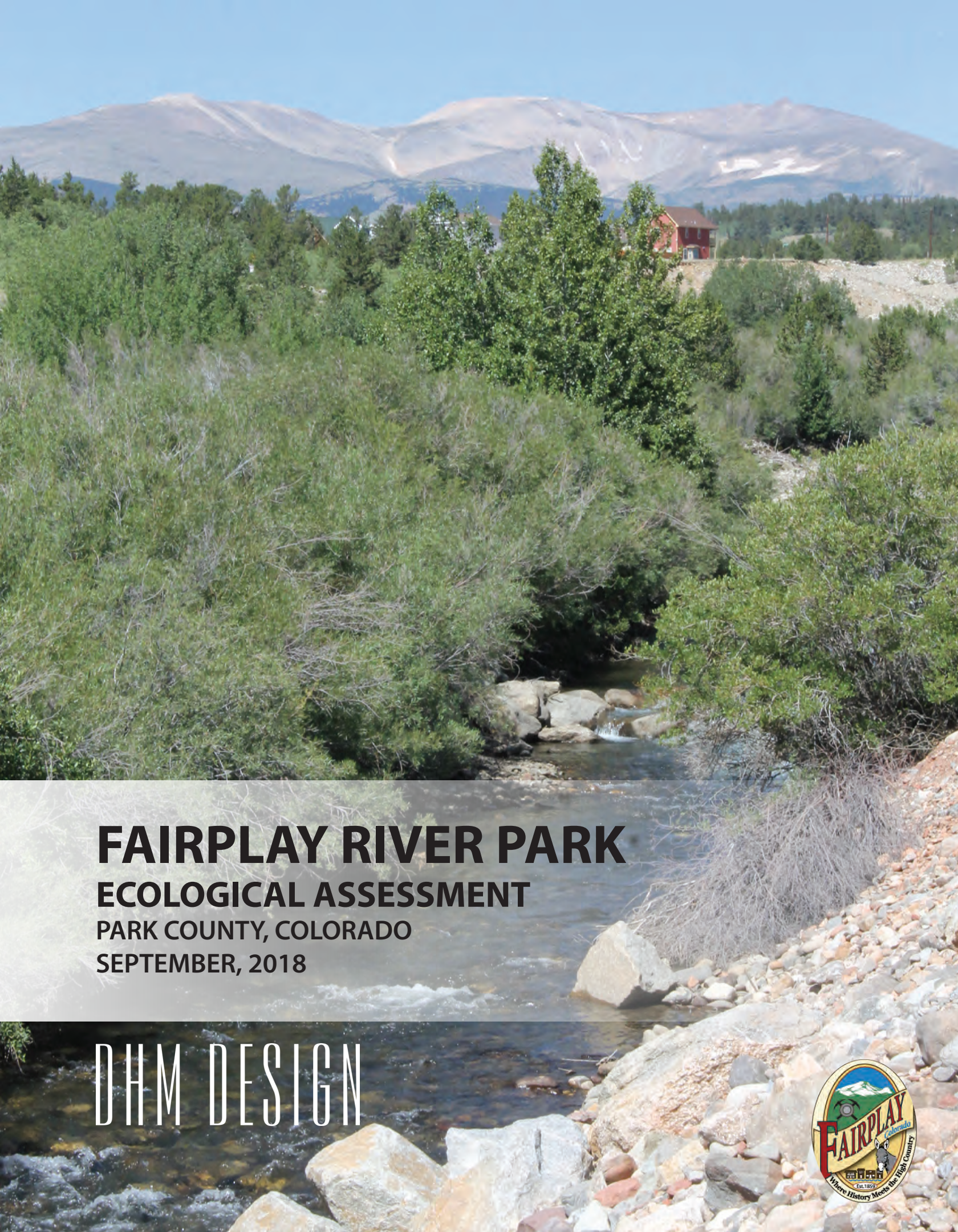

FAIRPLAY RIVER PARK

ECOLOGICAL ASSESSMENT

PARK COUNTY, COLORADO

SEPTEMBER, 2018

DHM DESIGN

Prepared for: The Town of Fairplay
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1.0 Introduction

The Town of Fairplay in partnership with the Trout Unlimited, Colorado Wildlife Federation, Colorado Parks and Wildlife and Park County are developing a master plan for river and riparian improvements to the Fairplay River Park along the Middle Fork South Platte River in Park County, Colorado. The 100-acre parcel is owned by the Town of Fairplay and is situated North and West of Highway 285 and Southeast of the Town of Fairplay. This parcel (Project Area) encompasses the 1.3 miles of the Middle Fork of the South Platte River and includes both sides of the Middle Fork South Platte River (See Figure 1).

The master plan proposes stream, riparian and recreational improvements to capitalize on economic development while giving a high priority to the maintenance and enhancement of a vital and healthy river system. This report provides an evaluation of the existing riparian ecological conditions within and around the Project Area (see figure 1) and identifies ecological and river system intervention recommendations and opportunities for amenity improvements.

The report details existing environmental and wildlife constraints, and makes recommendations for stakeholder consideration. This report also provides recommendations on recreation, education and interpretation opportunities throughout the Project Area.

2.0 Methods

As part of this report, a professional site analysis was conducted that included a Riparian Ecological Integrity Assessment and Functional River Assessment. The findings of these studies are the base data on which existing conditions were defined and recommendations are based.

2.1 Ecological Integrity Assessment for Colorado Wetlands

To evaluate the riparian ecologic condition of the Project Area an Ecological Integrity Assessment (EIA) for Colorado Wetlands Field Manual, Version 2.1 as developed Colorado Natural Heritage Program, Colorado State University, 2016 was used. This is an assessment method that measures overall wetland condition with an emphasis on biological integrity. The method combines quantitative vegetation metrics with qualitative metrics that evaluate landscape context, hydrology, soils, water quality, and size into a multi-metric index. Final EIA scores rank a riparian systems condition on a four-tiered scale (excellent/good/ fair/poor), as compared to unaltered wetlands of the same type. This methodology was chosen because it has the ability to provide baseline data to establish existing conditions and evaluate restoration efforts over time. The EIA method provides land managers with a tool to measure the ecological integrity of riparian habitats and wetlands, and could be used to target sites for restoration or further protection.

FIGURE 1: View looking at Fairplay Beach across recreational pond.

2.1.1 Existing Conditions Analysis

A Level 2.5 EIA Assessment was conducted for the site on August 8th-10th, by Jeremy Allinson of DHM Design, Corp. In accordance with the Field Manual, Version 2.1 (Lemly et al., 2016). Major ecological factors scored included landscape context, buffer, vegetation condition, hydrological condition, and size, and the ratings are based on deviation from "natural" reference benchmarks. For the purpose of this report the Project Area and Assessment Area refer to the 100-acre parcel that includes 1.1 mile of the Middle Fork South Platte River.

The results of the EIA for the Fairplay River Park shows the site has an Overall Ecological Integrity Score of 2.21, which represents a C+ letter grade, or a fair riparian condition (See table 1). The major constraining factors leading to the score include the highly disturbed areas from historic and current placer mining activities that have taken place within Project Area.

2.1.2 Post-Restoration Assessment

A proposed condition EIA was prepared assuming completion of the recommended restoration activities. Over time, the EIA rating of the Middle Fork of the South Platte Restoration Project riparian habitat will likely increase to a 3.06 score, which represents an B letter grade, signifying good condition. The major factors leading to the increase in ecological health include an increase of all vegetation metrics including restoration of the native plant species community, structural diversity, and elimination of noxious invasive weeds. In addition, size and connectivity scores would be increased once the riparian habitat is restored to its original width.

2.2 Functional River Assessment

FACStream (Functional Assessment of Colorado Streams) is a method for assessing functional condition of stream reaches in Colorado using 29 sub-variables to score 10 state variables that combine to an overall condition score based on the degree of impairment.

A FACstream analysis reads like a report card representing the functional condition, or "health" of a reach at increasing levels of detail. The condition score, state variables, and sub-variables are all scored used the academic grading scale where the letter grades (A-F) correspond to numerical scores on a 50-100 scale (Table 1). Each grade represents a condition class defined by the degree of impairment. Pristine streams that have no impact would score 100 (A+). 50 (F-) represents the lowest level of functioning for a reach that is profoundly impaired but still recognizable as a feature conveying water. This assessment method is completed at three (3) different scale levels, a reach level, riparian level and watershed level. For the purpose of this report, the field assessment was conducted at a reach level scale and impairment levels were assigned for the entire 1.1 mile section of river. The "assessment area" is defined as the stream reach plus the immediately adjacent riparian zone.

2.2.1 FACStream Framework

The FACStream framework consists of a set of state variables, each with several sub-variables, organized according to the landscape pyramid. These components are ordered in an outline. State variables are identified in the form Vxxx, with the subscript indicating a particular variable. The sub-variables for each state variable are simply numbered, for example Vhyd1 is a sub-variable for the Vhyd variable, water supply. For the purpose of this report and to assist with future project planning, a level 2 rapid site assessment was conducted on site. The variables and sub variables listed below were utilized to assess the river system within the Project area at a reach level. General observations for the variables listed below were made to provide a high-level assessment of the reach.

Watershed Scale

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

	Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank				**2.21**	**C+**
Overall Ecological Integrity + Size Score and Rank				**1.96**	**C-**
Rank Factor: LANDSCAPE CONTEXT	0.30			**1.83**	**C-**
LANDSCAPE METRICS	0.33			**1.50**	**C-**
L1. Contiguous Natural Land Cover	1	2	2		
L2. Land Use Index	1	2	1		
BUFFER METRICS	0.67			**2.00**	**C+**
B1. Perimeter with Natural Buffer	n/a	2	2		
B2. Width of Natural Buffer	n/a	3	2		
B3.1. Condition of Natural Buffer - Veg	n/a	2	2		
B3.2. Condition of Natural Buffer - Soils	n/a	2	2		
Rank Factor: CONDITION	0.70			**2.37**	**C+**
VEGETATION METRICS	0.55			**2.67**	**B-**
V1. Native Plant Species Cover	1	3	3		
V2. Invasive Nonnative Plant Species Cover	1	3	3		
V3. Native Plant Species Composition	1	3	3		
V4. Vegetation Structure	1	2	2		
V5. Regen. of Native Woody Species **(opt.)**	1	2	2		
V65. Coarse and Fine Woody Debris (**opt.**)	1	3	3		
HYDROLOGY METRICS	0.35			**2.00**	**C+**
H1. Water Source	1	2	2		
H2. Hydroperiod	1	1	2		
H3. Hydrologic Connectivity	1	2	2		
PHYSIOCHEMISTRY METRICS	0.10			**2.00**	**C+**
S1. Soil Condition	1	2	2		
S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	2	2		
S3. Algal Growth **(opt.)**	0.5	2	2		
Rank Factor: SIZE	n/a			**2.00**	**C+**
SIZE METRICS	1			**2.00**	**C+**
Z1. Comparative Size **(opt.)**	1	NA	2		
Z2. Change in Size **(opt.)**	1	NA	2		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

TABLE 1. Level 2.5 EIA Assessment

Water Supply (Vhyd) - Water is supplied to the reach from its contributing watershed in a characteristic pattern represented by its hydrograph. Anthropogenic stressors in the watershed may alter the hydrograph to change the overall annual volume of water that the reach receives (Vhyd1), and/or the frequency, magnitude, and duration of peak flows (Vhyd2) and low flows (Vhyd3). This variable rates the degree to which the amount and timing of water source is impacted by stressors within the watershed.

Vhyd1: Total Volume
Vhyd2: Peak Flows
Vhyd3: Minimum Flows

Sediment Supply (Vsed) - Sediment is produced in the contributing watershed via land erosion (Vsed1) (including both surface erosion, mass erosion, and point sources), and channel erosion (Vsed2). Some sediment enters the reach directly from valley side slopes, but most is discharged to the reach from the contributing watershed as bedload and suspended sediment in the stream. Watershed impacts affect sediment production, and major drainage impacts such as dams affect the delivery of sediment to the reach (Vsed3). This variable rates the degree of impact to the natural rate of sediment supply including the amount, timing, and size distribution of sediment.

Vhyd1: Land Erosion
Vhyd2: Channel erosion
Vhyd3: Transport

Chemical Supply (Vchem) - The physicochemical properties of the stream reach are largely inherited to the site from the contributing watershed, and biochemical processing by stream organisms and physical changes within the channel and floodplains can alter these conditions on the reach to some lesser degree. This variable uses three sub-variables to rate the degree of departure from a natural temperature regime (Vchem1), amounts of organic inputs (POM, DOM) and nutrients (N, P, K) (Vchem2) in the incoming water as well as shifts to the characteristic water quality sub-variables such as pH, conductivity, turbidity, and contaminants (Vchem3).

Vhyd1: Temperature
Vhyd2: Organics/nutrients
Vhyd3: Water Quality

Riparian Scale

Riparian Vegetation (Vveg) - Riparian vegetation is critically important to supporting a stream reach. It provides the root structure and roughness that stabilizes banks, channels, and floodplains as well as providing a buffer to the stream from nearby stressors. Riparian vegetation also provides cover, shading, and habitat for species whose life history utilizes both aquatic and terrestrial life stages. This variable rates impacts to the natural extent, cover, and composition of riparian vegetation across the width of the historic floodplain (Vveg1) as well as along the edge of the stream (Vveg2).

Vhyd1: Riparian vegetation
Vhyd2: Streamside vegetation

Debris supply (Vdeb) - Organic debris consists of the bodies and fragments of dead organisms, especially plants. Large woody debris (LWD) is the coarsest organic input to the stream, functioning primarily as a structural component and secondarily as a nutrient and energy source. Detritus includes smaller vegetative fragments such as leaves, needles, twigs, and grass, plus animal bodies and feces. Detritus is often the primary energy source for a stream reach, but it also functions in forming micro-habitat and substrate structure. This variable considers these two materials separately (Vdeb1 and Vdeb2) to rate the degree to which the amount, timing and character of organic debris supply to the reach has been altered by stressors in the fetch area which includes the riparian area and adjacent side slopes.

Vhyd1: LWD Supply
Vhyd2: Detritus Supply

Reach Scale

Stream Morphology (Vmorph) - Streams exhibit characteristic patterns of geometry (morphology) by process domain as a result of geomorphic processes such as dynamic equilibrium between hydrology and sediment, adaptations to natural disturbances, and response to biotic agents such as vegetation and beavers. Morphology is also frequently altered directly by humans. This variable rates the degree of departure from the reference stream morphology arising from channel evolution (Vmorph1), and as a degree of departure from reference conditions in planform (Vmorph2), dimension (Vmorph3), and profile (Vmorph4). Morphological impairment on streams in alluvial valleys is often a consequence of instability caused by stressors within or outside the reach.

Vmorph1: Evolution
Vmorph2: Planform
Vmorph3: Dimension
Vmorph4: Profile

Floodplain Connectivity (Vcon) - Floodplain connectivity describes the degree to which water can access and hydrate the active floodplain. The amount and timing of water flow interacts with reach-scale channel and floodplain morphology to create a characteristic pattern in the frequency (Vcon1), lateral extent (Vcon2), and duration of saturation (Vcon3) from over-bank flows and groundwater exchange on the reach. Thus, floodplain connectivity may be drastically altered by either watershed-scale hydrological impacts (hydrograph) or site-scale geomorphic impacts including artificial levees, channelization, channel enlargement, and entrenchment. While the term floodplain has many different meanings in different disciplines, the area of concern in this variable is the active "bankfull" floodplain that typically has a saturation return interval of 0-5 years.

Vcon1: Saturation Frequency
Vcon2: Floodplain Width
Vcon3: Saturation Duration

Stream Stability (V_{stab}) - Stability and resilience are considered together to rate the probability that the stream will maintain its geomorphic structure. Stability assessment ($V_{stab}1$) is based on the dynamic equilibrium concept of balance between sediment supply and transport represented by Lane's Balance. Thus, stressors include anthropogenic alterations to stream power including hydrology (V_{hyd}), channel morphology (V morph), sediment supply (V_{sed}), and stabilizing factors like riparian vegetation (V_{veg}). Resilience ($V_{stab}2$) rates the ability of the system to recover after a large disturbance such as a large flood, wildfire, or mass erosion event. Primary factors include its ability to move and adjust, so riparian vegetation (V_{veg}) and floodplain connectivity (V_{con}) are key, along with stressors such as channel hardening and floodplain encroachment.

Vstab1: Dynamic Equilibrium
Vstab2: Resilience

Physical Structure (Vstr) - Heterogeneity in the physical structure of a stream is the result of complex interactions between water, substrate, and debris, via the processes of erosion, scour, and deposition that shape the form of bed, banks, and substrate. As in the case for morphology, biological drivers such as riparian vegetation and beavers may have a profound impact on physical structure and diversity. This variable rates the degree to which characteristic patterns of structural heterogeneity are altered by stressors by considering two scales of resolution. The coarse scale Vstr1 is meant to represent a level relevant for fish and larger animals by considering patterns of water velocity, depth, and physical cover. At a finer scale, Vstr2 is more relevant to benthic macroinvertebrate habitat, looking at characteristic substrate material size, type, and packing.

Vstab1: Coarse Structure
Vstab2: Fine Structure

Biotic Structure (Vbio) - Biotic structure is the amount and diversity of organisms that live in the stream reach for all or part of their life history. The biota supported by the reach is not only a high-order function, but also component of the natural infrastructure of the reach that performs

FACStream Summary					
Scale	Variable		Grade	Degree of Impairment	Confidence
Watershed	V_{hyd}	Flow Regime	C+	Significant/mild	L
	V_{sed}	Sediment Regime	C+	Significant/mild	M
	V_{chem}	Water Quality	B	Mild	L
Riparian	V_{con}	Floodplain Connectivity	C	Significant	M
	V_{veg}	Riparian Vegetation	C	Significant	M
	V_{deb}	Debris	C+	Significant/mild	L
Stream	V_{morph}	Stream Morphology	D	Severe	M
	V_{stab}	Stability	D	Severe	M
	V_{str}	Physical Structure	C+	Significant/mild	M
	V_{bio}	Biotic Structure	B	Mild	
Overall FCI			Reach Condition Score	Degree of Impairment of Reach	
0.54			C	Significant	

TABLE 2. Overall reach FACStream assessment results

biochemical processing through a characteristic trophic structure. Sticking with convention, the diversity of organisms is assessed by taxonomic group in sub variables (Vbio1-5) to account for alterations caused by direct and indirect stressors.

Vbio1: Microbes
Vbio2:Macrophytes
Vbio3: Macroinvertebrates
Vbio4: Fish
Vbio5: Other Animal

The results of the river assessment for the Middle Fork South Platte within the Project Area are included in Table 1 on the following page.

The Functional Capacity Index (FCI) is a dimensionless index that rates the functional capacity of

The reach relative to reference standard on a scale of 0.00 to 1.00 reflecting the degree of aquatic habitat functionality from none to 100%. The functional capacity for the reach was 0.54. FCI may then be used to provide a quantitative estimate of the amount aquatic function provided by the reach using a measure called the stream functional unit (SFU). One SFU is equal to the amount of function performed by one foot of stream in completely unimpaired condition. The general SFU equation is derived from the premise that the amount of function is equal to the Reach Length (L), times its relative ability to perform functions compared to a reference standard example of the same type of stream; that is, its Functional Capacity (FC):

$$SFU = L \times (FC) = 3{,}213 \text{ ft}$$

SFU is expressed in units of functional feet of stream habitat. The current functional feet of stream habitat for the Project Area is 3,213 ft. The overall reach condition score was a C rating and the degree of impairment of the reach was significant primarily due to mine tailings on site and in surrounding areas. The functional assessment score sheets are included in Appendix 3. Based on the metrics used for the overall reach assessment

and field observations, impairment ratings were assigned to all sections of the reach and are shown on the Existing Stream Health Assessment Map in Appendix A.

2.3 Recreational, Educational and Interpretive Field Analysis

To analyze the recreational, educational and interpretive opportunities on the site professional landscape architects and designers visited and inventoried the site. Recommendations are based on projects of similar type and scale, a familiarity with the surrounding community and amenities and communicated stakeholder goals and wishes.

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3.0 Existing Conditions

The existing conditions of the Project Area are diverse. The ecologic health and communities vary by location on site. In general, the site ranges from hosting very special and intact riparian communities to areas of high degradation, particularly where historic mining activities have taken place, with opportunities for restoration.

3.1 Landform, Elevation and Size

The Project Area is located on a relatively flat terrace along a semi-confined section of the Middle Fork of the South Platte at an elevation of 9,877 feet. The 103-acre Project Area encompasses the east and west side of the Middle Fork of the South Platte and is located in S33 T9S R77W parts of Section 33, Township 9 South and Range 77 West in Park County, Colorado, see figure Figure 1. This section of river is located within the physiographic province of the Southern Rocky Mountains and within the Mountain hydrological region in Colorado (Capesius and Stephens 2009). The reach is located at the top of the South Platte River Watershed and the Middle Fork South Platte is one of three main forks to the South Platte River. The Project Area is located within an unconfined valley with relatively good connection to the floodplain with the exception of areas where historic mine tailings exist. Throughout the project area, the valley slopes west to east at a 1-2% slope.

3.2 Land Use

Historically, the Project Area was heavily mined for gold and other minerals, this is evident of the large tailings piles that still exist today. Today, no land use activities take place on the property. The riparian corridor provides habitat for wildlife and is used for recreational activities including fishing in the Middle Fork of the South Platte, gold panning, hiking and wildlife observation. Adjacent land uses include mixed use residential and business to the north, mining to the west, and mixed use business and residential to the east.

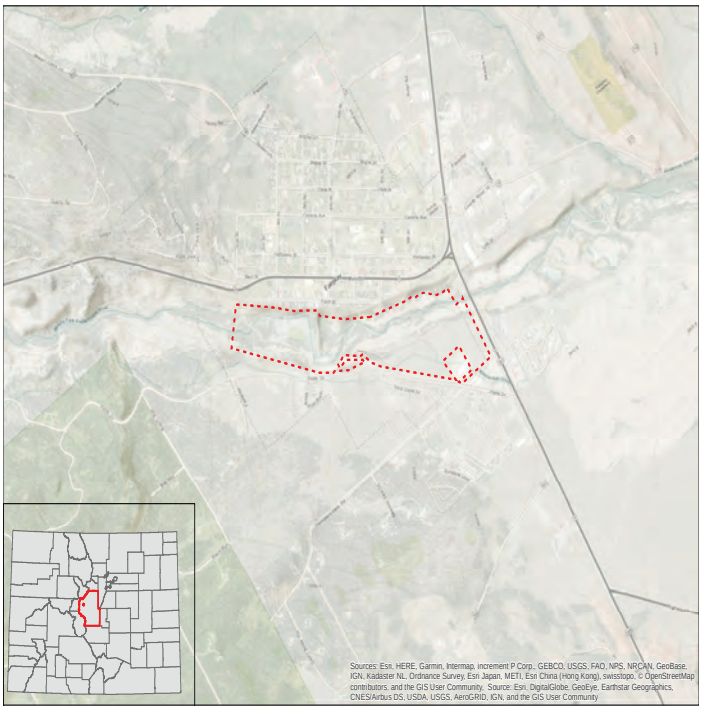


FIGURE 1- Project location Map

3.3 Vegetation

The existing vegetation within the Project Area is consistent with that typically found within high altitude riverine riparian systems and is characterized by both deciduous and coniferous tree stands, shrublands and scrub shrub wetlands, herbaceous zones that include various species of sedges and forbs and uplands. The vegetative composition and diversity is generally healthy throughout the property, with the exception of disturbed areas and tailings piles. The vegetative diversity and resilience is intimately tied to the hydrological regime within the riparian system. When the river overflows it's banks, it feeds water into the surrounding plants and soils, creates natural levees, and deposits sediment which have a direct impact on plant species and composition. The combination of a historical frequent disturbance regime and place placer mining activities has increased the presence of non-native and noxious vegetation on the property in some areas.

A detailed vascular plant species list is included in Appendix C, table 1. Vegetative species associated with the mapped ecological community types

in Appendix A, Existing Ecological Communities. A review of species specific to each vegetative community is provided in sections 3.7.1 through 3.7.4.

3.4 Soils

The Project Area is characterized by two soil mapping units including Hodden Sandy Loam Complex (unit 47) and Dumps, Dredge Tailings (unit 28) , as described and illustrated in the Soil Survey of Fairplay, Colorado. Each unit is briefly described below.

The Hodden Sandy Loam complex, which occurs on alluvial fans and outwash terraces, formed in alluvium derived predominantly from sandstone and shale. Typically, the surface layer is a sandy loam about 4 inches thick. The next layer is a very gravelly sandy loam about 4 inches thick. The subsoil is about 8-12 inches of very gravelly coarse sandy loam over about 12-18 inches of a gravelly sandy loam. Permeability is moderate to a depth of 30 inches and rapid below that depth. The available water capacity is low, runoff is slow and the hazard of erosion is moderate. The Dumps, Dredge Tailings which formed during mining operations consists mostly of small and large cobble and is persistent throughout the site.

3.5 Hydrology

The Project Area is located immediately adjacent to the Middle Fork South Platte River below the 100-year floodplain (see Figure 1). This section of the Middle Fork South Platte River is a perennial stream and the alluvial aquifer likely extends to the toe of the slope on both sides of the river. Hydrogeological influences from the toe on the north side of the river increase groundwater availability and influence on the Palustrine Emergent Wetland areas located on the north side of the river. On the south side of the river, there are two small spring fed ponds that are situated between the undisturbed dredge piles and the toe of the slope. Toe slope wetlands are prevalent throughout the project area where the water table is high along the slope of the toe. There is an approximately 5-acre pond located in the center of the Project Area.

3.6 Growing Season

The closest WETS weather station with information on the growing season is the Fairplay S. Park Road station located near the Town of Fairplay at an elevation of 9,995 feet. The mean high temperature of 71.1°F occurs in July and the mean low of 10.5°F occurs in February. The growing season length as defined by 39°F air temperature, is 123 days with a 50% chance of occurring between May 23 and October 10 (USDANRCS, 2017).

3.7 Ecologic Communities Definitions

The Project Area is characterized by the ecological system type of Rocky Mountain Montane Riparian Woodland and Shrubland. The major vegetative zones that occur within the Project assessment areas include Riparian Shrubland and Scrub Shrub Wetland, Riparian Palustrine Emergent Wetland, Forested Riparian and Upland. A full list of vascular plant species observed within the project area is included in Table 1.

FIGURE 2- View looking at three different vegetative zones. Palustrine Emergent Wetland in foreground, Riparian Scrubland, and Forested Riparian in background.

3.7.1 Riparian Scrubland / Scrub Shrub Wetland

The Riparian Scrubland / Scrub Shrub Wetland zone within the Project Area is dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. The most dominant vegetative class of within the Project Area at 18.4 acres, this system occurs on both sides of the river and includes the following dominant vegetation types: sandbar willow (Salix exigua), mountain willow (Salix monticola), Bebs willow (Salix bebbiana), Geyer willow (Salix geyeriana), whiplash willow (Salix lucida), wax current (Ribes cereum), shrubby cinquefoil (Dasiphora fruticose) and silver sage (Salvia argenea).

FIGURE 3- View of high quality Scrub Shrub Wetland in background, Palustrine Emergent Wetland in foreground.

3.7.2 Palustrine Emergent Wetland

This emergent wetland class is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (USFWS, 2018). With vegetation present for most of the growing season, these wetlands are dominated by perennial plants. This wetland type occurs in throughout the Project Area including along point bars, backwater areas and side channels of the Middle Fork South Platte River.

A large high quality emergent wetland is located where the Middle Fork South Platte River enters the pond. The toe of the slope at the north side of the Project Area and again towards the south side, where the wetland is large and is of very high quality, with significant vegetative composition, diversity and structure. The total acreage for this type of wetland is 2.7 acres. Dominant vegetative species for this type of system within the Project Area include: water sedge (Carex aquatilis), wooly sedge (Carex pellita), joint leaf sedge (Juncus articulates), analog sedge (Carex simulate) Beaked sedge (Carex rostrata), variegated scouring rush (Equisetum variegatum), smooth scouring rush (Equisetum laevigatum) artic Rush (Juncus articus) Colorado rush (Juncus confusus), alpine bluegrass (Poa alpine) , marsh Bluesgrass (Poa leptocoma) and common horsetail (Equisetum arvense).

FIGURE 4- View looking at high quality Palustrine Emergent wetland.

3.7.3 Forested Riparian

This vegetative zone includes mature trees over 6 meters (20 feet) tall and is found mostly along the periphery and intermittently throughout the Project Area. The dominant tree species within the Project Area includes: narrow-leaf cottonwood (Populus angustifolia), bristlecone pine (Pinus longaeva) and quaking aspen (Populus tremuloides). Other tree

species occurring within the Project Area include: blue spruce (Picea pungens) and Lodgepole pine (Pinus contorta).

FIGURE 5- View looking at typical Forested Riparian zone located on periphery of project area, Quaking Aspen (Populus tremuloides) and Narrow-leaf Cottonwood (Populus angustifolia)

3.7.4 Upland

A 25-acre section of upland is located on the south east side of the Project Area. The upland vegetation is typical of that found in the Southpark region and consists mostly of montane grasslands dominated by slimstem muhly (Muhlenbergia filiculmis), Arizona fescue (Festuca arizonica), blue gramma (Bouteloua gracilis), yellow rabbitbrush (Chrysothamnus viscidiflorus), and fringed sage (Artemisia frigida).

FIGURE 6- Upland area typical for Southpark area (no project specific upland image available).

3.7.5 River Condition and Angling Opportunities

The river function is discussed in detail in section 2.2.1. This section reviews the existing condition of the river including the aquatic habitat and angling opportunities within the Project Area. The quality of aquatic habitat varies throughout the project area. A river restoration project was completed in 2006 by the Town of Fairplay and Park County. These river improvements increased habitat diversity and angling opportunities throughout the reach. Major flooding occurred in June of 2015 and it is evident within the stream channel and where the river improvements exist. The composition of the alluvial channel throughout the reach makes it a highly mobile bed. For discussion purposes, this section will review the river in two reaches, upstream (west) of the existing pond to the project boundary and downstream (east) of the existing pond to Highway 285.

3.7.5.1 Upper Reach - Middle Fork South Platte

The upper reach within the Project Area consists a meandering primary river channel with active secondary channels and branches. Braiding occurs as the stream reaches the Pond. The entrenchment ratio throughout this section varies from slightly entrenchment to little or no entrenchment. Mid-channel bars formed from rapid deposition occur throughout the reach and point bars and braided channels disperse flow across the floodplain in this area (See figure 7). The dominant bed form in this section is pool riffle and step pool. Fishing opportunities occur throughout this section, constraints to fish habitat include cover and river depth. There are many naturally occurring riffles that provide good macroinvertebrate habitat as well as step pools and cutbanks in this section that provide good cover and habitat for fish (See figure 8). Beaver activity within this reach has created several backwater areas that provide excellent juvenile fish rearing habitat (See figure 9). Spawning habitat occurs throughout the reach in pool tailouts and side channels. Overall, minimal bank erosion is occurring throughout this section of reach, there is one area with significant bank erosion located in the

FIGURE 7- View looking at braided section of river, braided channels and dispersed flow.

FIGURE 8- View looking at step pool and riffle section of river.

FIGURE 9- View looking at fish rearing backwater habitat created by beaver dam.

FIGURE 10 - View looking at significant bank erosion in Upper Reach.

middle of the reach downstream of a fish habitat structure (See figure 10). Multiple active channels within this section constrain low flow and function of river improvement features.

3.7.5.2 Lower Reach - Middle Fork South Platte

The lower reach within the Project Area from the existing pondto the Highway 285 bridge consists of a single channel that generally follows the centerline of the valley bottom with little and no sinuosity. The dominant bed form within this section is step pool and pool riffle. Entrenchment in this section various from slightly entrenched to entrenched where the river abuts the mine

FIGURE 11- View looking at entrenched area where side bank erosion is taking place undermining existing river structure.

FIGURES 12 & 13- View looking at active gold panning areas where bank erosion and degradation are taking place.

tailings (See figure 11). Deposition from active erosion in these areas have decreased river depth and degraded fish habitat. The existing fish habitat structures throughout the reach are mostly functioning and provide good holding water and cover for fish. Some structures are being undermined by active erosion where mine tailings exist and areas where active gold panning is taking place (See figures 12 and 13 previous page). Fishing opportunities are limited in this section and access is challenging do to unstable steep banks.

3.7.6 Wildlife and Threatened and Endangered Species

The Project Area provides habitat for a variety of wildlife species. A complete list of threatened and endangered species and known and likely species to occur, is included in Appendix C, Table 2, Project Area Wildlife Species List. The Project Area provides quality habitat for various migratory bird species, mammals and fish.

Mammal habitat is limited due to the size and surrounding land use. CPW Mapped habitat within the Project Area includes overall range and winter range for larger ungulates such as Mule deer (Odocoileus hemionus), Elk (Cervus canadensis), and Black bear (Ursus americanus). Moose scat was observed throughout the Project Area. The Project Area is within mapped human conflict areas for black bear and mountain lion (Puma concolor). Beavers are present within the system, this was evident by a large beaver den located in the pond and multiple beaver dams located througout the river (see figure 14). Beavers, a keystones species, add complexity and habitat to the river system. Additional potential mammal species likely to occur within the Project Area are listed in Appendix A, Table 2.

Fish species likely to occur within the Project Area include Rainbow trout (Oncorhynchus mykiss), Brown trout (Salmo trutta), Brooke trout (Salvelinus fontinalis), Colorado Cutthroat trout (Oncorhynchus clarki pleuriticus). Various types of fish habitat are present throughout the Project Area.

No Threatened or Endangered Species (T&E) were observed within the Project Area. State and federal T&E species likely to occur in the Project Area include: U.S. Fish and Wildlife (USFWS) endangered Least Tern (Sterna antillarum), state listed species of concern northern leopard frog (Lithobates pipiens) and the peregrine falcon (Falco peregrinus), which is also a state listed species of concern. Colorado Parks and Wildlife Species Activity Mapping (SAM) data and USFWS Information for Planning and Consultation (IPAC) data was utilized for desktop review. Some T&E species listed under the USFWS IPAC report are unlikely to occur within the Project Area, consultation with a local biologist is recommended prior to any proposed project

FIGURE 14 - View looking at beaver dam creating shallow backwater habitat for waterfowl and amphibians.

development.

4.0 Restoration Opportunities

There are ample opportunities for riparian habitat preservation, enhancement and restoration across the Project Area. DHM has developed a restoration concept which addresses the existing conditions with four types of interventions by ecologic community type:

- Preserve
- Enhance
- Create
- Future Restoration Opportunities

4.1 Restoration Concept

The Project Area restoration concept focuses on two main ecologic communities, riparian and wetland. For the purpose of this report and based on stakeholder goals, upland communities are reserved for future restoration opportunities. The surveyed riparian and wetland communities are recommended for preservation, enhancement or creation.

- Preservation - The protection of intact and functioning wetland or riparian through ecologic and landscape planning and site development.
- Enhancement - The restoration of partially functioning healthy wetlands and riparian areas. This can include noxious weed elimination, planting, seeding, and other restoration techniques.
- Creation - Identifying and re-establishing areas that are heavily degraded but have the opportunity, due to location, and surrounding vegetation for full restoration activities resulting in the creation of a new wetland or riparian area.

These opportunities are mapped on and shown on pages in Appendix A. All priorities and decisions about restoration actions should be guided by stakeholder goals and values.

4.1.1 Riparian Restoration Opportunities

As discussed in the existing conditions section, the health and quality of the riparian environment within the Project Area is good. This report recommends 10.1 acres for preservation, 0.45 acres for enhancement, and 1.1 acres for creation.

4.1.1.1 Riparian Preservation

Riparian preservation includes developing a regular monitoring and maintenance plan to preserve the existing high quality riparian habitat. Monitoring noxious and native vegetation will preserve and sustain current riparian conditions. By limiting access to sensitive areas and minimizing disturbance by directing human traffic through way-finding and the creation of designated, formalized paths can greatly reduce impact to these areas. This report recommends preserving approximately 18.4 acres of high quality riparian habitat.

4.1.1.2 Riparian Enhancement

Riparian enhancement will improve existing conditions to increase habitat value. This is done through the development and implementation of a weed management plan to control noxious vegetation, identifying aboricultural maintenance needs/plans and increasing plant diversity through planting and seeding. The resulting enhancement will provide increased habitat value for wildlife and improve overall ecological conditions. This report recommends that Project Area Stakeholders consider interventions to enhance approximately

FIGURE 15 - View looking at recommended area for riparian and wetland enhancement opportunity.

1.7 acres of riparian habitat (see figure 15).

4.1.1.3 Riparian Creation

Riparian creation is the most intensive of the three types of restoration. This involves grading the topography to create elevations with the appropriate available water to support native riparian vegetation plantings. Areas identified within the report are immediately adjacent to the river bank and are located in close proximity to the river water table. Areas identified for bank stabilization as part of river improvements are ideal locations for this recommended intervention as bank stabilization and riparian creation are both interventions with overlapping goals. This report recommends that at the Project Area Stakeholders consider 1.8 acres of Riparian Creation (see figure 16).

FIGURE 16 - View looking at location for riparian creation. Minor grading and plantings stabilize bank.

4.1.2 Wetland Restoration Opportunities

As discussed in the existing conditions section, the health and quality of the wetland environment within the Project Area is good to excellent. This report recommends 2.8 acres for preservation and 1.2 acres for enhancement.

FIGURE 17 -View looking at wetland preservation area.

4.1.2.1 Wetland Preservation

Wetland preservation includes regular monitoring and maintenance of plant species, the percent cover of the plants, and the hydrological conditions on site. Monitoring can assist with understanding overall wetland health, identify trends, and allow for short term and long term preservation and maintenance planning. The identification and use of trails in these areas would dramatically reduce human impacts and provide excellent learning and wildlife viewing opportunities. This report recommends 1.6 acres for wetland preservation (see figure 17).

4.1.2.2 Wetland Enhancement

Wetland Enhancement including noxious and invasive species control. Minimal noxious and invasive plant species were observed within wetland areas on site. Selective planting and maintenance

FIGURE 18- View looking at opportunity for Wetland Enhancement. Large thistle patch encroaching on wetland channel.

can enhance what is already considered a high-quality wetland within the Project Area. This report recommends that at the Project Area Stakeholders consider 1.2 acres within the Project Area for wetland enhancement (see figure 18).

4.1.3 River Restoration Opportunities

River restoration and maintenance opportunities exist throughout the Project Area. An evaluation of the existing river habitat structures, stream channel and function was conducted and recommendations in this section are based on those observations. Overall, there is a need for minor maintenance to some of the existing instream structures to increase function and prevent further erosion and degradation. The Project Area contains an abundance of root wads, logs and large boulders, these materials could be utilized for areas where bank stabilization is needed and as instream habitat features to improve overall habitat diversity and composition. An example of functioning structures and created habitat can be found on the very upstream section of the Project Area (See figure 19).

The flood event that occurred in 2015 has caused significant headcutting in areas (particularly upstream of the Pond) in which the migration of cobble and other substrate has created large point bars on both sides of the river and the stream channel has filled in places (See figure 20). Regrading and removal of cobble and substrate in these areas would improve low flow channel conditions, increase pool depths, and improve overall aquatic habitat and river function. There are several areas where the channel is wide and the low flow velocity is minimal, utilizing excavated material from point bars would improve low flow conditions in these areas (See figure 21). The removal or regrading of mine tailings in areas identified on the Stream Improvement Opportunities Graphic in Appendix A would significantly improve the overall function and aquatic habitat. This would allow the river to better connect to the floodplain, stabilize the bank and prevent further erosion and allow for the progression of the river planform from a straight confined section to a more sinuous, meandering

FIGURE 19 - View looking at functioning existing structure and placed log for habitat.

FIGURE 20- View looking at point bars and areas where cobble and other substrate has filled in active channel.

FIGURE 21 - View looking at area requiring maintenance to increase low flow and improve habitat in channel.

form. This would also create better river access in these areas.

4.2 Ecological Performance Standards (Success Criteria)

Ecological and river performance standards and success criteria for riparian enhancement and creation opportunities should be established and agreed upon by all stakeholders, designers, and agencies to provide a clear road map for success. Vegetative success criteria can include the identification of thresholds for percent cover, vegetative composition, and native vs. non-native species. New plantings and seeded areas should be monitored on a regular basis to ensure success. Areas where hydrological conditions are necessary for growth should be monitored regularly. For creation and enhancement areas, adjustments to site conditions may be necessary to allow for optimal success. River maintenance activities should be identified and a phased approach and schedule should be developed to ensure success.

5.0 Recreation, Education and Interpretation Opportunities

5.1 Existing Conditions

The current on-site the opportunities for people to engage in recreation and with the ecology and nature of the Project Area are limited. Existing amenities such as trails, river access and interpretive signage is minimal. Existing trails exist throughout the Project Area, with some trails more defined than others. There is an improved existing trail consisting of crusher fines that connects the town of Fairplay to the Recreation area located on the south side of the Pond. The main existing recreation area is the Fairplay Beach and camping loop, which consists of a shade shelter, 10 improved camp sites, picnic tables and fire rings. Unimproved singletrack trails used for access to the pond, fishing along the river and gold panning exist throughout the Project Area. Gold panning occurs throughout the project area in and along the river. Identifying specific locations where gold panning can occur would decrease ongoing and future stream and ecological degradation.

Additional challenges existing on site includes access across the river. There are two existing bridges located below the pond and no bridge access from the north above the pond. A small access bridge would benefit this section. The majority of the Project Area is currently not ADA/ABA accessible.

Opportunities for new recreational, educational and interpretive amenities have been identified and are shown on the Recreation Opportunity Survey Graphic in Appendix A. There are many unique features of the site that have the potential to serve as the basis for recreational, interpretive and educational programming elements for diverse audiences. There are numerous opportunities to program the site building on interactive, recreational, and interpretive experiences, while simultaneously improving, restoring and protecting the health and ecology of the area.

This tandem approach is the recommended method to bring cultural and ecological value to the site simultaneously. The following sections identify opportunities for; public gathering spaces, educational and interpretive sites, trail improvements, access and recreation. No significant local, state or federal permitting challenges are anticipated for the recreation, education and interpretive opportunities.

5.2 Public Gathering Spaces

As discussed in the previous section, the Park has one existing formalized gathering space located south of the pond. An additional location for a potential picnic area/gathering space is located to the north of the pond was identified and is shown on Appendix A, Recreation Opportunity Survey. This area is ideally located near the existing stairs offering easy access and would be an ideal spot for a quick picnic. Nearby wetlands provide educational and interpretive opportunities immediately adjacent to and east of this area. As with all other project elements, final locations for public gathering space will be developed through a collaborative process with the project team, stakeholder group and general public. Constraints of this site include the limited access to the area for people of different abilities and mobility types. Stakeholders should consider what the target audience is for these gathering places and what additional amenities will need to be on site to facilitate those user types.

5.3 Educational and Interpretive Opportunities

Many interpretive elements have already been introduced to the site. The proximity to the Town of Fairplay, residential neighborhoods, and existing trail networks create an ideal opportunity for educational and interpretive elements that could reach a large and diverse segment of the community. This report recommends the introduction of interpretive materials and signage to direct users to the Park from Town. Also, visual signage from Highway 285 would provide park awareness and increase park usage. Additional

interventions could include bilingual signage, the inclusion of tactile elements, view platforms and three-dimensional exhibits.

Every site has a unique story to tell and this parcel is no exception. Communicating a larger story and engaging with more interpretive opportunities the site will describe a more interesting narrative. Interpretive elements to consider are as follows:

- Including both science and cultural interpretive topics.
- Hydrology and river morphology.
- Expanded information about variety of wildlife including birds and their habitats.
- Human history including mining and the history of Fairplay.
- Understanding place through surrounding landmarks and mountain ranges.
- The water cycle and our local watersheds
- Importance of water resources and water quality.
- Insects and macro invertebrates in wetlands and riparian areas.
- Angling and fish habitat.
- Mine reclamation and restoration.

The proposed new amenities would link together places on the site that help create a unique narrative. This report recommends working with DHM and conservation groups who have experience on similar local projects to create the educational and interpretive programming.

5.4 Recreational Opportunities

Currently the Project Area supports many passive recreation activities such as angling, walking, hiking, bird watching, picnicking, and nature play. All of these activities could be enhanced by improving, updating and programing the Project Area. A dual benefit of the proposed enhancements is that they would help to protect the restored ecology by directing people into areas specifically designed for recreation and intentionally directing people away from ecologically sensitive areas.

Angling opportunities would be greatly improved by the recommended river bank restorations and in-stream restorations proposed in Section 4.0. Fishing and fishing access could also be greatly improved by formalizing river access points to places along the bank which are safe, stable and offer opportunities for people with a range of capabitlities to interact with the river, (see Appendix A Recreation Opportunity Survey).

Walking and hiking through the site could be improved in a host of ways. Trail improvements and access are discussed in the following section. Hiking and walking offer low impact exercise.

The existing wildlife and bird watching opportunities on the site have the potential to be vastly expanded at the site. Wetland and riparian areas host some of the greatest bird life of any ecosystem type. The ecological restorations recommend in section 4.0 would improve the habitat of bird populations and provide birding enthusiasts with an incredible in-town amenity. Adding wildlife viewing blinds in key areas would provide visitors with an intimate opportunity for viewing wildlife. Focusing on this recreation type also gives the project team an opportunity to collaborate and work with other specialty groups such as the local Audubon Society Chapter. Furthermore, focusing on bird watching as a major element of recreation on the site will encourage users to protect the ecosystem and respect the Project Area.

Finally picnicking and nature play exploration are two recreation objectives that can be easily met by formalizing public gathering areas. A focus on these types of recreation gives families, school groups and people of all ages a passive and enjoyable way to experience the natural environment. These elements can easily and imaginatively be incorporated through seating, shade and interactive interpretive elements.

20

5.5 Trail Improvements and Access

This report advocates for an improved trail system that provides access and connectivity for park visitors. The most ideal trail system would lead visitors to the different planned amenities, as well as allow them to experience the riparian corridor. The recommendation is for the trail to follow existing trail corridors, where possible, to minimize impact to healthy vegetation areas. The incorporation of a small loop trail could be a valuable asset allowing visitors to engage with unique places within the Project Area. Importantly the existing trail needs to be cleared of obtrusive vegetation, undergo over-do maintenance, be reinforced in areas where it is eroding and have way finding practices such as clear lines of sight and signage incorporated.

There are three types of trails which would be most appropriate for the site. The primary trail type would be composed of a wide, firm surface and would connect to the public gathering spaces and interpretive, educational areas. This trail will be accessible for less mobile individuals. The second type of trail would be more primitive and narrow. This trail could pass through several existing and healthy riparian areas. A bridge would be valuable for accessing the upper section of the river and the large high quality wetland located above the pond. Signage is recommended to keep visitors out of identified wetlands throughout the Project Area.

As with all other project elements, alternatives for the trail system configuration will be developed through a collaborative process with the project team, stakeholder group and general public.

Appendix A – Fairplay River Park Ecological and Recreational Graphic Package

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | EXISTING ECOLOGICAL COMMUNITIES: A

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | EXISTING ECOLOGICAL COMMUNITIES: B

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

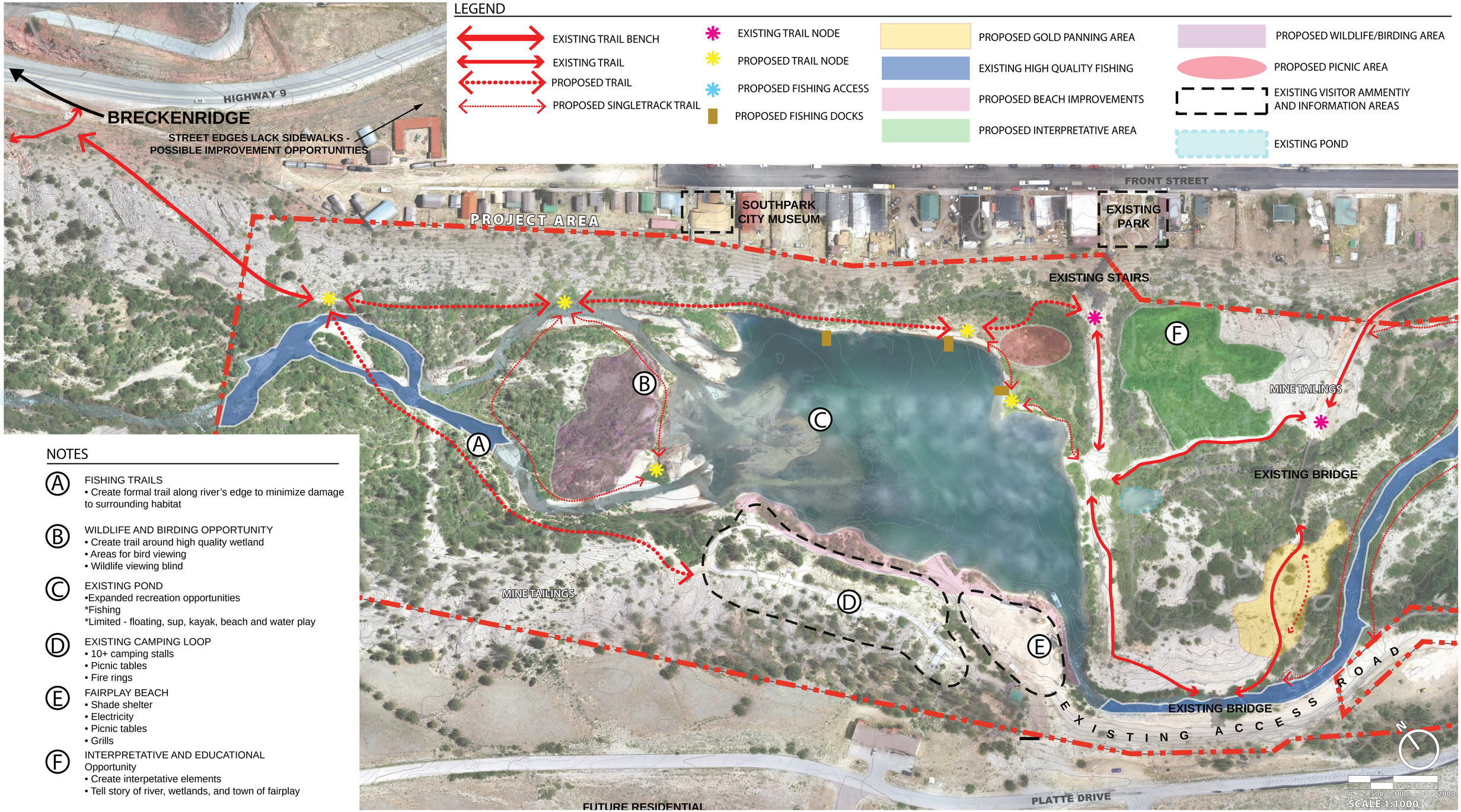
FAIRPLAY RIVER PARK | RESTORATION OPPORTUNITIES: A

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | RESTORATION OPPORTUNITIES: B

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018



NOTES

A FISHING TRAILS
- Create formal trail along river's edge to minimize damage to surrounding habitat

B WILDLIFE AND BIRDING OPPORTUNITY
- Create trail around high quality wetland
- Areas for bird viewing
- Wildlife viewing blind

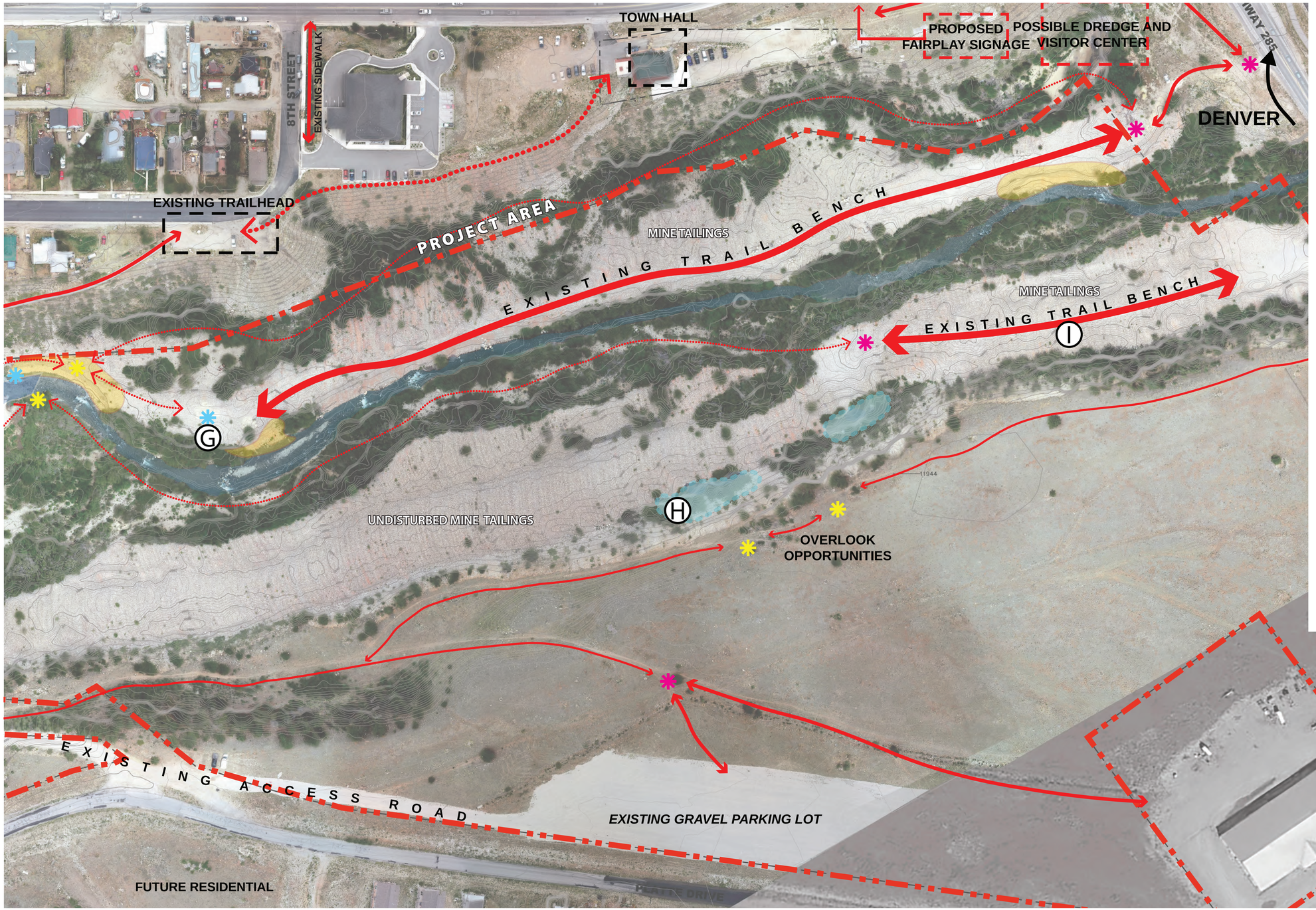
C EXISTING POND
- Expanded recreation opportunities
- *Fishing
- *Limited - floating, sup, kayak, beach and water play

D EXISTING CAMPING LOOP
- 10+ camping stalls
- Picnic tables
- Fire rings

E FAIRPLAY BEACH
- Shade shelter
- Electricity
- Picnic tables
- Grills

F INTERPRETATIVE AND EDUCATIONAL Opportunity
- Create interpetative elements
- Tell story of river, wetlands, and town of fairplay

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING



LEGEND

- EXISTING TRAIL BENCH
- EXISTING TRAIL
- PROPOSED TRAIL
- PROPOSED SINGLETRACK TRAIL
- EXISTING TRAIL NODE
- PROPOSED TRAIL NODE
- PROPOSED FISHING ACCESS
- PROPOSED GOLD PANNING AREA
- EXISTING HIGH QUALITY FISHING
- PROPOSED VISITOR AMMENTIY AND INFORMATION AREAS
- EXISTING VISITOR AMMENTIY AND INFORMATION AREAS
- EXISTING POND

NOTES

G RIVER ACCESS
- Views to peaks
- Fishing
- Gold panning
- "Touch the Water"

H SPRING-FED PONDS (2)
- Fed by underground spring
- Contain fish
- Educational opportunities

I EXISTING TRAIL BENCHES
- Utilize with possible new asphalt/ gravel trails

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | RECREATION OPPORTUNITY SURVEY: B

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | EXISTING STREAM HEALTH ASSESSMENT: A

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

LEGEND

- SIGNIFICANT ACTIVE EROSION
- EXISTING DROP STRUCTURES

RIVER IMPAIRMENT RATING

- SEVERE
- SIGNIFICANT
- MILD
- NEGLIGIBLE

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | EXISTING STREAM HEALTH ASSESSMENT: B

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

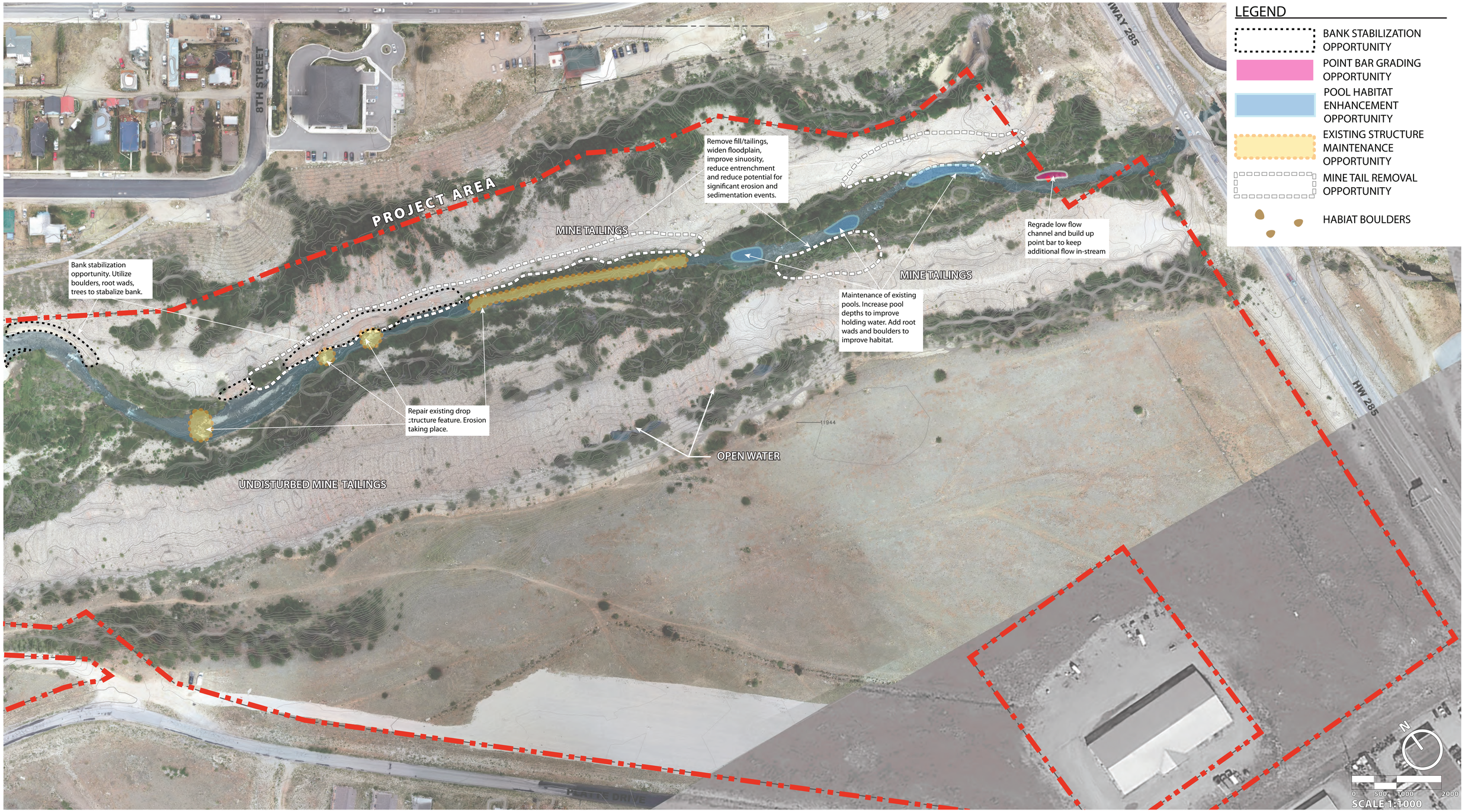
LEGEND

- BANK STABILIZATION OPPORTUNITY
- POINT BAR GRADING OPPORTUNITY
- POOL HABITAT ENHANCEMENT OPPORTUNITY
- EXISTING STRUCTURE MAINTENANCE OPPORTUNITY
- HABITAT BOULDERS

DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | STREAM IMPROVEMENT OPPORTUNITIES: A

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018



DHM DESIGN
LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

FAIRPLAY RIVER PARK | STREAM IMPROVEMENT OPPORTUNITIES: B

FAIRPLAY RIVER RESTORATION
SEPTEMBER 2018

Appendix B - River Assessment and Ecological Integrity Data Sheets

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID: MFSP - 1
Site Name: Assessment Area 1
Project: Fairplay River Park
Date Sep-18

Ecol System: Rocky Mountain Subalpine Montain Riparian Woodland/Shrubl
HGM: Riverine
Cowardin: Palustrine Forested/Scrub Shrub/Emergent

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

	Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank				**2.21**	**C+**
Overall Ecological Integrity + Size Score and Rank				**1.96**	**C-**
Rank Factor: LANDSCAPE CONTEXT	0.30			**1.83**	**C-**
LANDSCAPE METRICS	0.33			**1.50**	**C-**
L1. Contiguous Natural Land Cover	1	2	2		
L2. Land Use Index	1	2	1		
BUFFER METRICS	0.67			**2.00**	**C+**
B1. Perimeter with Natural Buffer	n/a	2	2		
B2. Width of Natural Buffer	n/a	3	2		
B3.1. Condition of Natural Buffer - Veg	n/a	2	2		
B3.2. Condition of Natural Buffer - Soils	n/a	2	2		
Rank Factor: CONDITION	0.70			**2.37**	**C+**
VEGETATION METRICS	0.55			**2.67**	**B-**
V1. Native Plant Species Cover	1	3	3		
V2. Invasive Nonnative Plant Species Cover	1	3	3		
V3. Native Plant Species Composition	1	3	3		
V4. Vegetation Structure	1	2	2		
V5. Regen. of Native Woody Species **(opt.)**	1	2	2		
V65. Coarse and Fine Woody Debris (**opt.**)	1	3	3		
HYDROLOGY METRICS	0.35			**2.00**	**C+**
H1. Water Source	1	2	2		
H2. Hydroperiod	1	1	2		
H3. Hydrologic Connectivity	1	2	2		
PHYSIOCHEMISTRY METRICS	0.10			**2.00**	**C+**
S1. Soil Condition	1	2	2		
S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	2	2		
S3. Algal Growth **(opt.)**	0.5	2	2		
Rank Factor: SIZE	n/a			**2.00**	**C+**
SIZE METRICS	1			**2.00**	**C+**
Z1. Comparative Size **(opt.)**	1	NA	2		
Z2. Change in Size **(opt.)**	1	NA	2		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

2015 COLORADO WETLAND ECOLOGICAL INTEGRITY ASSESSMENT (EIA) – SITE INFORMATION

LOCATION AND GENERAL INFORMATION

Site ID: MFSP - 1 Site Name: Fairplay River Park LEVEL 2.5 ASSESSMENT

Date: August 8-10, 2018 Surveyors: Jeremy Allinson

General Location: Adjacent to the Town of Fairplay County: Park County

General Ownership: Town of Fairplay Specific Ownership: Town of Fairplay

Directions to Point:

From the Town of Fairplay proceed south on Highway 285, the Project Area is located to the west of the bridge upstream on both sides of river.

Access Comments (note permit requirements or difficulties accessing the site):

Contact the Town of Fairplay prior to visit for access constraints.

GPS COORDINATES OF TARGET POINT AND ASSESSMENT AREA

Dimensions of AA:

___40-m radius circle

✓ Freeform polygon, limited to 0.5 ha

___Wetland boundary, other (note in comments)

Elevation (m): 1893 m or 6,200 ft

Slope (deg): 1 deg (2%)

Aspect (deg): 320 deg

AA-Center (Circle AAs Only) WP #: 84 UTM E: 413427mE UTM N: 4341936mN Error (+/-): 13.2 ft.

AA-1 WP #: 67 UTM E: 414102mE UTM N: 4341692mN Error (+/-): 10.2 ft

AA-2 WP #: 73 UTM E: 413587mE UTM N: 4341878mN Error (+/-): 11.5 ft.

AA-3 WP #: 76 UTM E: 413494mE UTM N: 4341978mN Error (+/-): 11.5 ft.

AA-4 WP #: 82 UTM E: 413257mE UTM N: 4342116mN Error (+/-): 10.8 ft

AA-Track Track Name: Uknown Area: 103 acres

AA Placement and Dimensions Comments:

AA 1-4 represent seasonal palustrine emergent herbacious wetlands on site.

PHOTOS OF ASSESSMENT AREA (Taken at four points on edge of AA looking in. Record WPs of each photo in table above.)

AA-1 Photo #: NA Aspect: NA

AA-2 Photo #: 4268 Aspect: 280 deg

AA-3 Photo #: 4270 Aspect: 320 deg

AA-4 Photo #: 4157 Aspect: 270 deg

Photo Range: 4157-4270

Comments: None

Site ID / Name: MSFP - 1 /FAIRPLAY RIVER PARK Date: September 2018

ENVIRONMENTAL DESCRIPTION AND CLASSIFICATION OF ASSESSMENT AREA

Wetland / riparian / upland inclusions: *(should = 100%)*

13 % AA with true wetland and/or water

21 % AA with non-wetland riparian area

28 % AA with upland inclusions

Large mine Tailings/Bare ground 38%

Wetland origin: *(if known)*

____ Natural feature with minimal alteration

✓ Natural feature, but altered or augmented by modification

____ Non-natural feature created by passive or active management

____ Unknown

Ecological System: (see manual for key and pick the *best match*) Fidelity: High Med Low

Rocky Mountain Subalpine Montain Riparian Woodland/Shrubland

Cowardin Classification Fidelity: High Med Low

(see manual and pick *one each* of System, Class, Water Regime, and optional Modifier for dominant type)

Palustrine Forested / Scrub Shrub / Emergent

HGM Class: (pick *only one*) Fidelity: High Med Low

✓ Riverine* ____ Lacustrine Fringe

____ Depressional ____ Slope

____ Flats ____ Novel (Irrigation-Fed) Riverine / Slope

**Specific classification and metrics apply to the Riverine HGM Class*

***RIVERINE SPECIFIC* CLASSIFICATION OF THE ASSESSMENT AREA**

Confined vs. Unconfined Valley Setting

_____ Confined Valley Setting (valley width < 2x bankfull width)

✓ Unconfined Valley Setting (valley width ≥ 2x bankfull width)

Stream Flow Duration

✓ Perennial

_____ Intermittent

_____ Ephemeral

Proximity to Channel

_____ AA includes the channel and both banks

✓ AA is adjacent to or near the channel (< 50 m) and evaluation includes one or both banks

_____ AA is > 50 m from the channel and banks were not evaluated

Stream Depth at Time of Survey (if evaluated)

✓ Wadeable

_____ Non-wadeable

MAJOR ZONES WITHIN THE ASSESSMENT AREA (See manual for rules and definitions. Mark each zone on the site sketch.)

Zone 1 Description: Scrub Shrub Riparian	Dom spp: Salix exigua, Salix monticola	% of AA: 35
Zone 2 Description: Forested Riparian	Dom spp: Pinus longaeva, Populus tremuloides	% of AA: 20
Zone 3 Description: Palustrine Emergent	Dom spp: Carex pellita, Equisetum arvense	% of AA: 50
Zone 4 Description: Upland	Dom spp: Festuca arizonica, Festuca thurberi	% of AA: 30
Zone 5 Description: _____	Dom spp: _____	% of AA: _____

ENVIRONMENTAL AND CLASSIFICATION COMMENTS

Classification Issues (important for sites with medium or low fidelity to one or more classification systems):

The vegetation has been modified in some areas from it's pre-disturbance condition.

AA REPRESENTATIVENESS

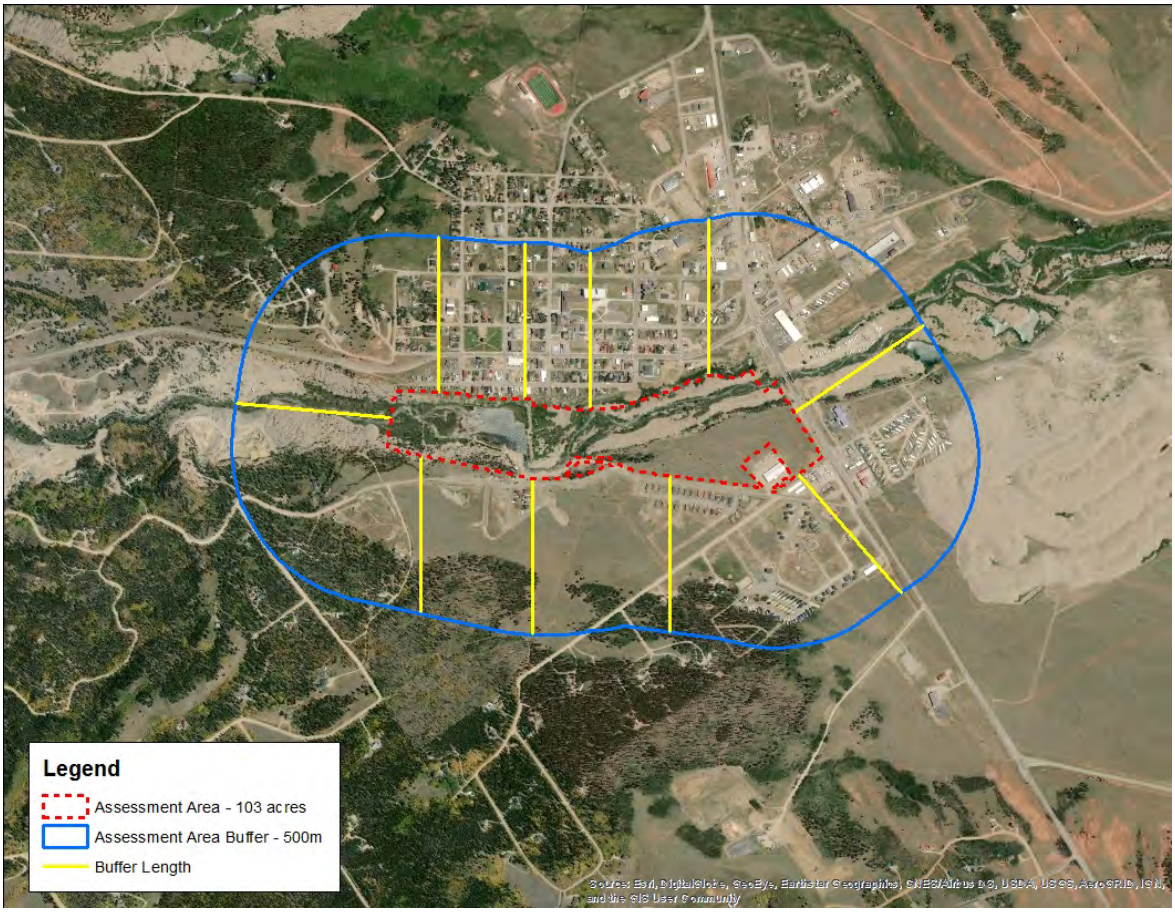
Is AA the entire wetland/riparian area? ☐ Yes ☑ No

If no, is AA representative of larger wetland/riparian area? ☑ Yes ☐ No ☐ NA (*if AA is the entire wetland*)

Comments: The assessment area is 103 acres, the entirety of the project area.

ASSESSMENT AREA DRAWING

Add north arrow and approx. scale bar. Document **habitat features** and **biotic and abiotic zones** (particularly open water), inflows and outflows, and indicate direction of drainage. Include location of **AA points, soil pits,** and **water chemistry** samples. If appropriate, add a **cross-sectional diagram** and indicate slope of side.



ASSESSMENT AREA DESCRIPTION AND COMMENTS

Overall site description and details on site hydrology, soil, and vegetation.

LEVEL 2.5 VEGETATION, SOILS & BASIC WATER CHEMISTRY

VEGETATION PLOT SPECIES TABLE

Cover Classes 1: trace 2: <1% 3: 1–<2% 4: 2–<5% 5: 5–<10% 6: 10–<25% 7: 25–<50% 8: 50–<75% 9: 75–<95% 10: >95%

Scientific Name or Pseudonym	Coll #	Press (√)	Photos	Cover Class	Workspace
INSERT EC					

Appendix C
Vascular Plant Species List
Fairplay River Park

Scientific Name	Common Name	Family	Origin*
Trees			
Pinus longaeva	Bristlecone Pine	Pinaceae	N
Picea pungens	Blue Spruce	Pinaceae	N
Populus angustifolia	Narrowleaf Cottonwood	Salicaceae	N
Populus tremuloides	Quaking Aspen	Salicaceae	N
Pinus contorta	Lodgepole Pine	Salicaceae	N
Juniperus horizontalis	Creeping Juniper	Cupressaceae	N
Shrubs/Subshrubs			
Dasiphora fruticosa	Shrubby cinquefoil	Rosaceae	N
Ribes cereum	Wax currant	Grossulariaceae	N
Amelanchier alnifolia	Serviceberry	Rosaceae	N
Chrysothamnus nauseosus	Rubber rabbitbrush	Asteraceae	N
Chrysothamnus viscidiflorus	Yellow rabbitbrush	Asteraceae	N
Artemisia cana	silver sagebrush	Asteraceae	N
Achillea millefolium	Western Yarrow	Asteraceae	N
Distegia involucrata (Lonicera)	Twinberry, Bush honeysuckle	Caprifoliaceae	N
Prunus virginiana var. melanocarpa	Native chokecherry	Rosaceae	N
Ribes inerme	Whitestem gooseberry	Grossulariaceae	N
Salix geyeriana	geyer willow	Rosaceae	N
Rosa woodsii	Wood rose	Rosaceae	N
Salix exigua	Sandbar willow	Salicaceae	N
Salix frageilis	Crack willow	Salicaceae	I
Salix lucida	Whiplash willow	Salicaceae	N
Salix monticola	Mountain willow	Salicaceae	N
Perennial Graminoids			
Carex aquatilis	Water sedge	Carex	N
Carex simulata	Analog sedge	Carex	N
Primula egaliksensis	Meadow fescue	Primulaceae	N
Carex nebrascensis	Nebraska sedge	Carex	N
Carex rostrata	Beaked sedge	Carex	N
Carex pellita	Wooly sedge	Carex	N
Juncus articulatus	Joint leaf sedge	Carex	
Isolepis cernua	Nodding rush	Cyperaceae	N
Juncus articus subs. Ater(=J.balticu)	Baltic rush	Juncaceae	N
Juncus confusus	Colorado rush	Juncaceae	N
Poa leptocoma	Marsh bluegrass	Poaceae	N
Deschampsia cespitosa	Tufted hairgrass	Poaceae	N
Poa alpina	Alpine bluegrass	Poaceae	N
Perrenial Forbs			
Castilleja	Indian paintbrush	Orobanchaceae	N
Pedicularis groenlandica	elephant's head	Orobanchaceae	N
Ipomopsis aggregata	Scarlet gilia	Polemoniaceae	N
Phacelia sericea	Silky Phacelia	Hydrophyllaceae	N
Cirsium arvense (Breea)	Canada Thistle	Asteraceae	I+
Chamerion latifolium	Dwarf fireweed	Onagraceae	N
Matricaria chamomilla L.	False chamomile	Asteraceae	I+
Helenium autumnale L.	Common sneezeweed	Asteraceae	I
Geranium L.	Blue geranium	Geraniaceae	N
Penstemon strictus	Rocky Mountain penstemon	Scrophulariaceae	N
Veronicastrum serpyllifolia	Thyme leaf speedwell	Scrophulariaceae	N
Vicia americana	American vetch	Fabaceae	N
Ferns and Fern Allies			
Equisetum arvense	Field horsetail	Equisetaceae	N
Hippochaete hyemalis	Scouring rush	Equisetaceae	N
Annual/Biennial Forbs			
Carduus acanthoides	Plumeless thistle	Asteraceae	I+
Melilotus albus	White sweet clover	Fabaceae	I
Melilotus officinalis	Yellow sweet clover	Fabaceae	I
Linaria vulgaris	Yellow toadflax	Brassicacae	I+

*Origin
N=Native, I=Introduced, I+ Colorado State listed Noxious Weed

GROUND COVER BY HABITAT TYPE

Estimate cover of each ground cover by habitat type. Estimate cover based on 1% or 5% increments (not cover classes).

Cover (unless otherwise noted) →	C	Comments
Actual cover of water (any depth, vegetated or not, standing or flowing) (A+B+C below)		Surface water present.
Actual cover of open water zone and no vegetation (or only algae) (A)		
Actual cover of water zone with emergent vegetation (B)	<1%	
Actual cover of water zone with submergent / floating vegetation (C)		
Actual predominant depth of water (cm)	Variable	
Actual max depth of water (cm)	Variable	
Potential cover of water at ordinary high water	Variable	
Potential predominant depth at ordinary high water (cm)	2-4 ft	
Stability of water level *(Pick one:* A: permanent and stable / B: permanent but fluctuates / C: intermittent or ephemeral)	B	
Cover of exposed bare ground (any substrate, can have algae cover)	<50%	Mine tailings
Cover of litter (all cover, including under water or vegetation)	15%	
Depth of litter (cm) – average of four non-trampled locations where litter occurs	2-5cm	
Count of standing dead trees (>25 cm diameter at breast height)	NA	
Cover of standing dead shrubs or small trees (<25 cm diameter at breast height)	NA	
Cover of downed coarse woody debris (fallen trees, rotting logs, >25 cm diameter)	NA	
Cover of downed fine woody debris (<25 cm diameter)	0**	
Cover bryophytes (all cover, including under water, vegetation or litter cover)	<3%	
Cover lichens (all cover, including under water, vegetation or litter cover)	0%	
Cover algae (all cover, including under water, vegetation or litter cover)	0%	

VERTICAL STRATA BY HABITAT TYPE

Estimate cover of each vertical strata by habitat type. Estimate height using classes. Estimate cover base on 1% or 5% increments (not classes).

Height Classes 0: <0.2 m 1: 0.2–0.5 m 2: 0.5–1m 3: 1–2 m 4: 2–5 m 5: 5–10 m 6: 10–15 m 7: 15–20 m 8: 20–35 m 9: 35–50 m 10: >50 m

Vertical Vegetation Strata (live or very recently dead)	**Height / Cover →**	H	C	Comments
(T1) Dominant canopy trees (>5 m and >~ 30% cover)	Pinus longaeva	6	65%	
(T2) Sub-canopy trees (> 5m but < dominant canopy height) or trees with sparse cover	Populus angustifolia	5	35%	
(S1) Tall shrubs, tree saplings or seedling (>2 m)	Salix exigua, Salix monticola, Salix lucida	3	65%	
(S2) Short shrubs (<2 m)	Dasiphora fruticose	2	60%	
(HT) Herbaceous total	Variety of species	1	50%	
(H1) Graminoids (grass and grass-like plants)	Variety of species	1	38%	
(H2) Forbs (all non-graminoids)	Variety of species	1	2%	
(AQ) Submergent or floating aquatics		--	0	

Site ID / Name:_____ Date: _____

SOIL PROFILE DESCRIPTION – SOIL PIT 1 ☐ **Representative Pit?** **WP # _____ Photo #s _____ (mark on site sketch)**

Depth to saturated soil (+/-cm): _____ Depth to free water (+/-cm): _____ ☐ Pit dry and groundwater not observed Settling Time: _____

Horizon (optional)	Depth (cm)	Matrix Color (moist)	Dominant Redox Features Color (moist)	%	Secondary Redox Features Color (moist)	%	Texture	Remarks (*note % visible salts in each layer)*

Hydric Soil Indicators: See field manual for descriptions and check all that apply to pit.

____Histosol (A1)
____Histic Epipedon (A2/A3)
____Mucky Mineral (S1/F1)
____Hydrogen Sulfide Odor (A4)
____Gleyed Matrix (S4/F2)
____Depleted Matrix (A11/A12/F3)
____Redox Features (S5/F6/F8/S6/F7)
____**No Hydric Indicators**

Major Soil Type:
____Histosol
____Histic Epipedon
____Clayey/Loamy
____Sandy

SOIL PROFILE DESCRIPTION – SOIL PIT 2 ☐ **Representative Pit?** **WP # _____ Photo #s _____ (mark on site sketch)**

Depth to saturated soil (+/-cm): _____ Depth to free water (+/-cm): _____ nd groundwater not observed Settling Time: _____

Horizon (optional)	Depth (cm)	Matrix Color (moist)	Dominant Redox Features Color (moist)	%	y Redox Features (moist)	%	T	Remarks (*note % visible salts in each layer)*

Hydric Soil Indicators: See field manual for descriptions and check all that apply to pit.

____Histosol (A1)
____Histic Epipedon (A2/A3)
____Mucky Mineral (S1/F1)
____Hydrogen Sulfide Odor (A4)
____Gleyed Matrix (S4/F2)
____Depleted Matrix (A11/A12/F3)
____Redox Features (S5/F6/F8/S6/F7)
____**No Hydric Indicators**

Comments:

Major Soil Type:
____Histosol
____Histic Epipedon
____Clayey/Loamy
____Sandy

Site ID / Name:_____ Date: _____

SOIL PROFILE DESCRIPTION – SOIL PIT 3 ☐ **Representative Pit?** **WP # _____ Photo #s _____ (mark on site sketch)**

Depth to saturated soil (+/-cm): _____ Depth to free water (+/-cm): _____ ☐ Pit dry and groundwater not observed Settling Time: _____

Horizon (optional)	Depth (cm)	Matrix Color (moist)	Dominant Redox Features Color (moist)	%	Secondary Redox Features Color (moist)	%	Texture	Remarks (*note % visible salts in each layer)*

Hydric Soil Indicators: See field manual for descriptions and check all that apply to pit.

____Histosol (A1)
____Histic Epipedon (A2/A3)
____Mucky Mineral (S1/F1)
____Hydrogen Sulfide Odor (A4)
____Gleyed Matrix (S4/F2)
____Depleted Matrix (A11/A12/F3)
____Redox Features (S5/F6/F8/S6/F7)
____**No Hydric Indicators**

Major Soil Type:
____Histosol
____Histic Epipedon
____Clayey/Loamy
____Sandy

BASIC WATER CHEMISTRY - PH, EC, AND TEMPERATE MEASUREMENTS ☐ **No water observed**

Take pH, EC, and water temperature recording at up to four locations within the ... the appropria... istics. Take measurements within representative examples of the water within or adjacent to the AA, including channels, pools, and/or groundwater. T... ypoints at each loca... te water depth in cm, + for surface water, - for groundwater.

#	GPS WP#	Time of day	Location	D... (...	Surface OR Ground	Standing ... (NA for g...	Clear OR Turbid (NA for ground)	Open OR Shade (NA for ground)	pH	EC	Temp
1					Surface / Ground	Standing / Flowing	Clear / Turbid	Open / Shade			
2					Surface / Ground	Standing / Flowing	Clear / Turbid	Open / Shade			
3					Surface / Ground	Standing / Flowing	Clear / Turbid	Open / Shade			
4					Surface / Ground	Standing / Flowing	Clear / Turbid	Open / Shade			
5					Surface / Ground	Standing / Flowing	Clear / Turbid	Open / Shade			
6					Surface / Ground	Standing / Flowing	Clear / Turbid	Open / Shade			

Water chemistry measurement comments:

Site ID / Name: MSFP - 1 /FAIRPLAY RIVER PARK Date: September 2018

2015 COLORADO WETLAND ECOLOGICAL INTEGRITY ASSESSMENT (EIA) – METRICS

LANDSCAPE METRICS

L1. CONTIGUOUS NATURAL LAND COVER

Select the statement that best describes the **contiguous natural land cover** within the 500 m envelope surrounding the AA. See list of natural land covers in the field manual.

Intact: AA embedded in 90–100% contiguous natural land cover.	**A**
Variegated: AA embedded in 60–90% contiguous natural land cover.	**B**
Fragmented: AA embedded in 20–60% contiguous natural land cover.	**C**
Relictual: AA embedded within <20% contiguous natural land cover.	**D**

L2. LAND USE INDEX

Select the statement that best describes the intensity of surrounding land use. Use the **Land Use Index** Worksheet (last page) to calculate the Land Use Index score.

Land Use Index = 9.5–10.0	**A**
Land Use Index = 8.0–9.4	**B**
Land Use Index = 4.0–7.9	**C**
Land Use Index = <4.0	**D**

Landscape comments:

BUFFER METRICS

B1. PERIMETER WITH NATURAL BUFFER

Select the statement that best describes the **perimeter of the AA with natural buffer**. Buffer land covers must be ≥ 5 m wide and extend along ≥ 10 m of the AA perimeter. See list of buffer land covers in the field manual.

Natural buffer surrounds 100% of the AA perimeter.	**A**
Natural buffer surrounds 75–99% of the AA perimeter.	**B**
Natural buffer surrounds 25–74% of the AA perimeter.	**C**
Natural buffer surrounds <25% of the AA perimeter.	**D**

B2. WIDTH OF NATURAL BUFFER

Select the statement that best describes the **width of the natural buffer**. Estimate the width of buffer land covers along eight lines radiating out from the AA at the cardinal and ordinal directions (N, NE, E, SE, S, SW, W, NW) and average their width. Estimate up to 100 m.

Average buffer width is 100 m	**A**
Average buffer width is 75–99 m	**B**
Average buffer width is 25–74 m	**C**
Average buffer width is <25 m	**D**

B3. CONDITION OF NATURAL BUFFER

Select the statement that best describes the **natural buffer condition**. Select one statement per column. Only consider the actual natural buffer measured in metrics above. *Remember to look for **non-native hay grasses** when evaluating native / non-native vegetation in the buffer.*

Abundant (≥95%) relative cover native vegetation and little or no (<5%) cover of non-native plants.	**A**	Intact soils, no water quality concerns, little or no trash, AND little or no evidence of human visitation.	**A**
Substantial (75–95%) relative cover of native vegetation and low (5–25%) cover of non-native plants.	**B**	Intact or minor soil disruption, minor water quality concerns, moderate or lesser amounts of trash, AND/OR minor intensity of human visitation or recreation.	**B**
Low (25–75%) relative cover of native vegetation and moderate to substantial (25–75%) cover of non-native plants.	**C**	Moderate or extensive soil disruption, moderate to strong water quality concerns, moderate or greater amounts of trash, AND/OR moderate intensity of human use.	**C**
Very low (<25%) relative cover of native vegetation and dominant (>75% cover) of non-native plants OR no buffer exists.	**D**	Barren ground and highly compacted or otherwise disrupted soils, significant water quality concerns, substantial amounts of trash, extensive human use, OR no buffer exists.	**D**

Buffer comments:

VEGETATION COMPOSITION METRICS

V1. NATIVE PLANT SPECIES COVER (RELATIVE)		V2. INVASIVE NONNATIVE PLANT SPECIES COVER (ABSOLUTE)	
Select the statement that best describes the relative cover of **native plant species** within the AA.		Select the statement that best describes the absolute cover of **invasive nonnative plant species** within the AA. Use list provided in the manual.	
AA contains >99% relative cover of native plant species.	**A**	Invasive nonnative species are absent from all strata.	**A**
AA contains 95–99% relative cover of native plant species.	**B**	Invasive species present, but sporadic (<4% absolute cover).	**B**
AA contains 85–95% relative cover of native plant species.	**C**	Noxious weeds somewhat abundant (4–10% cover).	**C**
AA contains 60–85% relative cover of native plant species.	**C-**	Noxious weeds abundant (10–30% cover).	**C-**
AA contains <60% relative cover of native plant species.	**D**	Noxious weed very abundant (>30% cover).	**D**

V3. NATIVE PLANT SPECIES COMPOSITION

Select the statement that best describes the **native plant species composition** (species abundance and diversity) within the AA. Look for native species diagnostic of the system vs. native increasers that may thrive in human disturbance.

Native plant species composition with expected natural conditions: i) Typical range of native diagnostic species present, AND ii) Native species sensitive to anthropogenic degradation are present, AND iii) Native species indicative of anthropogenic disturbance (i.e., increasers, weedy or ruderal species) absent to minor.	**A**
Native plant species composition with minor disturbed conditions: i) Some native diagnostic species absent or substantially reduced in abundance, OR ii) Native species indicative of anthropogenic disturbance are present with low cover.	**B**
Native plant species composition with moderately disturbed conditions: i) Many native diagnostic species absent or substantially reduced in abundance, OR ii) Native species indicative of anthropogenic disturbance are present with moderate cover.	**C**
Native plant species composition with severely disturbed conditions: i) Most or all native diagnostic species absent, a few remain in low cover, OR ii) Native species indicative of anthropogenic disturbance are present with high cover.	**D**

Vegetation composition comments:

VEGETATION STRUCTURE METRICS

V4. VEGETATION STRUCTURE (VERTICAL AND HORIZONTAL)

Select the statement below that best describes the **overall vertical and horizontal structure** within the AA. Vertical structure relates to the number of vertical vegetation strata. Horizontal structure relates to the number and complexity of biotic and abiotic patches within the wetland/riparian area. See reference card for potential structural patches. Assess each site based on the expected conditions within its Ecological System type. For woody systems, rate regeneration and woody debris individually on next page, then consider those ratings in the overall assessment of structure.

Herbaceous systems: Marsh, Meadow, Playa	***Woody systems: Riparian and Floodplain***	
General: Vegetation structure is at or near minimally disturbed natural conditions. Little to no structural indicators of degradation evident.		
Structural patches/zones are appropriate in number and type for the system (can be few in playas, fens, meadows). There is diversity in vertical strata within the herbaceous vegetation (some tall and some short layers and/or low cover of shrubs or trees, where appropriate). Litter and other organic inputs are typical of the system (i.e., playas should have low litter while meadows and marshes should have moderate amounts of litter).	AA is characterized by a complex array of nested or interspersed patches. Canopy (if present) contains a mosaic of different ages or sizes, including large old trees and obvious regeneration. Number of live stems is well within expected range. Shrub and herbaceous layers are complex, providing a diversity of vertical strata. Woody species are of sufficient size and density to provide future woody debris to stream or floodplain. Litter layer is neither lacking nor extensive.	**A**

General: Vegetation structure shows minor alterations from natural conditions.		
Marshes: cattail and bulrush density may prevent animal movement in some areas of the wetland, but not throughout. ***Meadows:*** grazing and mowing have minor effects. ***Playas:*** natural areas of bare ground are still prevalent, though non-native or weedy species may be encroaching.	AA is characterized by a moderate array of nested or interspersed zones with no single dominant zone, though some structural patches (especially open zones) may be missing. Canopy still heterogeneous in age or size, but may be missing some age classes. Vertical strata may be somewhat less complex than natural conditions. Woody debris or litter may be somewhat lacking.	**B**
General: Vegetation structure is moderately altered from natural conditions.		
Marshes: cattail and bulrush density may prevent animal movement in half or more of the wetland. ***Meadows:*** grazing and mowing have moderate effects. ***Playas:*** natural areas of bare ground are present, but non-native or weedy species have filled in many area.	AA is characterized by a simple array of nested or interspersed zones. One zone may dominate others. Vertical strata may be moderately less complex than natural conditions. Site may be denser than natural conditions (due to non-native woody species) or may be more open and decadent. Woody debris or litter may be moderately lacking.	**C**
General: Vegetation structure is greatly altered from natural conditions.		
Marshes: cattail and bulrush density prevent animal movement throughout the wetland. ***Meadows:*** grazing and mowing greatly affect the structure of the vegetation and prevalence of litter. ***Playas:*** natural areas of bare ground are absent due to an abundance of non-native or weedy species.	AA is characterized by one dominant zone and several expected structural patches or vertical strata are missing. Site is either extremely dense with non-native woody species or open with predominantly decadent or dead trees. Woody debris and/or litter may be absent entirely or may be excessive due to decadent trees.	**D**

V5. REGENERATION OF NATIVE WOODY SPECIES		**V6. COARSE AND FINE WOODY DEBRIS**	
Select the statement that best describes the **regeneration of native woody species** within the AA.		Select the statement that best describes **coarse and fine woody debris** within the AA.	
Woody species are naturally uncommon or absent.	**NA**	There are no obvious inputs of woody debris or woody species are naturally uncommon.	**NA**
All age classes of *native* woody species present. Native tree saplings /seedlings and shrubs common to the type present in expected amounts and diversity. Regeneration in obvious.	**A**	AA characterized by moderate amount of coarse and fine woody debris, relative to expected conditions. There is wide size-class diversity of standing snags and downed logs in various stages of decay. For riverine wetlands, debris is sufficient to trap sediment, but does not inhibit stream flow. For non-riverine wetlands, woody debris provides structural complexity, but does not overwhelm the site.	**A/B**
Age classes of *native* woody species restricted to mature individuals and young sprouts. Middle age groups appear to be absent or there is some other indication that regeneration is moderately impacted.	**B**		
Native woody species comprised of mainly mature individuals OR mainly evenly aged young sprouts that choke out other vegetation. Regeneration is obviously impacted. Site may contain Russian Olive and/or Salt Cedar.	**C**	AA characterized by small amounts of woody debris OR debris is somewhat excessive. For riverine wetlands, lack of debris may affect stream temperatures and reduce available habitat.	**C**
Native woody species predominantly consist of decadent or dying individuals OR are absent from an area that should be wooded. Site may be dominated by Russian Olive / Salt Cedar.	**D**	AA lacks woody debris, even though inputs are available.	**D**

Vegetation structure comments (including regeneration and woody debris):

Site ID / Name: MSFP - 1 /FAIRPLAY RIVER PARK Date: September 2018

HYDROLOGY METRICS

H1. WATER SOURCE

Check off all *major* water sources in the table to the right. Select the statement below that best describes the **water sources** feeding the AA during the growing season.

✓	Overbank flooding	_____	Irrigation via direct application
✓	Alluvial aquifer	_____	Irrigation via seepage
✓	Groundwater discharge	_____	Irrigation via tail water run-off
_____	Natural surface flow	_____	Urban run-off / culverts
_____	Precipitation	_____	Pipes (directly feeding wetland)
✓	Snowmelt	_____	Other:

Water sources are natural. Site hydrology is fed by precipitation, groundwater, natural runoff, or natural flow from an adjacent freshwater body. The system may naturally lack water at times, even for several years. There is no indication of direct artificial water sources, either point sources or non-point sources. Land use in the local watershed is primarily open space or low density, passive use with little irrigation.	**A**
Water sources are mostly natural, but also include occasional or small amounts of inflow from anthropogenic sources. Indications of anthropogenic sources include developed land or irrigated agriculture that comprises < 20% of the immediate drainage area, some road runoff, small storm drains or other minor point source discharges. No large point sources control the overall hydrology.	**B**
Water sources are moderately impacted by anthropogenic sources, but are still a mix of natural and non-natural sources. Indications of moderate contribution from anthropogenic sources include developed land or irrigated agriculture that comprises 20–60% of the immediate drainage area or moderate point source discharges into the wetland, such as many small storm drains or a few large ones or many sources of irrigation runoff. The key factors to consider are whether the wetland is located in a landscape position that supported wetlands before irrigation / development *AND* whether the wetland is still connected to its natural water source (e.g., modified ponds on a floodplain that are still connected to alluvial aquifers or natural stream channels that now receive substantial irrigation return flows).	**C**
Water sources are primarily from anthropogenic sources (e.g., urban runoff, direct irrigation, pumped water, artificially impounded water, or another artificial hydrology). Indications of substantial artificial hydrology include developed or irrigated agricultural land that comprises > 60% of `the immediate drainage basin of the AA, or the presence of major drainage point source discharges that obviously control the hydrology of the AA. The key factors to consider are whether the wetland is located in a landscape position that likely never supported a wetland prior to human development *OR* did support a wetland, but is now disconnected from its natural water source. The reason the wetland exists is because of direct irrigation, irrigation seepage, irrigation return flows, urban storm water runoff, or direct pumping.	**D**

Water source comments:

H2. HYDROPERIOD

Select the statement below that best describes the **hydroperiod** within the AA (extent and duration of inundation and/or saturation). Search the AA and 500 m envelope for hydrologic stressors (see list on following pages). Use best professional judgment to determine the overall condition of the hydroperiod. For some wetlands, this may mean that water is being channelized or diverted away from the wetland. For others, water may be concentrated or increased. *Please add comments on next page.*

Hydroperiod is characterized by natural patterns of inundation/saturation and drawdown and/or flood frequency, duration, level and timing. There are no major hydrologic stressors that impact the natural hydroperiod. Riparian channels are characterized by equilibrium conditions with no evidence of severe aggradation or degradation indicative of altered hydrology.	**A**
Hydroperiod inundation and drying patterns deviate slightly from natural conditions due to presence of stressors such as: flood control/water storage dams upstream; berms or roads at/near grade; minor pugging by livestock; small ditches or diversions removing water; or minor flow additions from irrigation return flow or storm water runoff. Outlets may be slightly constricted, but not to significantly slow outflow. Riparian channels may have some sign of aggradation or degradation, but approach equilibrium conditions. Playas are not significantly impacted pitted or dissected. *If wetland is artificially controlled,* the management regime closely mimics a natural analogue (it is very unusual for a purely artificial wetland to be rated in this category).	**B**
Hydroperiod inundation and drying patterns deviate moderately from natural conditions due to presence of stressors such as: flood control/water storage dams upstream or downstream that moderately effect hydroperiod; two lane roads; culverts adequate for base stream flow but not flood flow; moderate pugging by livestock that could channelize or divert water; shallow pits within playas; ditches or diversions 1–3 ft. deep; or moderate flow additions. Outlets may be moderately constricted, but flow is still possible. Riparian channels may show distinct signs of aggradation or degradation. *If wetland is artificially controlled,* the management regime approaches a natural analogue. Site may be passively managed, meaning that the hydroperiod is still connected to and influenced by natural high flows timed with seasonal water levels.	**C**

Hydroperiod inundation and drawdown patterns deviate substantially from natural conditions from high intensity alterations such as: significant flood control / water storage das upstream or downstream; a 4-lane highway; large dikes impounding water; diversions > 3ft. deep that withdraw a significant portion of flow, deep pits in playas; large amounts of fill; significant artificial groundwater pumping; or heavy flow additions. Outlets may be significantly constricted, blocking most flow. Riparian channels may be concrete or artificially hardened. *If wetland is artificially controlled,* the site is actively managed and not connected to any natural season fluctuations.	**D**

Hydroperiod comments:

H3. HYDROLOGIC CONNECTIVITY

Select the statement below that best describes the degree to which **hydrology within the AA is connected to the larger landscape** throughout the year, but particularly at times of high water. Consider the effect of impoundments, entrenchment, or other obstructions to connectivity that occur within the surrounding landscape, if those impoundments clearly impact the AA.

Marsh / Meadow variant	***Playa variant***	***Riverine / Riparian variant***	
No unnatural obstructions to lateral or vertical movement of surface or ground water. Rising water in the site has unrestricted access to adjacent upland, without levees, excessively high banks, artificial barriers, or other obstructions to the lateral movement of flood flows.	Surrounding land cover / vegetation does not interrupt surface flow. No artificial channels feed water to playa.	Completely connected to floodplain (backwater sloughs and channels). No geomorphic modifications made to contemporary floodplain. Channel is not entrenched.	**A**
Minor restrictions to the lateral or vertical movement of surface and ground water by unnatural features such as levees, road grades or excessively high banks. Up to 25% of the site may be restricted by barriers to drainage. Restrictions may be intermittent along the margins of the AA, or they may occur only along one bank or shore. Flood flows may exceed the impoundments, but drainage back into the wetland may be incomplete due to the impoundments.	Surrounding land cover / vegetation may interrupt a minor amount of surface flow. Artificial channels may feed minor amounts of excess water to playa.	Minimally disconnected from floodplain. Up to 25% of stream banks may be affected by dikes, rip rap, and/or elevated culverts. Channel may be somewhat entrenched, but overbank flow occurs during most floods.	**B**
Moderate restrictions to the lateral or vertical movement of surface and ground water by unnatural features such as levees, road grades or excessively high banks. Between 25–75% of the site may be restricted by barriers to drainage. Flood flows may exceed the impoundments, but drainage back into the wetland may be incomplete due to the impoundments.	Surrounding land cover / vegetation may interrupt a moderate amount of surface flow. Artificial channels may feed moderate amounts of excess water to playa.	Moderately disconnected from floodplain due to multiple geomorphic modifications. Between 25-75% of stream banks may be affected by bikes, rip rap, concrete, and/or elevated culverts. Channel may be moderately entrenched and disconnected from the floodplain except in large floods.	**C**
Essentially no hydrologic connection to adjacent landscape. Most or all stages may be contained within artificial banks, levees, or comparable features. Greater than 75% of the site is restricted by barriers to drainage.	Surrounding land cover / vegetation may dramatically restrict surface flow. Artificial channels may feed significant amounts of excess water to playa.	Channel is severely entrenched and entirely disconnected from the floodplain. More than 75% of stream banks may be affected by dikes, rip rap, concrete and/or elevated culverts. Overbank flow never occurs or only in severs floods.	**D**

Hydrologic connectivity comments:

PHYSIOCHEMICAL METRICS

S1. SUBSTRATE / SOIL DISTURBANCE

Select the statement below that best describes disturbance to the substrate or soil within the AA. For playas, the most significant substrate disturbance is sedimentation or unnaturally filling, which prevents the system's ability to pond after heavy rains. For other wetland types, disturbances may lead to bare or exposed soil and may increase ponding or channelization where it is not normally. For any wetland type, consider the disturbance relative to what is expected for the system.

No soil disturbance within AA. Little bare soil OR bare soil areas are limited to naturally caused disturbances such as flood deposition or game trails OR soil is naturally bare (e.g., playas). No pugging, soil compaction, or sedimentation.	**A**
Minimal soil disturbance within AA. Some amount of bare soil, pugging, compaction, or sedimentation present due to human causes, but the extent and impact are minimal. The depth of disturbance is limited to only a few inches and does not show evidence of altering hydrology. Any disturbance is likely to recover within a few years after the disturbance is removed.	**B**
Moderate soil disturbance within AA. Bare soil areas due to human causes are common and will be slow to recover. There may be pugging due to livestock resulting in several inches of soil disturbance. ORVs or other machinery may have left some shallow ruts. Sedimentation may be filling the wetland. Damage is obvious, but not excessive. The site could recover to potential with the removal of degrading human influences and moderate recovery times.	**C**
Substantial soil disturbance within AA. Bare soil areas substantially degrade the site and have led to altered hydrology or other long-lasting impacts. Deep ruts from ORVs or machinery may be present, or livestock pugging and/or trails are widespread. Sedimentation may have severely impacted the hydrology. The site will not recover without active restoration and/or long recovery times.	**D**

Substrate / soil comments and photo #'s:

S2. SURFACE WATER TURBIDITY / POLLUTANTS

Select the statement that best describes the **turbidity or evidence or pollutants** in surface water within the AA.

No open water in AA	**NA**
No visual evidence of turbidity or other pollutants.	**A**
Some turbidity in water (such as turbidity caused by high flows or naturally occurring in playas) OR presence of other pollutants, but limited to small and localized areas within the wetland. Water may be slightly cloudy.	**B**
Water is cloudy or has unnatural oil sheen, but the bottom is still visible. *Note: If the sheen breaks apart when you run your finger through it, it is a natural bacterial process and not water pollution.*	**C**
Water is milky and/or muddy or has unnatural oil sheen. The bottom is difficult to see. *Note: If the sheen breaks apart when you run your finger through it, it is a natural bacterial process and not water pollution.*	**D**

S3. ALGAL GROWTH

Select the statement that best describes **algal growth** within surface water in the AA. Exclude *Chara* (multicellular algae) in cover estimate.

No open water in AA or evidence of open water.	**NA**
Water is clear with minimal algal growth.	**A**
Algal growth is limited to small and localized areas of the wetland. Water may have a greenish tint or cloudiness.	**B**
Algal growth occurs in moderate to large patches throughout the AA. Water may have a moderate greenish tint or sheen.	**C**
Algal mats are extensive, blocking light to the bottom. Water may have a strong greenish tint and the bottom is difficult to see.	**D**

Water quality comments and photo #'s:

Turbidity and algal growth may be natural depending on recent weather patterns and flow timing (i.e., higher flows are often more turbid). Please rank the system as you see it, regardless of whether the conditions are natural. Include good notes and take photos.

SIZE METRICS

Z1. COMPARATIVE SIZE

Select the statement below that best describes the **absolute size** of the wetland, as compared with others of its type.

Meadows and Marshes	*Playas and Fens*	*Riparian Areas*	
>10 hectares (>25 acres)	>2 hectares (>5 acres)	>5 km (>3 miles)	**A**
2–10 hectares (25 acres)	0.5–2 hectares (5 acres)	1–5 km (3 miles)	**B**
0.5–2hectares (5 acres)	0.1–0.5 hectares (1 acre)	0.1–1 km (0.6 mile)	**C**
<0.5 hectare (<1 acre)	<0.1 hectare (<0.25 acre)	<0.1 km (<0.06 mile)	**D**

Comparative size comments:

Z2. CHANGE IN SIZE

Select the statement below that best describes the **change in size** of the wetland.

Occurrence is at, or only minimally reduced (<15%) from its original, natural extent, and has not been artificially reduced in size.	**A**
Occurrence is only somewhat reduced (15-10%) from its original natural extent.	**B**
Occurrence is modestly reduced (10-30%) from its original, natural extent.	**C**
Occurrence is substantially reduced (>30%) from its original, natural extent.	**D**

Change in size comments:

Land Use Index Worksheet

Land Use Categories[1]	*Coefficient*	*500 m Envelope*	
		% Area	*Score*
Paved roads, parking lots, domestic, commercial, and industrial buildings	0	0	0
Gravel pit operation, open pit mining, strip mining, abandoned mines	0		
Unpaved roads (e.g., driveway, tractor trail, 4-wheel drive roads)	1	.03	.03
Resource extraction (oil and gas) Placer Mining	1	40	40
Tilled agricultural crop production (corn, wheat, soy, etc.)	2		
Intensively managed golf courses, sports fields, lawns	2		
Vegetation conversion (chaining, cabling, rotochopping, clearcut)	3		
Heavy grazing by livestock	3		
Logging or tree removal with 50-75% of large trees removed	4		
Intense recreation (ATV use / camping / popular fishing spot, etc.)	4		
Permanent crop agriculture (hay pasture, vineyard, orchard)	4		
Dam sites and disturbed shorelines around water storage reservoirs. Include open water of reservoir is there is intensive recreation, such as boating.	5		
Old fields and other disturbed fallow lands dominated by non-native species	5		
Moderate grazing on rangeland	6		
Moderate recreation (high-use trail)	7		
Selective logging or tree removal with <50% of large trees	8		
Light grazing on rangeland	9		
Light recreation (low-use trail)	9	.001	.009
Natural area / land managed for native vegetation	10	15	150
*Percentages estimated based of aerial imagery	Total Land Use Score		190

Buffer Width Worksheet

1: 78	5: 103
2: 135	6: 89
3: 102	7: 92
4: 96	8: 96

Average width: 98.88 m

Site ID / Name: MSFP - 1 /FAIRPLAY RIVER PARK Date: September 2018

2015 COLORADO ECOLOGICAL INTEGRITY ASSESSMENT (EIA) –STRESSOR CHECKLIST

Stressors: *direct threats*; "the proximate (human) activities or processes that have caused, are causing, or may cause the destruction, degradation, and/or impairment of biodiversity and natural processes" or altered disturbance regime (e.g. flooding, fire, or browse).

Some Important Points about Stressors Checklists:

1. The Stressors Checklist must be completed for the 500 m envelop surrounding the AA (Landscape) and for the 0.5 ha AA (Veg, Hydro, Soils). Rely on imagery in combination with what you can field check.
2. Assess stressors in the 500 m envelope for their effects on land surrounding the AA (*NOT how they may impact the AA*)
3. Stressors for Vegetation, Soils, and Hydrology are assessed across the full 0.5 ha assessment area (AA)
4. Severity has been pre-assigned for many stressors. If the severity differs from the pre-assigned rating, cross it out and note the true severity. If there is more than one pre-assigned value, circle the appropriate value.
5. To comment, note the stressor number before writing comments.

SCOPE of Threat (% of AA or Buffer affected by direct threat)	
1 = Small	Affects a small portion (1-10%) of the AA or landscape
2 = Restricted	Affects some (11-30%) of the AA or landscape
3 = Large	Affects much (31-70%) of the AA or landscape
4 = Pervasive	Affects all or most (71-100%) of the AA or landscape
SEVERITY of Threat within the defined Scope (degree of degradation to AA or Buffer)	
1 = Slight	Likely to only slightly degrade/reduce
2 = Moderate	Likely to moderately degrade/reduce
3 = Serious	Likely to seriously degrade/reduce
4 = Extreme	Likely to extremely degrade/destroy or eliminate

UPDATE

		500 m Envelope Landscape			ASSESSMENT AREA (0.5 ha)									
					Vegetation			Soil / Substrate			Hydrology			
	STRESSORS CHECKLIST	Scope	Severity	IMPACT	Scope	Severity	IMPACT	Scope	Severity	IMPACT	Scope	Severity	IMPACT	Comments
	1. Residential, recreational buildings, associated pavement	3	3	2										
D	2. Industrial, commercial, military buildings, associated pavement		4											
E	3. Oil and gas wells and surrounding footprint		4											
V	4. Roads (gravel=2, paved=3, highway=4), railroad=3	2	2, 3, 4	2										
E	5. Sports field, golf course, urban parkland, expansive lawns	~~3~~	~~2~~	~~3~~										
L	6. Row-crop agriculture, orchard, nursery	~~1~~	~~3~~	~~1~~										
O	7. Hay field, fallow field	~~2~~	~~2, 3~~	~~2~~										
P	8. Utility / power line corridor	1	1, 2, 3			1, 2, 3								
	9. Other [specify]:													
R	10. Low impact recreation (hunting, fishing, camping, hiking, bird-watching, canoe/kayak)	1	1	1	1	1	1							
E	11. High impact recreation (ATV, mountain biking, motor boats)		3			3								
C	12. Other [specify]:													
	13. Tree resource extraction (clear cut=3 or 4, selective cut= 2 or 3)		2, 3, 4			2, 3, 4								
	14. Vegetation management (cutting, mowing)		2			2								
V	15. Livestock grazing, excessive herbivory by native species (ungulates, prairie dogs) (low=1, mod=2, high=3)		1, 2, 3			1, 2, 3								
E	16. Insect pest damage (low=1, mod=2, high=3)		1, 2, 3			1, 2, 3								
G	17. Invasive plant species (see noxious weed list)		3		1	3	3							
	18. Direct application of agricultural chemicals, herbicide spraying		2, 3			2, 3								
	19. Other [specify]:													
N	20a. Evidence of recent fire (low=1, mod=2, high=3)		1, 2, 3			1, 2, 3								
A	20b. Recent beaver dam blowout		1, 2			1, 2								
T	21. Other [specify]:													

Site ID / Name: MSFP - 1 /FAIRPLAY RIVER PARK Date: September 2018

		500 m Envelope Landscape			ASSESSMENT AREA (0.5 ha)									
					Vegetation			Soil / Substrate			Hydrology			
	STRESSORS CHECKLIST	Scope	Severity	IMPACT	Scope	Severity	IMPACT	Scope	Severity	IMPACT	Scope	Severity	IMPACT	Comments
SOILS	22. Excessive sediment or organic debris (inputs from recently logged sites, sedimentation in playas)	1	1	1										
	23. Excessive erosion or loss of organic matter (gullying, decay of organic soils)													
	24. Trash or refuse dumping													
	25. Filling or dumping of sediment (spoils from excavation)													
	26. Substrate removal (excavation)													
	27. Indirect soil disturbance (compaction or trampling by livestock, human use, vehicles)	1	1	1										
	28. Direct soil disturbance (grading, compaction, plowing, discing, deeply dug fire lines)	1	1	1										
	29. Physical resource extraction (rock, sand, gravel, minerals, etc.)	2	2	4	2	4	8							
	30. Obvious excess salinity (dead or stressed plants, salt crusts)													
	31. Other [specify]:													
HYDROLOGY	32. PS discharge (waste water treatment, factory discharge, septic)													
	33. NPS discharge (urban / storm water runoff)													
	34. NPS discharge (agricultural runoff, excess irrigation, feedlots, excess manure)										1	1	1	
	35. NPS discharge (mine runoff, discharge from oil and gas)	2	4	8	2	4	8							
	36. Large dams / reservoirs													
	37. Impoundments, berms, dikes, levees that hold water in or out													
	38. Canals, diversions, ditches, pumps that move water in or out													
	39. Excavation for water retention (gravel ponds, pitted playas)													
	40. Groundwater extraction (few small wells=2, extensive extraction cause a lowered water table=4)													
	41. Flow obstructions (culverts, paved stream crossings)													
	42. Engineered channel (riprap, armored channel bank, bed)													
	43. Control of flow and energy (weir/drop structure, dredging)													
	44. Other [specify]:													
Stressors Very Minimal or Not Evident (check box, if true)		☐			☐			☐			☐			
STRESSOR RATING BY CATEGORY (Envelope, Veg, Soils, Hydro)		Score: 3.6	Rating: H		Score: 3.7	Rating: H		Score: 0.8	Rating: L		Score: 1	Rating: 0.3		HIS Score: 8.4 / HIS Rating: High
OVERALL HUMAN STRESSOR INDEX (HSI) – use category weights		0.3			0.3			0.1			0.3			

Threat Impact Calculator		Scope			
		Pervasive = 4	Large = 3	Restricted = 2	Small = 1
Severity	Extreme = 4	VERY HIGH = 10	High = 7	*Medium = 4*	Low = 1
	Serious = 3	High = 7	High = 7	*Medium = 4*	Low = 1
	Moderate = 2	*Medium = 4*	*Medium = 4*	Low = 1	Low = 1
	Slight = 1	Low = 1	Low = 1	Low = 1	Low = 1

Category / HSI Roll-up Formulas	
Score	Rating
10+	Very High
7 – 9.9	High
4 – 6.9	Medium
1 – 3.9	Low
0 – 0.9	Absent

Middle Fork South Platte River	River/Stream	Date	August 8-10, 2018
Site 1/Reach 1	Site/Reach ID	Evaluators	Jeremy Allinson
Fairplay River Park	Project ID		
5950 Reach length (feet)		Affiliation	Natural Resource Coordinator/L

C+	**V_{hyd}**	B+	$V_{hyd}1$: Total Volume
L	Confidence	B	$V_{hyd}2$: Peak Flows
		C+	$V_{hyd}3$: Base Flows
		C	$V_{hyd}4$: Flow Variability
C+	**V_{sed}**	D-	$V_{sed}1$: Land Erosion
M	Confidence	D-	$V_{hyd}2$: Channel Erosion
		D	$V_{hyd}3$: Transport
B	**V_{chem}**	B	$V_{chem}1$: Temperature Regime
L	Confidence	D	$V_{chem}2$: Organics/Nutrients
		B	$V_{chem}3$: Inorganics/Toxins
C	**V_{con}**	C	$V_{con}1$: Saturation Frequency
M	Confidence	C-	$V_{con}2$: Floodplain Width
		C	$V_{con}3$: Saturation Duration
C	**V_{veg}**	C	$V_{veg}1$: Woody Veg. Structure
M	Confidence	C	$V_{veg}2$: Herbaceous Veg. Str.
		B	$V_{veg}3$: Species Diversity
C+	**V_{deb}**	B	$V_{deb}1$: LWD
L	Confidence	C	$V_{deb}2$: Detritus
D	**V_{morph}**	C	$V_{morph}1$: Stream Evolution
M	Confidence	C-	$V_{morph}2$: Planform
		C	$V_{morph}3$: Dimension
		D-	$V_{morph}4$: Profile
D	**V_{stab}**	D-	$V_{stab}1$: Dynamic Eq.
M	Confidence	D-	$V_{stab}2$: Resilience
C+	**V_{str}**	C	$V_{str}1$: Hydraulic Structure
M	Confidence	B+	$V_{str}2$: Coarse Scale
		B-	$V_{str}3$: Fine Scale
B	**V_{bio}**	C+	$V_{bio}1$: Biotic Structure
	Confidence		
C	**Reach Condition Score**		

Process Domain

Physographic Region	Rockies
Hydrologic Region	Mountains
Ecoregion	CF
Strahler Order	2
Valley Confinement	UC
Valley Slope	L
Riparian Reference	Forested

Morphology

Stream Type	Rosgen	SEM
Existing	D	8
Reference	DB	0

Biology Functions FCI	**0.58**
Physicochemical Functions FCI	**0.60**
Geomorphology Functions FCI	**0.48**
Hydraulic Functions FCI	**0.48**
Overall FCI	**0.54**

FACStream Summary					
Scale	Variable		Grade	Degree of Impairment	Confidence
Watershed	V_{hyd}	Flow Regime	C+	Significant/mild	L
	V_{sed}	Sediment Regime	C+	Significant/mild	M
	V_{chem}	Water Quality	B	Mild	L
Riparian	V_{con}	Floodplain Connectivity	C	Significant	M
	V_{veg}	Riparian Vegetation	C	Significant	M
	V_{deb}	Debris	C+	Significant/mild	L
Stream	V_{morph}	Stream Morphology	D	Severe	M
	V_{stab}	Stability	D	Severe	M
	V_{str}	Physical Structure	C+	Significant/mild	M
	V_{bio}	Biotic Structure	B	Mild	
Overall FCI			Reach Condition Score	Degree of Impairment of Reach	
0.54			C	Significant	

Appendix C – Wildlife and Plant Species Lists

Appendix C - Table 1
Vascular Plant Species List
Fairplay River Park

Scientific Name	Common Name	Family	Origin*
Trees			
Pinus longaeva	Bristlecone Pine	Pinaceae	N
Picea pungens	Blue Spruce	Pinaceae	N
Populus angustifolia	Narrowleaf Cottonwood	Salicaceae	N
Populus tremuloides	Quaking Aspen	Salicaceae	N
Pinus contorta	Lodgepole Pine	Salicaceae	N
Juniperus horizontalis	Creeping Juniper	Cupressaceae	N
Shrubs/Subshrubs			
Dasiphora fruticosa	Shrubby cinquefoil	Rosaceae	N
Ribes cereum	Wax currant	Grossulariaceae	N
Amelanchier alnifolia	Serviceberry	Rosaceae	N
Chrysothamnus nauseosus	Rubber rabbitbrush	Asteraceae	N
Chrysothamnus viscidiflorus	Yellow rabbitbrush	Asteraceae	N
Artemisia cana	Silver sagebrush	Asteraceae	N
Achillea millefolium	Western Yarrow	Asteraceae	N
Distegia involucrata (Lonicera)	Twinberry, Bush honeysuckle	Caprifoliaceae	N
Prunus virginiana var. melanocarpa	Native chokecherry	Rosaceae	N
Ribes inerme	Whitestem gooseberry	Grossulariaceae	N
Salix geyeriana	Geyer willow	Rosaceae	N
Rosa woodsii	Wood rose	Rosaceae	N
Salix exigua	Sandbar willow	Salicaceae	N
Salix frageilis	Crack willow	Salicaceae	I
Salix lucida	Whiplash willow	Salicaceae	N
Salix monticola	Mountain willow	Salicaceae	N
Perennial Graminoids			
Carex aquatilis	Water sedge	Carex	N
Carex simulata	Analog sedge	Carex	N
Primula egaliksensis	Meadow fescue	Primulaceae	N
Carex nebrascensis	Nebraska sedge	Carex	N
Carex rostrata	Beaked sedge	Carex	N
Carex pellita	Wooly sedge	Carex	N
Juncus articulatus	Joint leaf sedge	Carex	
Isolepis cernua	Nodding rush	Cyperaceae	N
Juncus articus subs. Ater(=J.balticu)	Baltic rush	Juncaceae	N
Juncus confusus	Colorado rush	Juncaceae	N
Poa leptocoma	Marsh bluegrass	Poaceae	N
Deschampsia cespitosa	Tufted hairgrass	Poaceae	N
Poa alpina	Alpine bluegrass	Poaceae	N
Perrenial Forbs			
Castilleja	Indian paintbrush	Orobanchaceae	N
Pedicularis groenlandica	Elephant's head	Orobanchaceae	N
Ipomopsis aggregata	Scarlet gilia	Polemoniaceae	N
Phacelia sericea	Silky Phacelia	Hydrophyllaceae	N
Cirsium arvense (Breea)	Canada Thistle	Asteraceae	I+
Chamerion latifolium	Dwarf fireweed	Onagraceae	N
Matricaria chamomilla L.	False chamomile	Asteraceae	I+
Helenium autumnale L.	Common sneezeweed	Asteraceae	I
Geranium L.	Blue geranium	Geraniaceae	N
Penstemon strictus	Rocky Mountain penstemon	Scrophulariaceae	N
Veronicastrum serpyllifolia	Thyme leaf speedwell	Scrophulariaceae	N
Vicia americana	American vetch	Fabaceae	N
Ferns and Fern Allies			
Equisetum arvense	Field horsetail	Equisetaceae	N
Hippochaete hyemalis	Scouring rush	Equisetaceae	N
Annual/Biennial Forbs			
Carduus acanthoides	Plumeless thistle	Asteraceae	I+
Melilotus albus	White sweet clover	Fabaceae	I
Melilotus officinalis	Yellow sweet clover	Fabaceae	I
Linaria vulgaris	Yellow toadflax	Brassicacae	I+

*Origin
N=Native, I=Introduced, I+ Colorado State listed Noxious Weed

Appendix C Table 2 – Potential State / Federal Threatened and Endangered Species

Species (Common Name)	Scientific Name	Type	Listing
Peregrine Falcon	*Falco peregrinus*	Bird	State Special Concern (SC)
Burrowing owl	*Athene cunicularia*	Bird	State Threatened
Least Tern	*Sterna antillarum*	Bird	Federally Threatened
	Known or Suspected Animal List		
American dipper	*Cinclus mexicanus*	Bird	N/A
American kestrel	*Falco sparverius*	Bird	N/A
American robin	*Turdus migratorius*	Bird	N/A
Bald eagle	*Haliaeetus leucocephalus*	Bird	N/A
Black-billed magpie	*Pica hudsonia*	Bird	N/A
Black-capped chickadee	*Poecile atricapillus*	Bird	N/A
Blue-gray gnatcatcher	*Polioptila caerulea*	Bird	N/A
Canada goose	*Branta canadensis*	Bird	N/A
Chipping sparrow	*Spizella passerina*	Bird	N/A
Cinnamon teal	*Anas cyanoptera*	Bird	N/A
Common raven	*Common raven*	Bird	N/A
Cooper's hawk	*Accipiter cooperii*	Bird	N/A
Cordilleran flycatcher	*Empidonax occidentalis*	Bird	N/A
Dark-eyed junco	*Junco hyemalis*	Bird	N/A
Downey woodpecker	*Picoides pubescens*	Bird	N/A
Dusky flycatcher	*Empidonax oberholseri*	Bird	N/A
Fox sparrow	*Passerella iliaca*	Bird	N/A
Great blue heron	*Ardea herodias*	Bird	N/A
Great horned owl	*Bubo virginianus*	Bird	N/A
Flammulated owl	*Psiloscops flammeolus*	Bird	N/A
Northern Pygmy-owl	*Glaucidium gnoma*	Bird	N/A
Long-eared owl	*Asio otus*	Bird	N/A
Short-eared owl	*Asio flammeus*	Bird	N/A
Boreal owl	*Aegolius funereus*	Bird	
Green-winged teal	*Anas carolinensis*	Bird	N/A
Hairy woodpecker	*Leuconotopicus villosus*	Bird	N/A
House finch	*Haemorhous mexicanus*	Bird	N/A
House wren	*Troglodytes aedon*	Bird	N/A
Lewis' woodpecker	*Melanerpes lewis*	Bird	N/A
Lincoln's sparrow	*Melospiza lincolnii*	Bird	N/A
MacGillivray's warbler	*Geothlypis tolmiei*	Bird	N/A
Mallard	*Anas platyrhynchos*	Bird	N/A
Mountain dove	*Spilopelia chinensis*	Bird	N/A
Mountain bluebird	*Sialia currucoides*	Bird	N/A
Mountain chickadee	*Poecile gambeli*	Bird	N/A
Orange-Crowned warbler	*Vermivora celata*	Bird	N/A
Osprey	*Pandion haliaetus*	Bird	N/A
Peregrine falcon	*Falco peregrinus*	Bird	N/A
Plubeous vireo	*Vireo plumbeus*	Bird	N/A
Northern flicker	*Colaptes auratus*	Bird	N/A
Red-tailed hawk	*Buteo jamaicensis*	Bird	N/A
Red-winged blackbird	*Agelaius phoeniceus*	Bird	N/A
Ruby-crowned kinglet	*Regulus calendula*	Bird	N/A
Song sparrow	*Melospiza melodia*	Bird	N/A
Spotted sandpiper	*Actitis macularius*	Bird	N/A
Stellars jay	*Cyanocitta stelleri*	Bird	N/A
Townsend's solitaire	*Myadestes townsendi*	Bird	N/A
Tree swallow	*Tachycineta bicolor*	Bird	N/A
Vesper sparrow	*Pooecetes gramineus*	Bird	N/A
Western tanager	*Piranga ludoviciana*	Bird	N/A

Table 2 – Potential State and Federal Threatened and Endangered Species (cont.)

Species (Common Name)	Scientific Name	Type	Listing
White-breasted nuthatch	*Sitta carolinensis*	Bird	N/A
White-crowned sparrow	*Zonotrichia leucophrys*	Bird	N/A
Wild turkey	*Meleagris gallopavo silvestris*	Bird	N/A
Yellow warbler	*Setophaga petechia*	Bird	N/A
Yellow-rumped warbler	*Setophaga coronata*	Bird	N/A
American beaver	*Castor canadensis*	Mammal	N/A
Big brown bat	*Eptesicus fuscus*	Mammal	N/A
Black bear	*Ursus americanus*	Mammal	N/A
Bobcat	*Lynx rufus*	Mammal	N/A
Bushy-tailed woodrat	*Neotoma cinerea*	Mammal	N/A
Common muskrat	*Ondatra zibethicus*	Mammal	N/A
Squirrel	*Sciuridae*	Mammal	N/A
Common porcupine	*Erethizon dorsatum*	Mammal	N/A
Coyote	*Canis latrans*	Mammal	N/A
Deer mouse	*Peromyscus*	Mammal	N/A
Moose	*Alces alces*	Mammal	N/A
Elk	*Cervus canadensis*	Mammal	N/A
Ermine or short-tailed weasel	*Mustela erminea*	Mammal	N/A
Golden-mantled ground squirrel	*Callospermophilus lateralis*	Mammal	N/A
Hoary bat	*Lasiurus cinereus*	Mammal	N/A
Least chipmunk	*Tamias minimus*	Mammal	N/A
Little brown myotis	*Myotis lucifugus*	Mammal	N/A
Long-legged myotis	*Myotis volans*	Mammal	N/A
Long-tailed weasel	*Mustela frenata*	Mammal	N/A
Meadow vole	*Microtus pennsylvanicus*	Mammal	N/A
Montane vole	*Microtus montanus*	Mammal	N/A
Mountain lion	*Puma concolor*	Mammal	N/A
Mule deer	*Odocoileus hemionus*	Mammal	N/A
Northern pocket gopher	*Thomomys talpoides*	Mammal	N/A
Raccoon	*Procyon lotor*	Mammal	N/A
Silver-haired bat	*Lasionycteris noctivagans*	Mammal	N/A
Striped skunk	*Mephitis mephitis*	Mammal	N/A
Rainbow trout	*Oncorhynchus mykiss*	Fishes	N/A
Brown trout	*Salmo trutta*	Fishes	N/A
Brooke trout	*Salvelinus fontinalis*	Fishes	N/A
Colorado Cutthroat Trout	*Oncorhynchus clarki pleuriticus*	Fishes	N/A
Mountain Whitefish	*Prosopium williamsoni*	Fishes	N/A

Appendix D - Additional Photo Documentation

View looking at area where sigificant bank erosion is taking place. Active erosion taking place at both low and high flows. Significant at high flows. Reccomended intervention would be to stabalize bank with root wads and boulders.

View of active bank erosion area. Reccomended intervention would be to stabalize bank with root wads and boulders.

View of bank erosion area influenced by cobble deposition causing incising of stream channel and increased flow.

Reduce impacts by regrading cobble deposition and re-align channel.

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River Bank Erosion

FAIRPLAY RIVER PARK
August 2018

View looking at high functioning section of river located upstream of Project Area. Diverse habitat for fish, cover, and good flow.

View looking at functional habitat structure upstream of Project Area. Log stabalized with cable and minimal cobble deposition.

View looking at high quality natural fish habitat within Project Area. Good cutbank habitat with deep pool.

View looking at low functioning stream section. Reccomendend intervention grade point bars and low flow channel to increase habitat.

View looking at low fucntion stream system. Regrade low flow channel to improve holding water for fish.

View looking at existing sctructur requiring maintenance. Regrade cobble bar to allow for pool function.

View looking downstream at bank erosion leading to undermining of existing river structure. Reccomended intervention would be to remove or regrade talings to stabalize slope. Key in addtional boulders to stabalize structure. Add riparian planings to stablalize slope.

View looking upstream at significantly impaired section of river bank. Highly incised bank is actively eroding. Reccomended intervention would be to remove and re-grade tailings to stabalize slope. Add riparian plantings to stabalize slope.

View looking updstream at significantly impaired sectio of river. Highly incised bank.

View looking at structures created for gold panning.

View looking at gold panning activities on river channel.

View looking at man-made pools created for gold panning.

View looking at erosion and undermining taking place to existing river structure from gold panning activities.

View looking at poool and bank degradation caused from gold panning activities.

View looking at high quality, high functioning wetland. Good plant composition and diversity.

View looking at high quality wetland.

View looking at beaver complex occuring within Project Area.

View looking at beaver dam that has created good fish rearing habitat.

High quality fish rearing habitat.

Functional existing wetland. Good location for interprative/educational opportunities.