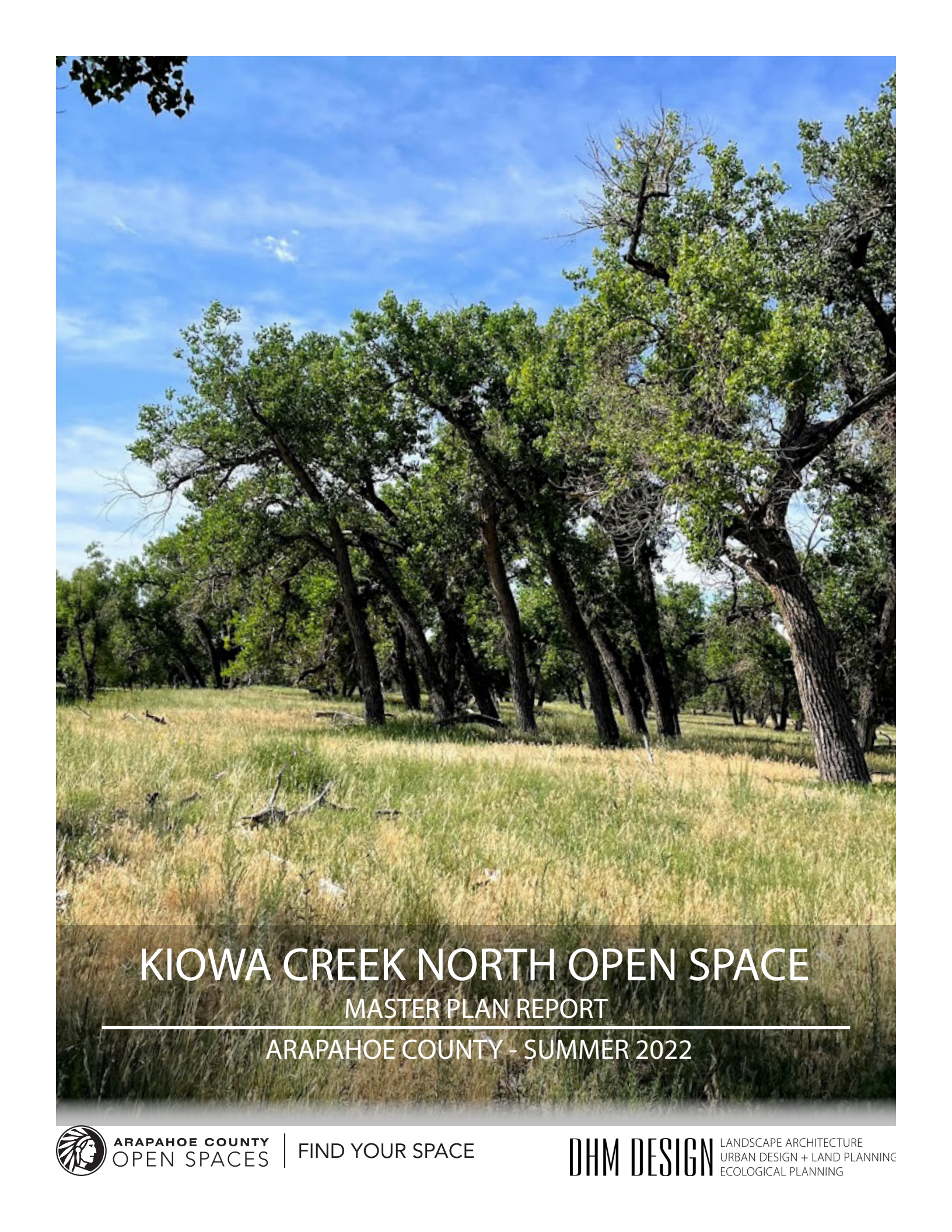




KIOWA CREEK NORTH OPEN SPACE

MASTER PLAN REPORT

ARAPAHOE COUNTY - SUMMER 2022



ARAPAHOE COUNTY
OPEN SPACES

| FIND YOUR SPACE

DHM DESIGN

LANDSCAPE ARCHITECTURE
URBAN DESIGN + LAND PLANNING
ECOLOGICAL PLANNING

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Design Team

Arapahoe County Open Spaces:

Shannon Carter, Open Spaces and Intergovernmental Relations Director
Roger Harvey, Open Spaces Planning Administrator
Raymond Winn, Open Space Planner
Glen Poole, Parks Coordinator

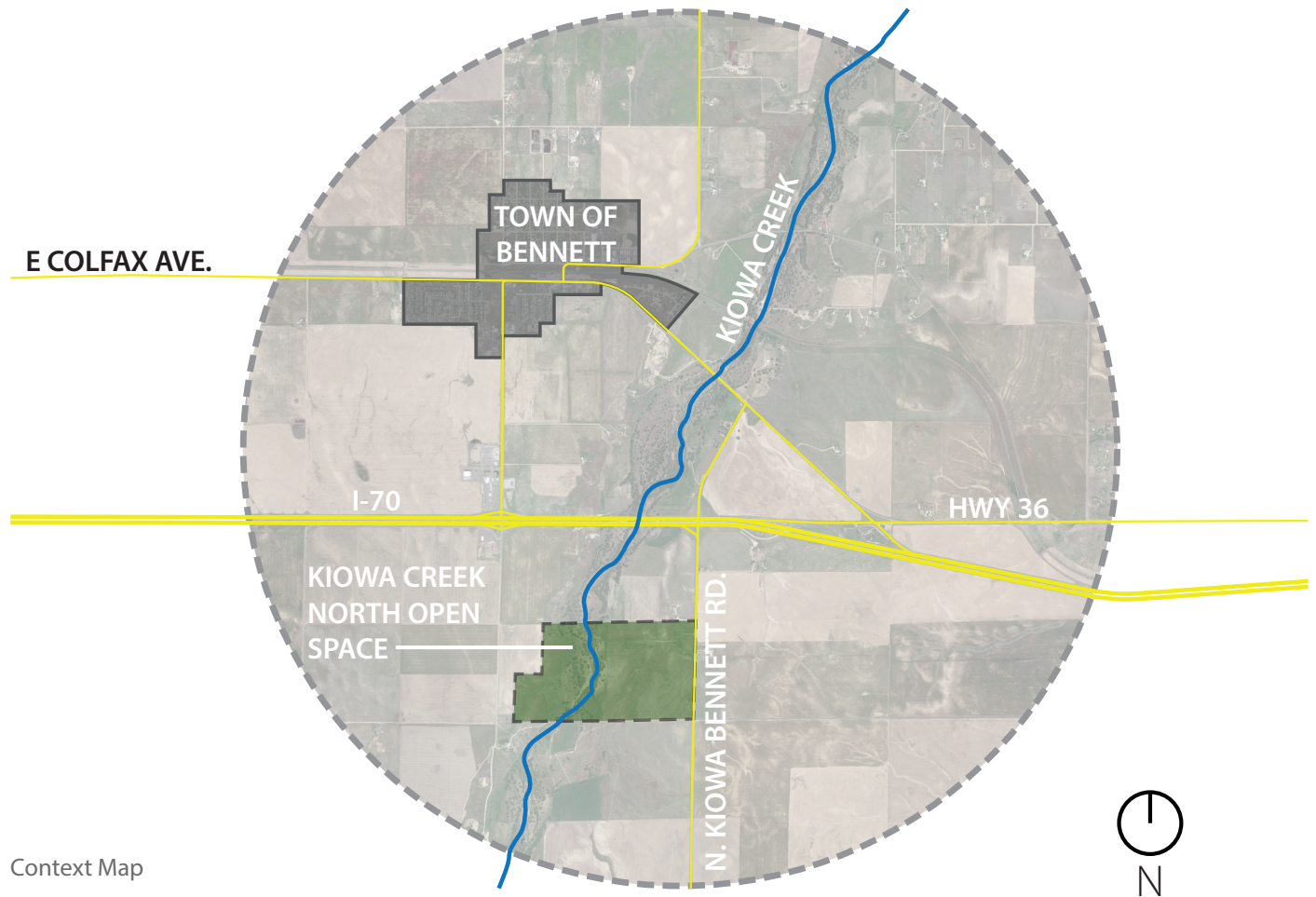
DHM Design:

Matthew Whipple, Principal
Joe Anderson, Designer

Two Dot Consulting:

Kelly Kinsman, Environmental Specialist

Executive Summary

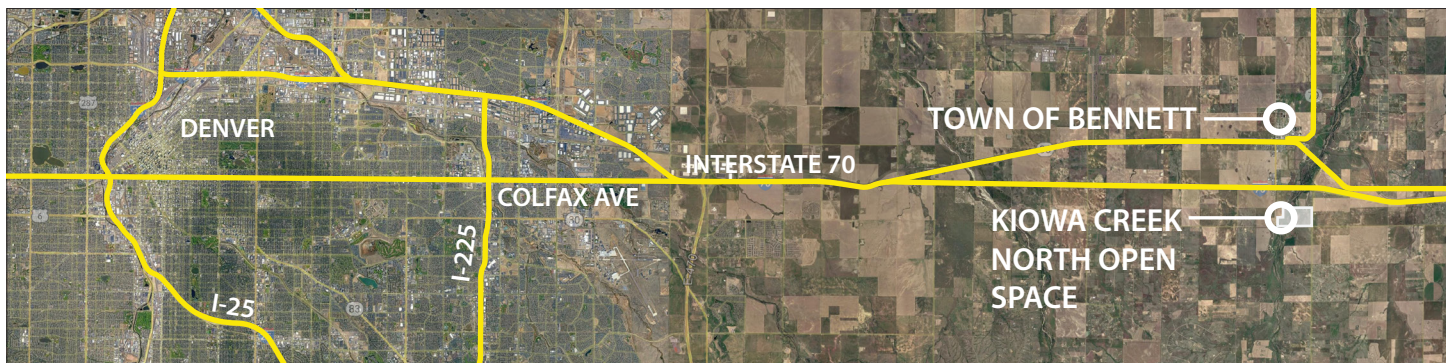


Context Map

Kiowa Creek North, located in Arapahoe County on the northwest corner of Kiowa Bennett Road and Mitchell Road, in Bennett, Colorado, and is approximately 265 acres of unimproved open space. The property was purchased in 2009 to be maintained as an open space, for future passive use recreation. Project programming was determined through community outreach efforts and available budget. The site is unique because of its matrix of ecological communities and intact riparian corridor splitting the site. This riparian corridor provides abundant opportunities for enhancing and preserving essential wildlife habitat and a unique ecological setting amongst highly developed rural agricultural communities.

DHM Design began developing the master plan for the Kiowa Creek North property in 2020, and further design development is on-going. The proposed master plan includes looped multi-use trails, equestrian trails, picnic areas, site overlooks, parking areas, and ecological enhancement of degraded areas of the site. The following report details site background information, the site assessment process, program recommendations and alternates, and public feedback of the proposed master plan.

Site Location

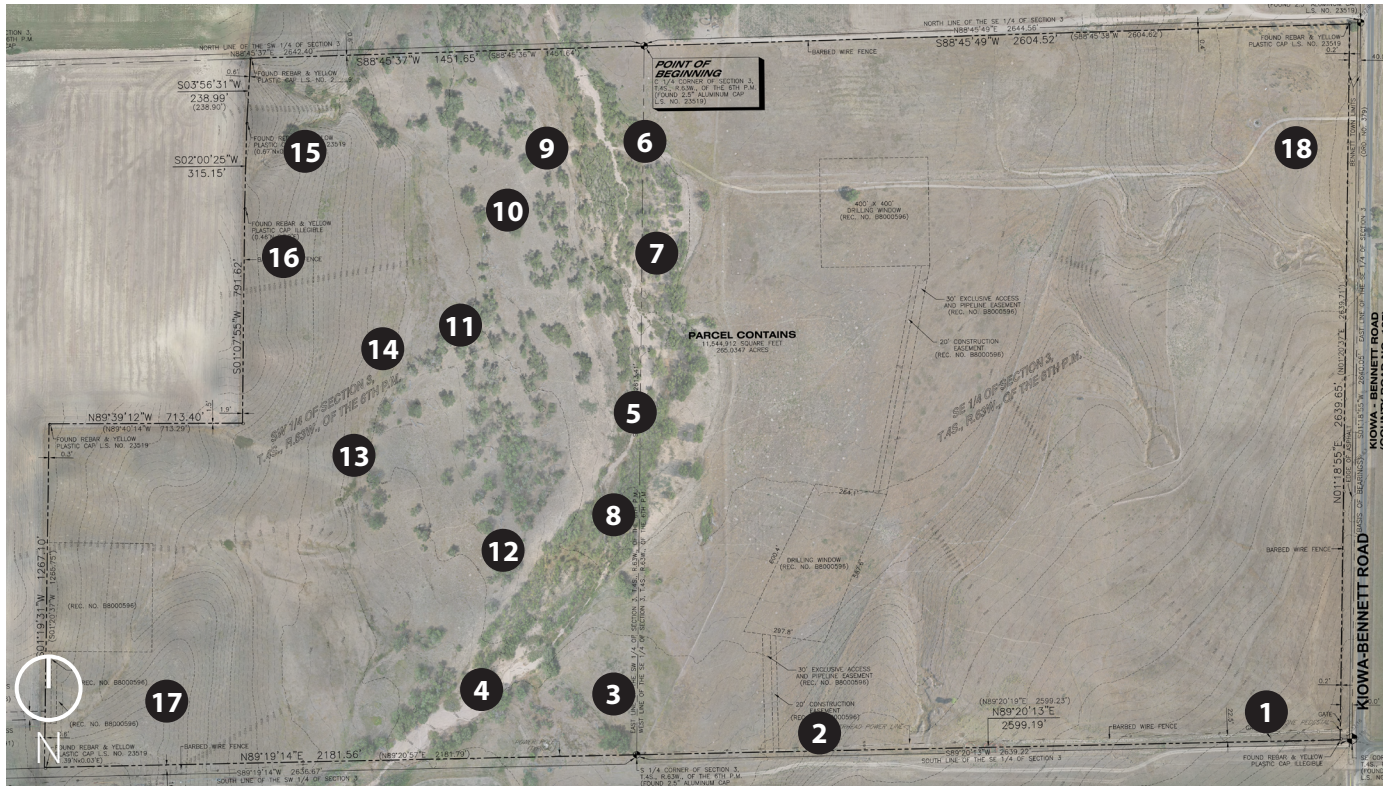


Kiowa Creek North Open Space comprises 265 acres of unimproved rural land in East Arapahoe County. Located roughly 2 miles south of the town of Bennett, CO. on N. Kiowa-Bennett Road.

Background Information

Existing Site Conditions

ALTA Survey - Provided by County



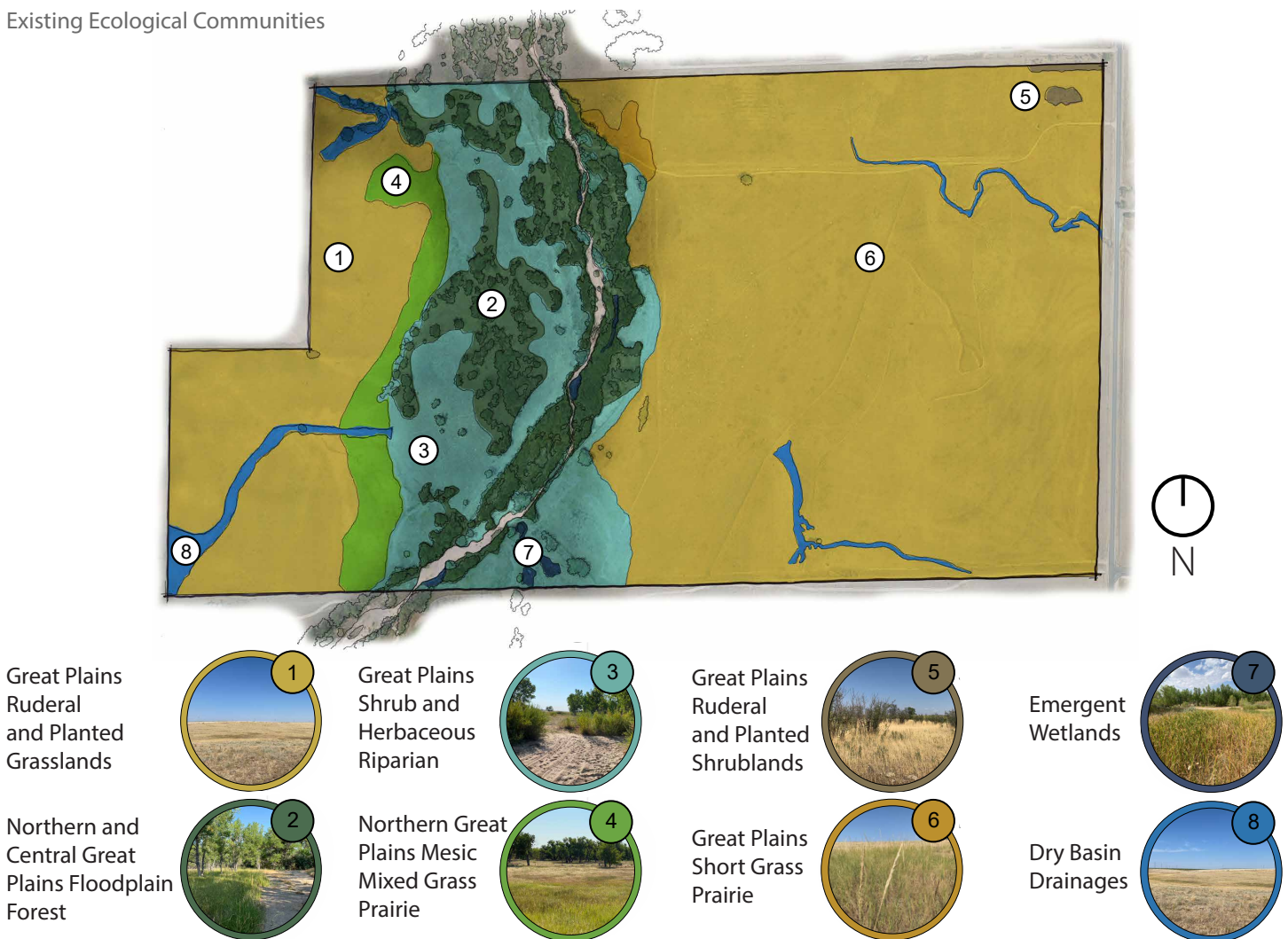
Existing Site Photos





Ecological Communities

Existing Ecological Communities



From a broad ecological perspective, the land encompassing Kiowa Creek Open Space can be categorized into two distinct community types based upon landform and positioning; 1). Prairie, and 2). Riparian floodplain. The higher elevations on the east and west side of the property are reminiscent of short grass prairie ecosystems, and the lower elevations adjacent to Kiowa Creek consists of a riparian ecosystem. To better define the site ecology, the site has been delineated into a more descriptive and accurate set of niche ecological communities based upon defining vegetative and hydrologic characteristics. A total of seven vegetative communities have been identified within the Kiowa Creek North Open Space in accordance with the United States National Vegetation Classification (NVC). These communities are shown above.

DHM Design completed the ecological assessment in summer 2020, along with outlining potential restoration opportunities for the site, and completing a noxious vegetation report. These two reports can be used to transform the degraded areas of the property into healthy ecosystems that can be used as an educational opportunity for the community, while also reducing required maintenance for the new open space. See Appendix B for Ecological Assessment and Recommendations Report.

Wildlife on the Property



Pronghorn



Prebble's
Meadow Jumping
Mouse



Black-tailed
Prairie Dog



Coyote



Bull Snake



Rio Grande
Turkey



Greater Prairie
Chicken



Red-tailed Hawk



Northern Flicker



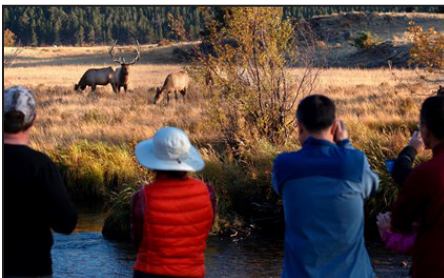
Western
Meadowlark

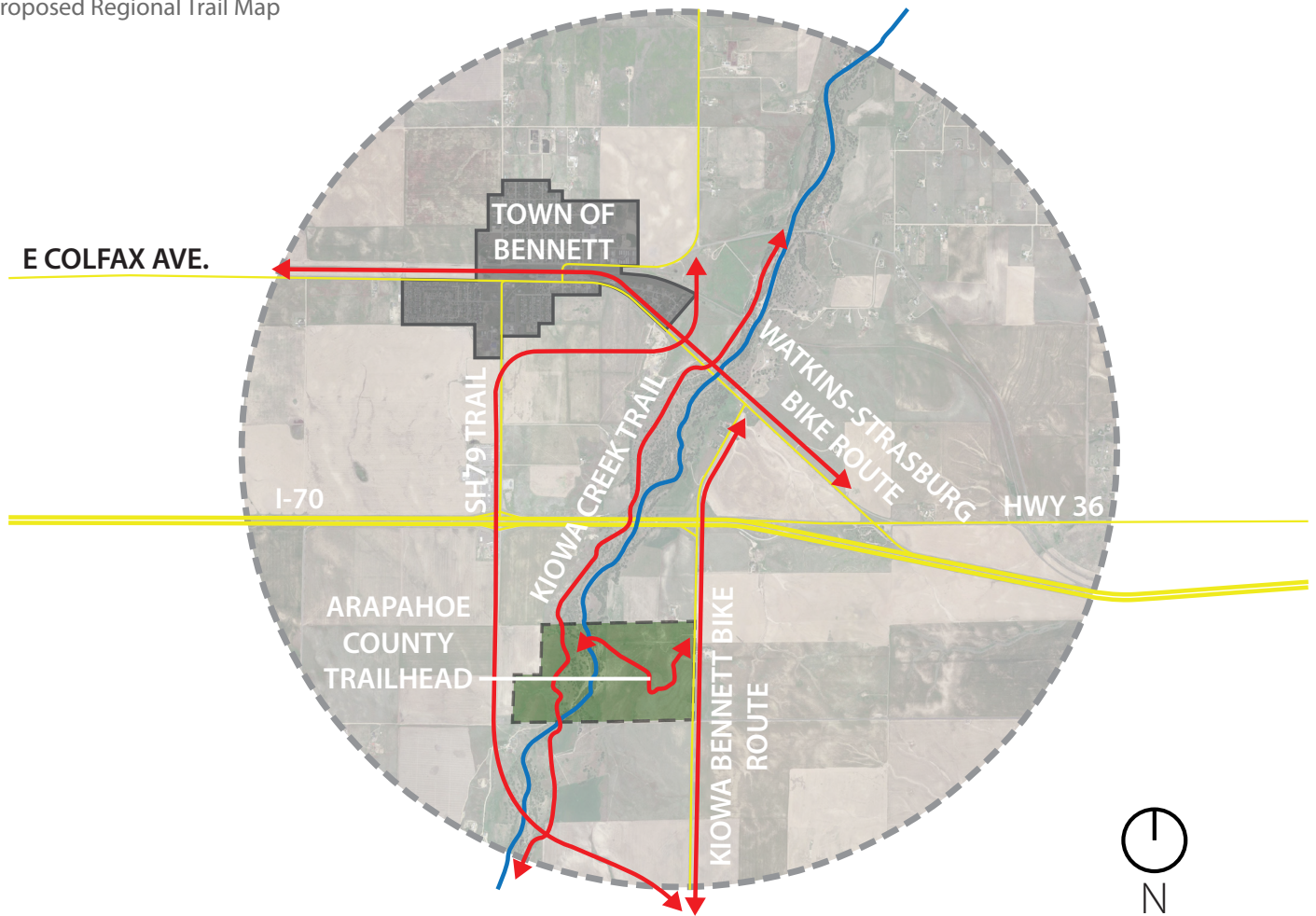
Wildlife

The short grass prairie, in combination with the associated wetland systems and riparian corridor of Kiowa Creek supports a diversity of wildlife, providing critical habitat for many species. During the site inventory, a number of wildlife species were observed, including: red-tailed hawks, downy woodpeckers, western meadowlarks, northern flicker, house finch, mule deer, cottontail rabbit, coyote, greater prairie chickens, turkey, and bull snake.

The DHM Design team views wildlife on site as a huge opportunity for bird watching and wildlife observing. The U.S. Fish and Wildlife database provides an extensive list of species that populate the property and could exist on the property (Appendix B). Another opportunity within the project is to provide educational signage about the wildlife on site, their migratory patterns, and the species' connection to Kiowa Creek North Open Space and its ecological communities.

Examples of Wildlife Viewing Opportunities



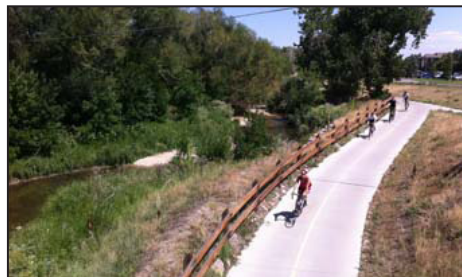


Proposed Regional Trail System

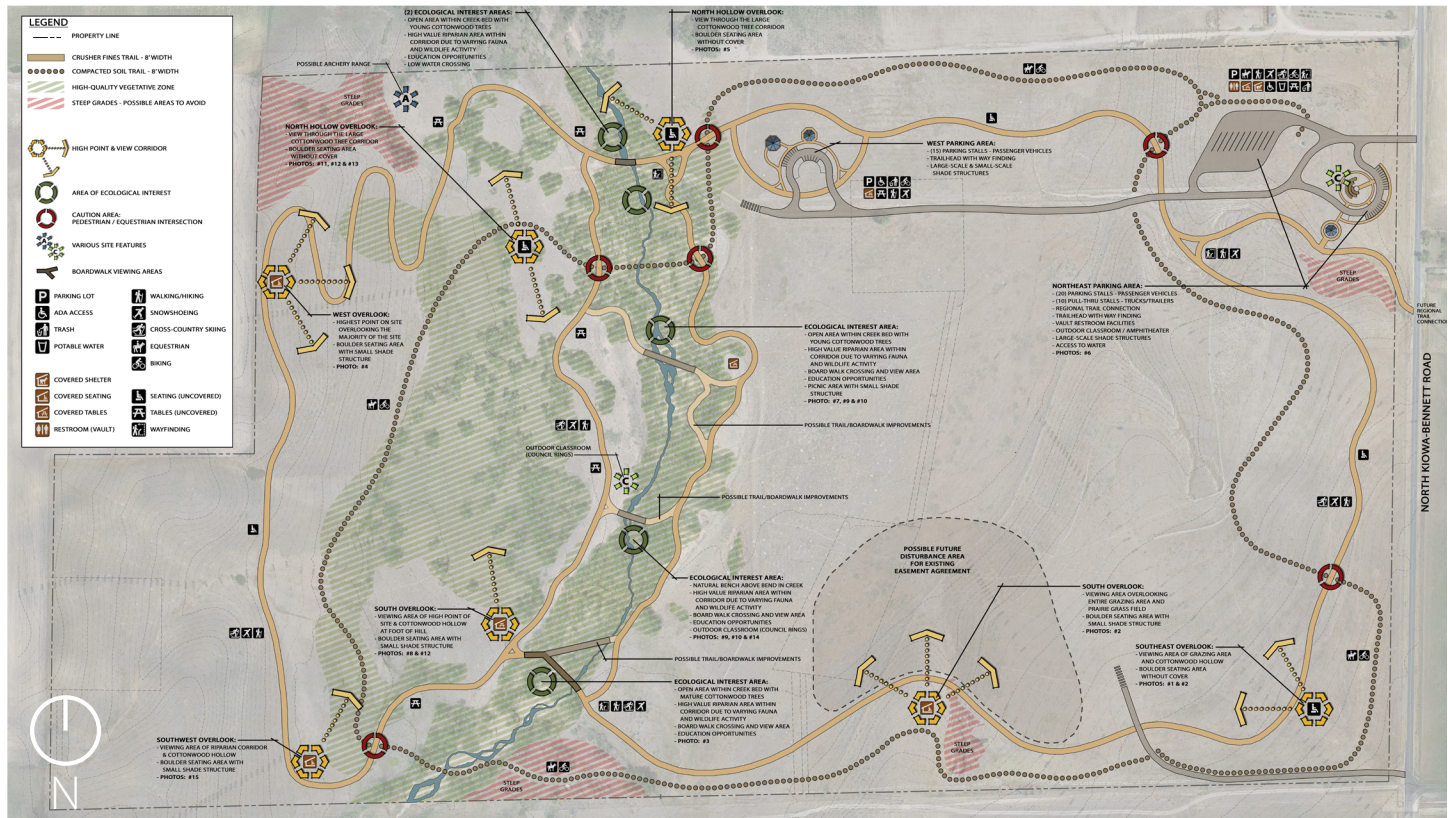
In 2011, the Arapahoe County Open Spaces Department awarded the Town of Bennett a grant to develop a bike trail system to connect the town with nearby parks and other regional trails. The map above shows some of the proposed trails that would be accessible from Kiowa Creek North Open Space (Re: Bennett Regional Trail Plan, 2011). These proposed bike trail plans were put into consideration when the open space master plan was developed. A connection from the Kiowa-Bennett Bike Route to the Arapahoe County Trailhead within the Kiowa Creek North Open Space is proposed, consisting of an underpass underneath N. Kiowa-Bennett Road connecting the east and west sides of the road (Appendix C)

The DHM Design team used the proposed trail system to inform master plan decisions like surface material and trail locations to ensure the Kiowa Creek North Open Space will be cohesive with the trail system when it is completed.

Examples of Trail Systems Within Arapahoe County



Conceptual Master Plan



Master Plan

Overview

The preliminary plan preserves high-quality ecological habitats found throughout the corridor while providing recreational and educational opportunities with deliberate and minimal impact to the site. Soft surface trails create several loops of varying lengths around the property and connect to the nearby Antelope Hills neighborhood. Trailside seating allows visitors to observe and appreciate view corridors and ecological areas of interest. The boardwalk/trail system through the creek corridor provides access while protecting this delicate riparian environment. Existing entrances and on-site roads allow vehicle access into the site and to multiple parking areas, including horse trailer parking. Shade structures, picnic areas, educational and wayfinding signage, outdoor classrooms, an equestrian challenge course, restroom with drinking water, and future grazing area with fencing are just some of the many site elements you would find in this beautiful open space area. (See Appendix D for Master Plan Enlargement)

Project Goal

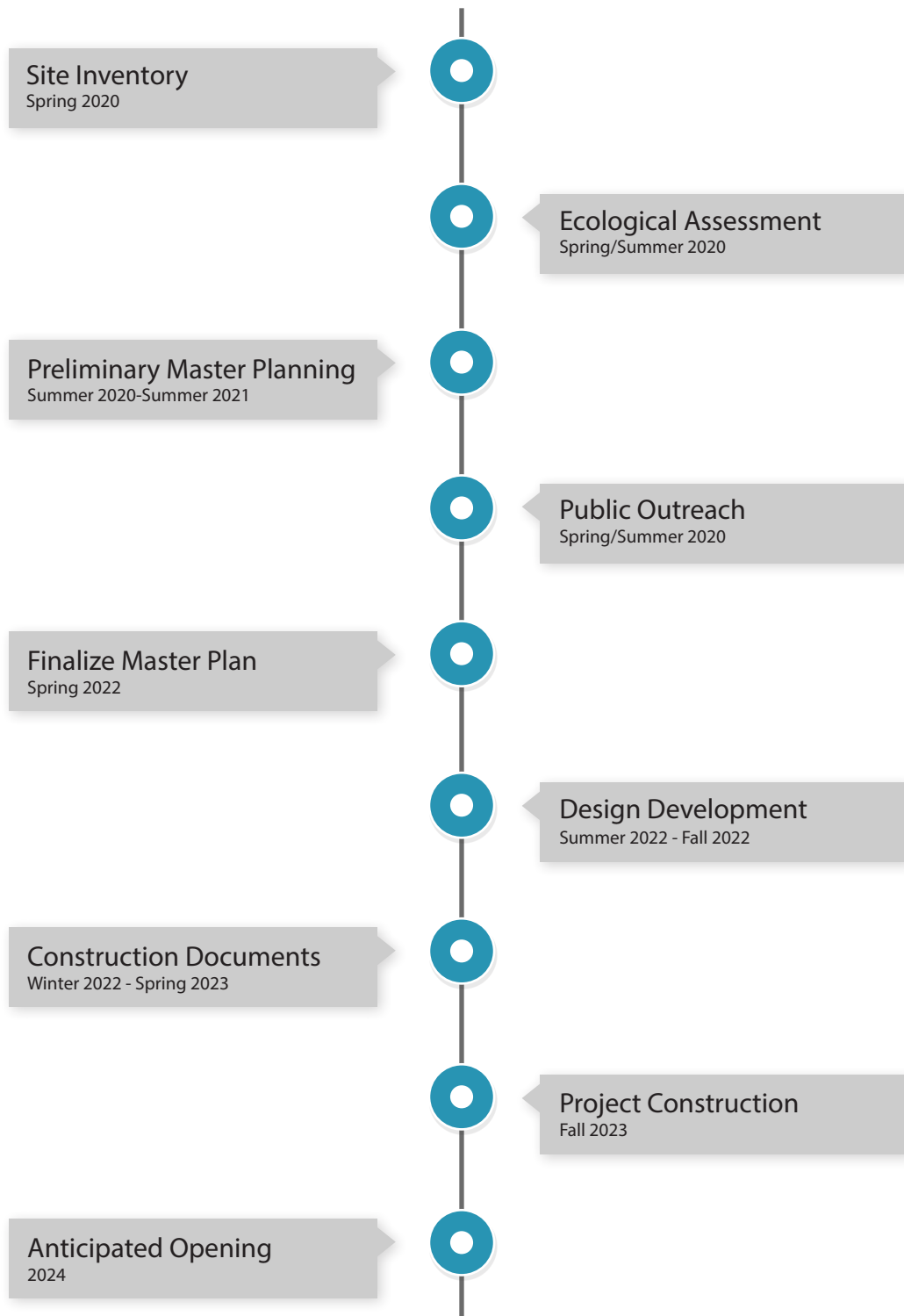
The design team developed a list of goals for the Kiowa Creek North Open Space Master Plan to ensure it was successful in both recreation and in environmental preservation. The overriding goal of this project is to create a passive recreation destination in eastern Arapahoe County while protecting the site's high-quality ecosystems.

Anticipated Amenities

The Kiowa Creek North Open Space master plan includes numerous amenities for the enjoyment of its visitors in all seasons. Due to grant funding restrictions by Arapahoe County Open Spaces, no active recreation amenities will be part of the master plan. Active recreation refers to a structured, individual, or team activity that requires the use of special facilities, courses, fields, or equipment. Passive recreation amenities included in the master plan are as follows:



Project Milestones



The above timeline outlines the project status as completed to date, and the remaining milestones of the project. The completion of all stages could change over time, and the project may be completed sooner or later than the listed date.



The DHM Design team and Arapahoe County Open Spaces Staff attended the Bennett Days Celebration in the Town of Bennett with the goal of presenting to the public for feedback. Community members of all ages provided feedback on the Kiowa Creek North Open Space master plan and the other supplemental information. In general, feedback on the project was very positive with great suggestions. With the predominantly positive feedback received and excitement over the project, the overriding question we received was in regard to when the project was going to be constructed.

Along with in-person outreach, a project website was created to gather public feedback and document the process. (Web Address: <https://kiowacreekopenspace.com/>) The website hosts the master plan, site photos, and imagery of possible amenities giving the community an overall understanding of the project. Feedback was gathered from the website via a five question survey and feedback/comment form.

Results listed below:

Community Feedback Examples:



Brian – December 12, 2021 I'm very excited to see this project moving forward. I would appreciate serious consideration for multi-use path construction to include: walking/hiking/equestrian only trails, mountain bike/ebike trails for more aggressive cycling conditions, and paved pathways for road bikes enthusiasts who prefer to cycle at a faster pace without risk of injury to others.

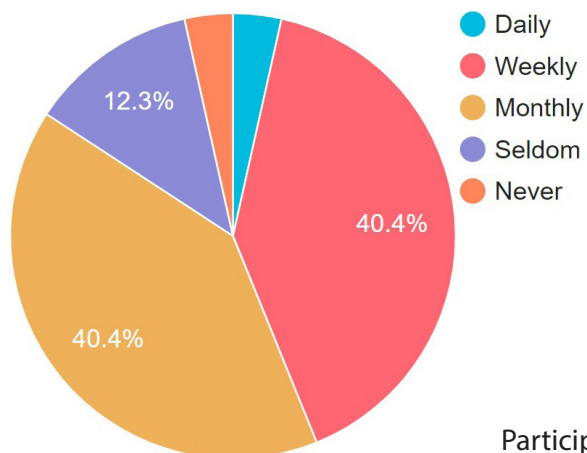
Andrew – November 18, 2021 Would enjoy any volunteerism.

Joseph – November 8, 2021 Very excited about the project and being able to utilize our bicycles in a safe environment. Currently only feel safe riding in the Antelope Hills neighborhood due to the lack of bike lanes on the Kiowa-Bennett rode.

Frank – November 8, 2021 It's gratifying to see this happening — land we and future generations can enjoy and appreciate.

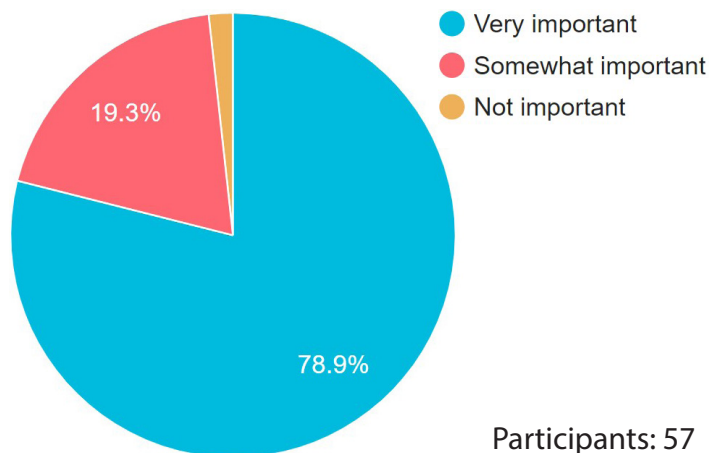
Susan – November 8, 2021 Has “someone” performed a floristic survey of the open space? If not, perhaps the Denver Botanic Gardens botanists and volunteers would be interested.

Q1: Considering the variety of passive-use recreational opportunities the concept plan outlines, how often would you visit the Kiowa Creek North Open Space site?



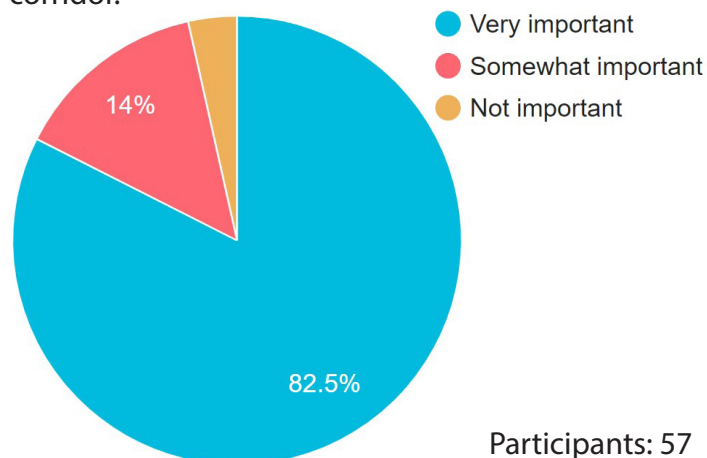
Participants: 57

Q2: How important is the following to you? Preservation and restoration of quality ecological habitats found throughout the corridor.



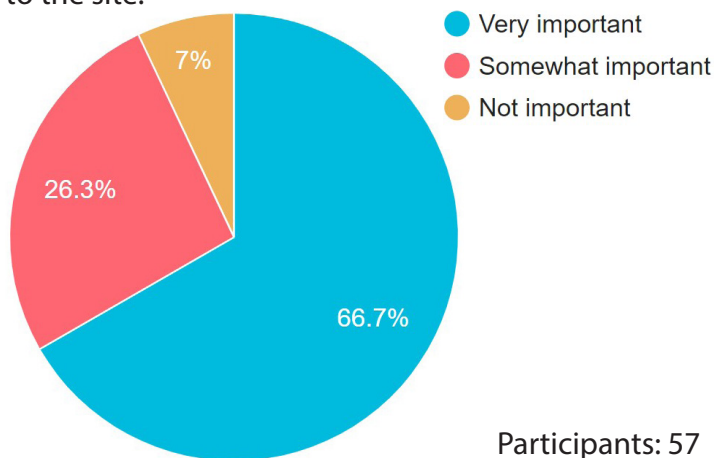
Participants: 57

Q3: How important is the following to you? Protection of extensive and sometimes unique wildlife and vegetation found throughout the corridor.



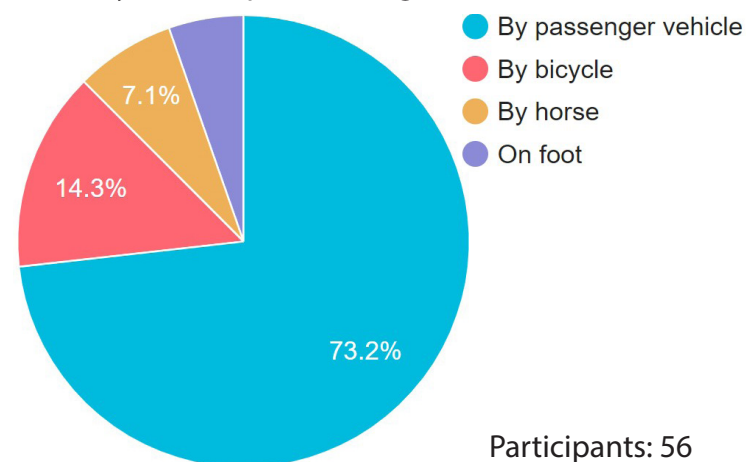
Participants: 57

Q4: How important is the following to you? Provide both recreational and educational opportunities, while ensuring very deliberate and minimal impact to the site.



Participants: 57

Q5: When visiting Kiowa Creek North Open Space, how do you anticipate arriving?



Participants: 56

Opinion of Estimated Costs

Kiowa Creek North Open Space

Opinion of Estimated Costs - Magnitude of scale use only

Prepared By: DHM Design
January 24, 2022

Value Engineered w/ ACOS Staff - 02.11.2022

Category	Unit	Qty	Unit Cost	Total Cost	Notes
Project Start-Up					
Project Start Up and Preparation	LS	\$3,337,272.00	10.00%	\$333,727.20	
- Mobilization					
- Permits					
- Vehicle Tracking					
- Dust Control (Water)					
Potholing Utilities (Non-Destructive)	EA	5	\$1,200.00	\$6,000.00	Area around well & pump
Erosion Control & Stormwater Management	LS	1	\$100,000.00	\$100,000.00	Allowance - Revise with further detail
Construction Staking / Surveying	LS	1	\$40,000.00	\$40,000.00	Allowance - Revise with further detail
Section Subtotal				\$479,727.20	
Site Preparation					
Tree Protection - Orange Fencing	LF	5,500	\$3.00	\$16,500.00	Phasing areas of construction would lower this cost dramatically
Riparian Corridor Minor Restoration/Stabilization	LS	1	\$100,000.00	\$100,000.00	Allowance - Revise with further detail - Permits, BMP's, etc.
Section Subtotal				\$116,500.00	
Earthwork & Drainage					
Cut/ Fill - Complete In Place	CY	10,000	\$19.00	\$190,000.00	Allowance - Revise with further detail - Grading of trails, roads, parking lot, benching of walls at underpass, amp.
Strip and Stockpile Existing Topsoil	CY	5,000	\$19.00	\$95,000.00	Allowance - Revise with further detail - May not need this line item, patchback of grading
Topsoil Placement	CY	5,000	\$19.00	\$95,000.00	Allowance - Revise with further detail - May not need this line item, patchback of grading
Misc. Engineered Drainage Improvements	LS	1	\$300,000.00	\$300,000.00	Allowance - Revise with further detail - Outfalls, pipe, armoring, etc.
Section Subtotal				\$680,000.00	
Sitework & Hardscape					
Gravel - West Parking Lot	SF	17,600	\$3.00	\$52,800.00	Parking drive and (15) parking stalls
Gravel - East Parking Lot	SF	19,950	\$3.00	\$59,850.00	Main Drive and (32) parking stalls
Gravel - Horse Trailer Parking Lot & Staging Area	SF	60,470	\$3.00	\$181,410.00	(10) parking slots - 40' Length
Asphalt Millings - Entrance Drive	SF	19,950	\$6.50	\$129,675.00	Main Drive from entrance to West Parking
Soft Surface Trail - Equestrian Trail	LF	12,900	\$2.00	\$25,800.00	Equestrian trail - Clear & grub only
Crusher Fines Trail - East Loop - 6' Width	SF	72,640	\$4.50	\$326,880.00	4" depth, stabilized - Filter fabric removed - East side of Kiowa Creek
Crusher Fines Trail - West Loop - 6' Width	SF	58,456	\$4.50	\$263,052.00	4" depth, stabilized - Filter fabric removed - West side of Kiowa Creek
Crusher Fines Trail - Regional Bike Connection - 6' Width	SF	7,315	\$4.50	\$32,917.50	4" depth, stabilized - Filter fabric removed - Located at underpass to East Parking area
Crusher Fines Walks - West Parking Lot - 5' Width	SF	11,525	\$4.50	\$51,862.50	4" depth, stabilized - Filter fabric removed - Located around parking lot and connections to main trail
Crusher Fines Walks - Northeast Parking Lot - 5' Width	SF	5,200	\$4.50	\$23,400.00	4" depth, stabilized - Filter fabric removed - Located around parking lot and connections to main trail
Crusher Fines Area - Boulder Seating Areas (19)	SF	9,500	\$4.50	\$42,750.00	4" depth, stabilized - Filter fabric removed - Located at each seating area along trail
Low Water Crossing - North	LS	1	\$45,000.00	\$45,000.00	Allowance - Revise with further detail - Concrete apron, possible breakaway railing
Boardwalk Crossings/Features/Seating Area - South	LF	100	\$1,800.00	\$180,000.00	Allowance - Revise with further detail - Includes boardwalk, railings, helical piers, seating, adjacent trail improvements
Section Subtotal				\$1,415,397.00	
Site Structures, Elements & Site Furniture					
Shade Structure - Large	EA	2	\$85,000.00	\$170,000.00	Allowance - Revise with further detail - Custom per County Standards - go prefab
Shade Structure - Medium	EA	2	\$65,000.00	\$130,000.00	Allowance - Revise with further detail - Custom per County Standards
Shade Structure - Small (Trailside Seating)	EA	4	\$25,000.00	\$100,000.00	Allowance - Revise with further detail - Custom per County Standards
Restroom - Prefab (CXT or equal)	EA	1	\$165,000.00	\$165,000.00	Allowance - Revise with further detail - (4) stall, vault, possible tie into water (well) for maintenance
Outdoor Classroom - Lower Riparian Area	EA	1	\$25,000.00	\$25,000.00	Boulders, grading, crusher fines, small lean-to shade structure
Sandstone Boulder - Trailside Seating Areas	EA	11	\$2,000.00	\$22,000.00	Includes placement
Drinking Fountain - Tie to existing well	EA	2	\$15,000.00	\$30,000.00	Allowance - Revise with further detail - Tied to restroom to allow for hose bib
Hosebib at Equestrian Area	EA	2	\$5,000.00	\$10,000.00	Allowance - Revise with further detail
Well Improvements	LS	1	\$40,000.00	\$40,000.00	Allowance - Revise with further detail - Pump, enclosure, etc.
Trailside Handrail - Underpass and steep area to west	LF	1,115	\$75.00	\$83,625.00	Allowance - Revise with further detail - Steel
Fencing - Entry Gates to Open Space Site	EA	1	\$7,000.00	\$7,000.00	
Fencing - Parking Lots	LF	300	\$75.00	\$22,500.00	Allowance - 3-Rail Decorative
Picnic Tables	EA	23	\$2,100.00	\$48,300.00	
Bike Racks	EA	12	\$500.00	\$6,000.00	
Trash Receptacles	EA	15	\$250.00	\$3,750.00	Drums
Hitching Posts	EA	20	\$500.00	\$10,000.00	Wood Post
Hammock Post	EA	6	\$500.00	\$3,000.00	Wood Post or Metal post with footing
Bike Repair Station	EA	2	\$1,600.00	\$3,200.00	
Removal and Replacement of Existing Large Logs	EA	30	\$500.00	\$15,000.00	For erosion control, seating, hammock posts, decorative use - Leave on site
Interpretive Signage Package	LS	1	\$20,000.00	\$20,000.00	Allowance - Revise with further detail - Estimating (20) signs on site
Site Wayfinding	LS	1	\$20,000.00	\$20,000.00	Allowance - Revise with further detail - Trail markers, mile markers, crossings, directional, vehicular
Entry Monument	LS	1	\$10,000.00	\$10,000.00	Allowance - Revise with further detail
Archery Range	LS	1	\$15,000.00	\$15,000.00	Allowance - Revise with further detail
Horse Challenge Area	LS	1	\$20,000.00	\$20,000.00	Allowance - Revise with further detail
Section Subtotal				\$979,375.00	
Project Construction Sub-Total:				\$3,670,999.20	
15% Design & Construction Contingency				\$550,649.88	
Project Construction Total:				\$4,221,649.08	

Notes:

1. All unit prices are approximate and based on recent bids received on projects of similar type.
2. Opinion of Estimated Costs does not include any possible County required fees that may be incurred.
3. Additional landscape material not placed on site (with exception of demonstration garden) due to lack of irrigation - Adding landscape material would create need for County Maintenance Staff to handwater all locations (plantings and trees).
4. All grazing elements have been removed per request of ACOS
5. All Kiowa-Bennett Road improvements have been removed from this cost estimate and would be provided under separate project budget

Bid Alternate Options**Sitework & Hardscape**

Crusher Fines Trail - East Loop - Additional 2' Width	SF	24,200	\$4.50	\$108,900.00	4" depth, stabilized - Filter fabric removed - East side of Kiowa Creek
Crusher Fines Trail - West Loop - Additional 2' Width	SF	19,500	\$4.50	\$87,750.00	4" depth, stabilized - Filter fabric removed - West side of Kiowa Creek
Crusher Fines Trail - Regional Bike Connection - Additional 2' W	SF	2,450	\$4.50	\$11,025.00	4" depth, stabilized - Filter fabric removed - Located at underpass to East Parking area
Boardwalk Crossings/Features/Seating Area - North	LS	97	\$1,800.00	\$174,600.00	Allowance - Revise with further detail - Includes boardwalk, railings, helical piers, seating, adjacent trail improvements
Boardwalk Crossings/Features - Central	LS	69	\$1,800.00	\$124,200.00	Allowance - Revise with further detail - Includes boardwalk, railings, helical piers, seating, adjacent trail improvements
Amphitheater - East Parking Area	EA	1	\$100,000.00	\$100,000.00	Allowance - Revise with further detail - Boulder seating, planting, trail connections, paving (concrete or CF)
Fencing - Entry Gates to Open Space Site	EA	1	\$7,000.00	\$7,000.00	
Section Subtotal				\$613,475.00	

