

Conceptual Review Agenda

Meetings hosted via Zoom Web Conferencing

Please use the URL and Meeting ID # listed below to join the Review Meeting

Review Date

11/6/2025 10:15 AM

Project Name

Livestock Grazing at Rigden Farms

CDR250074

Applicant

Christof Meyer

562-556-7188

christof@aloterraservices.com

Planner: Jill Baty

Engineer: Tim Dinger

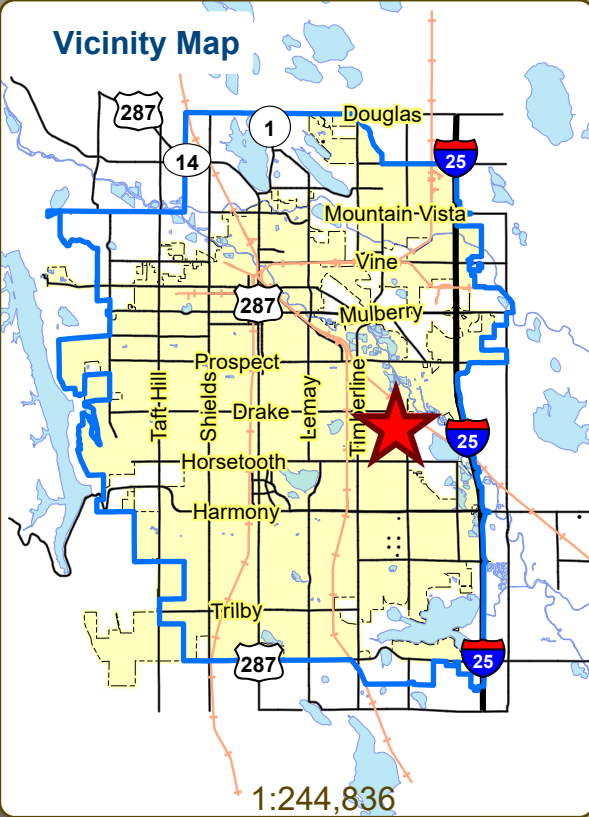
DRC: Todd Sullivan

Description

This is a request to have livestock grazing at Rigden Farm HOA. (parcel # 8729174012). The applicant is proposing hogs to treat the invasive weeds in Rigden Farm's open space area. Access can be taken from Caspian Way. The property is approximately 0.13 mi west of Ziegler Rd and approximately 0.25 mi north of William Neal Pkwy. The site is located in the Low Density Mixed-Use Neighborhood District (LMN) and the project is subject to an Addition of Permitted Use (APU) and Major Amendment (MJA).

Livestock Grazing at Rigden Farms- Farm Animals

Vicinity Map



Aerial Site Map



Zoning Map



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CONCEPTUAL REVIEW:
APPLICATION

General Information

All proposed development projects begin with Conceptual Review. Anyone with a development idea can schedule a Conceptual Review meeting to get feedback on prospective development ideas. At this stage, the development idea does not need to be finalized or professionally presented. However, a sketch plan and this application must be submitted to City Staff prior to the Conceptual Review meeting. The more information you are able to provide, the better feedback you are likely to get from the meeting. **Please be aware that any information submitted may be considered a public record, available for review by anyone who requests it, including the media.** The applicant acknowledges that they are acting with the owner's consent.

Conceptual Reviews are scheduled on three Thursday mornings per month on a "first come, first served" basis and are a free service. One 45 meeting is allocated per applicant and only three conceptual reviews are done each Thursday morning. A completed application must be submitted to reserve a Conceptual Review time slot. **Complete applications and sketch plans must be submitted to City Staff on Thursday, no later than end of day, two weeks prior to the meeting date.** Application materials must be e-mailed to preappmeeting@fcgov.com. If you do not have access to e-mail, other accommodations can be made upon request.

At Conceptual Review, you will meet with Staff from a number of City departments, such as Community Development and Neighborhood Services (Zoning, Current Planning, and Development Review Engineering), Light and Power, Stormwater, Water/Waste Water, Advance Planning (Long Range Planning and Transportation Planning) and Poudre Fire Authority. Comments are offered by staff to assist you in preparing the detailed components of the project application. There is no approval or denial of development proposals associated with Conceptual Review. At the meeting you will be presented with a letter from staff, summarizing comments on your proposal.

BOLDED ITEMS ARE REQUIRED **The more info provided, the more detailed your comments from staff will be.**

Contact Name(s) and Role(s) (Please identify whether Consultant or Owner, etc) _____

Are you a small business? ☐ Yes ☐ No **Business Name** (if applicable) _____

Your Mailing Address _____

Phone Number _____ Email Address _____

Site Address or Description (parcel # if no address) _____

Description of Proposal (attach additional sheets if necessary) _____

Proposed Use _____ **Existing Use** _____

Total Building Square Footage _____ S.F. Number of Stories _____ Lot Dimensions _____

Age of any Existing Structures _____

Info available on Larimer County's Website: <http://www.co.larimer.co.us/assessor/query/search.cfm>

If any structures are 50+ years old, good quality, color photos of all sides of the structure are required for conceptual.

Is your property in a Flood Plain? ☐ Yes ☐ No If yes, then at what risk is it? _____

Info available on FC Maps: <http://gisweb.fcgov.com/redirect/default.aspx?layerTheme=Floodplains>.

Increase in Impervious Area _____ S.F.

(Approximate amount of additional building, pavement, or etc. that will cover existing bare ground to be added to the site)

Suggested items for the Sketch Plan:

Property location and boundaries, surrounding land uses, proposed use(s), existing and proposed improvements (buildings, landscaping, parking/drive areas, water treatment/detention, drainage), existing natural features (water bodies, wetlands, large trees, wildlife, canals, irrigation ditches), utility line locations (if known), photographs (helpful but not required). Things to consider when making a proposal: How does the site drain now? Will it change? If so, what will change?

Rigden Farms Restoration

Adaptive Management Plan

2024



Prepared For: Tara Tate, Property Manager; *T Square Property Management*

Date: 4/26/2024

SECTION 1: Adaptive Management Strategies and Monitoring

Purpose

The purpose of the Rigden Farms Adaptive Management Plan is to outline specific approaches, strategies, and protocols related to the restoration and conversion of degraded uplands and turf grass sites to native grasslands (“the project”). This plan outlines the adaptive management process, including a site monitoring strategy, designed to inform weed management, site protection, and other maintenance treatments (e.g., reseeding, planting, erosion control, etc.) necessary to accomplish the project’s restoration goals stated below.

Adaptive Management Background

Adaptive management is an iterative process, incorporating monitoring results to inform ongoing maintenance and re-treatments that may be required to achieve long-term success of a restoration project. Monitoring data provides feedback for land managers and project designers, allowing for the comparison of updated results with baseline conditions. The development and implementation of maintenance treatments (e.g., weed management, irrigation, site protection, spot seeding, etc.) is a critical step in the adaptive management cycle: monitor, analyze, prescribe, and implement treatments; monitor, analyze.... It is expected that the frequency and intensity of monitoring and maintenance treatments will diminish over time, as goals are met.

Project Goals

The project is located within the Rigden Farms residential development and contains a greenbelt with a small unnamed creek running through the center of the site from east to west. The areas within the project serve as walkways, bike paths, natural play areas, and as natural parks for residents to enjoy the outdoors close to home. The following goals are provided as a recommendation. The goals below were developed by AloTerra for this adaptive management project.

Revegetation Goals:

Goal 1: Significant reduction of total cover of listed noxious weed species (less than 10% cover of Colorado List A, B, and C species).

Goal 2: Continued conversion of upland (turf grass, weedy) sites to native grassland habitats (Increase complexity, structural diversity, species diversity, and aesthetics through native plants on-site). Driven by HOA’s goal to continue reducing water usage.

Goal 3: Increasing accessibility and usability of native habitats (including pond and upland habitats).

Monitoring Elements

Overview

Monitoring is the process of measuring or assessing specific physical, chemical, and/or biological parameters over time (Thayer, 2003; Natural Resources Conservation Service, 2007). Monitoring should

utilize consistent approaches so that data can be accurately compared over the length of the monitoring effort (Lewis et al., 2009). The type of monitoring employed depends on the accuracy of the data required, and can have significant cost implications. Three general monitoring types are provided below, with examples of specific questions they might answer:

- *Implementation monitoring* is conducted during or immediately after project construction.
Q: Was the project installed according to design specifications, permit requirements, and landowner/client agreements?
- *Effectiveness monitoring* is used to assess general post-project conditions, with respect to project designs.
Q: Did the intended project outcomes get achieved, at the expected magnitude, over the appropriate time frame? This is accomplished by comparing pre-project with post construction conditions.
- *Validation monitoring* is used to determine the cause-and-effect relationship between restoration treatments and biotic or physical responses.
Q: Did macroinvertebrates, wildlife, vegetation, or water quality respond to the changes in physical and biological attributes or components brought about by the project?

Implementation monitoring refers to quantifying the location and type of restoration work completed, as compared to the intended design. Initial implementation was completed prior to AloTerra's involvement at Rigden Farm. An updated implementation design is proposed in this plan, with monitoring to be included. This will be conducted by AloTerra during recommended treatment implementation. Effectiveness and validation monitoring are proposed in this plan, and are recommended for a minimum of three growing seasons post-implementation, or until goals are met. Both qualitative and quantitative methods will be employed.

Monitoring can use *subjective* (i.e., qualitative) or *objective* (i.e., quantitative) methods to help identify and address project failures due to potential stressors, such as drought, pedestrian and dog disturbance, geese, etc., and to inform maintenance needs. Subjective methods, such as repeat photography or categorical monitoring forms, can effectively document site changes and quickly inform maintenance activities necessary to correct problems. However, purely qualitative approaches and casual observations can often over- or under-represent important data such as vegetation cover, and can vary significantly from one observer to another. Such errors can occur due to observer bias (e.g., a human's natural tendency to score green vegetation higher than bare soil) as well as limitations of methodology (e.g., the oblique angle represented in repeat photographs taken across a landscape portrays higher vegetation canopy cover than what exists).

Conversely, quantitative monitoring is more data-driven and aims to measure project outcomes through science-based methods designed to minimize observer bias. Quantitative monitoring results may also be used to guide the criteria and methodology for future restoration projects and maintenance activities of a site, more accurately address permitting and funding entity requirements (e.g., bond release, SWMP cover requirements, USACE mitigation release, etc.), support requests for contractors to address warranty items (e.g., a minimum of 50% vegetation cover), and support long-term tracking of certain parameters (e.g., changes in plant community structure and composition over time).

At Rigden Farms, a combination of subjective and objective methods is proposed, to balance cost effectiveness with objectivity. To strike this balance, we propose integrating some categorical observations (i.e., high, moderate, low, none; or scoring 0-5 for various element conditions) into rapid assessments. However, it is essential to employ repeatable/consistent methods over time. As personal and management circumstances change over time, data will be collected and managed in a way that can be easily understood and interpreted by a variety of future land managers, community members, and practitioners.

Monitoring Timeline and Responsibilities

Vegetation monitoring should be conducted once per year for three years. Vegetation monitoring should occur at the peak of the growing season, approximately late July to early August. Weed assessments should occur in mid-spring, to inform the need and extent of subsequent treatments, and each time that weeds are treated, approximately 3-4 times per season. Baseline monitoring was conducted on March 25 and 26, 2024. During this visit, the site was assessed for general vegetation, erosion patterns, infrastructure, and constraints / opportunities. Due to the time of year, most vegetation was dormant, and further monitoring is needed to fully encapsulate site conditions. Current conditions are included in **Appendix A**.

Monitoring Methods

This section provides a summary of monitoring methods for native and non-native vegetation at the project. **Appendix B** includes a static version of the monitoring forms for these monitoring methods.

Vegetation Monitoring

Vegetation Cover: Both a rapid assessment of general site conditions (categorical observation-based protocol) and species dominance will be used to quantify herbaceous community composition and canopy cover (structural diversity) in revegetated areas. Specific vegetation “communities” have been identified, and will be monitored as unique entities within Rigden Farm. Using “quadrants” (5 sq. ft. plots) at key locations, vegetation will be quantified by estimating for density, biomass, cover, and frequency (percentage). In addition, general vegetation patterns are quantified via a rapid assessment process during the growing season. Refer to **Figure 1** for a preliminary assessment of proposed quadrant locations. Refer to **Table 1** for a preliminary list of native species presence on-site.

Table 2. DRAFT native species list for Rigden Farms

Common Name	Scientific Name	Growth Type
yellow rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	NS
Baltic rush	<i>Juncus arcticus</i>	NPG-L
big bluestem	<i>Andropogon gerardii</i>	NPG-L
birch Spp.	<i>Betula Spp.</i>	NT
blue grama	<i>Bouteloua gracilis</i>	NPG-L
Colorado bedstraw	<i>Galium coloradense</i>	NPF
Maximilian sunflower	<i>Helianthus maximiliani</i>	NPF
narrowleaf cattail	<i>Typha angustifolia</i>	NPF

peachleaf willow	<i>Salix amygdaloides</i>	NS
sandbar willow	<i>Salix interior</i>	NS
slender wheatgrass	<i>Elymus trachycaulus</i>	NPG-L
witchgrass	<i>Panicum capillare</i>	NAG-L

Noxious Weed Assessment: A categorical observation-based protocol to count and identify weed populations. Noxious weed presence/absence lists will be created once per year to inform treatments needed. Refer to the weed treatment calendar, species specific treatment recommendations, intensive weed management area in **Appendix D**, and vegetation monitoring form in **Appendix B**.

Repeat Photography Points: A subjective assessment that will provide estimates of vegetation cover and revegetation success, to inform gross changes in specific areas. Refer to **Appendix C** for the Photo-Point locations and current photographs of the project.



Figure 1. Project boundaries with proposed monitoring quadrants.

SECTION 2: Weed Management Strategies

Weed Management

With regards to their impacts on native plant communities and/or social values, non-native plants (i.e., weeds) can be benign, invasive, or noxious. Weeds have long been recognized as ecologically and economically detrimental for multiple reasons, a complete account of which is beyond the scope of this document. Several non-native aggressive species have been identified in the project, which are capable of out-competing native plants for water, light, and nutrients, or secrete phytotoxins. These actively inhibit the growth of native vegetation while providing minimal benefits for soil stabilization, forage, and other wildlife and pollinator benefits in comparison to native vegetation. Identified invasive species have an advantage over native species in part because they lack the full spectrum of biological controls (i.e., insect predators, plant pathogens, etc.) that serve to keep their populations in check in their country of origin. As such, they are more likely to continue to spread unabated throughout a watershed by displacing native plants and forming dense monocultures in disturbed conditions such as those present in many native developments.

Several non-native species at Rigden Farms were identified during initial vegetation assessments by AloTerra. Formal weed inventory was conducted through the creation of a comprehensive list of weeds and their state rank (**Table 2**) at different locations throughout the project. Informal assessments will be conducted while on site for weed treatments. An additional formal weed inventory should be conducted in the spring/summer of 2025 and 2026 to map the density and distribution of weeds more accurately at Rigden Farms after one growing season following intensive weed management and revegetation.

The Colorado Noxious Weed Act (C.R.S. 35-5.5-101-119) creates a legally binding obligation for the removal/control of noxious species. Through the Colorado Department of Agriculture, a list of A, B, and C species is managed and periodically updated to prioritize the control of weeds. To assist with weed management, a great variety of weed management resources are provided by these entities, including how to create a weed management plan, best management practices for weed management, and more:

Colorado Department of Agriculture website:

<https://www.colorado.gov/pacific/agconservation/noxious-weed-publications>,

Colorado State University Extension, Weed Resources:

<http://www.ext.colostate.edu/sam/weeds.html>

Colorado Weed Management Association

<https://cwma.org/>

State of Colorado Noxious Weed Act Priority List Definitions:

List A - Species that have not become established in the state and may have not even been reported in the state yet. The most effective way to treat these species is to eradicate them wherever they are found, and to prevent their introduction into the state if they are not yet present.

List B - Species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species.

List C - These are species for which the Noxious Weeds Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of list C species.

Watch List (WL) - Species that have been determined to pose a potential threat to the agricultural productivity and environmental values of the lands of the state. The Watch List is intended to serve advisory and educational purposes only. Its purpose is to encourage the identification and reporting of these species to the Commissioner to facilitate the collection of information to assist the Commissioner in determining which species should be designated as noxious weeds. When managing for weeds at Rigden Farms, given the goals of increased native biological diversity of a site, it is important to note that the list of species in Table 2 are not the only species to be managed. Species such as tumble mustard (*Sisymbrium altissimum*, unlisted in Colorado) are not a significant concern, while species such as common kochia (*Kochia scoparia*, unlisted in Colorado) can be highly disruptive to a restoration project, currently to the Rigden Farm community, and for long-term site management. As such, our weed management recommendations below target listed and unlisted species alike, whether their management is required by the State of Colorado.

The most cost-effective time to manage invasive vegetation is early in a project's lifetime before invasive plants have a chance to spread through abundant seeds or vegetative propagules. Since the initial monitoring stage has taken place, and species of concern have been identified and documented prior to project implementation, treatment of these species should begin in the summer of 2024, during, and after revegetation as needed. Consistent monitoring will take place throughout and after project implementation, to address follow-up treatments recommendations for invasive species problems. Since Rigden Farm contains an existing seed bank of weed species (kochia, curly dock, thistles, etc.) it is imperative to reduce this seed bank prior to any disturbance that occurs during revegetation activities. This requires intensive weed management throughout the summer of 2024, at which point (September) the site will be assessed for the possibility of revegetation.

Table 2. DRAFT weed list for Rigden Farms (NL = not listed)

Priority	Common Name	Scientific Name	CNWA List
High	Knapweed	<i>Centaurea Spp.</i>	B
High	Scotch Thistle	<i>Onopordum acanthium/tauricum</i>	B
High	Field Bindweed	<i>Convolvulus arvensis</i>	C
High	Canada Thistle	<i>Cirsium arvense</i>	B
High	Musk Thistle	<i>Cardus nutans</i>	B

High	Houndstongue	<i>Cynoglossum officinale</i>	B
High	Russian Olive	<i>Elaeagnus angustifolia</i>	B
High	Common Kochia	<i>Kochia scoparia</i>	NL
High	Pepperweed	<i>Lepidium latifolium</i>	B
High	Hoary Cress	<i>Lepidium draba</i>	B
High	Russian Thistle	<i>Salsola tragus/paulsenii</i>	NL
Moderate	Smooth Brome	<i>Bromus inermis</i>	NL
Moderate	Cattail	<i>Typha latifolia</i>	NL
Moderate	Crack Willow	<i>Salix fragilis</i>	NL
Moderate	Common Mullein	<i>Verbascum thapsus</i>	C
Moderate	Prickly Lettuce	<i>Lactuca serriola</i>	NL
Moderate	Curly Dock	<i>Rumex crispus/obtusifolius</i>	NL
Low	Goosefoot	<i>Chenopodium spp.</i>	NL
Low	Annual Mustards	<i>Multiple Species</i>	NL

Weed Management Recommendations

Treating invasive species found within the project is a primary goal in restoring this area to a more visually pleasing, accessible, and productive condition by increasing biodiversity, providing wildlife and pollinator habitat, and reducing bare ground. Site management will integrate a variety of restoration and management activities to control the invasion of non-native vegetation, which could include:

- Comply with all state and local weed laws, regulations, and requirements. Information and contact information can be found at the county website (<https://www.larimer.org/naturalresources/weeds>),
- Avoid the use of any pre-emergent herbicides within seeding areas,
- Selecting appropriate and diverse early- to mid-seral seed mixes with the potential to fully occupy a given area's botanical niches,
- Spot seeding and planting in optimal seasons, and using appropriate seeding rates and seeding methods to increase the likelihood of high vegetation cover in the early years following restoration,
- Minimizing or eliminating the use of nitrogen, as invasive species are preferentially stimulated over native species using nitrogen,
- Paying close attention to the invasive species seeds that are often present in a seed mix,
- Eliminate the presence of undesirable non-native species brought to the restoration site by cars, heavy equipment, and via other vectors (cattle and other livestock, clothing and boots of residents and volunteers, and others),

- Monitor for the appearance of new populations of weeds. Treatment of small populations of weeds is often more effective than attempting to combat large established populations,
- Spot treatment of weeds within re-seeded areas,
- Developing an iterative weed management plan, informed by regularly scheduled monitoring, and
- Keeping records of all weed management activities to aid in monitoring and future planning.

Weed Treatments

Complete weed surveys will be on-going to better understand the extents of each weed populations following treatments, and hence further develop a comprehensive weed management plan based on priority species and their current and projected distribution. The weed list presented in **Table 2** details general priorities based on problematic characteristics of the species identified in preliminary assessments. Currently identified dominant species are kochia, Curly Dock, Hoary Cress, and Canada Thistle. See **Appendix D** for the Weed Treatment Calendar.

Due to the limitations of conducting invasive species assessments outside of the growing season, it is possible that additional noxious or invasive species may be identified at a later time.

Tree Treatments and Removal

A single variety of invasive or undesirable tree species have been identified on site during the course of our assessment. This species is also listed in **Table 2**. The species of concern is Russian Olive. Despite the fact that many of these tree species often hold an aesthetic appeal to the public, non-native or introduced species have the ability to negatively impact their ecosystems over time, and Russian Olive also is known for its large and painful thorns, decreasing access to the project areas. It may not always be feasible or cost effective to remove every invasive tree present however, strategically doing so can greatly benefit the health and integrity of the surrounding plant and animal communities.

SECTION 3: Site Protection and Maintenance

Site Protection

In addition to being aware of the negative effects invasive plants can have on desired native vegetation, this plan considers the impacts recreation and wildlife can have on newly planted vegetation.

Wildlife Control

Unmanaged impacts from livestock or wildlife in a revegetation site can be devastating to newly established plant materials. As such, wildlife population such as deer and geese should be observed closely for a period of four to three years post-construction. Once riparian and upland vegetation is well established, damage caused by typical levels of wildlife browsing and grazing should not negatively impact the trajectory of recovery of the system. Currently, geese are noticed on-site to be a potential threat to establishing native species. Protection should be highly considered prior to any revegetation efforts.

Site Maintenance

Maintenance is the collection of actions taken to help ensure a given stream restoration project performs as designed and attains project objectives (Natural Resources Conservation Service, 2007). Maintenance is closely tied to management and involves the initial set of planned activities as well as unplanned activities following project implementation. Without any maintenance, substantial efforts may be required to correct failures in structures or other design elements. Active and frequent maintenance can often result in reduced “reconstruction” and “repair” costs down the road.

Maintenance is most beneficial in the first three to five years following planting, apart from the occurrence of significant (i.e., 50 years or greater) flood events. Excessive flood flows soon after planting can cause substantial erosion and slope failure, resulting in unacceptable soil and plant loss. Such areas may need to be replanted, inter-planted, or reinforced by other means. Other maintenance efforts may include: (a) placement of large woody debris and other toe protection treatments on banks to redirect water away from the established areas, (b) repairs of in-stream rock structures, (c) invasive species management, (d) supplemental irrigation, and (e) fencing. Results from monitoring efforts will ultimately provide a list of recommended maintenance activities for Rigden Farm.

Revegetation Recommendations

Supplemental planting and seeding should occur in areas where vegetation is slow to establish. Type of seed (e.g., upland, riparian, etc.), and methods of seeding, as well as any amendments or soil surface protection, will be recommended at the end of each growing season. September will be a critical monitoring period to identify the ability to implement revegetation strategies. Areas with large bare gaps larger than 1 sq. ft. require inter-seeding via hand broadcast. Any areas with excessively large gaps (> 10 sq ft.) require additional planting.

Erosion Control Recommendations

Minor surface erosion is present in areas with minimal vegetation. Erosion control can be controlled through the proper establishment of vegetation at Rigden Farms. Any large reseeding efforts require the use of proper “soil-surface protection”. Interseeding gaps larger than 5 sq. ft. require soil surface protection efforts. For this project, the placement of Agricultural Straw, crimped with tackifier will be sufficient in stabilizing soil and revegetation.

Existing Communities

To accurately ascertain project results, in support of specific treatment actions, it is important that the resolution of monitoring be specific enough to gauge site-specific changes. If there is not adequate resolution in monitoring, it is possible that adaptive management recommendations will not be specific enough, or that the “blending” of results across too broad an area will provide inaccurate results, and hence inaccurate recommendations. The existing communities have been identified below to adequately encapsulate site conditions. Due to the nature of assessing vegetation during a primarily dormant period of vegetation, refinement is needed following continued monitoring.

Table 2. Existing vegetation conditions and recommendations for management. Refer to **Appendix A** for Plot locations.

Existing Community	Current Conditions	Location Specific Treatments
Native Grass Dominant	Minimal noxious weed presence with high vegetation coverage. Dominant species include blue grama, buffalograss, and sideoats grama.	Spot spray invasive species present.
Native / Non-native Grass	High vegetation coverage with sporadic noxious weed presence. Dominant species include crested wheatgrass, smooth brome, and blue grama.	Spot treatment of noxious weeds. Inter-seed as necessary.
Non-native Grass	High vegetation coverage with intermediate noxious weed presence. The dominant species is smooth brome.	Spot treatment of noxious weeds. Inter-seeding as necessary.
Dense Weeds / Degraded Upland	Approximately 50-70% vegetation coverage with primary species including Canada thistle, musk thistle, curly dock, and kochia. Low soil organic matter (SOM).	Spot treatment of listed noxious weeds. Soil amending and inter-seeding will be required.
Kochia	Dense coverage of kochia monoculture. Low SOM with a likely extensive seed bank of kochia.	Deplete seed bank by consistent mowing and herbicide application (boom spray). Re-seeding will be required following depletion of seed bank.
Bare Ground	Very low SOM resulting in areas minimal vegetation growth (< 30% coverage). Species vary.	Need for soil amendment (compost) and re-seeding. Spot treatment of noxious weeds.
Cattails	A dense ring of cattail monoculture surrounds the pond, prohibiting access and species diversity.	Excavation of cattails is required to remove root structures and prohibit growth. Key locations should be identified as access points for cattail removal.
Swale	Ditch resulting from stormwater drainage. Wetland conditions present, with dominant species being coyote and peachleaf willow.	Treatment of crack willow or Russian olive where noxious tree species are present.

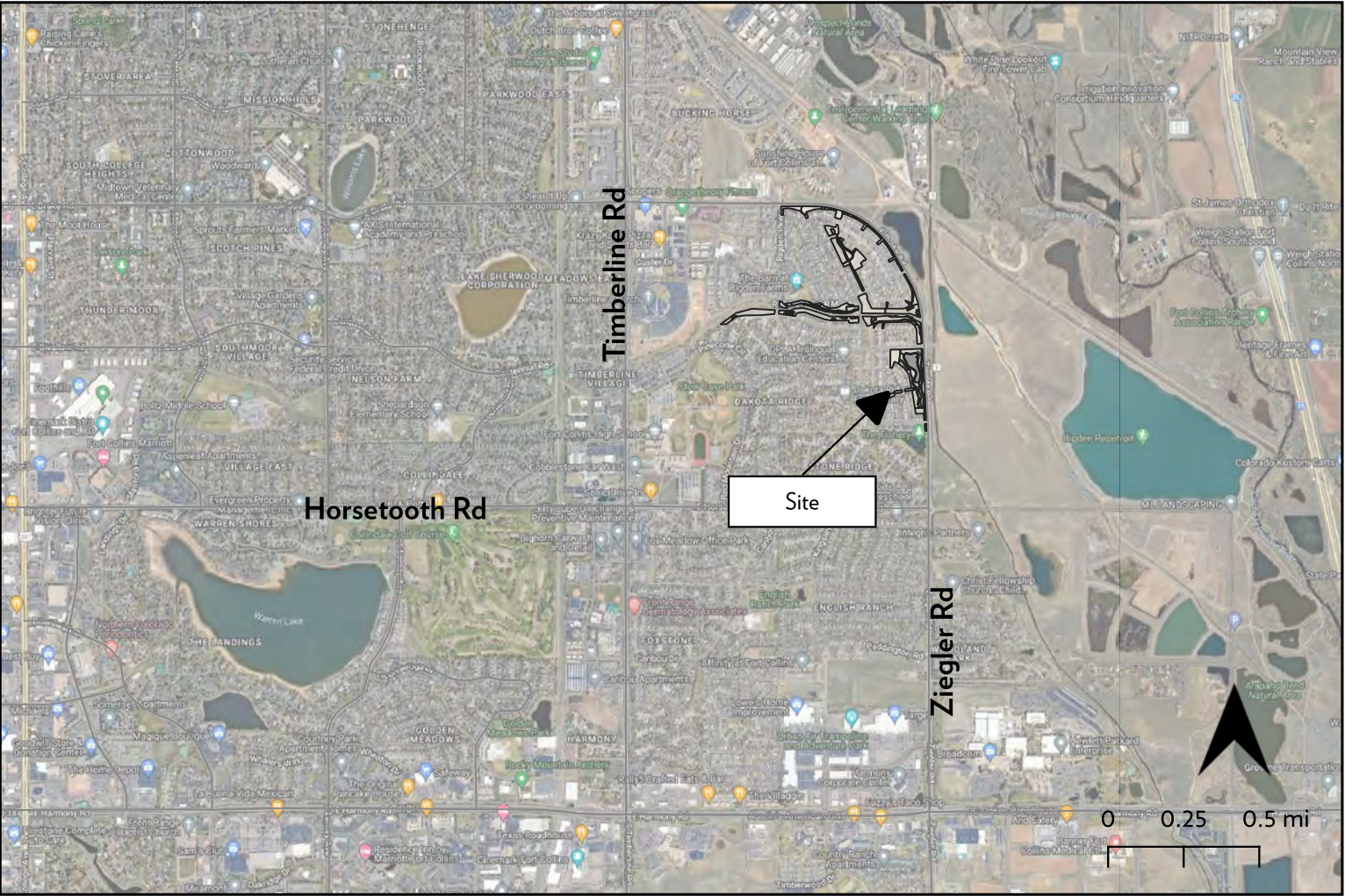
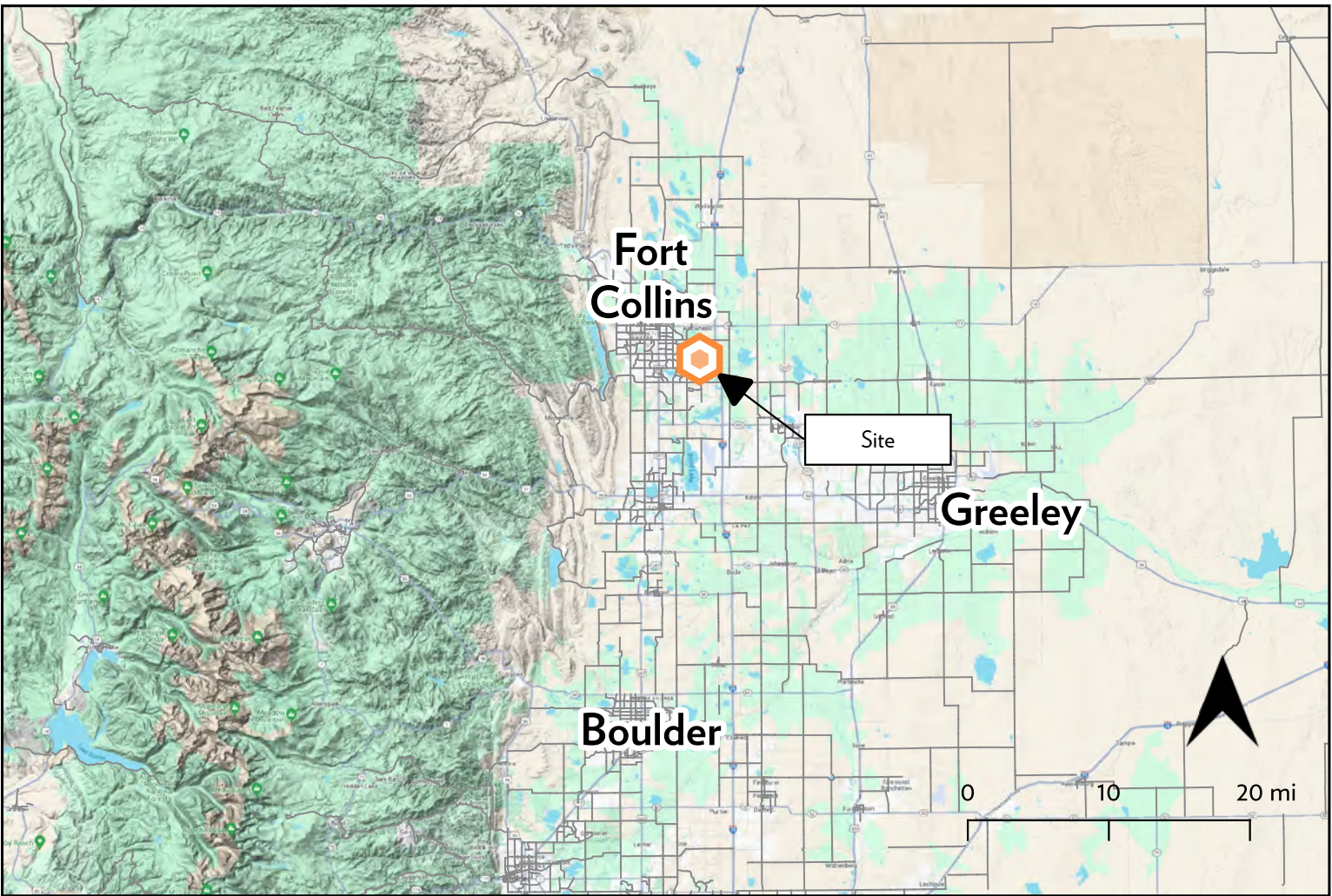
Reporting

Annually, an adaptive management update will be provided to the Rigden Farm HOA, to outline specific restoration and maintenance treatments we recommend, based on monitoring results, and in support of project goals. We anticipate that report will be provided by the end of September each year. Additional monitoring is needed this summer to fully encapsulate the vegetation conditions. A supplementary report to this initial plan will be provided around September 15.

Concluding Remarks

Our intention in developing this adaptive management plan is to address the need to enhance ecological functionality, and resilience while increasing accessibility to the site and reducing water usage. With an interdisciplinary team in place, and stemming from an understanding of management goals, it is our hope this plan will allow for adequate monitoring and maintenance necessary to support the restoration vision within the community of Rigden Farm.

Appendix A: Treatment Areas



Rigden Farm Restoration - Adaptive Management

Fort Collins, CO

- INDEX
- 1) Site Location
 - 2) Current Conditions
 - 3) Weed Management
 - 4) Revegetation
 - 5) Accessibility Improvements

Concept Design Not for Construction	
DATE ISSUED: 04/26/2024	
Site Location	Fort Collins, CO
PREPARED FOR:	Rigden Farm HOA
PREPARED BY:	
LAYER PROJECTION: ESPG: 2231 NAD 83 / Colorado North	
SOURCE OF MAP: Google Satellite Imagery	
SHEET NO: 1 of 5	

Current Conditions
Rigden Farms - Fort Collins, CO

Rigden Farm
HOA



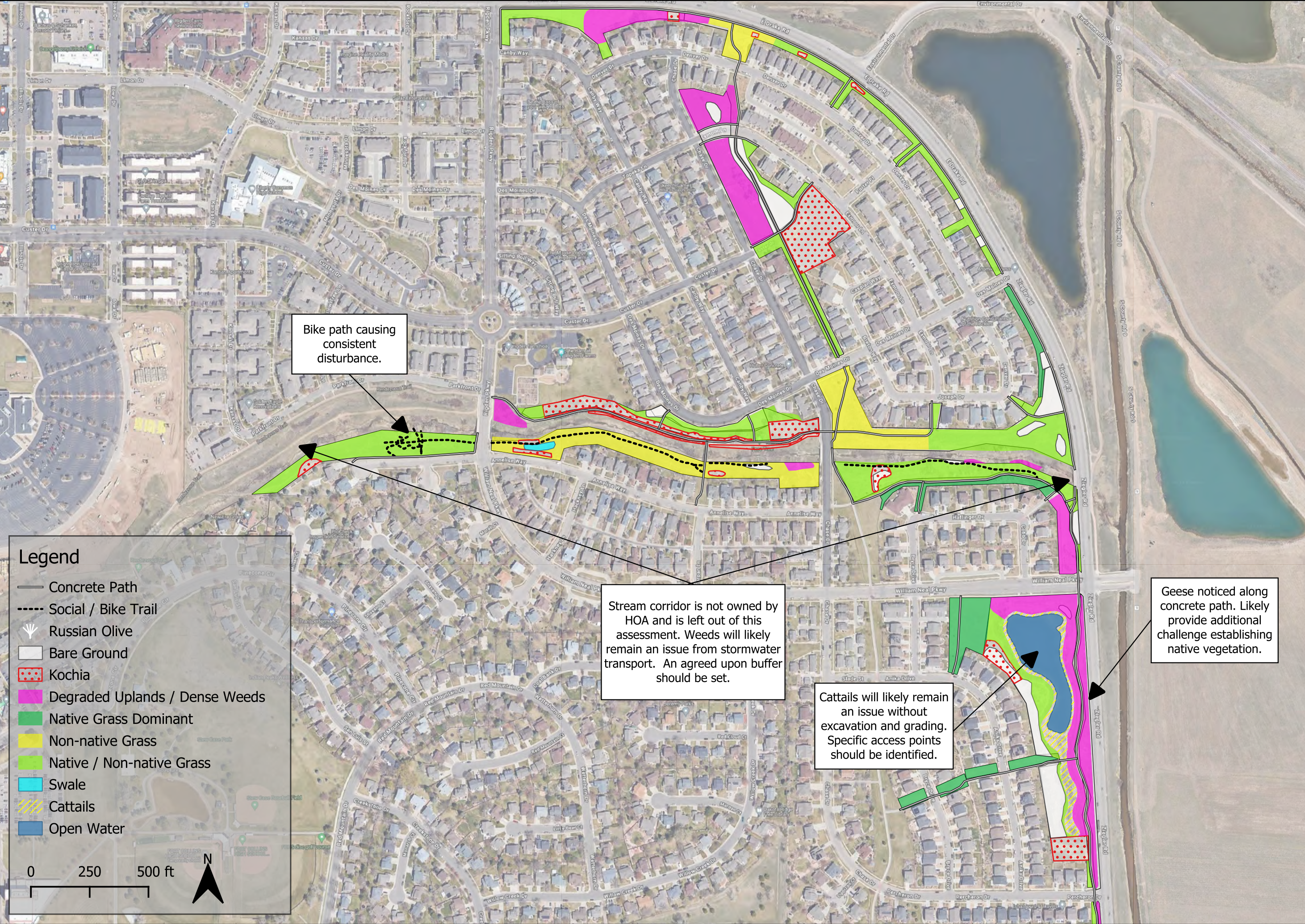
PREPARED FOR:

PREPARED BY:

LAYER PROJECTION: ESPG: 2231
NAD 83 / Colorado North

SOURCE OF MAP: Google Satellite Imagery

SHEET NO: 2 of 5



Weed Management Notes

- Intensive Weed Management could include boom spraying, mowing, weed whacking, mechanical removal, and discing. Consistent management will be required prior to any re-seeding efforts. A weed seed bank is likely present and must be flushed.
- Spot treatment of noxious weed species should occur throughout the entirety of the site following the dedicated Weed Management Plan.

Legend

- Cattail Excavation
- Intensive Weed Treatment (9.1 AC)
- Spot Treatment (18.5 AC)
- Russian Olive Treatment (removal)

0 250 500 ft



Concept Design
Not for Construction

DATE ISSUED:
04/25/2024

Weed Management
Rigden Farms - Fort Collins, CO

Rigden Farm
HOA

PREPARED FOR:

PREPARED BY:



LAYER PROJECTION: ESPG: 2231
NAD 83 / Colorado North

SOURCE OF MAP: Google Satellite Imagery

SHEET NO: 3 of 5

Revegetation Notes

- Interseeding will be hand broadcast and hand raked. Soil surface protection is to be wood straw applied by hand at 50% coverage.
- Soil ammendment information will be following additional assessment and field soil analysis. Ammendments should contain low nitrogen content to prohibit weed seed germination.
- Re-seeding areas are likely to change following assessments throughout the growing season. On-going weed management activities may reduce needs for seeding and inter-seeding.
- Native tree replacement refers to the removal of Russian olive trees and replacement planting with a functional equivalent. Functional equivalents include peachleaf willow and cottonwood among a variety of wetland shrubs. Plant pallettes to be provided following further assessment into site conditions.
- Wetland shrub planting should take place following cattail excavation to prohibit re-intrusion of cattails.
- Seed mixes will be developed following further observation of vegetation and soil conditions.

Legend

- Interseeding (18.5 AC)
- Soil Amendments and Re-seeding (9.1 AC)
- Wetland Planting (1.0 AC)
- Native Tree Replacement

0 250 500 ft



Concept Design
Not for Construction

DATE ISSUED:

04/26/2024

Revegetation
Rigden Farms - Fort Collins, CO

Rigden Farm
HOA

PREPARED FOR:

PREPARED BY:



LAYER PROJECTION: ESPG: 2231
NAD 83 / Colorado North

SOURCE OF MAP: Google Satellite Imagery

SHEET NO: 4 of 5

Extra protection may be needed to prohibit impacts to re-seeding efforts from geese and other wildlife.

General Access Notes

- A beauty bend of approximately 12" should be left around each concrete path.
- Social / Bike Trails should be confirmed for maintenance or revegetation (ie. will these remain?).
- Pond improvements are currently preliminary design concepts. All access and priority cattail treatment areas should be discussed and further assessed.

Concept Design
Not for Construction

DATE ISSUED:
04/26/2024

Accessibility Improvements
Rigden Farms - Fort Collins, CO

Rigden Farm
HOA



PREPARED BY:

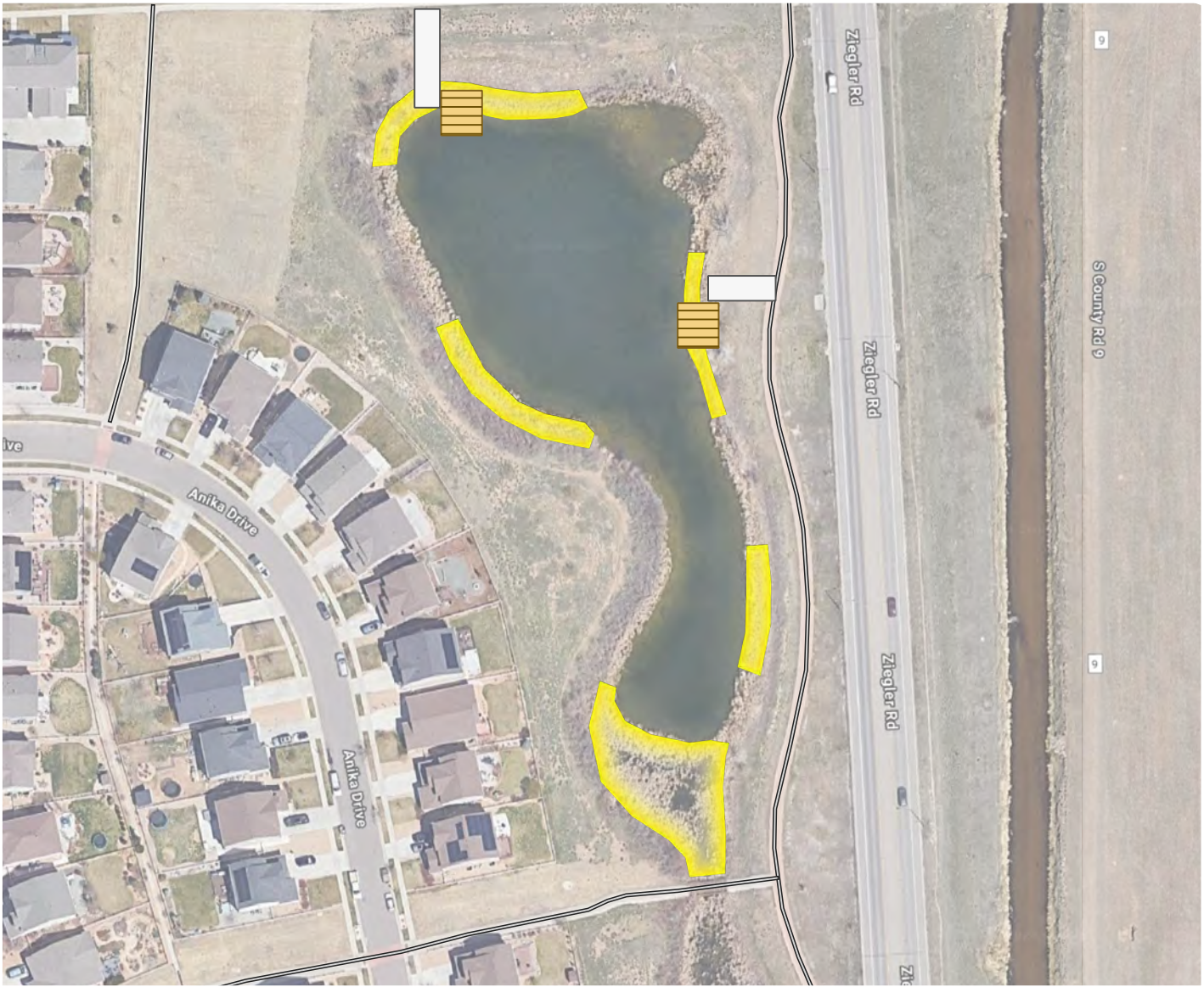
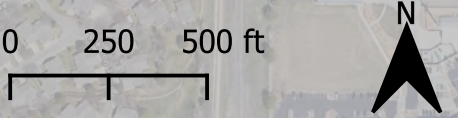
LAYER PROJECTION: ESPG: 2231
NAD 83 / Colorado North

SOURCE OF MAP: Google Satellite Imagery

SHEET NO: 5 of 5

Legend

- Concrete Path
- Social / Bike Trail
- Install Access Path to Pond
- Priority Cattail Excavation
- Potential Dock Installation



Appendix B: Vegetation Monitoring Forms

Reconnaissance Survey

- Rigden Farm

Project Site:

Observers:

Survey Date:

Plant Community Des.:

Plant Species Presence															
Plot Name (Density*)	Species 1			Species 2			Species 3			Species 4			Other Weed Presence/Absence	Native Presence Description	Comments (Disturbance levels, near infrastructure, intermixed, soils, wetlands, road, etc.)
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High			
				</											

* Density refers to the number of 1,000 s.f. units contained in the plot being Low (<25%), Medium (25 - 50%), or High (>50%) of the unit.

Quadrant Monitoring Form Site: Rigden Farm Restoration

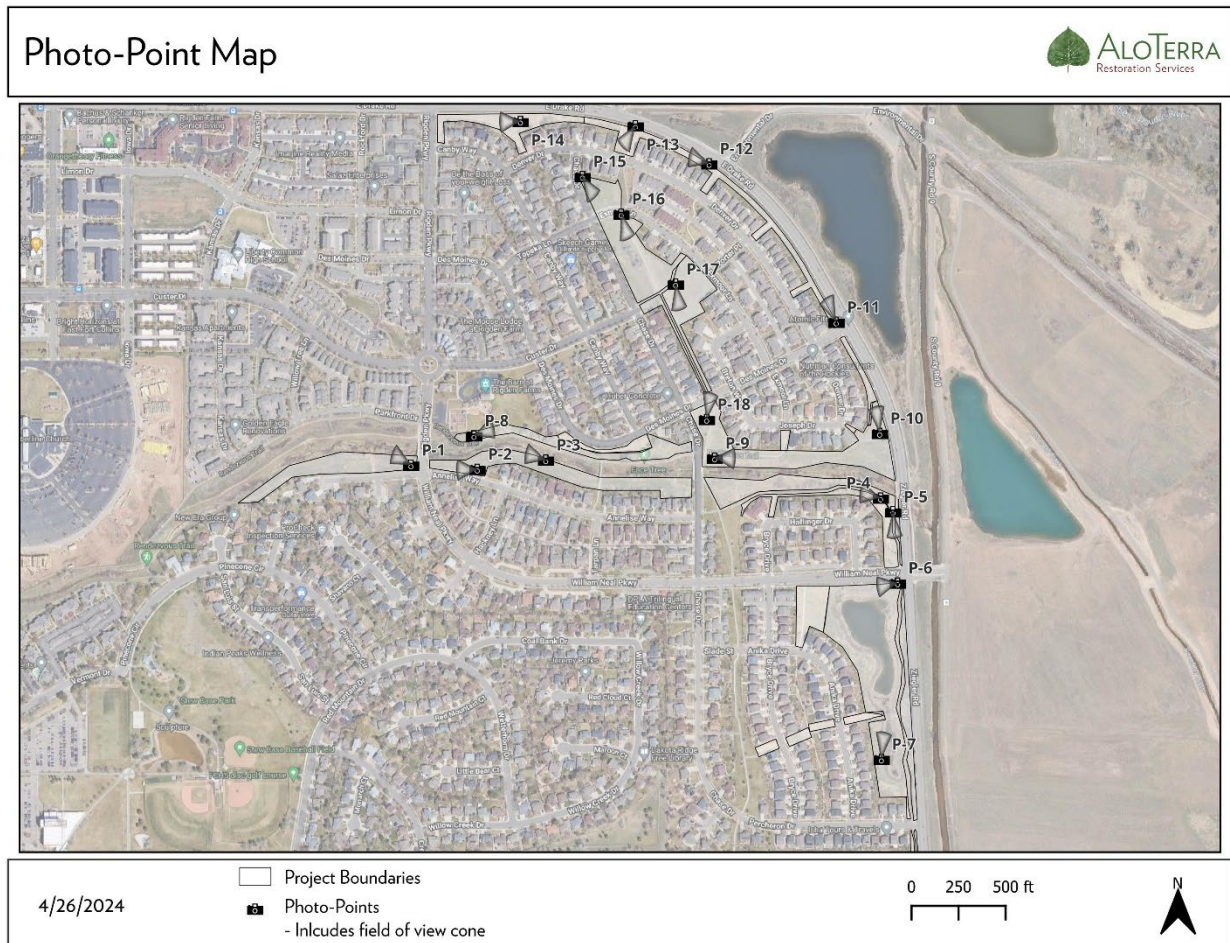
[illegible]

TRT BLOCK PHOTOS: Treatment type/Project Name-Property/monitoring date (e.g., S1-A/Aweida/07-18-23)

UNKNOWN (Unk): AF = annual forb; BF = biennial forb; PF = perennial forb; AG = annual grass; PG = perennial grass; FORB; GRASS
If you only know the Genus, spell out the genus and add "sp" (e.g., *Alyssum* sp.)

*Includes sand, gravel, cobble, rock. **Litter includes standing dead, wood, and any other organic matter.

Appendix C: Repeat Photography Points





P-1: View of Native / Non-native Grass with a ditch through the area. Peachleaf willows and past tree plantings are present. High vegetation coverage.



P-2: View of dense kochia bordering a concrete path. Native / Non-native grasses dominate slope leading towards a swale. Swale contains primarily coyote willow.



P-3: View of primarily smooth brome dominant slope. Slope leads towards stream running through center of the site. Social trail runs through center of area.



P-4: View of native grasses (blue grama, buffalograss) with tree plantings. Minimal weeds are present, with some spot treatment needed.



P-5: View of concrete path with severely degraded uplands on left (east) side. Transition into native grasses can be seen on the right (west) side.



P-6: View of degraded uplands with poor vegetation coverage. Weeds dominate site and are low to the ground. Evidence of goose traffic is present.



P-7: View of bare ground in between native / non-native grasses. Some weeds are present, with inter-seeding needed to increase diversity and vegetation coverage.



P-8: View of dense kochia along pathway. Intensive weed management and re-seeding will be required to increase native species diversity.



P-9: View of extensive bare ground intermixed with native / non-native grasses. Kochia and other weeds present.



P-10: View of extensive bare ground in a kochia dominant area. Poor soil conditions are present resulting in minimal native vegetation coverage.



P-11: View of high vegetation coverage, and primarily native grasses. Spot treatment of noxious weeds recommended.



P-12: View of high vegetation coverage, and mowed grasses along concrete path. Spot treatment and inter-seeding recommended.



P-13: View of bare ground with zones of high vegetation coverage in background. Intermediate weed coverage. Erosion control needed along ditch / swale.



P-14: View of bare ground leading up slope with relatively high weed coverage. Spot treatment and inter-seeding recommended.



P-15: View of non-native (smooth brome) dominant area with intermediate weed presence. Spot treatment and inter-seeding recommended.



P-16: View of degraded uplands with dense weeds and minimal native vegetation. Intensive weed management and re-seeding recommended.



P-17: View of degraded uplands with dense weeds and minimal native vegetation. Intensive weed management and re-seeding recommended. "Poisoned Area"



P-18: View of low native vegetation coverage and bare spots along path. Spot treatment and inter-seeding recommended.

Appendix D: Weed Management Plan



Weed Management Plan

Rigden Farm
April 24, 2024

Weed Management

A number of non-native weed species have been identified at the site. The Colorado Noxious Weed Act (C.R.S. 35-5.5-101-119) defines weeds as “alien plants or part of alien plants that have been designated by rule as being noxious or has been declared a noxious weed by a local advisory board, and meets one or more criteria: aggressively invades or is detrimental to economic crops or native plant communities; is poisonous to livestock; is a carrier of detrimental insects, diseases, or parasites; the direct or indirect presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.” Weeds are ecologically and economically detrimental and could undermine the success of any restoration and revegetation project. This is due to weeds competing with planted vegetation for water, nutrients, and light. In some instances, noxious weeds also secrete phytotoxins which actively inhibit the germination or growth of native vegetation. Non-native weeds provide less valuable food and cover resources for native wildlife and pollinators. These invasive species have an advantage over native species in part because they lack the full spectrum of biological controls (i.e., insect predators, plant pathogens, etc.) that serve to keep their populations in check in their country of origin. As such, they are more likely to continue to spread throughout the site by displacing native plants and forming dense monocultures.

The Colorado Noxious Weed Act creates a legally binding obligation for the removal/control of noxious species. Through the Colorado Department of Agriculture, a treatment priority list of A, B, and C species is managed and periodically updated in order to prioritize the control of weeds.

State of Colorado Noxious Weed Act List Definitions:

List A - Species that have not become established in the state and may have not even been reported in the state as yet. The most effective way to treat these species is to eradicate them wherever they are found, and to prevent their introduction into the state if they are not yet present.

List B - Species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species.

List C - These are species for which the Noxious Weeds Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of list C species.

Watch List (WL) - Species that have been determined to pose a potential threat to the agricultural productivity and environmental values of the lands of the state. The Watch List is intended to serve advisory and educational purposes only. Its purpose is to encourage the identification and reporting of these species to the Commissioner in order to facilitate the collection of information to assist the Commissioner in determining which species should be designated as noxious weeds.

Not Listed (NL) – Non-native species that are not listed as noxious by the state of Colorado but were addressed by AloTerra here due to potential problems posed by their presence such as interference with revegetation efforts or proposed agricultural use.

To assist with weed management, a great variety of weed management resources are provided by these entities, including how to create a weed management plan, best management practices for weed management, and more:

Colorado Department of Agriculture website:

<https://www.colorado.gov/pacific/agconservation/noxious-weed-publications>,

Colorado State University Extension, Weed Resources:

<http://www.ext.colostate.edu/sam/weeds.html>

Colorado Weed Management Association

<https://cwma.org/>

Weed Treatment

The most cost-effective time to start management of invasive vegetation is early in a project's lifetime, before invasive plants have a chance to spread through abundant seeds or vegetative propagules. Any disturbance of the soil (discing, tilling, plowing, heavy equipment traffic, etc.) will result in release and

recruitment of weed seeds. **Effective control of weeds will be an ongoing process for several years and will be an essential part of maintaining restoration efforts in perpetuity.**

When managing for weeds, given the project goals of increased biological and structural diversity, it is important to note that the list of species in Table 1 are not the only species to be managed. Species such as tumble mustard (*Sisymbrium altissimum*, unlisted in Colorado) are not a significant concern, while species such as cheatgrass (*Bromus tectorum*, list C) can be highly disruptive to a restoration project and to long-term site management. As such, our weed management recommendations below target listed and unlisted species alike, whether or not their management is required by the State of Colorado.

Weed Management Recommendations

Effective management will require integrating a variety of restoration and management activities to control the invasion of non-native vegetation, which include:

- Comply with all state and local weed laws, regulations, and requirements. Information and contact information can be found at the county website (<https://www.bouldercounty.org/property-and-land/land-use/noxious-weeds/>);
- Selecting appropriate and diverse early- to mid-seral seed mixes with the potential to fully occupy a given area's botanical niches;
- Seeding and planting in optimal seasons, and using appropriate seeding rates and seeding methods to increase the likelihood of high vegetation cover in the early years following restoration;
- Applying appropriate levels of soil amendments, as determined by proper soil testing;
- Minimizing or eliminating the use of nitrogen, as **invasive species are preferentially stimulated over native species by the use of nitrogen**;
- Monitor for the appearance of new populations of weeds. Treatment of small populations of weeds is often more effective than attempting to combat large established populations;
- Maintain weed free shop yards and equipment staging areas;
- Ensuring that equipment (mowers, tractors, trucks, etc.) are cleaned between activities;
- Elimination of weeds along roads and fence lines in order to intercept any new introductions of weeds and to avoid spreading weeds to neighbors;
- Eliminating the presence of undesirable non-native species brought to the site by heavy equipment, and via other vectors (cattle and other livestock, clothing and boots of residents and volunteers, and others);
- Developing an iterative weed management plan, informed by regularly scheduled monitoring;

- Spot treatment of weeds within re-seeded areas;
- Keeping records of all weed management activities to aid in monitoring and future planning. Especially for applications made near water.

Treatment Strategies

The treatments below include a combination of mechanical and chemical treatments for species likely to occur at the project site. Some general priorities based on problematic characteristics of the species identified in preliminary assessments have been made. Biological controls may also be available and should be researched and applied as desired.

Table 1. DRAFT Weed list for Rigden Farm Restoration

Priority	Common Name	Scientific Name	CNWA List
High	Knapweed*	<i>Centaurea Spp.</i>	B
High	Scotch Thistle	<i>Onopordum acanthium/tauricum</i>	B
High	Field Bindweed*	<i>Convolvulus arvensis</i>	C
High	Canada Thistle*	<i>Cirsium arvense</i>	B
High	Musk Thistle	<i>Carduus nutans</i>	B
High	Houndstongue	<i>Cynoglossum officinale</i>	B
High	Russian Olive	<i>Elaeagnus angustifolia</i>	B
High	Common Kochia	<i>Kochia scoparia</i>	NL
High	Pepperweed*	<i>Lepidium latifolium</i>	B
High	Hoary Cress*	<i>Lepidium draba</i>	B
High	Russian Thistle	<i>Salsola tragus/paulsenii</i>	NL
Moderate	Smooth Brome*	<i>Bromus inermis</i>	NL
Moderate	Cattail	<i>Typha latifolia</i>	NL
Moderate	Crack Willow*	<i>Salix fragilis</i>	NL
Moderate	Common Mullein	<i>Verbascum thapsus</i>	C
Moderate	Prickly Lettuce	<i>Lactuca serriola</i>	NL
Moderate	Curly Dock	<i>Rumex crispus/obtusifolius</i>	NL
Low	Goosefoot	<i>Chenopodium spp.</i>	NL
Low	Annual Mustards	<i>Multiple Species</i>	NL

*Herbicide necessary for effective control.

Treatment Types

There are five primary approaches to treating noxious weeds. While using only one method to treat weeds can yield some success, it is often most effective to use multiple treatment approaches in conjunction. For example, Canada thistle is best controlled by mowing the patch and allowing it to regrow for 1 -2 weeks before applying an herbicide with some residual activity to the patch. It may be possible and desirable to treat some weed species mechanically (mowing, hand pulling, etc.), but some species which reproduce by underground roots, have large energy reserves, or have long lived seed banks will require the use of an herbicide to effectively control.

Prevention – Ensuring that weeds are not introduced to or allowed to become established at the site as much as possible. This is done by cleaning equipment used at the site, using weed free mulches and hay, and monitoring any work sites for the appearance of noxious weeds

Cultural – The establishment of competitive and desired native vegetation at sites of soil disturbance and after weed eradication efforts. This is a critical element of weed management without which weed control efforts often prove futile.

Mechanical – Consists of physical methods to remove, damage, or destroy weedy plants. These methods include hand pulling, digging, seed head/flower removal, disking, and mowing. This method can be effective alone on annual and biennial weeds such as winter annual mustards, cheatgrass, kochia, and musk thistle. However, it often stimulates the spread of perennial species such as Canada thistle and thus must be used in conjunction with herbicide control.

Herbicide – Application of herbicide to weedy vegetation. Often the most effective and time-efficient method of managing weeds. **Always read, understand, and follow the label directions. The herbicide label is the LAW!** Herbicides can be selective to a certain class of plants such as broad leaves or grasses or can be broad-spectrum meaning that they will injure most plants which they contact. While there are often multiple herbicides labeled for use on any particular weed species, the examples provided are those that several sources (Colorado Department of Agriculture, US Forest Service, and CSU Extension, UC Davis Weed Research and Information Center) indicated to be highly effective at relatively low application rates. This is done in an effort to minimize cost and the amount of chemical applied. Herbicides are listed by their active chemical in order to encourage the use of lower cost generic products where possible. Many weed species, such as kochia and Russian thistle, can develop resistance to herbicides with continued application, so it is prudent to rotate the herbicides used. Herbicides often work best when used in conjunction with other control methods such as mowing, hand pulling, and seed head removal. When combining mechanical and herbicide application, use a treatment pattern of mechanical-regrow-herbicide. For example, mow a patch of Canada thistle; then allow it to regrow for one to two weeks; and then treat it with herbicide. All treatments should be followed up with native species revegetation efforts to prevent the reestablishment of weeds.

Biological – The use of grazing or highly species-specific arthropod predators or disease-causing agents to suppress and weaken a dense population of a particular species of weed. It is important to note that biological control will not eradicate a target weed from a site, but will reduce large, dense, and otherwise intractable populations to a state where other methods of control are more feasible. It is also

important to note that biological control is not a quick process; it typically requires 3 – 5 years to become established. Biological control agents are available for purchase through the Colorado Department of Agriculture Insectary. More information can be found the CDA website (<https://www.colorado.gov/pacific/agconservation/biocontrol>).

Species Treatment Recommendation

The information concerning weeds and weed treatment provided below is compiled from readily available public sources with the primary sources being the Colorado Department of Agriculture, Colorado Parks and Wildlife, the US Forest Service, Colorado State University Extension, and the University of California Davis Weed Research and Information Center. The species profiles are organized from highest priority to the lowest. Herbicides are identified by their primary active chemical since there are many different brand names available, though common brands are provided parenthetically.

Several treatment options have been provided to allow the client to select the option which works best with their land use goals. The bolded options are those that are anticipated by AloTerra to be most effective treatments with attention to the client's desire to minimize the use of certain chemicals especially those with long residuals.

Knapweed (*Centaurea Spp.*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: Knapweed is a biannual plant that has the ability to outcompete native vegetation and contribute to habitat loss and soil erosion. Each plant can produce up to 18,000 seeds per plant and they solely reproduce by seed.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Flower/Seed head removal	Year round	When needed	Prevention of seed spread	N/A
Chemical	5-7 oz/acre or 1 oz/gal aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100-gal spray solution)	Spring, Summer or Fall as plants enter dormancy	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	.6-1.3 pints/acre of Clopyralid (Transline) +0.25% non ionic surfactant	Spring; on rosettes and until before flowering	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks

Scotch Thistle (*Onopordum acanthium/tauricum*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: Thistles are highly competitive and persistent plants. Given suitable conditions, these weeds rapidly invade rangeland, pastures, abandoned fields, roadsides, and disturbed sites. A high density of thistles reduces availability of quality forage and the diversity of flora and fauna species. Additionally, most thistles have taproots that do not stabilize the soil as well as the fibrous roots of native grass species; therefore, high densities of thistles can contribute to soil erosion and stream sedimentation. Scotch thistle in high density stands can act as living barbed wire inhibiting the movement of wildlife, livestock, and people.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Mechanical	Flower/Seed head removal	Year round	When needed	Prevention of seed spread	N/A
Mechanical	Mowing as low as possible	Spring until seed set	Every 3 weeks	Reduction of flower production and stressing of plant prior to chemical treatment	N/A
Chemical	5-7 oz/acre or 1 oz/gal aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100-gal spray solution)	Spring, Summer or Fall as plants enter dormancy	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	1-3 oz/acre chlorsulfuron (Telar XP) + 0.25% non-ionic surfactant (1 qt/100 gal of spray solution); can be mixed into aminopyralid solution	Spring; on rosettes and until budding; incorporate mowing if possible	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks

Field Bindweed (*Convolvulus arvensis*)

- Priority: High
- State Noxious Weed Designation: List C; If left unchecked, will create monoculture.
- Reason for Concern: Field bindweed is an extremely difficult noxious weed to control because, in part, of its taproot that may go 20 feet deep into the soil, and which repeatedly gives rise to numerous long rhizomes. It poses threats to restoration efforts and riparian corridors by choking out grasses and forbs. It can decrease habitat biodiversity. It is one of the most serious weeds of agricultural fields in temperate regions of the world. It is also mildly toxic to grazing animals.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Chemical	24 oz. Quinstar/acre +4oz Overdrive/acre + 1% v/v methylated seed oil	At flowering in the spring and/or fall before dormancy	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	3-4 pints/acre or 3.84-6.4 oz/gal triclopyr (Garlon 3A)	Late spring to mid-summer	Annually	Death of individual plants – Will require multiple treatments	1-3 weeks to see damage several years to kill entire
Biological	<i>Aceria malherbae</i> , gall forming mite	Summer when plants are growing, and weather is conducive to insect survival	Repeated releases over several years	Establish long term suppression of dense populations	Several years, depending on the number of insects released

Canada Thistle (*Breea arvense/Cirsium arvense*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: Canada thistle is a highly competitive, persistent plant that grows in dense, impenetrable colonies. This species displaces desired forbs and grasses for both domestic animals and wildlife. It is an aggressive competitor for light, moisture, and nutrients. Its spiny leaves make Canada thistle inedible to most livestock and wild animals. **Produces allelopathic chemicals that actively inhibit the growth of other plants.**
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Mowing	Spring; once plants bolt	Every 3 weeks	Reduced seed production and dispersal capability; stimulation of vegetative budding and	Mechanical
Chemical	5 oz/acre or 1 oz/gal aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100-gal spray solution)	Spring; on rosettes and until flowering; incorporate mowing if possible. Fall on rosettes	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks; control in ~4
Chemical	1.5 oz/acre chlorsulfuron (Telar XP) + 0.25% non-ionic surfactant (1 qt/100 gal of spray solution); can be mixed into aminopyralid solution	Fall, at time of seed set as plants enter dormancy; incorporate mowing if possible	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks; control in ~4 years

Musk Thistle (*Carduus nutans*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: Thistles are highly competitive and persistent plants. Given suitable conditions, these weeds rapidly invade rangeland, pastures, abandoned fields, roadsides, and disturbed sites. A high density of thistles reduces availability of quality forage and the diversity of flora and fauna species. Additionally, most thistles have taproots that do not stabilize the soil as well as the fibrous roots of native species; therefore, high densities of thistles can contribute to soil erosion and stream sedimentation. Musk thistle also has allelopathic qualities meaning it can inhibit the growth of surrounding vegetation other than other thistle species. This activity especially effects nitrogen fixing species giving this species the potential to cause long- term declines in soil nitrogen input.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Mechanical	Mowing/Weed Whacking	Spring; once plants bolt	Every 3 weeks	Reduced seed production and dispersal capability; stimulation of vegetative budding and	Mechanical
Mechanical	Flower/Seed head removal	Year round	When needed	Prevention of seed spread	N/A
Chemical	5 oz/acre or 1 oz/gal aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100 gal spray solution)	Spring and summer; on rosettes and until flowering	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	1 oz/acre chlorsulfuron (Telar XP) + 0.25% non-ionic surfactant (1 qt/100 gal of spray solution); can be mixed into aminopyralid solution	Spring; on rosettes and until budding;	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks

Houndstongue (*Cynoglossum officinale*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: This species invades grasslands, pastures, shrublands, forestlands, croplands and riparian areas, and is an effective competitor that readily displaces desirable species, establishing monocultures and further degrading forage quality in disturbed habitats. Seeds are Velcro-like and are a nuisance to wildlife, and livestock. This species is also toxic to horses and cattle.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Mechanical	Seed head/Flower Removal	Year round	As often as new flowers are produced	Reduction of seed production	Many years, if ever
Chemical	1 – 1.5 oz/acres or 0.01-0.2 oz/gal Chlorsulfuron (Telar) + 1 qt/acre 2,4-D + 0.25% non-ionic surfactant	Spring; on rosettes and until flowering	Annually	Death of plants and suppression of seed growth; allow flush of native milkweeds	Visible damage in 1 - 3 weeks
Chemical	1 oz Metsulfuron (Escort)/acre + 0.25% to 0.5% v/v non ionic surfactant	Early spring, postemergence	Annually	Kill existing plants.	Visible damage in 1 -3 weeks. Control in several years.
Chemical	8 to 12 oz of imazapic + 0.25% to 0.5% v/v non ionic surfactant	Preemergent or early spring postemergent	Annually	Prevention of seed germination or kill existing plant	2-3 years to deplete seed bank. Control may increase in the 2nd year after

Russian Olive (*Elaeagnus angustifolia*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: Crowds out native vegetation and reduces habitat quality. Depletes ground water reserves and reduces species richness of birds in riparian areas.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Mowing small plants with forestry mower	Early in growing season	Annually	Clearing of above ground stems particularly in dense stands; resprouts should be foliar sprayed with herbicide the following year	2 – 3 years for control.
Mechanical	Hand grubbing small patches	Year round	When possible	Elimination of small patches	Several Years
Chemical	20% - 30% Triclopyr ester (Garlon 4) in 50%-75% carrier oil (Pathfinder pre- mixed product) basal bark application or cut surface for larger than 4" diameter	Fall. Never apply when temperatures exceed 80° F	Once with possible follow-up	Death of trees and suppression of resprouting	Visible damage the following spring; several years for control

Common Kochia (*Kochia scoparia*)

- Priority: High
- State Noxious Weed Designation: Not Listed; Control is necessary to decrease spread.
- Reason for Concern: Kochia aids in spreading fire; burns easily because stems are spaced in an arrangement that allows for maximum air circulation; dead plants contribute to fuel load by retaining their original shape for some time before decomposing. Because it is extremely efficient at using water, it thrives in warm, low rainfall environments. Although palatable to stock, kochia may be toxic in large quantities. Litter from kochia may chemically inhibit the growth Kochia also becomes a tumble weed.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Mowing	Spring through fall	Every 10 – 21 days	Reduction of seed production and stressing of plant prior to chemical treatment	2 – 3 years for control.
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Chemical*	4.5 oz/acre of Rejuvra (indaziflam) + .3 v/v of induce surfactant	Apply as a pre-emergent is fall when snow/rainfall is expected within 3 weeks. Do not apply on top of snow.	Every 3 years	Prevents annual species form germinating	Visible damage in 6-12 months. Control in several years.
Chemical	6-22 oz/acre Floroxypyr (Vista)) + 0.25% non-ionic surfactant (1 qt/100 gal of spray solution)	Post emergence from seedling to bloom	Annually	Death of plants; especially resistant biotypes	Visible Damage in 1-3 weeks

*Only use in level 1 areas that will not be re seeded.

Pepperweed (*Lepidium latifolium*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: This species is highly competitive and persistent plants. Given suitable conditions, these weeds rapidly invade rangeland, pastures, abandoned fields, roadsides, and disturbed sites. They reproduce by both seed and roots and quickly form a monoculture if untreated.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Chemical	1 oz. of Mestulfuron/acre + .25 v/v non ionic surfactant	Apply at flowering. (Early spring to early summer)	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	12 oz/acre of Imazapic +2 pints/acre methylated seed oil	Apply at flowering or post flower stage late spring to mid summer)	Annually	Death of plants	Visible damage in 1 - 3 weeks

Hoary Cress (*Lepidium draba*)

- Priority: High
- State Noxious Weed Designation: List B; Control is required and necessary to decrease spread.
- Reason for Concern: This species is highly competitive and persistent plants. Given suitable conditions, these weeds rapidly invade rangeland, pastures, abandoned fields, roadsides, and disturbed sites. They reproduce by both seed and roots and quickly form a monoculture if untreated.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Chemical	1 oz. of Mestulfuron/acre + .25 v/v non ionic surfactant	Apply at flowering. (Early spring to early summer)	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	12 oz/acre of Imazapic +2 pints/acre methylated seed oil	Apply at flowering or post flower stage late spring to mid summer)	Annually	Death of plants	Visible damage in 1 - 3 weeks

Russian Thistle (*Salsola kali*)

- Priority: High
- State Noxious Weed Designation: Not Listed; Control is necessary to decrease spread.
- Reason for Concern: Russian thistle aids in spreading fire; burns easily because stems are spaced in an arrangement that allows for maximum air circulation; dead plants contribute to fuel load by retaining their original shape for some time before decomposing. Russian Thistle also becomes a tumble weed. Acts as a host for some agricultural pathogens and pests.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Mowing	Spring through fall	Every 10 – 21 days	Reduction of seed production and stressing of plant prior to chemical treatment	2 – 3 years for control.
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Chemical*	4.5 oz/acre of Rejuvra (indaziflam) + .3 v/v of induce surfactant	Apply as a pre-emergent is fall when snow/rainfall is expected within 3 weeks. Do not apply on top of snow.	Every 3 years	Prevents annual species from germinating	Visible damage in 6-12 months. Control in several years.
Chemical	1 oz/acre chlorsulfuron (Telar XP) + 0.25% non-ionic surfactant (1 qt/100 gal of spray solution); can be mixed into 2,4-D solution	Spring; on rosettes and until budding; incorporate mowing if possible	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks

*Only use in level 1 areas that will not be re seeded.

Smooth Brome (*Bromus inermis*)

- Priority: Moderate
- State Noxious Weed Designation: Not Listed; Control is necessary to decrease spread.
- Reason for Concern: This is an incredibly persistent and competitive species. Once it forms a dense sod it excludes native species and reduces diversity. It is known to negatively affect native arthropod species in North American prairies.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Mowing as low as possible	Spring; mid to late May when grass is in the "boot" stage of growth	Repeat every 10 -21 days	Stressing of the plant to cause death	Several years for seed bank depletion
Chemical	10 oz/acre of imazapyr	Spring when plants are growing rapidly	Annually	Death of individual plants	2-3 years to deplete seed bank.

Cattail (*Typha latifolia*)

- Priority: Moderate
- State Noxious Weed Designation: List NL; Control is recommended.
- Reason for Concern: Typically found in streams and wetlands throughout the western United States. While Most species are native to Colorado, cattails can act as aggressive weeds and very successfully outcompete other vegetation. Cattails can create monocultures that leave little open water areas.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Before flowering	2-3 times per year	Death of plants and prevention of seed spread	Many years, to exhaust seed bank
Chemical	2 to 4 pt of clearcast (imazamox)/acre	Postemergence, from new growth to adult	Annually	Death of individual plants and Prevention of seed germination	Visible damage in 1 - 4 weeks.
Chemical	.5 to 2 qt of Habitat (imazapyr)/acre	Post emergence from boot to flowering	Annually	Death of individual plants	Visible damage in 1 - 4 weeks

Crack Willow (*Salix Fragilis*)

- Priority: Moderate
- State Noxious Weed Designation: List NL; Control is necessary to decrease spread.
- Reason for Concern: Crowds out native vegetation and reduces habitat quality. Depletes ground water reserves and reduces species richness of birds in riparian areas.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Mowing small plants with forestry mower	Early in growing season	Annually	Clearing of above ground stems particularly in dense stands; resprouts should be foliar sprayed with herbicide the following year	2 – 3 years for control.
Mechanical	Hand grubbing small patches	Year round	When possible	Elimination of small patches	Several Years
Chemical	20% - 30% Triclopyr ester (Garlon 4) in 50%-75% carrier oil (Pathfinder pre-mixed product) basal bark application or cut surface for larger than 4" diameter	Fall. Never apply when temperatures exceed 80° F	Once with possible follow-up	Death of trees and suppression of resprouting	Visible damage the following spring; several years for control

Common Mullein (*Verbascum thapsus*)

- Priority: Moderate
- State Noxious Weed Designation: List C; Control is recommended.
- Reason for Concern: Can create dense stands and near monocultures. Reduces forage for some wildlife.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Spring, Summer, and Fall	When needed	Death of plants and prevention of seed spread	Many years, if ever to exhaust seed bank
Mechanical	Flower/Seed head removal	Summer	When needed	Prevention of seed spread	N/A
Mechanical	Mowing	Spring, Summer, and Fall before seed set	Every 10 – 21 days	Suppression of seed production	N/A
Chemical	7 oz/acre aminopyralid (Milestone) + 0.5% non-ionic surfactant (2 qt/100 gal spray solution)	Spring and Fall before rosettes bolt	Twice per year	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks; many years to exhaust the seed bank

Prickly Lettuce (*Lactuca serriola*)

- Priority: Moderate
- State Noxious Weed Designation: Not Listed; Control is necessary to decrease spread.
- Reason for Concern: Can out compete native vegetation for water. May be toxic to some grazing animals.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Mechanical	Mowing	Spring through fall	Every 10 – 21 days	Reduction of seed production and stressing of plant prior to chemical treatment	2 – 3 years for control.
Mechanical	Flower/Seed head removal	Year round	When needed	Prevention of seed spread	N/A
Chemical	5 oz/acre aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100 gal spray solution)	Spring when in the rosette stage	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks

Curly Dock (*Rumex crispus/obtusifolius*)

- Priority: Moderate
- State Noxious Weed Designation: Not Listed; Control is necessary to decrease spread.
- Reason for Concern: Can outcompete native vegetation for resources and form monocultures, especially in grazed pastures. Under some conditions curly dock can become toxic to livestock.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Mechanical	Mowing	Spring through Fall before seed set	Every 10 – 21 days	Reduction of seed production and stressing of plant prior to chemical treatment	Many years for control.
Mechanical	Flower/Seed head removal	Year round	When needed	Prevention of seed spread	N/A
Chemical	5 oz/acre aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100 gal spray solution)	Spring when plants are actively growing	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks

Goosefoot (*Chenopodium spp.*)

- Priority: Low
- State Noxious Weed Designation: Not listed; If left unchecked, will create monoculture.
- Reason for Concern: As this invasive weed begins to dominate an area, it alters native plant communities and displaces native plants thus impacting wildlife.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Digging plant and as much of roots as possible	Spring; narrow window of 1 week after flowering.	Annually	Death of individual plant	Immediate for individual plant; Several years for patch seed bank depletion.
Mechanical	Mowing	Year round	Every 2 – 3 weeks	Suppression of seed production	2-3 for patch seed bank depletion
Chemical	5 oz/acre aminopyralid (Milestone) + 0.25% non-ionic surfactant (1 qt/100 gal spray solution)	Spring and summer when plants are actively growing	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks
Chemical	5 oz./acre of Imazapic + 1% v/v methylated seed oil	Apply as a pre-emergent in late summer or fall, or as a post emergent in spring to summer	Annually	Death of plants and suppression of seed growth	Visible damage in 1 - 3 weeks. Control in several years.
Chemical*	4.5 oz/acre of Rejuvra (indaziflam) + .3 v/v of induce surfactant	Apply as a pre-emergent in fall when snow/rainfall is expected within 3 weeks. Do not apply on top of snow.	Every 3 years	Prevents annual species from germinating	Visible damage in 6-12 months. Control in several years.

*Only use in level 1 areas that will not be re seeded.

Annual Mustards (*Multiple Species in Brassicaceae family*)

- Priority: Low
- State Noxious Weed Designation: Not Listed; Control is necessary to decrease spread.
- Reason for Concern: Can outcompete native vegetation for resources and form monocultures. Some species harbor diseases harmful to crops in the mustard family.
- Treatment Options:

Treatment Type	Treatment	Timing	Frequency	Expected Outcome	Expected Time to Success
Mechanical	Severing plant 2" below soil level with hand tools	Year round	When needed	Death of individual plant	Immediate for individual plant; many years for patch
Mechanical	Mowing	Spring through Fall before seed set	Every 10 – 21 days	Reduction of seed production and stressing of plant prior to chemical treatment	Many years for control.
Mechanical	Flower/Seed head removal	Year round	When needed	Prevention of seed spread	N/A
Chemical	.5-1 pints/acre Triclopyr (Garlon 3A)	When in rosette stage	Annually	Kill existing plants.	1 – 3 weeks for visible damage. Control in several years.
Chemical*	4.5 oz/acre of Rejuvra (indaziflam) + .3 v/v of induce surfactant	Apply as a pre-emergent is fall when snow/rainfall is expected within 3 weeks. Do not apply on top of snow.	Every 3 years	Prevents annual species form germinating	Visible damage in 6-12 months. Control in several years.

*Only use in level 1 areas that will not be re seeded.

Other Useful Resources

Boulder County Noxious weeds and Invasive Species Management:

<https://www.bouldercounty.org/property-and-land/land-use/noxious-weeds/>

Larimer County Herbicide Guide:

https://www.larimer.org/sites/default/files/uploads/2017/herbicide_.pdf

Colorado Department of Agriculture Herbicide Recommendations:

<https://drive.google.com/file/d/1Z7zZtAgRP6rK4pRE7EB54GLnPIJDzz2M/view>

Colorado Department of Agriculture Noxious Weeds Identification List:

<https://www.colorado.gov/pacific/agconservation/noxious-weed-species>

Technical Memorandum

Client: *Rigden Farm HOA*, Tara Tate, HOA manager,
CC: City of Fort Collins Developmental Review
Prepared By: *Aloterra Restoration Services, Inc.*
Date: August 12, 2025
Project: **Rigden Farm Adaptive Management Plan**

Dear City of Fort Collins,

Please find attached the project design for Rigden Farm HOA vegetation management plan and associated pigs grazing plan.

Gary McMahon

Director of Operations
AloTerra Restoration Services, Inc.
320 E. Vine Dr. Ste. 314
Fort Collins, CO 80524

Project Introduction

The Rigden Farm HOA has an extensive history of land management and water conservation with the intent to reintroduce native grassland habitat, but has struggled to reach the success that the residents, the HOA, and the City of Fort Collins have desired. As a continuation of ongoing efforts, Aloterra Restoration Services has developed a holistic and diverse vegetation management plan that includes chemical, mechanical, and biological treatments to achieve desired results and provide ecological uplift. See the **Site Plans** (Rigden Farm Adaptive Management Plan 2025) for additional details in regarding weed management and revegetation strategies. The main goals of this project are to adequately control the spread and abundance of noxious and invasive weeds throughout the site, and to re-establish native grasslands that require no watering; through the conversion of unsustainable turf grass lawns. Native grassland establishment is being experimentally assisted through the utilization of a Heritage breed of hog called "Large Black Hogs", a breed that is known to be docile, friendly, and good for consuming weeds and their seeds. The repeated seasonal administering of hog grazing to the site and on-going monitoring with a diverse set of treatment means and methods will ensure that Rigden Farm is able to successfully and safely meet project goals of beautiful open spaces of native grasslands that require no irrigation or mechanical maintenance - lessening their water consumption and carbon footprint.

Livestock Grazing Design

Introduction

For centuries livestock have worked for and with humans to manage vegetation and, for substantially longer, native ecosystems have co-evolved with grazers to function at their highest potential in a sustainable manner. Reintroduction of livestock into these ecosystems is a sustainable and cost-efficient method to bring ecological uplift to native habitats and provide weed control for weeds like Kochia, a weed that requires 10+ years of Invasive weed monoculture that warrants extensive soil treatment to reduce weed bank and allow for native seeding. Contrary to popular belief, if done correctly, the use of livestock and pigs creates minimal odors, and livestock vegetation managers provide numerous benefits to the land being managed. Some of the leading benefits are:

Natural and eco-friendly treatment: Using livestock such as pigs, sheep, etc. negates the need for other vegetation management methods such as herbicide and mowing/weed whacking which are known to introduce unnatural emissions and chemicals into the environment. In order to reduce their need for continued (annual) application of these herbicides in the target treatment area, Rigden HOA desires to accomplish turf conversion in the least resource-intensive way possible. Digging/Grazing animals are the more natural and effective method for eliminating the need for broadcast application of herbicide in areas with dense invasives. This method and project is being looked at for CSU as the future of lawn repurposing and open-space utilization.

Ecological uplift: Using animals for management reintroduces natural processes that benefit the land such as; Increased soil aeration leads to reduced soil compact and water runoff, the ability of roots to grow deeper into the soil, and increased oxidation of soil granting plant roots to ability to take up more essential nutrients. Increased soil organic matter improves soil structure, boosts water infiltration & nutrient cycling, and contributes to carbon sequestration. Finally, adding nitrogen to the soil through manure from the animals contributes essential macronutrient for plants to grow, creating native grasses that are more resilient and vigorous - benefitting soil and essential bacterium.

Water Conservation: The former watering plans of Rigden Farm HOA were much too water-intensive to continue without significant changes. For this reason, the Rigden HOA is implementing transformative native grassland conversion projects which align with the values of Fort Collins as a conservation-forward community. This project is one step towards their goals of reducing the acreage of irrigated turf across their entire HOA and potentially encouraging others to do the same. For this to be successful we also aim to collect data each year to inform the final report that we believe will demonstrate this is not only financially and ecologically affective, but also produces an aesthetically-appealing natural area.

Design

The proposed location within Rigden Farm HOA to receive pig grazing treatment is a heavily degraded field that has been fully taken over by a common weed called Kochia, and was requiring and receiving

irrigation/watering; can be seen in **Figure 1**. The pigs will have a small enclosure that will move periodically within the field, grazing one small area at a time, refer to the **Pig Grazing Notes: Figure 1.** for additional information and location of the purpose site. This grazing will provide the many benefits mentioned in the introduction, as well as deplete the soil of its weed seeds and eliminate any existing weeds living within the treatment area in order to prepare the field for native seeding in the fall. The expected duration of pig grazing is 7 months (April-Oct) a year for 3 additional years in order to give the pigs time to adequately graze the aboveground vegetation and significantly disturb the roots and seeds of the weed-infested area. Pigs will be on-site grazing until it is time to seed in the fall. See below for a complete schedule of all treatments including pig grazing duration. The pigs will receive daily check-in, feeding and monitoring 3 times a week, and weekly documentation of their progress throughout the project's duration.

1. First year (2024) - **Set the conditions for Restoration**
 1. Mow/Clear land of large invasive shrubs/plant
 2. Introduce grazing animals
 1. Rotate through 1/16 acre parcels
 2. Intensively grazed for short periods of time
 3. Drag harrow
 4. Plant sterile cover crop
 1. 50% Hairy Vetch (sterile) & 50% Winter Rye (sterile)
2. Second year (2025) - **Achieve 33% cover**
 1. Introduce grazing animals
 1. Rotate through 1/16 acre parcels
 2. Intensively grazed for short periods of time
 2. Drag harrow
 3. Plant sterile cover crop
 1. 50% Hairy Vetch (sterile) & 50% Winter Rye (sterile)
3. Third year (2026) - **Achieve 66% cover**
 1. Introduce grazing animals
 1. Rotate through 1/16 acre parcels
 2. Intensively grazed for short periods of time
 2. Drag harrow
 3. Plant sterile cover crop
 1. 50% Hairy Vetch (sterile) & 50% Winter Rye (sterile)
4. Fourth year (2027) - **Achieve full coverage w. Native seed**
 1. Introduce grazing animals
 1. Rotate through 1/16 acre parcels
 2. Intensively grazed for short periods of time
 2. Drag harrow
 3. Plant native seed mix at the conclusion of the season
5. Fifth year (2028) - **Maintenance + Inter -seeding**
 1. No grazing needed.
 2. Interseed with additional native seed mix and amend as needed

Over the past year, the local community of Rigden Farm has overwhelmingly approved of the grazing pigs in their neighborhood. This is evidenced by the large turnout of supporters at HOA meetings, the unanimous decision to renew their contract with AloTerra for the calendar year 2025, and the support of people who have sent in supportive emails and text messages. The general sense they have shared is that the small number of pigs in this concentrated area are relatively quiet. Additionally, because they are frequently moved (every 2 weeks) the impact on any particular homeowner is lessened. However, given the close proximity of our small team of pigs to the neighborhood, we are taking additional steps to ensure the impact of the animal's natural sounds are kept to a minimum.

- Figure 1** – Location of field being treated with pig grazing

