail Easements. Four narrow trail easements run parallel to the Wagner parcel. They were obtained because of the difficulty in constructing a trail within the Wagner parcel in these locations due to the river and topography.

Expansive views across agricultural fields and the future Loveland Great Western Reservoir

2.2 CLIMATE

EBTRNA is located along the western edge of the Great Prairie and therefore has highly variable weather. The climate is categorized as semi-arid with a strong seasonal variation in temperature, abundant sunshine and relatively low precipitation. High temperatures average between 81-85°F between June and August and low temperatures average between 21-23°F between November and March. Winters are generally cold but are characterized by significant temperature swings. High temperatures in the 50s are not uncommon in the winter months. Average annual precipitation is 15-16 inches, with the greatest amount occurring in April and May. Average annual snowfall is approximately 41 inches, but as a result of wind redistribution and topography, the snow depth can vary throughout the site.

2.3 VISUAL RESOURCES

EBTRNA conserves 271 acres of visually appealing farmland, riparian habitat along the river and ponds, open water and wetlands, and natural grasslands. It is mostly concealed from views from nearby roads, but a few adjacent residences can see into the property, and vice versa. There are beautiful long range views towards the foothills and Rocky Mountains to the west, but some of these views include mid-ground high voltage power lines. It will be important to retain the visual character of the riparian and wetlands area when designing recreational amenities and signs, as well as respect the open landscape associated with the fields by keeping vertical improvements at the edges.

2.4 NATURAL RESOURCES

The 2008 Loveland Natural Areas Sites Report mapped areas with predominantly natural characteristics on public and private land throughout the Loveland urban planning area. The report identified the dominant habitat types within the study area. The descriptions of the natural areas within this study area is useful background information, however the inventory is not detailed enough for site-specific mapping. Therefore, delineations of specific habitat types were developed for this management plan.

Existing baseline vegetation inventories associated with the various CEs within the study area were reviewed and ReGAP GIS data was obtained. These datasets were compared with data collected by field biologists during a site reconnaissance and a map of habitat types was developed for the study area, see Map D – Habitat Areas.

Habitat Areas

A total of nine general types of habitat were identified in the project area:

- Cultivated agriculture
- Orchard
- Fallow/Weedy
- Non-native grassland
- Wetlands
- Pond/Open water
- Cottonwood/Willow gallery and river riparian
- River

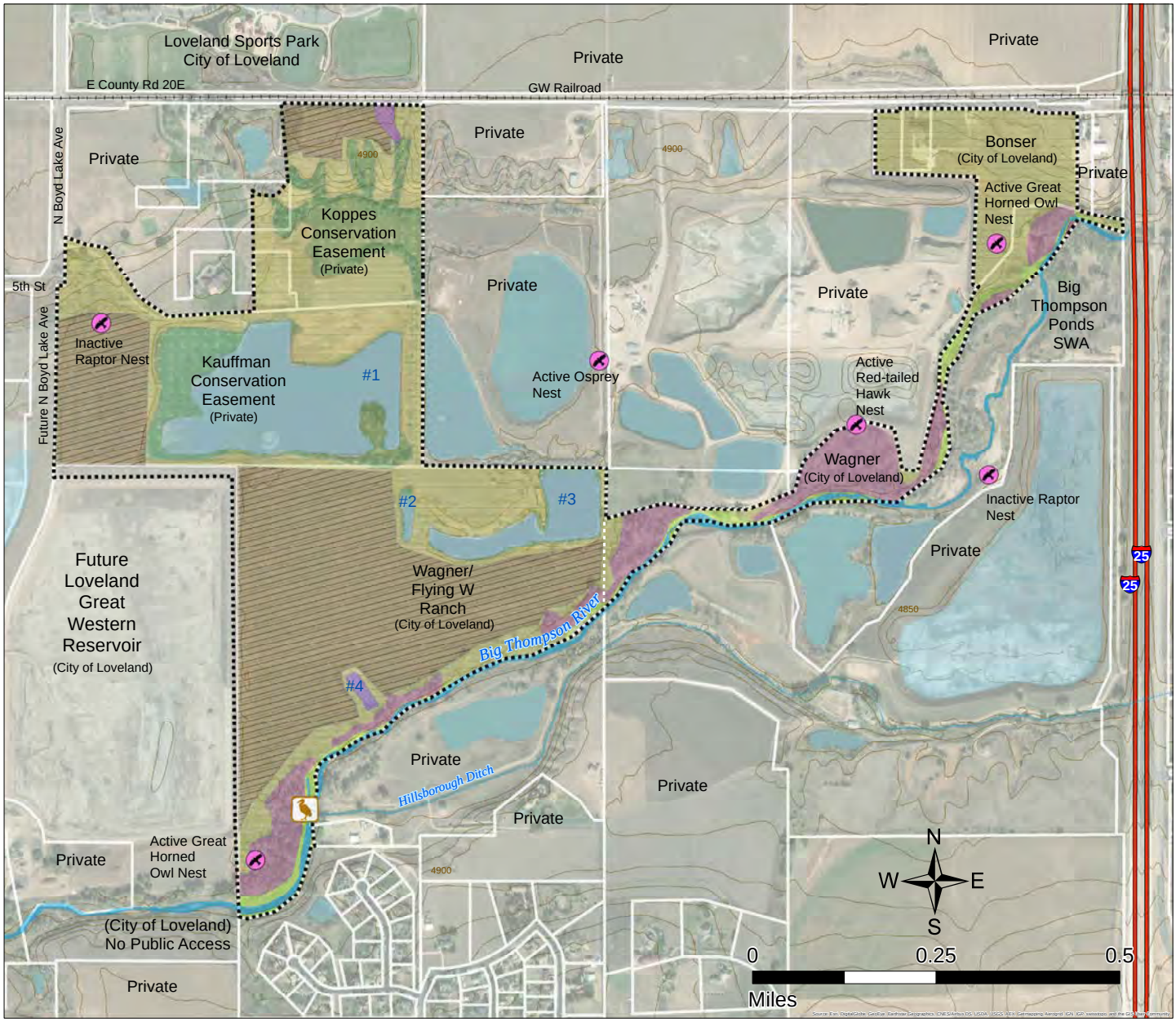
These habitat types, their conditions, and value to associated wildlife species are summarized below. Appendix B contains a list of representative species (common and scientific names) associated with the habitat types described below.

Cultivated Agriculture

These areas have been cultivated, primarily for alfalfa hay production. The agricultural fields are typically dominated by alfalfa and a variety of annual weed species including field bindweed, kochia, musk thistle, cheatgrass, and common dandelion. The photo below provides a representative view of an alfalfa hayfield. The overall value of cultivated agricultural areas as wildlife habitat is limited by the lack of woody vegetative cover, limited vegetation diversity, and seasonal mowing or tilling that results in short-term food and cover removal. The primary value of alfalfa hayfields as wildlife habitat occurs during the growing season when it contributes food sources and cover for small mammals and avian species prior to mowing. Deer mice, prairie voles, and thirteen-lined ground squirrels, as well as songbirds such as western meadowlark are species likely to live and breed in alfalfa fields. Machine usage during nesting season can destroy ground nests that may be present. Open-country raptors, including red-tailed hawk, Swainson's hawk, American kestrel, northern harrier, and great horned owls, as well as mammalian predators including coyote, striped skunk, and red fox, will also occasionally hunt in alfalfa fields. Grazing by Canada geese in agricultural fields is likely to occur as well, especially near ponds and the Big Thompson River.

Alfalfa field on Wagner/Flying W Ranch CE – Russian olive trees line Pond #1 in the distance

Map D - Habitat Areas



East Big Thompson River Natural Area Management Plan

August 24, 2020

Legend

- Raptor Nest
- Heronry
- Contour - 10 ft
- Railroad
- Canal
- River
- Project Boundary
- Parcel
- Open Water

Habitat Vegetation Community

- Cultivated Agriculture
- Fallow/Weedy
- Non-native Grassland
- Pond/Open Water
- Riverine Riparian
- Wetland
- Willow/Cottonwood Gallery

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Orchard

An orchard is located on the Koppes CE and contains an overstory of nine rows of cultivated fruit trees. Understory vegetation is non-native grassland, which is described below. The primary habitat value of a cultivated orchard is foraging and/or nesting habitat for a variety of songbirds, such as American robin and western kingbird. Mammals such as fox squirrel and raccoon will readily consume fruit. Understory vegetation provides food and cover for a variety of small mammals. Pollinators and other invertebrates are present in orchards and also serve as prey for other species, particularly birds. The orchard area provides additional vegetation species diversity and structure in an area that is otherwise predominantly non-native grassland.

Fallow/Weedy

These areas have been cultivated in the past but have been left to go fallow. As a consequence, these areas are vegetated primarily by annual weed species. Cheatgrass, smooth brome, kochia, puncturevine, and flixweed are the dominant species. In general, wildlife use of weed-dominated areas is similar to that described for agricultural fields, and is restricted primarily to small mammals and open-country songbirds. Tall weeds provide additional vegetation diversity and potential cover for birds and small mammals. However, these areas have very little value as foraging or nesting habitat. Dense stands of weeds are also occasionally used as bedding sites for mule deer and red fox.

Non-native Grassland

Non-native grassland is present throughout the study area, primarily in areas that are used for grazing. These areas have been converted from native grassland to non-native grassland communities by past agricultural practices. Dominant vegetation consists of introduced grass species, including crested wheatgrass, foxtail barley, blue wildrye, cheatgrass, and smooth brome. Subdominant species include flixweed, net-seed lambsquarters, kochia, red-stem filaree, field bindweed, western salsify, common mallow, prairie sage, yellow sweetclover, white clover, Russian thistle, puncturevine, and fringed sage. Large patches of non-native species also include curly dock, Russian knapweed, and musk thistle. Scattered small clumps of native rubber rabbitbrush and yucca are also present in non-native grassland. Occasional non-native and invasive Russian olive and Siberian elm trees are also present within the non-native grassland areas.

The overall value of non-native grassland as wildlife habitat is restricted by the general lack of woody vegetation, low vegetation species diversity, and the predominance of non-native grass and/or annual weed species. Deer mouse, thirteen-lined ground squirrel, prairie vole, northern pocket gopher, plains pocket gopher, and eastern cottontail are the principal species likely to establish resident populations in non-native grassland habitats.

Non-native grassland in southern portion of Wagner/Flying W Ranch CE

Songbirds such as Brewer's blackbird, common grackle, and black-billed magpie may also occasionally forage in these areas. Grazing by Canada geese is likely to occur as well, especially near ponds and the Big Thompson River. Species such as striped skunk, coyote, badger, and red fox will hunt prey in non-native grassland habitats. Raptors such as American kestrel, red-tailed hawk, northern harrier, Swainson's hawk, and great horned owl will hunt over non-native grassland.

No black-tailed prairie dog colonies are located within this habitat type, but there is a colony on private property immediately to the north of the Kauffman CE, which is an important prey source for raptors and mammalian predators.

This habitat type has great potential for restoration to native grassland if it were managed for that purpose, in lieu of grazing livestock.

Wetlands

Wetlands are located in drainages that are fed by seeps from the bluffs. These drainages flow towards the river and combine to form low-lying wetlands near the base of the bluffs. Wetlands are also located around existing ponds and along the Big Thompson River. Detailed wetlands delineation has not been performed for the study area, so the wetland areas that are mapped are general locations and will need to be mapped in detail prior to construction of any facilities.

Wetland vegetation associated with the seeps is dominated by common cattail in the wetter portions, while the edges support a mixture of herbaceous and woody species. Herbaceous species include showy milkweed, catchweed bedstraw, three-square, sedge, watercress, and non-native purple deadnettle, musk thistle, and smooth brome. Woody species at the edges include peach-leaved willow, and weedy invasive Russian olive and Siberian elm trees.

Wetlands on the Koppes CE are surrounded by Russian olive trees, and area fed from seeps that emerge from the base of the bluff (Google Earth aerial photograph, 2019)

Wetlands on the west end of Pond #1 are predominantly cattails, and Russian olive trees are along its edges

The predominance of non-native Russian olive trees at the edges of the seeps and around portions of the peripheries of some of the ponds limits their value as wildlife habitat, although some bird species will nest and forage in these trees. The primary value of the wetlands in seeps and ponds is for foraging and nesting by songbirds, as well as potential habitat for reptiles, amphibians, and invertebrates. A wide variety of avian species inhabits wetlands, including red-winged blackbird, common yellowthroat, and Sora. Areas with flowing surface water may be used by upland wildlife species for drinking water. Mammalian predators such as red fox, raccoon, and striped skunk may also occasionally forage in these areas. Wetlands, combined with the dryland landscape that are adjacent to them, is prime habitat for the Preble's meadow jumping mouse, a federally-listed endangered species.

Pond/Open Water

There are four ponds within the project area: one on the Kauffman CE, and three on the Wagner/Flying W Ranch CE. Pond #4 is small with steep sides, and was dry during the May and June 2020 field reconnaissance, and water levels were very low in 2019 (July 17, 2019 Google Earth). Aerial photos show the pond as dry in 2009, but in other years between 2009 and 2019, the pond contained water. The cause of the water variation is not known.

Pond #4 had no open water in June 2020

Ponds #1, #2 and #3 were excavated many years ago for gravel mining and are fed by groundwater, which results in fairly level water surfaces. Due to steep bank conditions that were created by the mining there are limited areas of riparian vegetation and wetlands associated with the ponds. There is a large marsh wetland area on the western edge of the Wagner/Flying W Ranch pond that is dominated by cattails. Wetlands and associated open water provide foraging, resting, and breeding habitat for waterfowl, shorebirds, wading birds, reptiles, amphibians, and invertebrates. Species using these ponds include muskrat, mallard, green-winged teal, western grebes, Virginia rail and marsh wren. Mammalian predators and deer (mule deer and white-tailed deer) likely use these ponds for drinking water and the vegetation around them to forage and hunt. An osprey nest on a man-made platform is located next to a pond on private property, west of the active mining operation. This nest was confirmed active in 2020 during field reconnaissance.

Pond edges that support cottonwood trees, willows and other native woody species can provide valuable wildlife habitat; however, the predominance of Russian olive trees currently limits the wildlife habitat value of the ponds.

Cottonwood/Willow Gallery and River Riparian

This vegetation community consists primarily of a plains cottonwood and willow overstory, with Russian olive trees, and a non-native grass understory that has been heavily grazed. Since the baseline inventory was completed for the Wagner/Flying W Ranch CE, the massive 2013 Big Thompson flood occurred, and it appears that the willow shrubs and Russian olive trees that were previously reported as lining the river are less prevalent. It is possible that invasive salt-cedar (Tamarisk sp.) is also in the area because this species was documented in 2005.

According to the Colorado Breeding Bird Atlas (Colorado Breeding Bird Atlas Partnership 2016), plains riparian habitat (e.g., cottonwood/willow gallery) comprises only three percent of Colorado's land area, but has a disproportionately high species richness and density of breeding birds. Representative avian species utilizing this habitat include Bullock's oriole, yellow warbler, western kingbird, black-billed magpie, northern flicker, mourning dove, house wren, American robin, blue grosbeak, and western wood-pewee. Raptors such as red-tailed hawk, great horned owl, and American kestrel were documented in this habitat in 2020. This vegetation community also provides suitable habitat for eastern screech-owl. Nest locations for red-tailed hawk and great horned owl that were documented during field reconnaissance in 2020 are presented on Map D – Habitat Areas. A great blue heron heronry is present at the southwest corner of the

Cottonwood gallery

study area. A total of six active nests were documented in 2020, which is considerably diminished from the extent reported in 2015 CPW data. This habitat type also provides potential nesting, roosting, and foraging habitat for bald eagle, although this species was not documented during field reconnaissance in 2020, and no nests were observed. Golden eagles will nest in mature riparian trees, but this species would be less likely to occur in this area than bald eagles. No bald eagles, golden eagles, or their nests were documented were documented during field reconnaissance in 2020.

In addition to the species described above, this habitat system provides dispersal and migratory corridors for birds and mammals across otherwise fairly treeless terrain. Representative mammal species that are typical in this habitat include beaver, mink, raccoon, striped skunk, red fox, coyote, and white-tailed deer, with an occasional black bear. This riparian habitat, combined with the dryland landscape that are adjacent to them, is prime habitat for the Preble's meadow jumping mouse, a federally-listed endangered species.

River

The Big Thompson River provides habitat for numerous fish, amphibian, reptile, and invertebrate species. Common carp, brown trout, and rainbow trout are documented in the Big Thompson River near Loveland (FishExplorer.com 2020), and CPW staff believe there are brown trout in this reach of the river. Representative amphibian and reptile species that would be expected in this habitat include tiger salamander, plains leopard frog, common garter snake, and northern crayfish. A wide variety of aquatic invertebrates inhabits the area around the Big Thompson River and serves as prey and pollinators in the ecosystem.

Preble's meadow jumping mouse (photo credit Boulder County Parks and Open Space)

Sensitive Species

For the purposes of this management plan, sensitive species include federally listed species, Colorado Species of Greatest Conservation Need (SGCN), Colorado Plants of Greatest Conservation Need (PGCN), and US Fish and Wildlife Service (USFWS) Birds of Conservation Concern (BCC). SGCN and PGCN are further categorized into Tier 1 and Tier 2, reflecting a relative degree of conservation priority. Appendix C contains a list of these species, their general habitat types, and potential for occurrence in the study area.

The USFWS Information for Planning and Consultation (IPaC) website was queried to obtain a report of federally listed species and BCC for the study area (USFWS 2020). Of the species on this report, two federally threatened species and one BCC have moderate to high potential to occur in the study area. A total of 27 SGCN and 4 PGCN also have some potential to occur in the study area (CPW 2015). Some species have multiple status designations.

Preble's Meadow Jumping Mouse (Threatened)

Typical habitat for Preble's meadow jumping mouse is comprised of well-developed plains riparian vegetation with adjacent, relatively undisturbed grassland communities and a nearby water source. These riparian areas include a relatively dense combination of grasses, forbs, and shrubs. The wetland seeps and riparian areas along the river could provide suitable habitat conditions for this subspecies. A site-specific survey has not yet been conducted to determine presence of this subspecies. A survey will be required and consultation with USFWS will be conducted to determine appropriate avoidance, minimization, and mitigation measures for any projects planned in the area.

Ute Ladies'-tresses (Threatened)

Ute ladies'-tresses has potential to occur in the project area. Suitable habitat typically consists of seasonally moist soils and wet meadows near lakes, springs, and streams. Some wet, grassy areas where water flows and cattails are not too dense are also potential habit for this species. A site-specific survey has not yet been conducted to determine presence of this species. A survey will be required and consultation with USFWS will be conducted to determine appropriate avoidance, minimization, and mitigation measures for any projects planned in the area.

Bald Eagle (BCC, Bald and Golden Eagle Protection Act [BGEPA])

The study area provides suitable nesting, foraging, and roosting habitat for bald eagles. The species has been documented in the area in winter. No bald eagles or nests were documented during the 2020 field reconnaissance of the study area. No communal winter roosts have been documented in the area.

Appendix D contains a list of references that were used to supplement field observations for habitat and wildlife.

Hillsborough Ditch diversion structure

2.5 CULTURAL RESOURCES

Logan Simpson conducted a Class I Cultural Background Literature Search to identify any previously recorded cultural resources that could possibly be impacted by the long term management or development of trails and facilities within the project area.

In order to determine whether any known cultural resources and previously conducted cultural surveys are located within the project area, information was gathered using the Office of Archaeology and Historic Preservation (OAHP) Compass online database. The National Register Information System (NRIS) database, historic topographical maps, the Bureau of Land Management (BLM) General Land Office (GLO) maps and title plats were also reviewed electronically. The results of the Class I Cultural Background Literature Search are discussed below.

Results of Class I Cultural Resource Inventory

Three previously recorded cultural resources were identified during the Class I cultural resources records search (Table 1). One of the sites is an historic electric transmission line that crosses in an east/west direction through the northern portion of the project area. An electric transmission line currently exists in the same alignment. Two others are at the edge or near the project area to the north and south. To the north, and outside of the project area, is the Great Western Railroad (founded in1901), which runs parallel to the north side of Larimer County Road 20E. To the south is the Hillsborough Ditch, which includes the river diversion structure in the Big Thompson River. One-half of the Hillsborough Ditch diversion structure is within the project boundary because the property line is the centerline of the Big Thompson River.

Both the Great Western Railroad and the Hillsborough Ditch show up on the 1906 United States Geological Survey (USGS) Loveland historic topographic map. Along with the ditch and rail road there are several roads on the historic USGS 1906 topographic map within the project area that could still be present on the ground but could only be verified by a Class III Cultural Resources Survey. There were no prehistoric sites that have been previously identified within the current project area however because the majority of the project area is a floodplain and has not had subsurface testing, a high likelihood exists that there would be buried cultural deposits because of flooding events. Two previously conducted cultural surveys have been completed within the project area (Table 2). Both of the Class III Cultural Resource Surveys are located on the east side of the project area along I-25. A large majority of the project area has not been subjected to a Class III Cultural Resources Survey.

Summary and Recommendations

Three previously recorded historic properties are located within the project are that are either eligible for the National Register of Historic Place (NRHP) or have not yet been evaluated for the NRHP (Table 3). Since the entirety of the area for this project has not been previously surveyed for cultural resources, it is recommended that a Class III Cultural Resources Survey be conducted prior to any ground disturbing activities, and the results summarized in a technical report that would be then subject to consultation with SHPO. If any NRHP-eligible properties are identified during the Class III Cultural Resources Survey and it is determined that the proposed undertaking will have an adverse effect on NRHP-eligible properties, then a Memorandum of Agreement will need to be executed, which will stipulate how adverse effects shall be resolved in consultation with SHPO.

Table 2. Cultural Resources within the Project Area and Eligibility to the NRHP

Smithsonian Number	Affiliation/site type	In/Out of Project Area	NRHP Eligibility Recommendation
5LR.850.3	Historic/Great Western Rail Road	Out	Eligible/Recommended
5LR.9384	Historic/Transmission Line	In	Needs Data/Officially
Not surveyed	Historic/Hillsborough Ditch	In	Needs Data/Officially

Table 3. Previous Class III Cultural Resources Surveys within the Project Area

OAHP Survey ID	Report Title	Author	Date of Survey	In/out of Survey Area
LR.SC.NR2	Big Thompson Simpson Ponds/Big Thompson River Streambank Stabilization in Larimer County. Colorado, Emergency Watershed Protection Program (EWP)[2]	Sims, Marsha	1999	In
MC.CH. R184	A Class III Archaeological Inventory of Corridor Alternatives and Miscellaneous Facilities Associated with the North I-25 Front Range Corridor Environmental Impact Statement, Adams, Boulder, Broomfield, Larimer and Weld Counties.[3]	Kinner et al.	2007	In

Table 4. Explanation of Compass NRHP Eligibility Data

Compass Designation	Explanation
Not eligible – field	Resource found not eligible for inclusion in the NRHP by a contractor in the field but not yet concurred upon by the SHPO
Not eligible – officially	Resource determined not eligible for inclusion in the NRHP with SHPO concurrence
Needs data – field	The visible surface expression of the resource does not yield enough information to evaluate the NRHP eligibility of the resource by a contractor
Needs data – official	The field designation of “needs data” for an eligibility recommendation by a contractor has been concurred upon by the SHPO
Eligible – field	Resource recommended eligible for inclusion in the NRHP by a contractor
Eligible – officially	Resource determined eligible for inclusion in the NRHP with SHPO concurrence

2 Sims, Marsha. Big Thompson Simpson Ponds/Big Thompson River Streambank Stabilization in Larimer County. Colorado, Emergency Watershed Protection Program (EWP). Natural Resources Conservation Service, Denver, 1999.

3 Kinner, Christopher; Painter, Mary; et al. A Class III Archaeological Inventory of Corridor Alternatives and Miscellaneous Facilities Associated with the North I-25 Front Range Corridor Environmental Impact Statement, Adams, Boulder, Broomfield, Larimer and Weld Counties. Centennial Archaeology, Fort Collins. 2007

2.6 SOILS

The soils in the project area are predominantly loams, sandy loams and clay loams according to the National Resource Conservation Service Soil Survey data.[4] These types of soils do not present limitations in terms of recreational facility development and are typical of dryland prairie and farmland in northern Colorado. Gravelly loam (soil type #60) exists along the steep south facing slopes of the bluffs, which has a higher erosion potential because of the slopes, not the type of soil itself. The Paoli fine sandy loam (#81), and Riverwash (#92) soils are indicative of frequent flooding from the Big Thompson River.

The soils data appears to be old because it does not recognize the presence of open water existing in the numerous ponds that have been excavated to extract gravel in the project area. Other areas have been highly disturbed, and soils replaced back over the disturbance. The 1999 aerial photo (Figure 1) below shows the ponds that existed at that time. Figure 1 also shows a large white area on the Kauffman property that contains many piles of fill material.

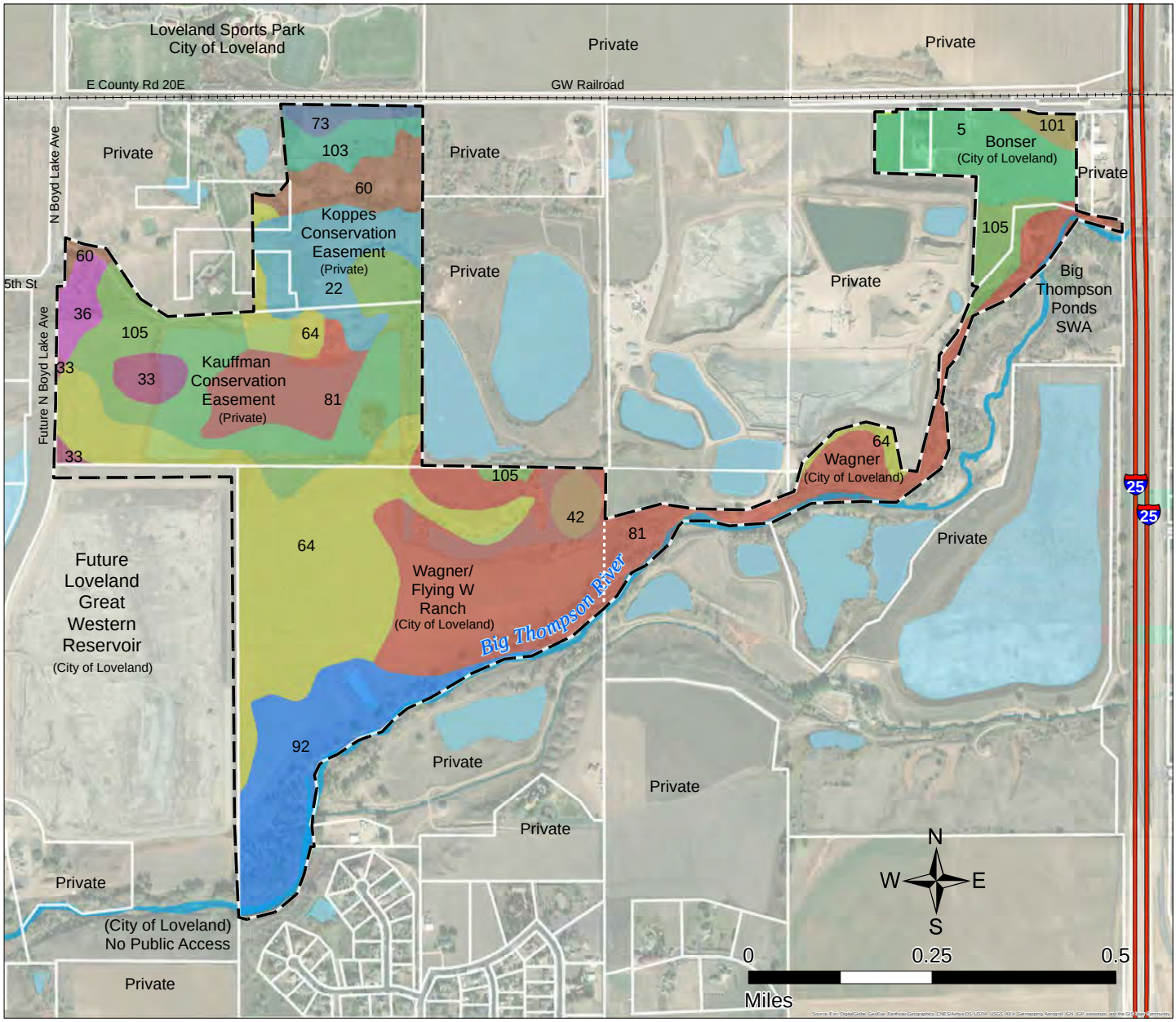
The composition of this fill material is likely lime pumped to this site in excess process water from the Great Western Sugar Factory which operated in Loveland until 1981.[5] The historic disposal of sugar beet processing wastes at the site is considered a Recognized Environmental Conditions (REC) according to American Society for Testing and Materials (ASTM) Standard E1527-13. A REC is defined as the presence or likely presence of hazardous substances or petroleum products on a site under conditions that indicate an existing release, a past release, or a material threat of a release of hazardous substances or petroleum products into the ground, ground water, or surface water of the site. Topsoil and other soil materials have subsequently been placed over the abandoned lime pond. The pond to the east (right) of this area was enlarged shortly after this photo was taken, and its western shore now extends into this disturbed area.

Because the project area has been highly modified over time, site-specific topsoil samples should be obtained prior to defining the methods and seed mixes for native restoration of lands owned by the COL. Some soils have shallow depths to groundwater, and geotechnical boring locations should be coordinated with soil types to confirm subsurface conditions. Specific descriptions for each soil type can be found on this website https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Figure 1. Previous soil disturbance on Kauffman CE. Photo credit: 1999 Aerial on Google Earth using a US Geological Survey photo

4 https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
5 Phase 1 Environmental Site Assessment, Kauffman Property, Loveland, CO. CTL Thompson, October 30, 2018.

Map E - Soil Classifications



East Big Thompson River Natural Area Management Plan

Legend

- Railroad
- Canal
- River
- Project Boundary
- Parcel
- Open Water

Soil Classifications

- 5 - Aquepts, loamy
- 64 - Loveland clay loam
- 22 - Caruso clay loam
- 33 - Fluvaquents
- 36 - Fort Collins loam
- 42 - Gravel pits
- 60 - Larim gravelly sandy loam
- 73 - Nunn clay loam
- 81 - Paoli fine sandy loam
- 92 - Riverwash
- 101 - Stoneham loam
- 103 - Stoneham loam
- 105 - Table Mountain loam

August 24, 2020

Data Source: USDA/NRCS - Feb 2017

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2.7 HYDROLOGIC FEATURES

The EBTRNA contains several hydrological features that are described below.

- Big Thompson River
- Gravel Ponds
- Ditch
- Hillsborough Ditch Diversion Structure
- Wetlands
- Future Loveland Great Western Reservoir Outfall Structures

Big Thompson River with typical low flow volume in September

Big Thompson River

The Big Thompson River flows along the south edge of the project area and has been highly modified over many years by irrigation diversions, farming and urban development at its edges. The typical flows range between 5 cubic feet per second (cfs) and 200 cfs through the year, with 500 cfs to 800 cfs peaks typically occurring in late May or June[6]. The flows in the river are highly managed to meet the requirements of municipal and irrigation water rights. Approximately 5,000 CFS flows in the 10% probability event (10-year), and 20,500 CFS flows in the 1% probability (100-year) event. When the river flows exceed 5,000 cfs water may flow out of the primary channel and over the adjacent lands; however, the 10% probability flood limits have not been mapped specifically for the project area. The 1% Risk (100-year) Floodplain covers much of the project area, and is shown on Map C - Project Area. This flood zone has restrictions in terms of changes to the landform and vegetation, as well as what can be constructed within it. Current floodplain regulations can be found on the COL Public Works website, and should be consulted before designing or constructing any improvements.

Larimer County's floodplain mapping is currently being updated, and according to preliminary maps, the 1% probability floodplain will cover the entire Loveland Great Western Reservoir, and extend to the base of the bluffs in most locations. It will also eliminate the small areas within the larger floodplain that are currently shown on the maps in this document. The new mapping is not yet publicly available, so when it is published, the boundaries should be updated on applicable maps, and current floodplain regulations would apply.

The 2015 *Big Thompson River Restoration Master Plan*, which was prepared after the devastating flood of September 2013, evaluated various aspects of the hydrology, hydraulics and ecological characteristics of the Big Thompson River. The eastern portion of Reach

6 https://waterdata.usgs.gov/nwis/uv?site_no=06741510

38, and the entire Reach 39 include the EBTRNA properties (Figures 3 and 4 below). Recommendations indicate conceptually how property could be protected, the low-flow channel of the river stabilized, riparian areas restored, and areas regraded and lowered to create more floodplain storage capacity and to reduce velocities during future large flood events. The plan also acknowledges the barrier to fish passage that the Hillsborough Ditch Diversion structure presents. The fish passage barrier in the middle of Reach 39 was a temporary access road across the river for the purposes of restoration work during 2013 and 2014. The legends on the reduced images below are difficult to read, so they are enlarged in Figure 2 below.

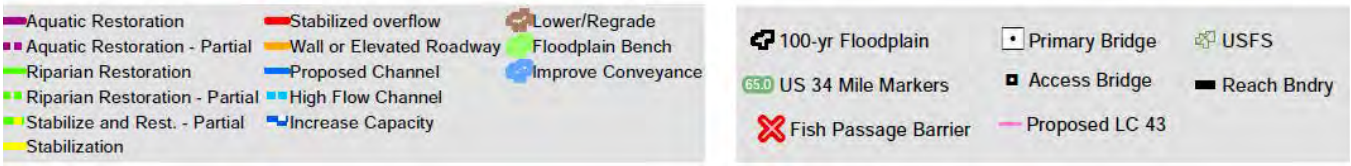


Figure 2. Legend enlargement for conceptual plans. Source: Big Thompson Restoration Master Plan, May 2015, Ayres Associates.

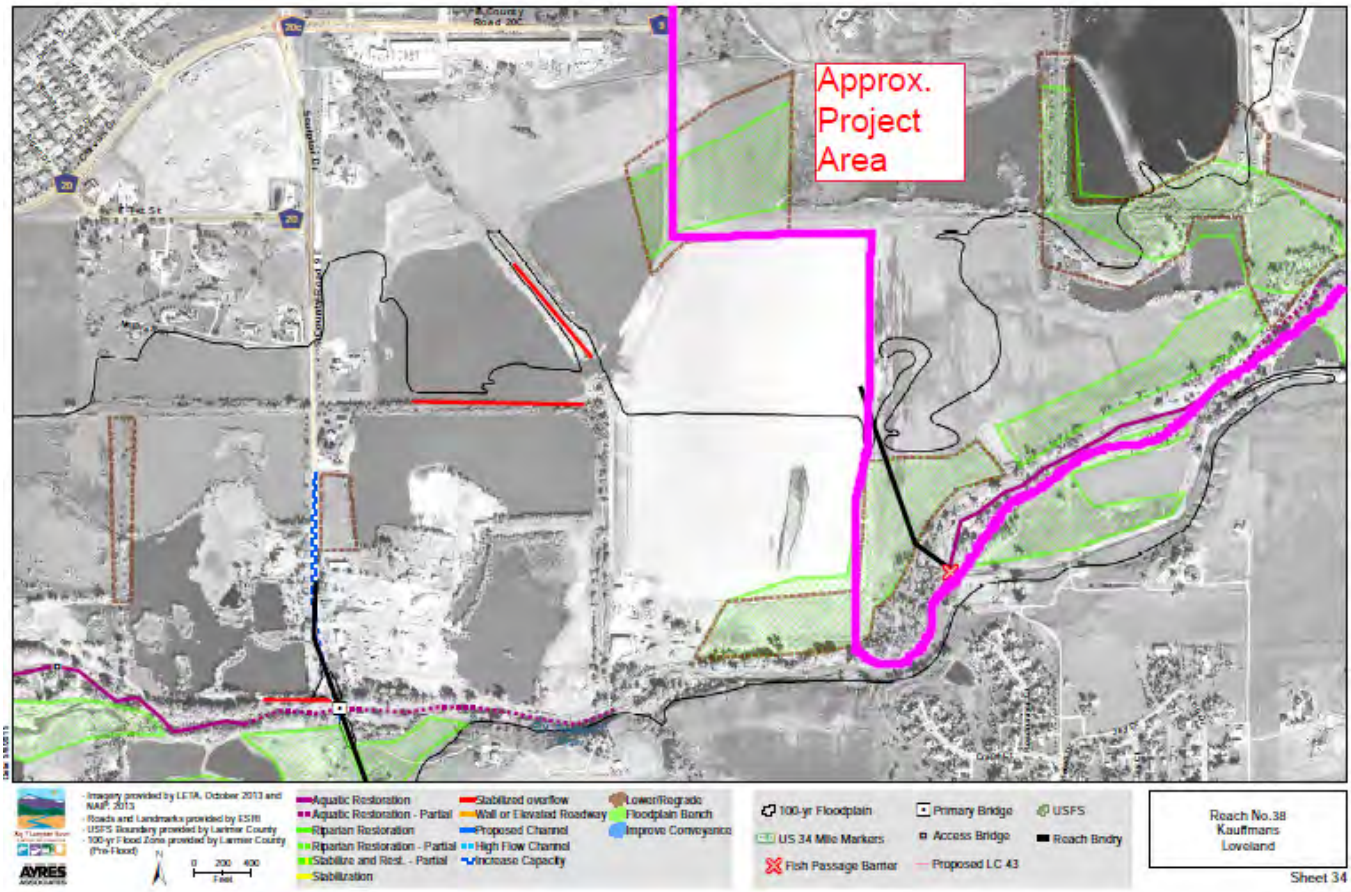


Figure 3. Reach 38 Conceptual Plan. Source: Big Thompson Restoration Master Plan, May 2015, Ayres Associates.

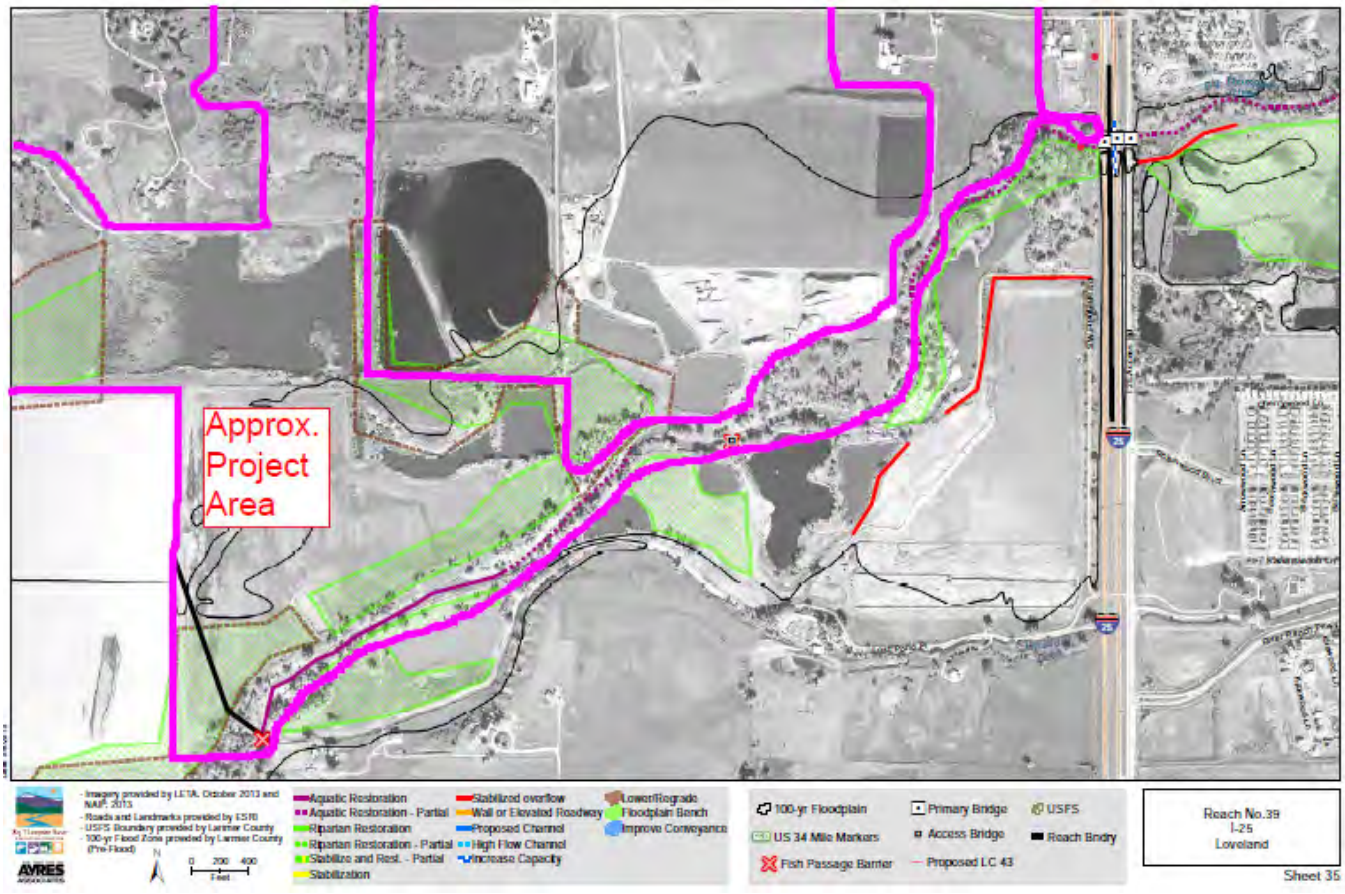


Figure 4. Reach 39 Conceptual Plan. Source: Big Thompson Restoration Master Plan, May 2015, Ayres Associates.

Gravel Ponds

The four gravel ponds are shown on Map D – Habitat Areas, and were previously described in terms of their habitat value. Pond #1, which is on the Kauffman property, is used by a private fishing club, and will not be open to the public. Ponds #2 and #3, which are on the Wagner/ Flying W Ranch parcel, could be open to the public and appear to have relatively stable water surface elevations. Their depths are not known, or the ability to support a sustainable fishery. Pond #4 water levels fluctuate, and in 2020 the pond was dry.

Pond #3

Hillsborough Ditch diversion structure. Google Earth aerial photograph, 2019.

Ditch

A ditch, and the Hillsborough Ditch diversion structure described below, are highlighted on Map F – Opportunities and Challenges, which is located in the next section of this document. A deep ditch runs from west to east at the north end of the agricultural field on the Kauffman property. This feature did not exist until 2004 based on aerial photography, and may be used to collect water that is seeping from the base of the bluff. The ditch starts approximately 1,000 feet west of the Kauffman property, and connects to the wetlands at the northwest corner of Pond #1.

Hillsborough Ditch Diversion Structure

The Hillsborough Ditch Diversion Structure is located at the southern end of the Wagner/Flying W Ranch parcel, and spans the Big Thompson River. This concrete structure diverts water into a large ditch that runs to the east, and is not passable by fish or boats. Access to maintain the diversion structure is via the private property on the south/east side of the river. Figure 5 is an aerial photograph of the structure.

Wetlands

Wetlands are shown on Map D – Habitat Areas, and were previously described.

Future Loveland Great Western Reservoir Outfall Structures

Adjacent to the western boundary of the planning area is a large water storage reservoir that is currently being lined with riprap by a contractor for the COL Water and Power Department. This property will not be available for public use due to safety concerns when the project is completed. As part of the reservoir project, an outflow pipe from the reservoir and a small drainage channel will need to be constructed through the south end of the Wagner/Flying W Ranch property within the conservation easement parcel. These features have not yet been designed and are shown on Map F – Opportunities and Challenges in the following section.

Guided bird walk at Morey Wildlife Reserve

Kestrel banding as part of Loveland's raptor nest monitoring program

2.8 OPPORTUNITIES AND CHALLENGES

The EBTRNA has many opportunities to become a natural area with outstanding visual, natural, recreational, and cultural resources for the public to enjoy. Because of its secluded nature, with little of its boundary adjacent to roads or dense urban development, it is an exceptional place to escape noise, enjoy views, watch wildlife, observe the landscape, and experience the sights and sounds of nature. It also has challenges that will need to be considered during design and management of the natural area. Map F – Opportunities & Challenges identifies some of the key features of the site, as well as gaps in connectivity for pedestrians and bicyclists.

Opportunities include:

- Protection of valuable wetlands and riparian habitats along the Big Thompson River, and around ponds;
- Paved extension of the COL Big Thompson River Trail for walking, running, bicycling, and other non-motorized activities;
- Soft surface trails;
- Big Thompson River access;
- Wildlife viewing;
- Picnicking;
- Fishing;
- Strengthening people's connection to nature though wildlife viewing, providing quiet places, nature walks, environmental education, public programming, volunteer opportunities, citizen science initiatives, and fishing clinics;
- Use of structures on the Bonser parcel for educational, recreation, or trailhead amenities;
- Restoration of agricultural areas back to native prairie habitat;
- Reconstruction of the Boyd Lake Avenue intersection at 5th Street to improve traffic safety, and add a trail crossing; and
- Potential partnerships for funding, construction activities, and programming (agencies, grants, organizations, and volunteers).

Existing private access road on Kauffman CE

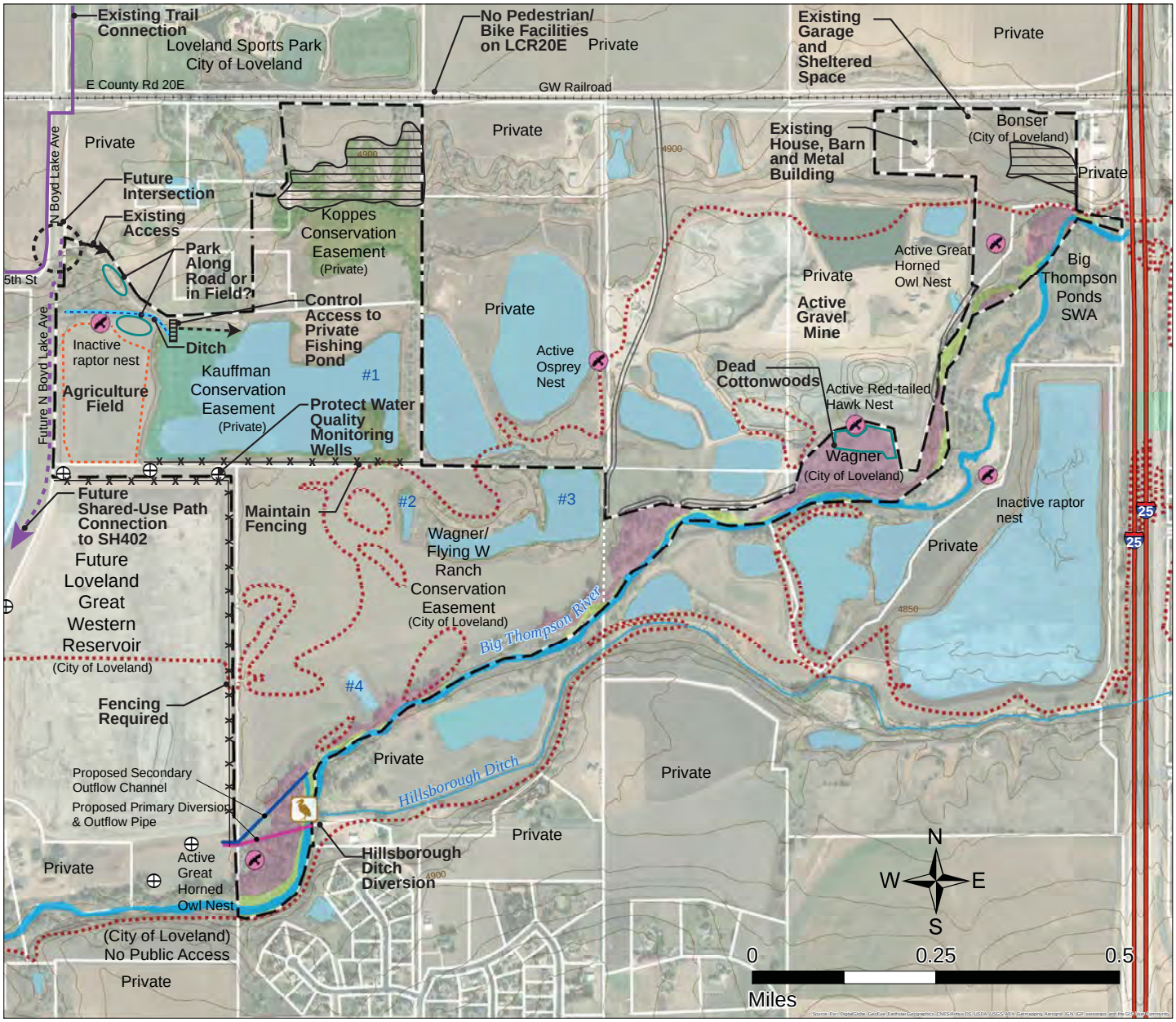
Curve on Boyd Lake Avenue with limited site distance

Active nest in Cottonwood gallery

Challenges include:

- Protection of conservation values while allowing public recreational access (nesting sites, important wetlands and riparian wildlife habitats, and potential threatened species);
- Accommodating tranquil and passive uses adjacent to a potentially high use paved trail;
- Lack of direct and safe pedestrian and bicyclist connectivity to other community amenities, and along CR20E;
- Private vehicular use of access road to fishing pond;
- Determining the best trail alignment, and location for trailhead(s) and parking;
- Steep slopes that are problematic for construction of accessible and sustainable trails;
- High traffic volume on Boyd Lake Avenue, and unsafe corner and sight distance at its south end;
- Regional trail connectivity to the east (under I-25 and to Johnstown's planned regional trail on the south side of the Big Thompson River);
- Defining future uses for the facilities on the Bonser parcel;
- Respecting privacy of adjacent properties, and ongoing mining operations;
- Successful native landscape restoration;
- Flood scour potential and floodplain development regulations;
- Timing of improvements to Boyd Lake Avenue and CR20E; and
- Funding for construction.
- Compatible recreational use with hunting on adjacent Big Thompson State Wildlife Area land

Map F - Opportunities & Challenges



East Big Thompson River Natural Area Management Plan

Legend

August 24, 2020

- Heronry
- Raptor Nest
- Monitoring Well
- Contour - 10 ft
- Railroad
- Canal
- River
- Access Easement
- Existing Trail
- Project Boundary
- Parcel Boundary
- Open Water
- 100 Year Floodplain
- Riverine Riparian
- Wetland
- Willow/Cottonwood Gallery
- Steep Slopes
- Proposed Trail Connection
- Proposed Fence
- Proposed Secondary Outflow Connection
- Proposed Primary Diversion & Outflow Pipe

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3. MANAGEMENT PLAN

3.1 OVERVIEW

The EBTRNA will provide a unique recreational trail experience for Loveland residents and visitors while protecting and improving the quality of the natural resources. Map G – Preferred Plan shows the proposed features and improvements. A multi-purpose paved trail, with a parallel soft surface trail, is proposed to traverse for more than two miles from west to east, ending at a trailhead on the Bonser parcel. Waysides for resting are included along the route, but their locations have not yet been determined. Other features, such as overlooks, fishing areas, fencing, native restoration and public use restrictions are shown on the plan.

The sections that follow describe the improvements and management strategies for visitors, natural resources, visual resources, agriculture and private lands, and cultural resources. These are followed by a list of implementation actions, projected timeframe, and probable cost for capital construction.

3.2 VISITOR MANAGEMENT

The purpose of visitor management is to emphasize the safety, health, and enjoyment of EBTRNA's visitors while conserving the site's cultural, physical and ecological features. When the public visit a natural area and understand the resources that are preserved, they will be more appreciative of how recreational pursuits can coexist with open lands goals. Educating youth on the intricacies of nature prepares them to be better future stewards of Loveland's natural resources and arise as leaders in the conservation of open lands. The Open Lands Division will utilize visitor management tools to monitor the impact of recreational use by visitors at EBTRNA to ensure it does not conflict with ecological, visual, or cultural values provided by the natural area.

The following visitor management and education actions will assist in protecting both visitors and the natural resources of the site while providing a high quality visitor experience by offering a diverse range of recreational opportunities.

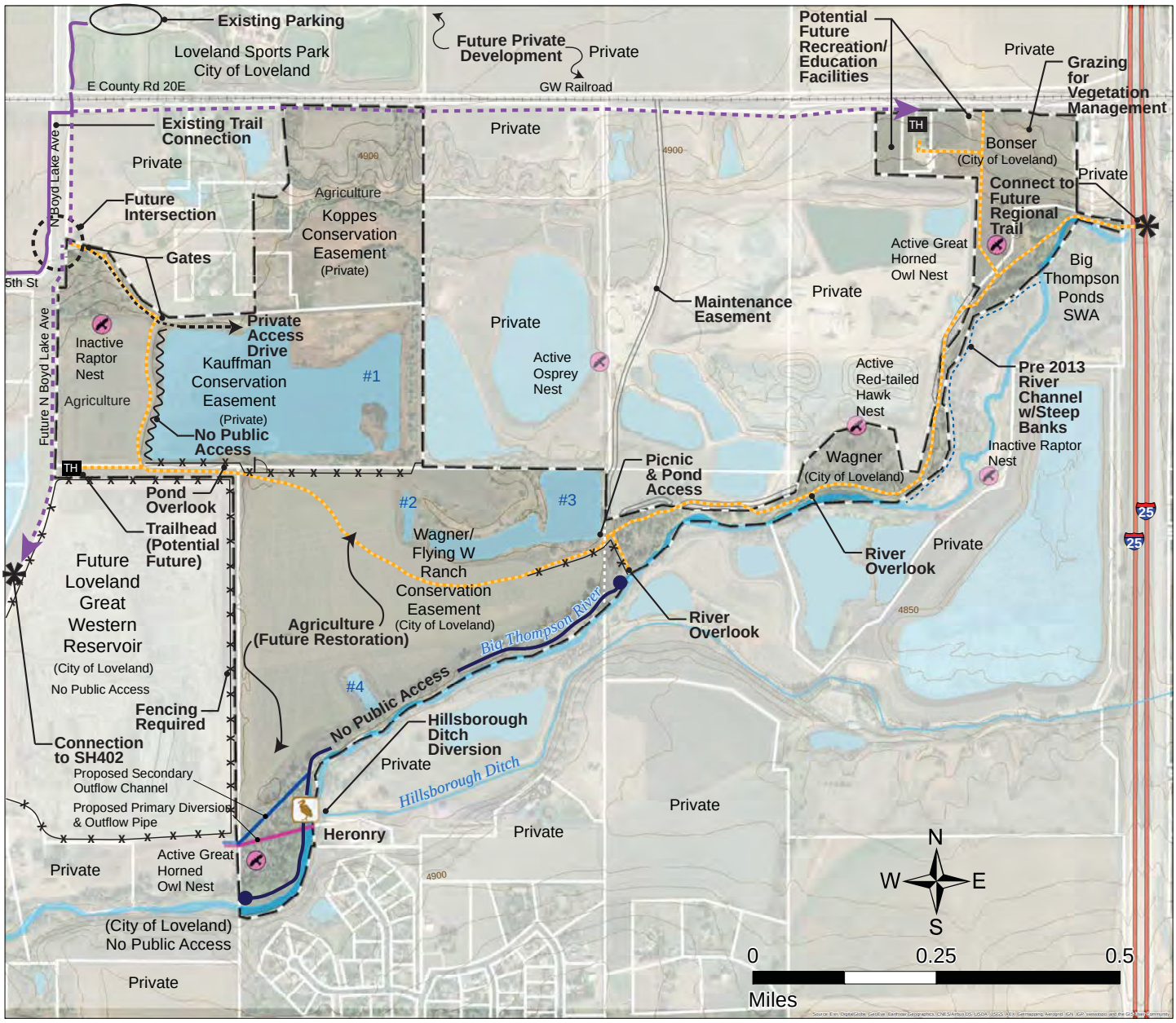
Facilities and Access Control

A multi-purpose paved trail with a parallel soft surface trail will be constructed. The trail begins at Boyd Lake Avenue where there is an existing access road on the Kauffman CE parcel. Trail users will share a 12-feet wide concrete path with vehicles that have permission to drive to the parking area north of Pond #1 for private fishing. There are many precedents on ways that trail users and cars can coexist safely on public/private easements. Signage, gates, bollards or other devices will be installed at either end of this portion of the trail to discourage or prevent public vehicles from accessing the private drive, as well as private vehicles associated with the fishing club lease from entering the rest of the trail system.

Low-use private access drive can share a widened trail section with public recreational users

From there, the trail runs south along the edge of the agricultural field, and turns to the east between Pond #1 and the reservoir property. An overlook is proposed in this location so visitors can observe the birds and wildlife that frequent the western area of the pond. Fencing will prevent trail users from accessing the pond's shoreline to fish, which is reserved for members of the private fishing club. While the CE would allow a trail around the pond, this is not a feature of the plan because of the potential conflicts between the public and private users. This also keep a larger habitat complex intact, which includes the pond, lower meadow and wetlands, bluffs, and the upper bench of agricultural land on the Koppes property.

Map G - Preferred Plan



East Big Thompson River Natural Area Management Plan

August 24, 2020

Legend

- Raptor Nest
- Heronry
- Contour - 10 ft
- Railroad
- Canal
- River
- Access Easement
- Existing Trail
- Project Boundary
- Parcel Boundary
- Open Water
- Proposed Trailhead
- Proposed Multi-purpose Trail
- Proposed Trail Connection
- Proposed Secondary Outflow Connection
- Proposed Primary Diversion & Outflow Pipe
- Proposed Fencing

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Potential location of overlook at south edge of Pond #1

Important wildlife habitat at the south end of the Wagner/Flying W CE

Southeast corner of Pond #3

Fencing will be installed around the perimeter of the COL Water Department's future reservoir to keep trail users out of the property for safety purposes.

The trail to the east and south is aligned to keep people away from the south end of the Wagner/Flying W Ranch CE where there is a heronry and future outlet structures for the reservoir. Keeping the trail away from the Big Thompson River through the CE is also desirable in order to minimize the potential for impacts on the many types of wildlife that rely on the Willow/Cottonwood Gallery and Riverine Riparian habitats. No fishing or public access will be allowed along this section of river for the same reason.

Pond #3 provides a great opportunity for the public to fish, and its location in the middle of the property is a good opportunity for trail users to rest, picnic and enjoy nature. A fishing pier, two picnic tables, benches and interpretive features are planned for the southeast corner of the pond.

These facilities may be constructed in a later phase due to ongoing gravel operations, which make it difficult to conduct daily maintenance activities by COL staff. Fencing along the south edge of the trail near this area is shown to keep people from creating ad hoc trails across the Wagner/Flying W parcel, and to denote the beginning of the section of river where fishing and public access are allowed.

The eastern portion of the trail must navigate a narrow corridor of public land and trail easements, while avoiding wetlands and riparian habitat impacts and potential riverbank erosion areas. Fishing access to the river will be allowed on the Wagner parcel, and two river overlooks and official access points are conceptually located along this stretch of trail.

The trail bends north and ascends a more gently-sloping area of the bluff to the Bonser parcel, where a trailhead is proposed. This trailhead may have as many as 50 parking spaces in anticipation of future high demand by local users and others who want to experience the length of the Big Thompson River trail when it is completed through Loveland, as well as the paved recreation trail system that loops entirely around the city, and the planned connection to Johnstown trails via the I-25 underpass. The trailhead is planned to be paved for ease of maintenance, and will have a vault restroom, picnic shelters, signage, benches and drinking water.

Example of a fishing pier (River's Edge Natural Area)

Brown trout have been found in this area of the Big Thompson River

An automatic gate will control entry times to correspond to daylight hours. The parking lot may be lighted with a security light. Access to the trail will be controlled with a gate or other barrier to restrict private vehicle use.

Fencing around the parking area will prevent vehicles from damaging agricultural or native landscapes. Other amenities could be included when the facility is designed in more detail.

Old barn, metal building, and brick residence on the Bonser property

The existing structures and utilities, and relatively level topography on the upper areas of the Bonser parcel, make this area attractive for the development of visitor facilities. The future of the brick house, metal storage building and old wood barn has not been determined yet. Because the COL does not have another site in the community that is planned for agricultural education, this site and its structures could potentially be renovated for this purpose. The metal building may also be suitable for maintenance vehicles and supplies. At this time, the area will be reserved for future planning and the facilities could continue to be leased in the meantime.

Garage and covered area on the Bonser property

COL property is very narrow adjacent to the Big Thompson River near I-25

The trail corridor could become a major regional trail link if Johnstown constructs a trail east of I-25 according to their adopted plans. The I-25 bridge is being reconstructed as part of a widening project, and its design will accommodate a trail under the bridge. In 2020 the COL studied how to construct the trail through the extremely narrow corridor to I-25. The study found that constructing a trail would require acquisition of land or a grading easement from the private property to the north because of the location and alignment of the river channel, and an extensive area of high quality wetlands.

Trail connections along CR20E and Boyd Lake Avenue, and a future crossing at the intersection of Boyd Lake Avenue and 5th Street, will be coordinated with the COL Public Works Department and future road improvements. These improvements are critical to providing complete trail loops through the city and around the EBTRNA.

Trail etiquette and multi-use trail signage will be placed as needed, and signage will be placed to encourage users to stay on-trail in order to protect the resource. Specific signs will identify areas where no public access is allowed.

The natural area will be closed when flooding or other unsafe or unsustainable conditions exist, in order to protect the resource from damages stemming from recreational activities, and to protect visitors.

Education and Interpretation

Interpretive exhibits will provide opportunities to educate the public on a variety of topics. An interpretive plan will be prepared, which will identify the most important themes (natural, or cultural/historic) for this site, versus other locations in the community.

Grazing on the Bonser property

3.3 NATURAL RESOURCES MANAGEMENT

The EBTRNA contains a wide variety of vegetation types. Impacts to natural resources will be mitigated through the use of buffers, access control, and the avoidance of sensitive plant communities and wildlife habitat.

Weed populations are one of the largest obstacles affecting a natural area's ability to contribute and sustain healthy ecosystems. If left unchecked, invasive weeds can overtake and permanently injure native plant populations. When no measures of removal or management are implemented, weeds will continue to endanger the condition of natural areas and restrict the variety of recreational pursuits and wildlife habitat that can occur there. Control of exotic and noxious weeds helps control their spread and eliminate threats to ecosystem function.

Vegetation Management Actions

The following vegetation resource management actions will help ensure that EBTRNA's natural resources receive the special attention and protection they require:

Exotic plants and noxious weeds:

- Apply adaptive, contemporary, integrated weed control methods. An integrated weed management plan will be designed to manage infestations by cultural, mechanical, biological and/or chemical control methods.
- Active control of exotic and noxious species will be necessary until native vegetation is well-established to 85% cover and abundance or more.

High quality habitat:

- Discourage visitors from entering high quality habitat areas by installing signs, and in strategic locations, installing fencing.
- Employ best practices for trail construction through riparian and wetlands areas, including avoiding impacts to trees and wetlands, and conducting a migratory bird survey prior to construction.
- Annually monitor ad hoc trail creation and adapt management practices as needed to protect the resource.

Cottonwood trees along the Big Thompson River and non-native grasslands

Rare, endangered, and threatened species:

- Conduct Preble's meadow jumping mouse and Ute ladies' tresses surveys in areas of construction.
- Provide mitigation plan for impacts to species if required.

Agriculture:

- Private agriculture will continue to be managed by the property owners according to the conditions of the CE's.
- An annual lease will continue for the Wagner/Flying W Ranch CE and the Bonser parcel until the areas are converted to native shortgrass prairie or other uses.

Native shortgrass prairie:

- Sixty-seven acres of shortgrass prairie will be reestablished in the future through planting, spraying, and mowing practices.

Riparian and wetland communities:

- Evaluate feasibility of enhancing habitat with minor grading and new native vegetation plantings, including cottonwood trees, willows and a diversity of other species.

Activities needed to obtain goals:

- Removal of non-native and undesirable vegetation
- Reseeding as necessary, including forbs once weeds are under control
- Develop annual work plans to perform prescribed activities
- Monitoring and mapping of progress
- Annual reassessment of restoration goals, activities and work plans

Wildlife Management Actions

The rapid urbanization of Loveland and Colorado in general has created many challenges and opportunities for wildlife management. When humans and wildlife meet, there is an inherent possibility of conflict, and also a chance for preserving wildlife populations and improving the public's understanding of, and appreciation for, wildlife. Natural areas located in the urban/suburban setting are critical for wildlife populations that are sensitive to development. Natural areas and open lands offer a variety of important services to wildlife, including providing habitat for pollinators and the plants relying on pollinators to reproduce, and creating the proper space and habitat for wildlife to forage, breed, travel, and protect themselves from predators. The conservation and management of Loveland's remaining wildlife habitat through natural areas and open lands provides accessible stewardship and recreation opportunities, and addresses the physical and mental issues associated with separation from nature that many urban residents experience.

The EBTRNA contains biologically diverse wildlife habitat in the transition zone between the Rockies and the Great Plains, including shortgrass prairie, ephemeral aquatic features, and habitats that support a variety of native wildlife species. The following wildlife management actions will assist in addressing the management of wildlife needs in EBTRNA.

- Avoid fragmenting habitats when developing new trails and accesses, and minimize impacts by using wildlife-friendly culvert designs.
- Minimize impacts on raptor nest sites by implementing setbacks, berms or vegetative screening near active nests.
- Offer education and interpretive exhibits to protect both wildlife and visitors.
- Promote stewardship by youth and adult users by providing information about native wildlife and habitats.
- Monitor for impact of recreational developments on wildlife populations.

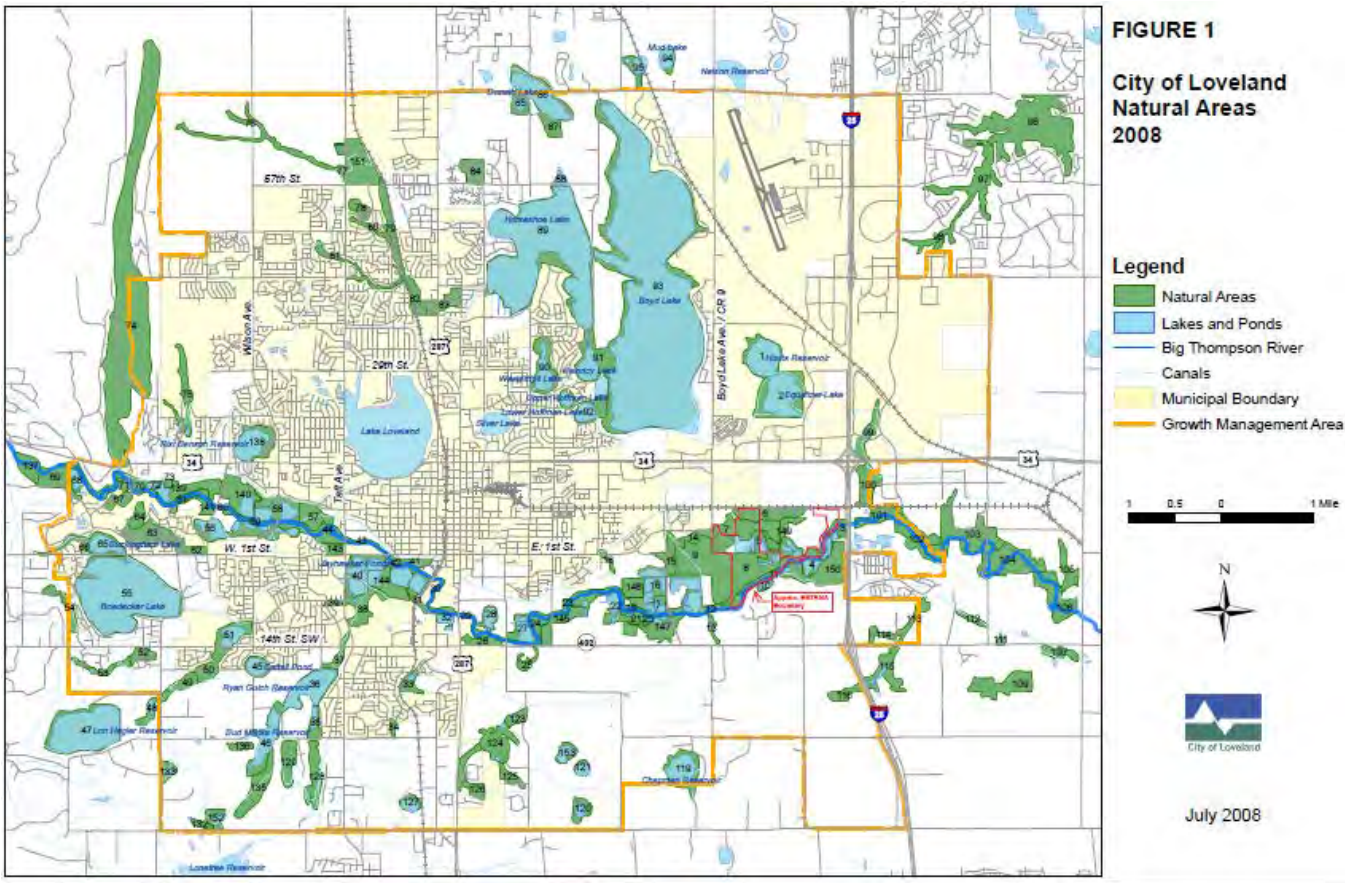


Figure 5. 2008 City of Loveland Natural Areas Map.

In addition to the above recommendations, the *2008 City of Loveland Natural Areas Sites*[7] document developed recommendations for managing portions of the EBTRNA, which should be considered in the future. Figure 6 is a map of the city's natural areas, and Figure 7 is an enlargement of a portion of the map, and shows that sites numbered 3, 5, 6, 7, 8, and 11, exist within the project area.

Relevant excerpts are included below and management actions are in ***bold italics font.***

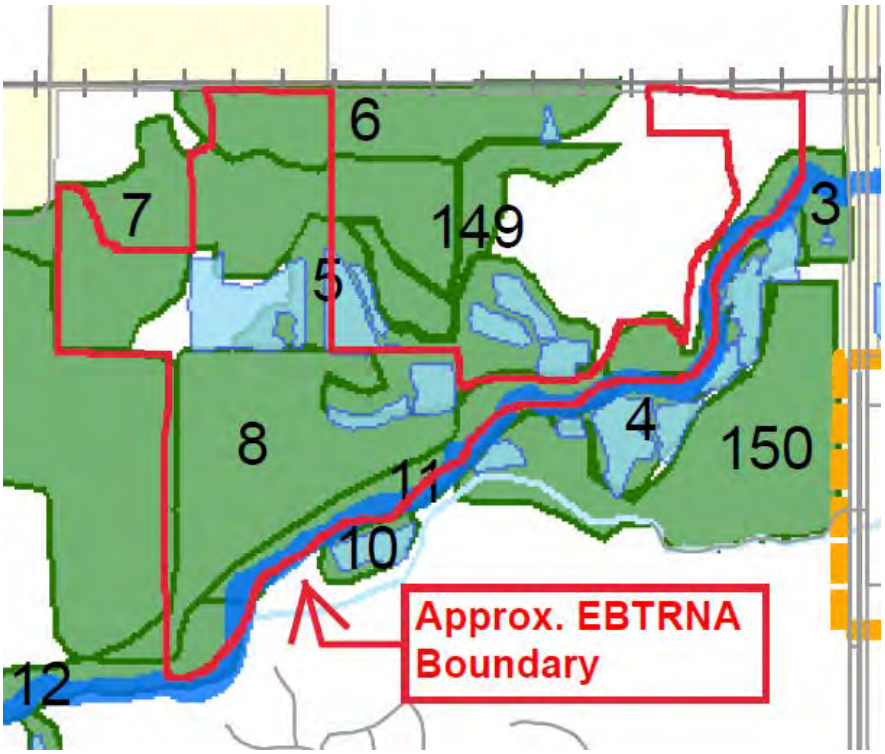


Figure 6. 2008 City of Loveland Natural Areas Map enlargement.

"SITE 3 - BIG THOMPSON RIVER NEAR I-25 *(Wagner parcel)*. Site 3 is a moderately impacted stretch of the Big Thompson River. It is bordered by the Big Thompson Ponds State Wildlife Area on the south and by active agricultural lands on the north. The northern shore appears to be impacted by grazing. Pasture grasses dominate the herbaceous understory and a shrub canopy is generally lacking. Large trees are present, however, and provide suitable songbird habitat and perches for raptors. ***The DOW [CPW] notes that bald eagles are present in the winter. Small Russian olive trees are present as well. These should be removed, and their re-establishment prohibited. Aside from the cattail marsh at the east end of the site, wetlands within the river are generally lacking. This stretch of the river is slow-moving and would be well suited to wetland re-establishment along the river banks. Additional enhancement suggestions include restricting grazing along the north shore, planting a diversity of native trees and shrubs along both sides of the river, and re-establishing native grasses and forbs in the understory."***

"SITE 5 - GRAVEL PONDS W. OF I-25 *(portions of the Kauffman CE and Wagner/Flying W Ranch CE)*. Site 5 consists of gravel ponds and adjacent uplands dominated primarily by weedy species and pasture grasses. For the most part, the ponds have steep side slopes and are lacking littoral zones. Trees and shrubs adjacent to the open water areas are also generally lacking. These ponds provide a large amount of open water among large tracts of agricultural lands and grassy fields. The aquatic and wetland diversity benefits wildlife greatly in an otherwise agricultural setting. ***The enhancement potential of these ponds is high. They are well suited to wetland creation that would increase waterfowl, songbird, mammal, and fisheries values. Shorelines could be reconfigured to have an undulating appearance which would provide additional surface area for wetland plants. Also, the addition of trees and shrubs near the open water would improve wildlife habitat."***

"SITE 6 - FIELDS AND WETLANDS E. OF CR 9E *(portion of the Koppes CE)*. Site 6 contains pastures, open water stock ponds and associated wetlands. The site is lacking significant trees and shrubs. It is surrounded by active agricultural lands and is bordered by Site 7 to the south. ***Enhancement suggestions include adding a diversity of upland trees and shrubs adjacent to the stock ponds. Additionally, the slopes of the ponds could be laid back to facilitate wetland development and to reduce erosion. Impacts to shoreline wetland vegetation can be reduced by controlling grazing."***

7 *The Nature of Things: City of Loveland Natural Areas Sites.* Cedar Creek Associates, July 2008.

"SITE 7 - PASTURE AT CR 9E AND CR 20C *(portion of the Koppes CE)*. Site 7 is a large grass/forb meadow supporting a small open water area and mesic wetland drainage. The site is bordered by the large grassy areas of Site 9, the ponds of Site 5 and the grass/forb areas and wetlands of Site 6. Site 7 provides good small mammal habitat and is likely used heavily by raptors, fox, and other predators. The DOW [CPW] notes that raptors frequently use this area. The wetland has moderate water quality improvement potential. The enhancement rating of this site is high. ***One important action that should be implemented is the removal of the invading Russian olive trees and Canada thistle. These species will soon overtake the entire area if left unchecked. The control of noxious weeds and establishment of native trees and shrubs can make this a very valuable wildlife area. Additional areas of open water would increase the wetland rating and provide better waterfowl habitat."***

"SITE 8 - PASTURE N. OF BIG THOMPSON RIVER/E. OF CR 9E (Wagner/Flying W Ranch CE). Site 8 consists of an actively grazed pasture with scattered trees and a small wetland swale. The pasture appears to be heavily grazed. Weedy species such as thistle and Russian olive appear to be encroaching as well. The wetland swale is dominated by bulrush. The site received a low habitat rating because of its small size and lack of structural plant diversity. However, the wetland is likely of some value to waterfowl and to small mammals. ***The site has a high enhancement potential due to its location near the river and adjacent open water areas. The site could be restored to native grasses and shrubs which would provide valuable upland habitat for many wildlife species. Currently its value to wildlife could be improved by controlling noxious weeds and reducing grazing. The site could function as a valuable upland component of the Big Thompson corridor if a diverse shrub and tree canopy was created and native grasses established."***

"SITE 11 - BIG THOMPSON RIVER N. OF HERON DRIVE *(portions of Wagner/Flying W Ranch CE and Wagner parcel)*. Site 11 is a narrow stretch of the Big Thompson River that has been heavily impacted by adjacent agricultural land uses, particularly grazing. The impacts of past and current grazing are evident. Most of the herbaceous understory has been closely grazed, and weedy noxious species such as thistle are invading. Russian olive trees are also present. In some areas, unvegetated river banks are eroding severely. Many large trees are present in this stretch. ***The control or elimination of grazing would improve the understory greatly. Additionally, streambanks should be stabilized, native vegetation re-established and noxious species eradicated. The establishment of a thick, shrubby understory would significantly improve songbird and small mammal habitat, particularly cover and nesting habitat."***

3.4 VISUAL RESOURCES MANAGEMENT

It will be important to retain the visual character of the riparian and wetlands areas when designing recreational amenities and signs, as well as respect the open landscape associated with the fields by keeping tall man-made improvements at the edges, where trees and shrubs provide a backdrop.

3.5 AGRICULTURE AND PRIVATE LANDS MANAGEMENT

Agriculture will continue on the two privately owned properties per the language in the Kauffman and Koppes CE's, and the private fishing club may continue to operate on Pond #1. The COL will coordinate the final design of the trail and future trailhead on Boyd Lake Avenue on the Kauffman CE property with the land owner, and construct a fence along the south edge of Pond #1 to prevent public access to the shoreline. The agricultural equipment will not be allowed to utilize the trail because of the potential for damage to the pavement. Equipment can cross the trail if necessary, and thicker portions of the trail will be designed to accommodate heavy vehicles in those locations. It is assumed that a 3-ton pickup truck would be adequate for accessing the pump at the south end of Pond 1#, and that vehicle could use the trail as required for operations.

An agricultural lease will be permitted on the Wagner/ Flying W Ranch CE and the Wagner parcel until the time the COL initiates restoration of the fields to native prairie. Agricultural leases on the Bonser property will be permitted in areas not affected by trailhead and trails, or until the COL decides upon a different management approach to the site.

3.6 CULTURAL RESOURCES MANAGEMENT

For thousands of years, many American Indian cultural groups lived in the mountains and plains of this area. Among them are the tribes today known as the Ute, Arapaho, Cheyenne, Lakota, Apache, and Comanche. Each possesses millennia of rich culture, language, artistry, and tradition deeply rooted in the land upon which they lived. Indigenous people likely traveled, camped and hunted along the Big Thompson River, but there are no recorded sites in the SHPO record. Sites may exist, but they could be buried under sediment from flood events or leveling associated with agriculture, or destroyed due to plowing. Two features within the project area are eligible for listing in the NRHP: an overhead electric line, and the Hillsborough Ditch.

Loveland could consider the lives of indigenous cultures as one of the themes for interpretation. Farming and its history in the Big Thompson Valley could be another strong theme.

3.7 IMPLEMENTATION

The recommendations of this management are summarized in the table below. The actions will take many years to implement, and target time frames are indicated, as well as potential capital costs.

Table 5. Implementation Actions

Action	Target Schedule			Est. Capital Cost	Description
	2021-2022	2023-2026	2027+		
General					
Obtain funding for implementation	X	X	X	N/A	Sources: Conservation Trust Open Lands Fund Grant Funding
Natural Resources Management					
Monitor grassland health	X	X	X		
Weed management	X	X	X		Develop a weed management strategy. Continue Russian olive removal and noxious weed control. Grazing to reduce weeds on east end of property (Bonser and portions of Wagner parcels).
Native shortgrass prairie and riparian restoration.			X	$224,000	Restore agricultural field on Wagner/Flying W Ranch CE and west end of Wagner parcel.
Big Thompson River Cottonwood/Willow, and River Riparian habitat enhancements		X	X	TBD	Riparian habitat improvements on south end of property with grading. Coordinate floodplain management with COL Public Works.
Trail user education			X	Cost in trail and trailhead est.	Interpretive exhibits and programs regarding natural resources on site.
Visitor education at Bonser center			X	TBD	
Coordinate with CPW regarding hunting at Big Thompson Ponds SWA	X	X	X		
Monitor nesting sites	X	X	X		
Design and construct visitor amenities and reservoir facilities in compliance with USFWS and CPW criteria for birds, wildlife and vegetation.		X	X	Part of site costs	
Visitor impact mitigation			X		Monitor visitor impacts and ad hoc trails to river and ponds, and implement controls as needed.
Agricultural Management / Leases					
Private property practices	X	X	X		Koppes and Kauffman CE agricultural practices communication and coordination. Kauffman property fishing club access coordination regarding design of shared trail/access road.

Action	Target Schedule			Est. Capital Cost	Description
	2021-2022	2023-2026	2027+		
Agricultural leases on COL properties	X	X			Agricultural lease on Wagner/Flying W Ranch parcel, and grazing on Bonser/Wagner parcels.
Bonser home and ranch facilities lease	X	X			Determine compatibility of private leased use of properties during Phase 1 trailhead development.
Recreation/Visitor Management					
Initiate routine patrol to safeguard the area and identify potential issues	X	X			
Maintain gates to prevent public access until site is open	X	X			
Future Loveland Great Western Reservoir Fencing		X	X	TBD	Along Loveland Great Western Reservoir edges – by Water Department. Approx. 3,900 LF adjacent to EBTRNA.
Trail connection to Loveland Sports Park along east side of Boyd Lake Ave.		X	X	TBD	Coordinate with Public Works Department for interim paved trail and improved crossing of CR20E in advance of future Boyd Lake Ave. extension and intersection improvements.
Multi-purpose trail design, permitting and construction			X	$2.56 million	Ten foot wide concrete trail with parallel four foot wide gravel trail connection from northwest corner at Boyd Lake Ave. to Bonser trailhead. Approximately 11,600 LF. Connection under I-25 not included. Includes culverts, miscellaneous drainage improvements, crossing ditch on north end of field on Kauffman property, Pond #1 overlook, two river access points (benches, platform, steps, and bank stabilization), two waysides and signs. Clean up and revegetate existing ad hoc parking area. Install main trail gate and trail access at Kauffman property and Boyd Lake Ave. Gate at private road to pond.
Bonser trailhead			X	$1.02 million	Gravel access road and 50 car parking lot, auto gate, vault toilet, fencing around the parking lot, signs, picnic shelters, drinking fountain.
Pond #3 boardwalk/ fishing pier and picnic areas			X	$255,000	Provide access to Pond #3 for fishing. Include improvement at end of access easement for maintenance vehicles, and access control fencing.
Bonser Education Center (future)			X	TBD	Indigenous cultures, farming and natural resources emphases. Requires renovations to existing structures, and provision of visitor amenities according to program that will be defined at a later date.

Action	Target Schedule			Est. Capital Cost	Description
	2021-2022	2023-2026	2027+		
Multi-purpose trail connection to Boyd Lake Ave. and trailhead (future)			X	$913,000	Ten foot wide concrete trail with parallel four foot wide gravel trail connection to Boyd Lake Ave. trailhead (approx. 625LF). 30 cars and vault toilet. Timing dependent upon road improvements by others.
Trail connection on CR20E			X	TBD	Coordinate with Public Works Department for interim paved trail along CR20E.
Visitor impact mitigation			X		Monitor visitor impacts and ad hoc trails to river and ponds, and implement controls as needed.
Cultural Resources Management					
Interpretive Plan		X			Develop a specific interpretive plan for EBTRNA, which may include cultural and historic themes.
Indigenous tribal consultation		X			Consult with indigenous tribes to understand if there are important connections to the site and landscape.
Visitor education at Bonser center			X	TBD	Action dependent upon interpretive plan and future master plan for the area.
Floodplain/ Stormwater Management					
Improve floodplain function		X	X	TBD	Consult with COL on potential project to improve floodplain storage capacity and ecological function.
Implement water quality improvement features at parking areas		X	X	Part of site costs	
Hillsborough Ditch Diversion reconstruction			X	TBD	Consider replacing structure so that it accommodates fish passage.
Design and construct facilities in compliance with floodplain design criteria		X	X	Part of site costs	

APPENDIX A.

JULY 20, 2020 PUBLIC OPEN HOUSE COMMENTS

What do you like the most about this plan?

"That you are building lots of trails in Loveland. We are for it. Recreational and bike areas are great!"

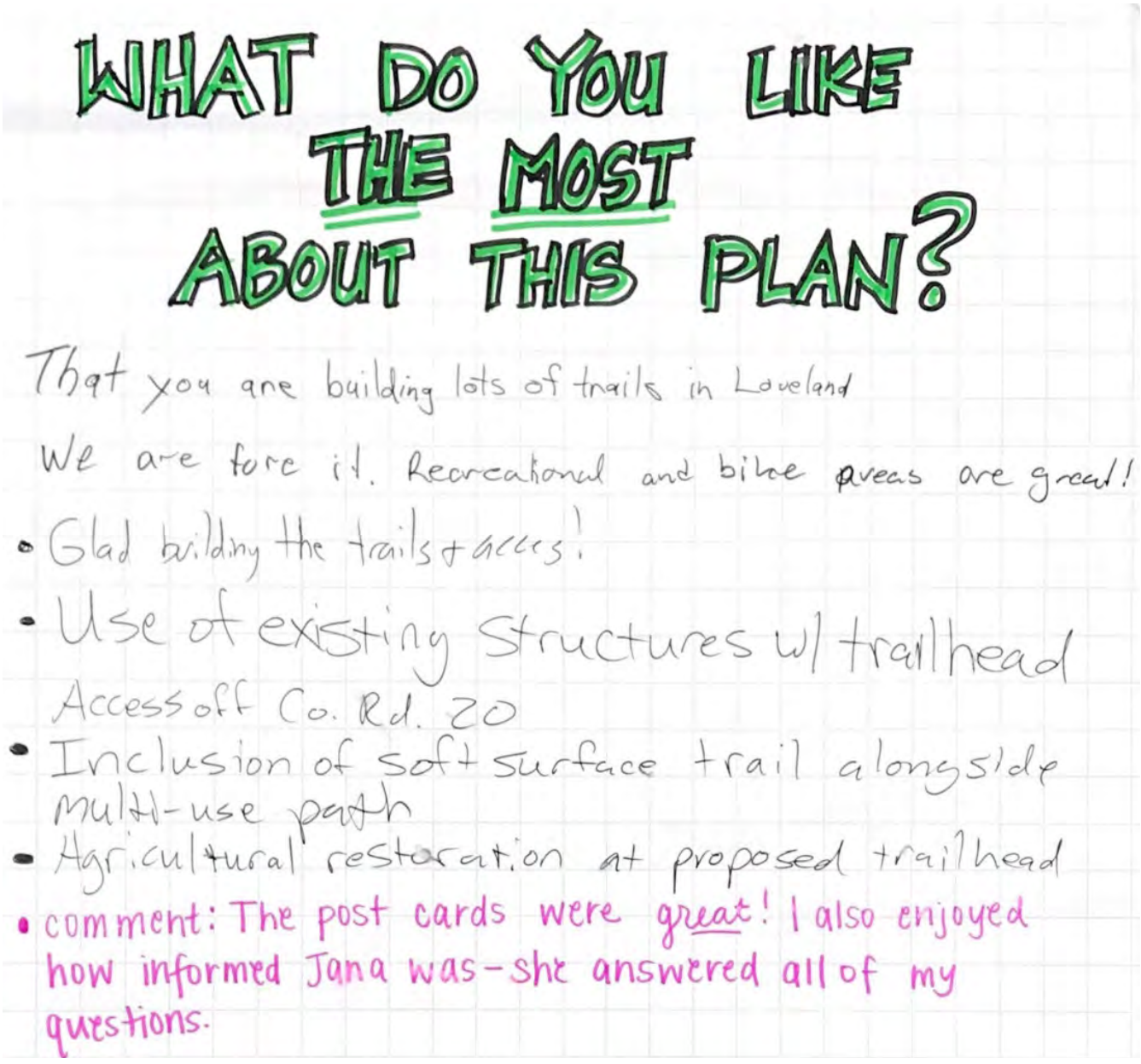
"Glad building the trails + access!"

"Use of existing structures w/trailhead access off Co. Rd. 20"

"Inclusions of soft surface trail alongside multi-use path"

"Agricultural restoration at proposed trailhead"

"comment: The post cards were great! I also enjoyed how informed Jana was – she answered all of my questions."



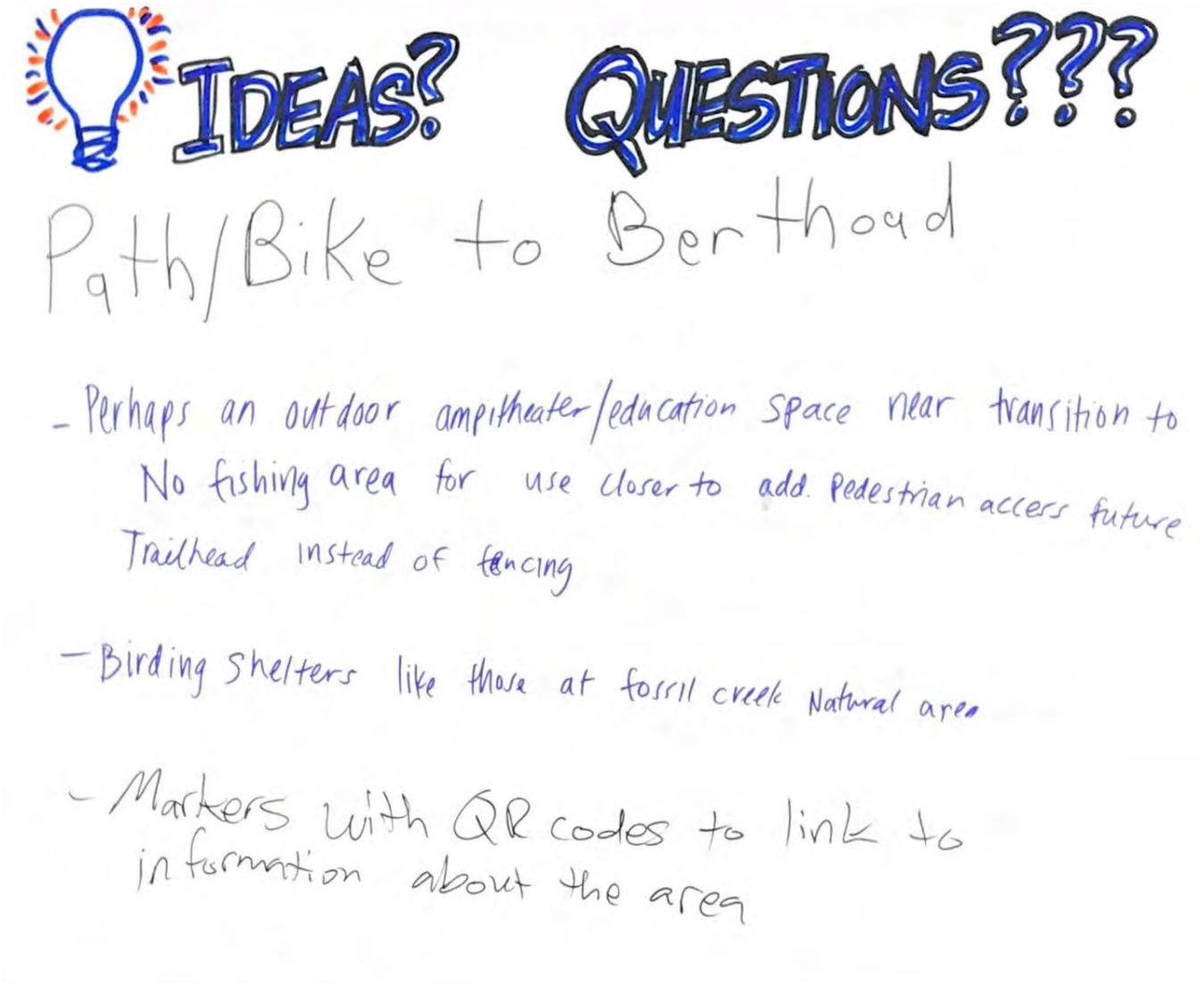
Ideas? Questions?

“Path/Bike to Berthoud”

“Perhaps an outdoor amphitheater/education space near transition to no fishing area for use closer to add pedestrian access future trailhead instead of fencing”

“Birding shelters like those at Fossil Creek Natural Area”

“Markers with QR codes to link to information about the area”



APPENDIX B.

REPRESENTATIVE SPECIES AND HABITAT ASSOCIATIONS

Representative Species and Habitat Associations		
Common Name	**Scientific Name**	**Habitat Associations**
Plant Species		
Alfalfa	*Medicago sativa*	Cultivated agriculture
Blue wildrye	*Elymus glaucus*	Non-native grassland
Catchweed bedstraw	*Galium aparine*	Wetlands
Cattail		Wetlands, pond/open water
Cheatgrass	*Bromus tectorum*	Cultivated agriculture, fallow/weedy, non-native grassland
Common dandelion	*Taraxacum officinale*	Cultivated agriculture
Common mallow	*Malva neglecta*	Non-native grassland
Crested wheatgrass	*Agropyron cristatum*	Non-native grassland
Curly dock	*Rumex crispus*	Non-native grassland
Field bindweed	*Convolvulvus arvensis*	Cultivated agriculture, non-native grassland
Flixweed	*Descurainain sophia*	Fallow/weedy, non-native grassland
Four-winged saltbush	*Atriplex canescens*	Fallow/weedy
Foxtail barley	*Hordeum jubatum*	Non-native grassland
Fringed sage	*Artemisia frigida*	Non-native grassland
Kochia	*Kochia scoparia*	Cultivated agriculture, fallow/weedy, non-native grassland
Musk thistle	*Carduus nutans*	Cultivated agriculture, non-native grassland, wetlands
Net-seed lambsquarters	*Chenopodium berlandieri*	Non-native grassland
Peach-leaved willow	*Salix amygdaloides*	Cottonwood/willow gallery and river riparian
Plains cottonwood	*Populus sargentii*	Pond/open water, cottonwood/willow gallery and river riparian
Prairie sage	*Artemesia ludoviciana*	Non-native grassland
Puncturevine	*Tribulus terrestris*	Fallow/weedy, non-native grassland
Purple deadnettle	*Lamium purpureum*	Wetlands
Red-stem filaree	*Erodium cicutarium*	Non-native grassland
Rubber rabbitbrush	*Chrysothamnus nauseosus*	Non-native grassland
Russian knapweed	*Acroptilon repens*	Non-native grassland
Russian olive	*Elaeagnus angustifolia*	Non-native grassland, wetlands, pond/open water, cottonwood/willow gallery and river riparian
Russian thistle	*Salsola iberica*	Non-native grassland
Sedge	*Carex brevior*	Wetlands
Showy milkweed	*Asclepias speciosa*	Wetlands
Siberian elm	*Ulmus pumila*	Non-native grassland, wetlands
Smooth brome	*Bromus inermis*	Fallow/weedy, non-native grassland, wetlands
Tamarisk	*Tamarisk spp.*	Cottonwood/willow gallery and river riparian

Representative Species and Habitat Associations		
Common Name	**Scientific Name**	**Habitat Associations**
Three-square	*Scirpus americanus*	Wetlands
Watercress	*Nasturtium officinale*	Wetlands
Western salsify	*Tragopogon dubius*	Non-native grassland
White clover	*Trifolium repens*	Non-native grassland
Willow	*Salix spp.*	Wetlands, pond/open water, cottonwood/willow gallery and river riparian
Yellow sweetclover	*Melilotus officianalis*	Non-native grassland
Yucca	*Yucca glauca*	Non-native grassland
Wildlife Species		
American badger	*Taxidea taxus*	Non-native grassland
American kestrel	*Falco sparverius*	Cultivated agriculture, cottonwood/willow gallery and river riparian, non-native grassland
American robin	*Turdus migratorius*	Cottonwood/willow gallery and river riparian, orchard
Bald eagle	*Haliaeetus leucocephalus*	Cottonwood/willow gallery and river riparian, pond/open water
North American beaver	*Castor canadensis*	Cottonwood/willow gallery and river riparian
Black bear	*Ursus americanus*	Cottonwood/willow gallery and river riparian
Black-billed magpie	*Pica hudsonia*	Cottonwood/willow gallery and river riparian, non-native grassland
Blue grosbeak	*Passerina caerulea*	Cottonwood/willow gallery and river riparian, fallow/weedy
Brewer's blackbird	*Euphagus cyanocephalus*	Fallow/weedy, non-native grassland
Brown trout	*Salmo trutta*	River
Bullock's oriole	*Icterus bullockii*	Cottonwood/willow gallery and river riparian
Canada goose	*Branta canadensis*	Cultivated agriculture, non-native grassland, pond/open water
Common carp	*Cyprinus carpio*	Pond/open water
Common garter snake	*Thamnophis sirtalis*	Pond/open water, river
Common grackle	*Quiscalus quiscula*	Non-native grassland, wetlands
Common yellowthroat	*Geothlypis trichas*	Wetlands
Coyote	*Canis latrans*	Cottonwood/willow gallery and river riparian, cultivated agriculture, non-native grassland
Deer mouse	*Peromyscus maniculatus*	Cultivated agriculture, non-native grassland
Eastern cottontail	*Sylvilagus floridanus*	Non-native grassland
Eastern screech-owl	*Megascops asio*	Cottonwood/willow gallery and river riparian
Fox squirrel	*Sciurus niger*	Cottonwood/willow gallery and river riparian, orchard
Great blue heron	*Ardea herodias*	Cottonwood/willow gallery and river riparian, pond/open water, wetlands
Great horned owl	*Bubo virginianus*	Cottonwood/willow gallery and river riparian, cultivated agriculture, non-native grassland
Green-winged teal	*Anas crecca*	Pond/open water

Representative Species and Habitat Associations		
Common Name	**Scientific Name**	**Habitat Associations**
House wren	*Troglodytes aedon*	Cottonwood/willow gallery and river riparian
Mallard	*Anas platyrhynchos*	Pond/open water
Marsh wren	*Cistothorus palustris*	Wetlands
American mink	*Neovison vison*	Cottonwood/willow gallery and river riparian
Mourning dove	*Zenaida macroura*	Cottonwood/willow gallery and river riparian, non-native grassland
Mule deer	*Odocoileus hemionus*	Cultivated agriculture, fallow/weedy, non-native grassland, pond/open water
Muskrat	*Ondatra zibethicus*	Pond/open water
Northern crayfish	*Orconectes virilis*	Pond/open water, river
Northern flicker	*Colaptes auratus*	Cottonwood/willow gallery and river riparian
Northern harrier	*Circus hudsonius*	Cultivated agriculture, non-native grassland
Northern pocket gopher	*Thomomys talpoides*	Non-native grassland
Osprey	*Pandion haliaetus*	Cottonwood/willow gallery and river riparian, pond/open water
Plains leopard frog	*Lithobates blairi*	Pond/open water, river
Plains pocket gopher	*Geomys bursarius*	Non-native grassland
Prairie vole	*Microtus ochrogaster*	Cultivated agriculture, non-native grassland
Raccoon	*Procyon lotor*	Cottonwood/willow gallery and river riparian, orchard, wetlands
Rainbow trout	*Oncorhynchus mykiss*	River
Red fox	*Vulpes vulpes*	Cottonwood/willow gallery and river riparian, cultivated agriculture, fallow/weedy, wetlands
Red-tailed hawk	*Buteo jamaicensis*	Cottonwood/willow gallery and river riparian, cultivated agriculture, non-native grassland
Red-winged blackbird	*Agelaius phoeniceus*	Wetlands
Sora	*Porzana carolina*	Wetlands
Striped skunk	*Mephitis mephitis*	Cottonwood/willow gallery and river riparian , cultivated agriculture, non-native grassland, wetlands
Swainson's hawk	*Buteo swainsoni*	Cultivated agriculture, non-native grassland
Thirteen-lined ground squirrel	*Ictidomys tridecemlineatus*	Cultivated agriculture, non-native grassland
Tiger salamander	*Ambystoma tigrinum*	Pond/open water, river
Virginia rail	*Rallus limicola*	Wetlands
Western grebe	*Aechmophorus occidentalis*	Pond/open water
Western kingbird	*Tyrannus verticalis*	Cottonwood/willow gallery and river riparian, orchard
Western meadowlark	*Sturnella neglecta*	Cultivated agriculture, non-native grassland
Western wood-peewee	*Contopus sordidulus*	Cottonwood/willow gallery and river riparian
White-tailed deer	*Odocoileus virginianus*	Cottonwood/willow gallery and river riparian, pond/open water
Yellow warbler	*Septophaga petechia*	Cottonwood/willow gallery and river riparian

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APPENDIX C.

SENSITIVE SPECIES HABITAT ASSOCIATIONS AND POTENTIAL FOR OCCURRENCE

Sensitive Species Habitat Associations and Potential for Occurrence				
Common Name	**Scientific Name**	**Status**	**General Habitat**	**Potential for Occurrence**
Mammal Species				
Canada lynx	*Lynx canadensis*	Threatened, SGCN Tier 1	Boreal forest	None. Suitable habitat is not present.
Hoary bat	*Lasiurus cinereus*	SGCN Tier 2	Riparian	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Little brown myotis	*Myotis lucifigus*	SGCN Tier 1	Riparian woodland	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	Threatened, SGCN Tier 1	Riparian scrub	High. The study area is within the geographic range for the subspecies and prime habitat is present.
Spotted bat	*Euderma maculatum*	SGCN Tier 1	Wetlands, riparian	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	SGCN Tier 1	Mines, caves, and structures in wooded areas	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Bird Species				
American white pelican	*Botaurus lentiginosus*	SGCN Tier 2	Lakes and ponds	Moderate. The study area is within the geographic range for the species and suitable habitat is present. Breeding season
Bald eagle	*Haliaeetus leucocephalus*	BCC, BGEPA, SGCN Tier 2	Mature trees near waterbodies	Moderate. Suitable nesting and foraging habitat exist. No nests or winter roosts are documented in the project area. Resident species
Cassin's sparrow	*Peucaea cassinii*	BCC, SGCN Tier 2	Arid grasslands with scattered shrubs	Low. Suitable breeding habitat is not present in the project area. Breeding season
Golden eagle	*Aquila chrysaetos*	BCC, BGEPA, SGCN Tier 1	Varies. Suitable nesting habitat includes mature trees and cliffs.	Low. Suitable breeding habitat is limited in the project area. The species is generally intolerant of human activity. Resident species
Lark bunting	*Calamospiza melanocorys*	BCC, SGCN Tier 2	Grassland, shrub-steppe, agricultural land.	Low. Suitable breeding habitat is limited in the project area. Breeding season
Lazuli bunting	*Passerina amoena*	SGCN Tier 2	Riparian	High. The study area is within the geographic range for the species and prime habitat is present. Breeding season

Sensitive Species Habitat Associations and Potential for Occurrence				
Common Name	**Scientific Name**	**Status**	**General Habitat**	**Potential for Occurrence**
Least Tern	*Sterna antilarum*	Endangered, SGCN Tier 2	Shorelines	None. This species only needs to be considered if the following condition applies: Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.
Lesser yellowlegs	*Tringa flavipes*	BCC	Breeds in boreal forest	Low. The species is a migrant through Colorado.
Lewis's woodpecker	*Melanerpes lewis*	SGCN Tier 2	Riparian	Moderate. The study area is within the geographic range for the species and suitable habitat is present. Resident species
McCown's longspur	*Calcarius mccownii*	BCC, SGCN Tier 2	Arid grasslands	None. Suitable habitat is not present in the project area. Breeding season
Mexican spotted owl	*Strix occidentalis lucida*	Threatened, SGCN Tier 2	Mature forests, canyons	None. Suitable habitat is not present.
Northern harrier	*Circus hudsonius*	SGCN Tier 2	Wetlands, grassland	Moderate. The study area is within the geographic range for the species and suitable habitat is present. Resident species
Piping plover	*Charadrius melodus*	Threatened, SGCN Tier 2	Shorelines	None. This species only needs to be considered if the following condition applies: Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.
Rufous hummingbird	*Selasphorus rufus*	SGCN Tier 2	Various, riparian	Low. The study area is within the geographic range for the species and suitable migration is present.
Semipalmated sandpiper	*Calidris pusilla*	BCC	Breeds near water is sub-arctic tundra	Low. The species is a migrant through Colorado.
Swainson's hawk	*Buteo swainsoni*	SGCN Tier 2	Grassland	Moderate. The study area is within the geographic range for the species and suitable habitat is present. Breeding season
Whimbrel	*Numenius phaeopus*	BCC	Boreal, subarctic, and subalpine forest and tundra	Low. The species is a migrant through Colorado.
Whooping crane	*Grus americans*	Endangered, SGCN Tier 2	Shorelines, ag fields	None. This species only needs to be considered if the following condition applies: Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Sensitive Species Habitat Associations and Potential for Occurrence				
Common Name	**Scientific Name**	**Status**	**General Habitat**	**Potential for Occurrence**
Willet	*Tringa semipalmata*	BCC	Wetlands and grasslands	Low. Suitable breeding habitat exists; however, the species is only known to breed in several locations in Colorado. Breeding season
Willow flycatcher	*Empidonax traillii*	BCC	Moist, shrubby areas with standing or running water, willows	Low. The species is more commonly known in the foothills and higher elevations. Breeding season
Reptile Species				
Common gartersnake	*Thamnophis sirtalis*	SGCN Tier 2	Riparian	High. The study area is within the geographic range for the species and suitable habitat is present.
Milk snake	*Lampropeltis triangulum*	SGCN Tier 2	Various habitats, riparian	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Fish Species				
Common shiner	*Luxilus cornutus*	SGCN Tier 1	Streams with cool, clear water, gravel bottoms and shaded by brush or trees	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Green back cutthroat trout	*Oncorhynchus clarkii stomias*	Threatened, SGCN Tier 1 wil	Coldwater streams and lakes	None. Suitable habitat is not present.
Iowa darter	*Etheostoma exile*	SGCN Tier 2	Streams with cool, clear water with undercut banks	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	Large rivers	None. This species only needs to be considered if the following condition applies: Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.
Plains topminnow	*Fundulus sciadicus*	SGCN Tier 1	Waters where there is abundant filamentous algal growths and still, clear water	Moderate. The study area is within the geographic range for the species and suitable habitat is present.
Plant Species				
North Park phacelia	*Phacelia formosula*	Endangered, PGCN Tier 1	Eroded soil outcrops	None. The species is only found in North Park.
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened, PGCN Tier 1	Moist meadows, perennial stream terraces, floodplains and oxbows	Moderate. Suitable habitat exists. The species has not been documented in the project area.

Sensitive Species Habitat Associations and Potential for Occurrence				
Common Name	**Scientific Name**	**Status**	**General Habitat**	**Potential for Occurrence**
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Tall grass prairies	None. This species only needs to be considered if the following condition applies: Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.
Colorado butterfly plant	*Oenothera coloradensis ssp. Coloradensis*	PGCN Tier 1	Wetlands	Low. The study area is within the geographic range for the species. Suitable habitat is limited due to past disturbance and predominance of non-native species.
Bell's twinpod	*Physaria bellii*	PGCN Tier 2	Barren land	Low. The study area is within the geographic range for the species. Suitable habitat is limited due to past disturbance and predominance of non-native species.

APPENDIX D.

HABITAT AND WILDLIFE REFERENCES

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