

Little Thompson Farm Stewardship Plan



September 22, 2016

Larimer County Department of Natural Resources



Adoption of the Stewardship Plan for Little Thompson Farm

The Stewardship Plan for the Little Thompson Farm was recommended for adoption by the Larimer County Open Lands Advisory Board on September 22, 2016 and was subsequently adopted by the Director of the Larimer County Natural Resources Department.

Gary Buffington, Director
Larimer County Natural Resources Department

Date

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1. INTRODUCTION

1.1 Background and Purpose

The Little Thompson Farm is part of a greater vision identified in the 2015 Larimer County Open Lands Master Plan to conserve irrigated agricultural lands for local food production, crop production, as well as other values of wildlife habitat, scenic views, cultural values and rural character. A key part of irrigated agricultural conservation includes protecting associated water resources. Specifically the master plan highlights investigating innovative approaches to conserving water with partners that also meet multiple purposes. In this case, finding a municipal partner to share the water (during defined years or periods of drought) while meeting multiple purposes of continued irrigated agriculture and wildlife habitat (during the majority of the time), is the intent. The Farm, and associated water rights, were acquired in August 2016, with the specific intent to protect the agricultural, cultural and scenic resources, while providing future agriculture-based public educational opportunities.

The purpose of this document is to provide guidelines and implementation strategies to direct the short-term (3-5 years) stewardship of the Farm until a future management plan is developed. Overall objectives of the plan are to:

- Protect, manage, and enhance agricultural, historic, visual and natural resources;
- Provide educational guided public and group tours to highlight the agricultural significance and operations, explain goals associated with water alternative transfer mechanisms, and showcase the resource values on-site;
- Define implementation activities and responsibilities for the above goals.

A management plan that builds on this stewardship plan will be developed that includes public participation in the future.

1.2 History

A historic assessment is currently underway for the Farm. Information shared by the Malchow Family includes that the Farm was originally owned by Frederick Mundt who purchased the property in 1904 and built the gable-roofed barn. John Charles “Carter” and Essie Malchow along with their son Howard and daughter in-law Beatrice (and their three children Peggy, Stephen and Jean) purchased the property in 1952. The Malchow family raised milk cows and sold the milk to Carnation, raised chickens and sold the eggs, finished beef cattle and farmed such crops as alfalfa, corn, silage, sugar beets, barley, oats, various vegetables and wheat. Specifically, the family also raised tomatoes for Kuners. Beatrice passed away in 2002 and Howard in 2006 and the farm remained in the Malchow family partnership until Larimer County purchased it in 2016.

1.3 Scope, Organization and Review of the Plan

The stewardship plan for the Farm contains two main sections: 1) a review of existing conditions, including agricultural, cultural, visual, natural, public use/educational, and socioeconomic resources and 2) a stewardship plan to guide management action on-site and outline implementation steps.

The draft stewardship plan will be reviewed by the Open Lands Advisory Board, Natural Resources Department staff and key subject experts and adopted by the Natural Resources Department Director.

2. EXISTING CONDITIONS

2.1 Overview

The Little Thompson Farm, comprising 211 acres, is located along Hwy 287, one mile south of the Town of Berthoud in Larimer County (Appendix A: Map 1). The legal description is: A portion of the west 1/2 of Section 27, T4N, R69W of the 6th P.M. The Farm boasts numerous resource values, including agricultural, natural, visual, cultural and socioeconomic, all described below.

2.2 Agricultural Resources

A Land Evaluation-Site Assessment (LESA) score was determined for the Farm based on soils and specific site characteristics as farm size, water availability, proximity to city annexed boundary, weed and erosion issues, visual and natural values to characterize the overall quality of this parcel for meeting the agricultural goals of the Department (Appendix C). The overall rating of cropland quality was excellent, in large part due to the prevalence of Class II (highly productive soils) and water availability.

Currently there are 188 irrigated acres under the center pivot and in the pivot corners that are farmed, 18 flood irrigated acres, and 5 acres around the farmstead (Appendix A: Map 2). Approximately 206 acres of the property are currently farmed via a lease with a private, local area farmer. There are two primary farmed fields separated by a ditch and row of large cottonwood trees. The north field is currently planted in corn and sugar beets. The south end of the Farm is level to gently sloping bottomland, immediately north of the Little Thompson River. This area has historically been planted to alfalfa, which is sub-irrigated by the river and can also be flood irrigated. In recent years the lessee has planted this area in dryland wheat to avoid the need for irrigation.

a. Climate, Topography and Soils

Annual precipitation at the Longmont and Loveland recording stations is slightly more than 14 inches per year, however, specific data is unavailable. Temperatures are relatively mild; highs above 95 degrees and lows below 10 degrees are rare. Peak precipitation generally occurs in mid to late spring, with monsoon weather patterns often developing in mid-summer. An average of 245 days per year are either clear or partly cloudy (McCarty 2015)

The topography of the Farm is generally characterized as level to gently undulating farmland that generally drains south towards the Little Thompson River. Elevations range from 5,000 feet along the south boundary to approximately 5,080 feet at the center of the pivot.

Soils are dominated by Class 2 soils (Appendix A: Map 3) but with the specific break out below:

Class I Soils. 2% of the Property and includes

Table Mountain Loam, 0-1% slopes.

Class I soils have few limitations that restrict their use. They are deep, well drained, a surface layer of loam, a subsoil of loam to clay loam and slopes of 0-1%. Mainly suitable for corn, sugar beets, barley, alfalfa, beans and wheat.

Class II Soils. 81% of the Property and includes:

Fort Collins Loam, 1-3% slopes;

Nunn Clay Loam, 0-1% slopes;
Nunn Clay Loam, 1-3% slopes;
Paoli Fine Sandy Loam, 1-3% slopes;
Wiley Silt Loam, 1-3% slopes.

Class II soils have moderate limitations that restrict their use. They are deep, well drained, a surface layer of loam or sandy loam to clay loam and sandy loam, a subsoil of loam to silty, sandy or clay loam and slopes of 0-3%. Mainly suitable for corn, sugar beets, barley, alfalfa, beans and wheat.

Class III Soils. 12% of the Property and includes:

Fort Collins Loam, 3-5% slopes.

Class III soils have severe limitations that restrict their use and need special conservation. They are deep to moderately deep, well to poorly drained, a surface layer of loam to clay loam, a subsoil of loam to clay and slopes of 3-5%. Mainly suitable for corn, sugar beets, barley, alfalfa, beans, wheat and some more suitable for pasture.

Class IV Soils. 5% of the Property and includes:

Larim Gravelly Sandy Loam, 5-40% slopes.

Class IV soils have very severe limitations that restrict their use and require very careful management. They are deep to shallow, well to poorly drained, a surface layer of loam to clay or loam, a subsoil of loam to clay or sandy loam or clay or gravel and slopes of 0-10%. Suitable for barley, alfalfa, wheat and some more suitable for pasture.

b. Water

The property is irrigated in the northern field via center pivot and the southern field via flood irrigation. Center pivot irrigation infrastructure includes a 2003 Zimmatic pivot that pulls from the holding pond (Appendix A: Map 2). A small portion of the south end of the site is in the 100-year floodplain and a slightly larger portion in the 500-year floodplain. Larimer County received a grant from the Colorado Water Conservation Board to evaluate options for alternative transfer mechanisms with municipalities as a way to share the water with municipal partners in dry years without removing it from agricultural purposes on-site in most years.

Water Rights:

- 240 shares C-BT
- 16 shares Handy Ditch and Reservoir. These shares are delivered to the property via the Dry Creek Lateral.
- 20 shares Dry Creek Lateral. This dirt-lined ditch runs along the north property boundary. Once the water enters the property, it is delivered through a concrete-lined ditch that runs along the west boundary and into an underground pipe cutting east about ¼ mile from south boundary and filling the holding pond.
- The farm is the second to last headgate on the Dry Creek Lateral, which ends just on the East side of Highway 287.

2.3 Natural Resources

a. Vegetation

Vegetation community types outside the agricultural fields total about 5 acres and include farmstead buildings/disturbed/roads, groundwater seed wetland, seasonal pond, riparian herbaceous fringe, and xeric grasslands.

No known rare or endangered plant species have been observed on-site. Several of the Farm's habitat types are either in degraded condition or, due to various uses in the past, have established state listed noxious weed species populations including Canada thistle, cheatgrass, common mullein, common teasel, Dalmatian toadflax, moth mullein, musk thistle, and Russian-olive.

A preliminary species list for all vegetation community types outside the agricultural fields can be found in Appendix E.

Farmstead Buildings/Disturbed/Roads

This vegetation type can be found around the houses and farm buildings and includes introduced grasses such as Kentucky bluegrass and weeds such as dandelions. There are gravel and paved roads in these areas as well as planted hedgerows and windbreaks. The hedgerows and windbreaks comprise planted trees on the north, south and west sides of the farmstead including a large signature burr oak tree, lilac bushes and a row of mature cottonwood trees along the ditch.

Groundwater Seep Wetland

The hillside wetland seeps include sedges, broadleaf cattail, curly dock, arctic rush, and a couple of moss species. Some of the moss has formed in past disturbance caused by farm vehicles.

Holding Pond

A small man-made holding pond is used for irrigation. The pond is partially fed by a hillside seep and is generally dry when irrigation is inactive.

Riparian Herbaceous Fringe

Degraded and discontinuous riparian communities exist along the ditch banks. Because the ditch is actively maintained by the ditch company and farm leasee, shrub and tree cover are sparse.

Xeric Grassland

This dry, upland grass community is the most widespread habitat type on the Farm outside of the agricultural fields. These areas are dominated by smooth brome and crested wheatgrass, two non-native pasture grasses as well as various non-native forbs including blue mustard, common dandelion, red stem filaree, and wild mustard. Native shortgrass prairie species such as buffalograss, blue grama, rabbitbrush, yucca, and fringed sage are interspersed.

b. Wildlife

Raptors and songbirds use the large cottonwood and planted trees for roost and perching sites. There is an active red-tailed hawk nest in a cottonwood tree in the northeast corner of the property. Another large nest, in a cottonwood just west of the beet shack does not appear active. Black bears and their cubs have been known to frequent the property, feeding on sugar beets.

There is very little likelihood of Preble's meadow jumping mouse suitable habitat or presence – no positive trapping for Preble's has occurred in the immediate vicinity.

2.4 Visual Resources

Located one mile south of the town of Berthoud and two miles from the Larimer/Boulder county line, the property is adjacent to Hwy 287 and is highly visible to the public. The property's visual appeal includes an iconic red barn, large cottonwood trees and gently rolling agricultural fields. Views from the Farm include a largely uninterrupted view west to the mountains.

2.5 Cultural Resources

The Farm has a rich cultural history. There are several historic buildings on-site including the barn, chicken house, brooder house, beet shack, and two houses, one of which may have once been a saloon associated with the Cherokee/Overland Trail. Items of known cultural interest in the barn include a trolley system with 5 interacting pulleys, the original chicken house door (stored for safety), original weather vane and lightening rods, and saved wood from the original barn construction stored inside. There is a marked gravesite on the east side of the pond thought to be that of a traveler who died in the 1850's/1860's along the Cherokee/Overland Trail route. The route bisected the Farm north-south, just east of the existing holding pond. The beet shack was donated to the Berthoud Historical Society and is located in the south-center of the property. Built by Germans from Russia, it was used as seasonal housing during the sugar beet harvest. The Ditch cross the south field called the Eaglin Ditch is also said to be one of the oldest active ditches in Larimer County.

2.6 Socioeconomic Resources

a. Land Status

Larimer County Natural Resources acquired the 211-acre Farm and associated water rights for \$8.4 million in August 2016. The land was purchased from the Malchow farm partnership. The County primarily worked with Jean Malchow and Margaret "Peggy" Malchow Sass on the acquisition. The water rights alone are estimated to account for \$6.8 of the acquisition cost (McCarty 2015). The County paid \$100,000 less than asking price in anticipation of having to spend up to \$100,000 on demolishing and removing some of the existing buildings in the farmstead area that include some asbestos-containing features.

Utilities

Water: Little Thompson Water District Tap – a 6" water line runs along Hwy 287

Sewer: Septic system; no sewer lines nearby

Electric: Poudre Valley REA

Heat: Propane

Buildings

There are 8 buildings on-site (Appendix A: Map 2) including (McCarty 2015):

- Wood frame/siding residence (1948), 904 s.f. above grade (2 beds/1bath); full basement partially finished.
- Wood frame/siding residence (1870 with later additions), 1190 s.f. above grade (2 beds/1bath); no basement. May have operated as a saloon historically.
- Double-wide mobile home (2005), 1782 s.f. (3 beds/2 bath), central air, post and pier foundation.
- Wood frame/gable metal roof Barn (1869), 2016 s.f. and adjacent loading chute
- Wood frame/gable metal roof loafing shed (1869), 1190 s.f.
- Brooder house (1870), 1648 s.f.
- Chicken house, next to the barn (~1870)
- Beet shack

Fences and Gates

Existing fencelines on the south and west are in average condition, mostly barbed wire.

Mineral Rights

Mineral rights are intact and included in the purchase by Larimer County and there are no leases or production (McCarty 2015).

Environmental Assessment

Based upon a Phase I Environmental Assessment of the property, there are two sites of concern (Terracon 2015). An area south of the barn shows soil staining believed to be from historic spills/leaks from a tractor and is recommended for excavation, disposal and subsequent sampling of these soils. The second site is the former HDPE mixing container site near the pond, which is recommended for future soil sampling if the use changes from farming, to confirm no contamination from fertilizers/pesticides.

b. Adjacent Land Use

The Farm is zoned FA1-Farming and adjacent lands are a combination of FA-1 Farming, small acreage parcels, and low to high density rural residential (see Appendix A: Map 1). The Farm is just outside Berthoud's GMA. This is the only publicly protected parcel in the immediate vicinity.

c. Access, Circulation and Traffic.

Hwy 287 provides direct access to the Farm and leads into an unpaved access road that is currently used for agricultural and residential purposes and can be used for maintenance and management purposes by Larimer County and for guided public tour access. The other direct access point to the property is off of CR6 about 10 feet from the northwest corner of the Farm. This access road is also utilized for ingress and egress by the adjacent farm property to the southwest.

This property also has an easement agreement with the Wagon Wheel Monument Subdivision to the south which provides for reciprocal use for ingress and egress access and utilities. The easement at the time the County purchased the property was being used partially for the access road called White Water Court, which is a publicly dedicated road utilized primarily by the subdivision landowners. West of the existing road, in the easement agreement area there were recently planted tree rows, beehives in a chain link fence area, and raised garden beds. The County Attorney advised the County to grant this approximately 41 foot wide easement area to the Wagon Wheel Monument Subdivision owners to avoid any future liability or legal issues that could arise from unclear ownership. The area of that easement from Highway 287 to the east to the west boundary of the Wagon Wheel Monument Subdivision amounts to approximately 43,906 square feet.

There are a couple of fences in the southwest corner that are intruding onto the property.

d. Public Facilities, Utilities and Services

Fire protection. Fire protection is ultimately the responsibility of the Larimer County Sheriff's Department. The open space, however, is also served by the Berthoud Fire Protection District.

Public safety. Visitor Services staff are responsible for site patrol and the education/enforcement of regulations and will regularly frequent the property to avoid such issues as unregulated entry, vandalism, etc.

e. Operations Budget and Funding

The operations and capital improvement projects associated with this stewardship plan will be funded through Help Preserve Open Space sales tax dollars as well as income from the existing Farm Lease (~\$33,000 annually). Maintenance dollars will cover the cost of overseeing the farming lease, ranger patrol, weed management, fence repair, trash removal, guided tours and other management needs.

3. STEWARDSHIP PLAN

3.1 Overview

The plan is divided into four main components: 1) agricultural resource management; 2) natural resource management; 3) cultural resource management; and, 4) public use/education opportunities.

Overall Vision

The near-term vision for management of the Farm is to finalize and follow a Farm Operations Plan (underway) that outlines what crops can be grown and rotations, and water use and allocation following potential water agreements developed between municipal water providers and the County. This stewardship plan will include the Farm Operations Plan as Appendix B once complete. It is anticipated until a Farm Operations Plan is in place, the existing farm lease will direct the agricultural uses of the property. Larimer County will further inventory and manage natural and cultural resource outside the leased farm fields. Limited, guided public and group tours led by Larimer County staff will showcase the agricultural activities, cultural values and the unique water transfer element of this farm protection effort.

3.2 Agricultural Management

An existing farm lease is already in place for the farmed areas and specifies terms, payment and the expectation that the lessee will control weeds and maintain infrastructure associated with the farmed fields only. Determining the amount of water needed for continued agriculture as part of a water sharing or partial divestment plan will be critical to the long-term agricultural operations on-site. A Farm Operations Plan is under development (Appendix D) to outline the spectrum of types of crops that can be grown on-site given water and other site opportunities and constraints.

Implementation Steps:

- Manage the existing farm lease and update as needed to meet county requirements and water allocation/availability extending for up to 5 year period.
- Continue to look for and finalize a plan for the water portfolio including alternative water sharing options, partial divestment, or other options that will ensure long-term agricultural production on-site.
- Finalize a Farm Operations Plan (being completed by an agronomist contractor) specifying crops grown and rotation, fallow year land management and lease modifications (cover crop, weed control, etc.), and water use and allocation once water agreements/determinations are in place.
- Evaluate Larimer County's niche and role in agriculture for potential future and long-term uses of the property.

3.3 Natural Resources Management

a. Vegetation Management.

Vegetation management at the Farm will focus on maintenance of desirable species and control of noxious weed species on-site. Portions of the property, along roads, ditches and between farmed fields have become invaded by non-native and noxious weed species. The control and potential removal of those species will be a priority as outlined in the Larimer County Noxious Weed Management Plan (Larimer County 2009).

Implementation Steps:

- Manage noxious weeds and other troublesome exotic vegetation as needed.
- Evaluate potential for restoration of upland, non-farmed areas as appropriate following development of Farm Operations Plan.
- Inventory tree species, assess tree health and implement any pruning or removal of large trees and shrubs.

b. Wildlife Management.

The Farm supports wildlife species associated with the non-farmed upland and wetland seep areas. Annual monitoring of the large cottonwood trees for nest sites will be conducted. In addition, the seeps and pond will be maintained in part to ensure water availability for wildlife.

Implementation steps:

- Maintain an updated presence/absence list of species with a focus on occurrences of sensitive or declining species (both plants and wildlife) to allow for an update in management strategy as new information is learned.
- Monitor large cottonwood trees along the ditch for nesting raptors.
- Annually monitor the active red-tailed hawk nest for nesting and fledgling success.
- As necessary, implement seasonal timing limitations on public activities within specified buffer distances of any active raptor nests.

3.4 Cultural Resource Management

There are several known cultural features of interest on-site including the Cherokee/Overland Trail route, “Traveler’s gravesite”, and several historic structures. A Phase I and Phase II Historic Structures Assessment will evaluate, confirm and provide additional information on the historic significance and stability/condition of the buildings and landscape that will help inform best practices to stabilize or manage the structures.

Implementation steps:

- Conduct a Phase I Historic Structures Assessment (HSA) to determine significance of each structure and the landscape.
- Conduct a Phase II Historic Structures Assessment to determine stabilization and improvement needs for buildings meeting Phase I HSA criteria of significance.
- Incorporate cultural history of the site into educational information.
- Determine and protect items of historic value for potential future use.
- Remove all debris and structures that have no historical or other use value.
- Work with the Berthoud Historic Society regarding management of the Beet Shack.

3.5 Public Use/Education Opportunities

Educational opportunities envisioned at the Farm include limited staff-guided public and group tours of the site with a focus on education of the agricultural practices, unique water sharing goals and plans, and cultural and historical features. Long-term public access may take on any number of forms within a spectrum of potential opportunities that will be evaluated over the next 3-5 years.

Implementation steps:

- Install gates, interim site signs and public information about the site.
- Facilitate guided public tours with a goal of 3-4 tours per year, plus additional tours upon request, during the agricultural growing season (April – October).

- Develop educational materials for use during guided public tours.
- Evaluate access improvement needs for short term public use as well as associated with long-term site plan.
- Collaborate with partners in northern Colorado working with agricultural education and interpretation.

3.6 Site Management

While the primary use on-site will include the continuation of the agricultural lease and limited public/group tours, a presence by Larimer County staff to ensure resource protection and site security is important. At the time of closing on the purchase of the property, gates will be installed and retrofitted with county locks at the four vehicle access points. Similarly, the buildings will be fitted with locks and ranger staff will include the property in regular patrols for site security, vandalism and other potential concerns.

Implementation Steps:

- Install locks and secure all buildings.
- Conduct regular ranger patrols.
- Evaluate leasing the residence in the short term or staff housing opportunities.
- Regularly check on utilities, buildings, and site for issues.
- Ameliorate any safety issues.
- Maintain, by mowing, pruning, etc. the vegetation around homestead.
- Work with Risk Management Department to include property on county insurance.

3.7 Land Acquisitions

Protection of lands adjacent to the Farm is desirable in order to buffer the open space from becoming an island surrounded by development. Various tools that may be used in land protection would include fee-simple and conservation easements acquisition. Any lands added to the property will be on a willing seller basis and fall under the guidelines of this Stewardship Plan or subsequent management plan.

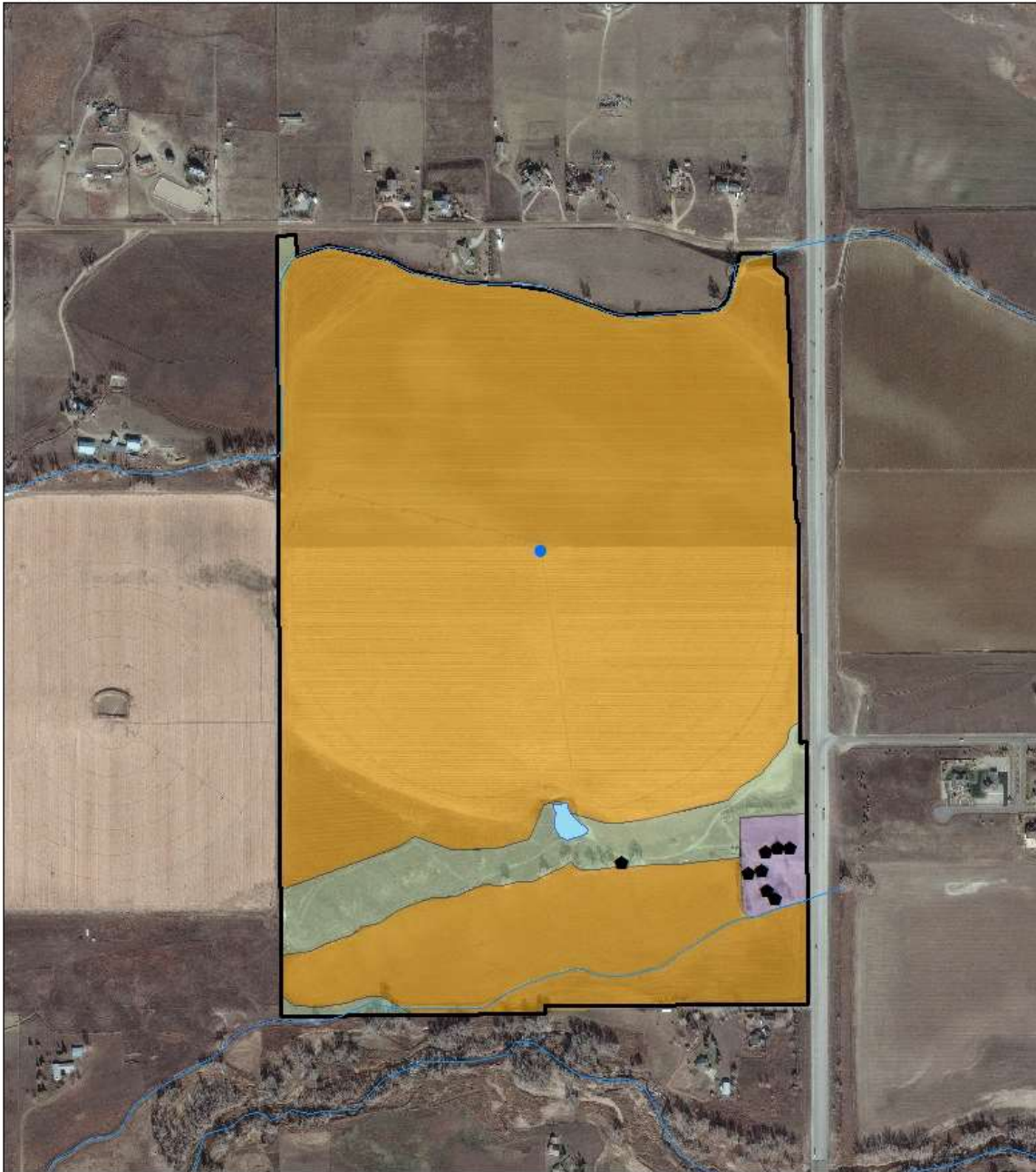
Implementation steps:

- Continue to work with adjacent landowners to protect lands as appropriate to buffer and to add to the greater whole for protecting this agricultural landscape.



3.8 Summary of Implementation Steps and Phasing

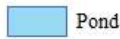
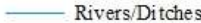
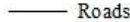
A tabular summary of implementation steps and proposed timelines are provided in Appendix B.

Map 2: Site Features

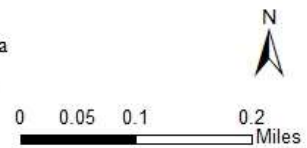


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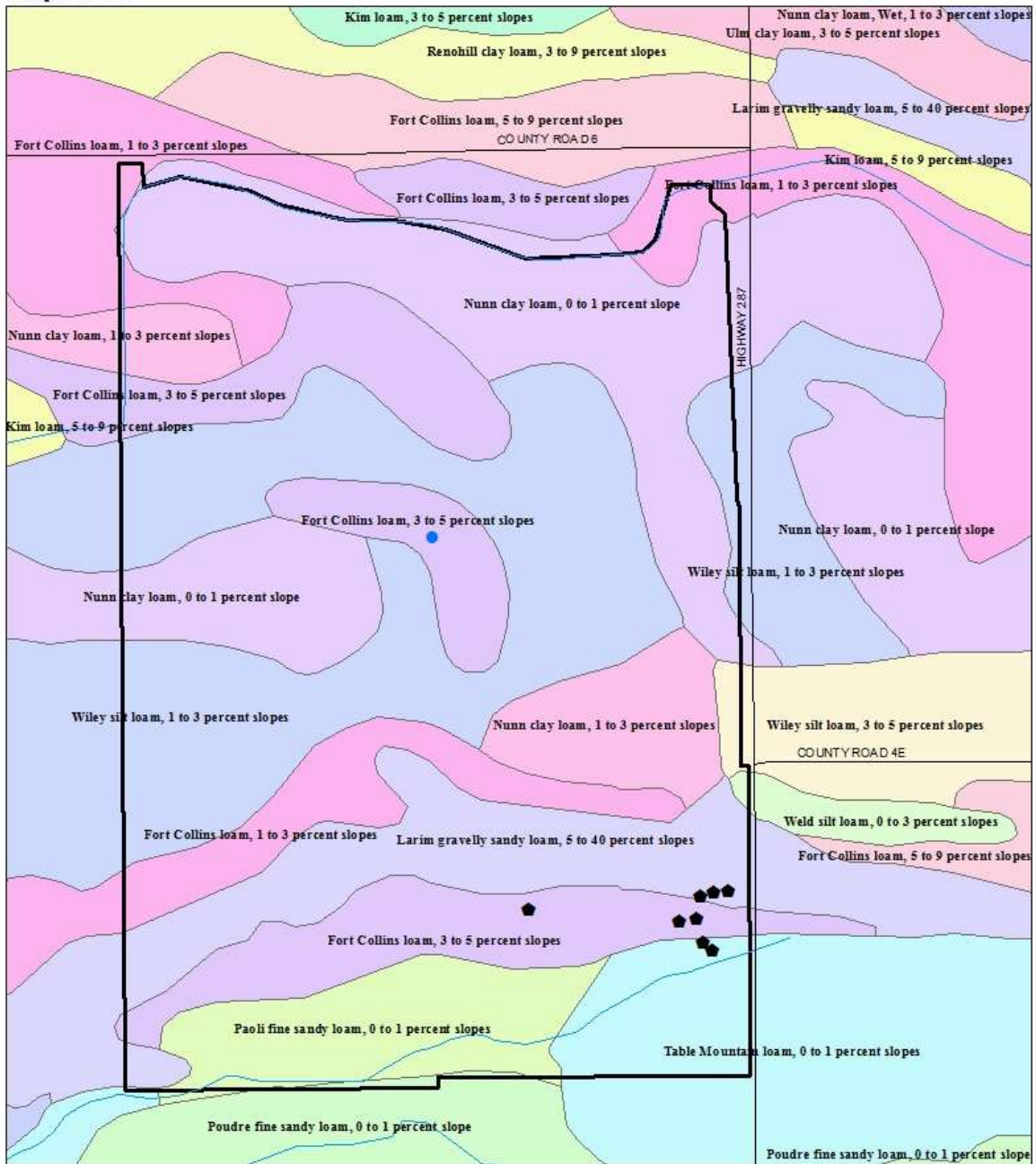
-  Little Thompson Ag Property
-  Center Pivot
-  Buildings

-  Pond
-  Rivers/Ditches
-  Roads

-  Farmstead Area
-  Farmed Areas
-  Grasslands



Map 3: Soils



Legend

- Little Thompson Ag Property
- Center Pivot
- Rivers/Ditches
- Buildings
- Roads



5. APPENDIX B: Summary of Implementation Steps

Implementation Steps	Cost Estimate	2016	2017	2018-2020
Agricultural Management				
Manage existing farm lease - update to meet county standards.	Minimal	X	X	Every 5 years
Finalize plans for the range of options related to the water portfolio.	Minimal	X		
Develop a Farm Operations Plan (part of CWCB grant)	\$33,000	X	X	
Natural Resource Management				
Manage noxious weeds and other troublesome exotic vegetation outside ag lease areas	\$2000/year	X		Ongoing
Evaluate sites for potential restoration as appropriate.	Minimal			
Maintain an updated presence/absence species list	Minimal			Ongoing
Monitor for potential raptor nest sites	Minimal			Ongoing
Assess tree health and prune/remove as needed.	Minimal	X		Ongoing
Cultural resource management				
Conduct a Phase I Historic Structures Assessment	\$5,000	X		
Conduct a Phase II Historic Structures Assessment	\$10,000	X		
Protect items of historic value for potential future use.	Minimal	X		
Remove all debris/structures that have no historical or other site value.	\$5000	X	X	X
Work with the Berthoud Historical Society regarding the Beet Shack.	Minimal	X	X	Ongoing
Public Use/Education Opportunities				
Install gates, interim site signs and appropriate public information about the site.	\$3500	X		Ongoing
Offer 3-4 guided tours during agricultural growing season.	Minimal	X	X	X
Develop educational materials for tours/ future use.	Minimal	X		Ongoing
Evaluate Larimer County's niche in agriculture regarding the potential future uses of the property.	Minimal	X	X	X
Site Management				
Install locks and secure all buildings.	Minimal			
Conduct regular ranger patrol		X	X	Ongoing
Evaluate leasing the residence short-term		X		
Regularly check buildings, utilities, etc.		X	X	Ongoing
Ameliorate any safety issues on-site.		X		
Work with Risk Management to include on county insurance		X		
Land Acquisitions				
Explore land acquisition and trail connections				Ongoing

6. APPENDIX C: Land Evaluation/Site Assessment Scoresheet

Name: Charles M. Gindler

Date: 5-11-15

Site: Malchow

Factor	Points		Weight		Score	Totals
LE – Land Evaluation	<u>101.8</u>	X	1.00	=	83.8	83.8
SA1 - Farm size	<u>20</u>	X	0.30	=	6	
SA1 - Water availability	<u>75</u>	X	0.20	=	15	
SA1 - Land condition	<u>100</u>	X	0.10	=	10	
					SA1 Total	31
SA2 - Distance to annexed boundary	<u>20</u>	X	0.15	=	3	
					SA2 Total	3
SA3 - Habitat value	<u>40</u>	X	0.07	=	2.8	
SA3 - Strategic value	<u>50</u>	X	0.10	=	5	
SA3 - Visual/Scenic value	<u>75</u>	X	0.04	=	3	
SA3 - Cultural/Historic value	<u>0</u>	X	0.04	=	0	
					SA3 Total	10.8
Total LESA Score (LE + SA1 + SA2 + SA3)						128.6

7. APPENDIX D: Farm Operations Plan (to be inserted when completed)

8. APPENDIX E: Species Lists

Plant species identified at the Little Thompson Farm

Common Name	Scientific Name	Family	Origin*	Life Form**
Forbs				
Alfalfa	<i>Medicago sativa</i>	<i>Fabaceae</i> - Pea	I	PF
Alyssum	<i>Alyssum</i> spp.	<i>Brassicaceae</i> - Mustard	I	AF
Aster	<i>Aster</i> spp.	<i>Asteraceae</i> - Sunflower		
Blue mustard	<i>Chorispora tenella</i>	<i>Brassicaceae</i> - Mustard	I	AF
Broadleaf cattail	<i>Typha latifolia</i>	<i>Typhaceae</i> - Cattail	N	PF
Canada thistle	<i>Cirsium arvense</i>	<i>Asteraceae</i> - Sunflower	I	PF
Cheatgrass	<i>Bromus tectorum</i>	<i>Poaceae</i> - Grass	I	AG
Common dandelion	<i>Taraxicum officinale</i>	<i>Asteraceae</i> - Sunflower	I	PF
Common horehound	<i>Marrubium vulgare</i>	<i>Lamiaceae</i> - Mint	I	PF
Common mallow	<i>Malva neglecta</i>	<i>Malvaceae</i> - Mallow	I	PF
Common teasel	<i>Dipsaucus fullonum</i>	<i>Dipsacaceae</i> - Teasel	I	BF
Curly dock	<i>Rumex crispus</i>	<i>Polygonaceae</i> - Buckwheat	N	PF
Curlycup gumweed	<i>Grindelia squarrosa</i>	<i>Asteraceae</i> - Sunflower	N	BF
Dalmatian toadflax	<i>Linaria dalmatica</i>	<i>Plantaginaceae</i> - Plantain	I	PF
Hairy evening primrose	<i>Oenothera villosa</i>	<i>Onagraceae</i> - Evening Primrose	N	PF
Moth mullein	<i>Verbascum blatteria</i>	<i>Scrophulariaceae</i> - Figwort	I	BF
Musk thistle	<i>Carduus nutans</i>	<i>Asteraceae</i> - Sunflower	I	BF

Mustard	Various spp.	<i>Brassicaceae</i> - Mustard		AF
Poison hemlock	<i>Conium maculatum</i>	<i>Apiaceae</i> - Parsley	I	BF
Purple locoweed	<i>Oxytropis lambertii</i>	<i>Fabaceae</i> - Pea	N	PF
Red stem filaree	<i>Erodium cicutarium</i>	<i>Geraniaceae</i> - Geranium	I	AF
Salsify	<i>Tragopogon dubius</i>	<i>Asteraceae</i> - Sunflower	I	BF
Sand lily	<i>Leucocrinum montanum</i>	<i>Liliaceae</i> - Lily	N	PF
Tall tumbled mustard	<i>Sisymbrium altissimum</i>	<i>Brassicaceae</i> - Mustard	I	AF
Western prickly pear	<i>Opuntia macrorhiza</i>	<i>Cactaceae</i> - Cactus	N	SU
Wild mustard	<i>Sinapsis arvensis</i>	<i>Brassicaceae</i> - Mustard	I	AF
Woolly mullein, common mullein	<i>Verbascum thapsus</i>	<i>Scrophulariaceae</i> - Figwort	I	BF
Graminoids (grasses, rushes, sedges)				
Artic rush	<i>Juncus articus</i>	<i>Juncaceae</i> - Rush	N	PG
Blue grama	<i>Bouteloua gracilis</i>	<i>Poaceae</i> - Grass	N	PG
Buffalograss	<i>Buchloë dactyloides</i>	<i>Poaceae</i> - Grass	N	PG
Crested wheatgrass^	<i>Agropyron cristatum</i>	<i>Poaceae</i> - Grass	I	PG
Kentucky bluegrass	<i>Poa pratensis</i>	<i>Poaceae</i> - Grass	I	PG
Smooth brome^	<i>Bromus inermis</i>	<i>Poaceae</i> - Grass	I	PG
Water sedge	<i>Carex aquatilis</i>	<i>Cyperaceae</i> - Sedge	N	PG
Shrubs				
Broom snakeweed	<i>Gutierrezia sarothrae</i>	<i>Asteraceae</i> - Sunflower	N	SS

Common lilac	<i>Syringa vulgaris</i>	<i>Oleaceae</i> - Olive	I	S
Prairie sagewort, fringed sagebrush	<i>Artemisia frigida</i>	<i>Asteraceae</i> - Sunflower	N	S or SS
Rabbitbrush	<i>Chrysothamnus</i> sp.	<i>Asteraceae</i> - Sunflower	N	S
Sagebrush	<i>Artemisia</i> sp.	<i>Asteraceae</i> - Sunflower	N	S
Succulents				
Western prickly pear	<i>Opuntia macrorhiza</i>	<i>Cactaceae</i> - Cactus	N	SU
Yucca	<i>Yucca glauca</i>	<i>Agavaceae</i> - Agave	N	SU
Trees				
Oak (white oak group)	<i>Quercus</i> sp.	<i>Fagaceae</i> - Beech	I	T
Plains cottonwood	<i>Populus deltoides</i>	<i>Salicaceae</i> - Willow	N	T
Russian-olive	<i>Elaeagnus angustifolia</i>	<i>Elaeagnaceae</i> - Oleaster	I	T

***Origin:** N, native; I, introduced

****Life Form:** AF, annual forb; BF, biennial forb; NA, not applicable; PF, perennial forb; PG, perennial graminoid; SS, subshrub; SU, succulent

^, indicates dominant species

9. BIBLIOGRAPHY

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