Best Opportunity Analysis for Diversified Vegetable Farms and Micro-Dairies

Background and Purpose

Supporting local agricultural producers is a longstanding tradition at OSMP. Environmental constraints such as soil quality and water availability limit most of the agricultural production on OSMP lands to livestock or hay/forage production rather than diversified vegetable farming. The recent and growing interest from Boulder's city leaders and the general community to support a greater diversity of local foods has led OSMP staff to evaluate the suitability of OSMP lands for diversified vegetable production. The purpose of this Best Opportunity Analysis is to identify OSMP properties most appropriate for diversified vegetable farming and/or for operating pasture-based micro-dairies.

Farmers commonly desire to keep pastured livestock in conjunction with a vegetable farm as it is both economical and a sustainable agricultural practice. Produce unfit to market or surplus can be fed to pastured livestock which in turn results in either a modest source of additional income (e.g. selling eggs or meat) and/or food. In this analysis, the term "diversified vegetable farming" includes the option for farmers to keep pastured livestock.

Micro-dairies are pasture-based dairies where the number of animals permitted is typically based on the property's zoning designation and parcel size. For example, in areas zoned Agricultural in Boulder County, four animal units per acre are permitted. Pasture-based dairies are distinguished from dairies with feed yards, because the animals graze in pastures rather than being fed in yards where feed is imported to sustain a higher density of animals than the vegetation would support. Micro-dairies or pasture-based dairies were included in this analysis because they are comparable to other types of livestock grazing and the infrastructure necessary for this type of operation already exists on several OSMP properties. Only properties with existing supporting infrastructure were considered for pasture-based micro-dairies.

There are currently five properties on OSMP lands with 27 acres in diversified vegetable farming and no micro- dairies.

Methodology

The analysis first identified OSMP properties which have suitable soils, adequate water availability, and have or are nearby infrastructure necessary to support diversified vegetable farming.[1] (The evaluation criteria are described in greater detail below.) The properties which met these essential agricultural characteristics were classified as candidates for further analysis. (Figure 1)

The candidate properties were then evaluated for compatibility with management area designations, existing resource management goals and other resources including sensitive species. (The evaluation criteria are described in greater detail below.) Staff conducted a site-specific evaluation of the infrastructure at each candidate property to determine which type(s) of operation the existing infrastructure is best suited to support. Staff then developed a recommendation for each of the candidate properties. Staff identified management strategies to minimize impacts to other resources and to guide the conversion and management of the properties identified for diversified vegetable farming or a micro-dairy. Staff also estimated the costs of infrastructure improvements and other management actions to convert and maintain the property as a diversified vegetable farm and/or micro-dairy.

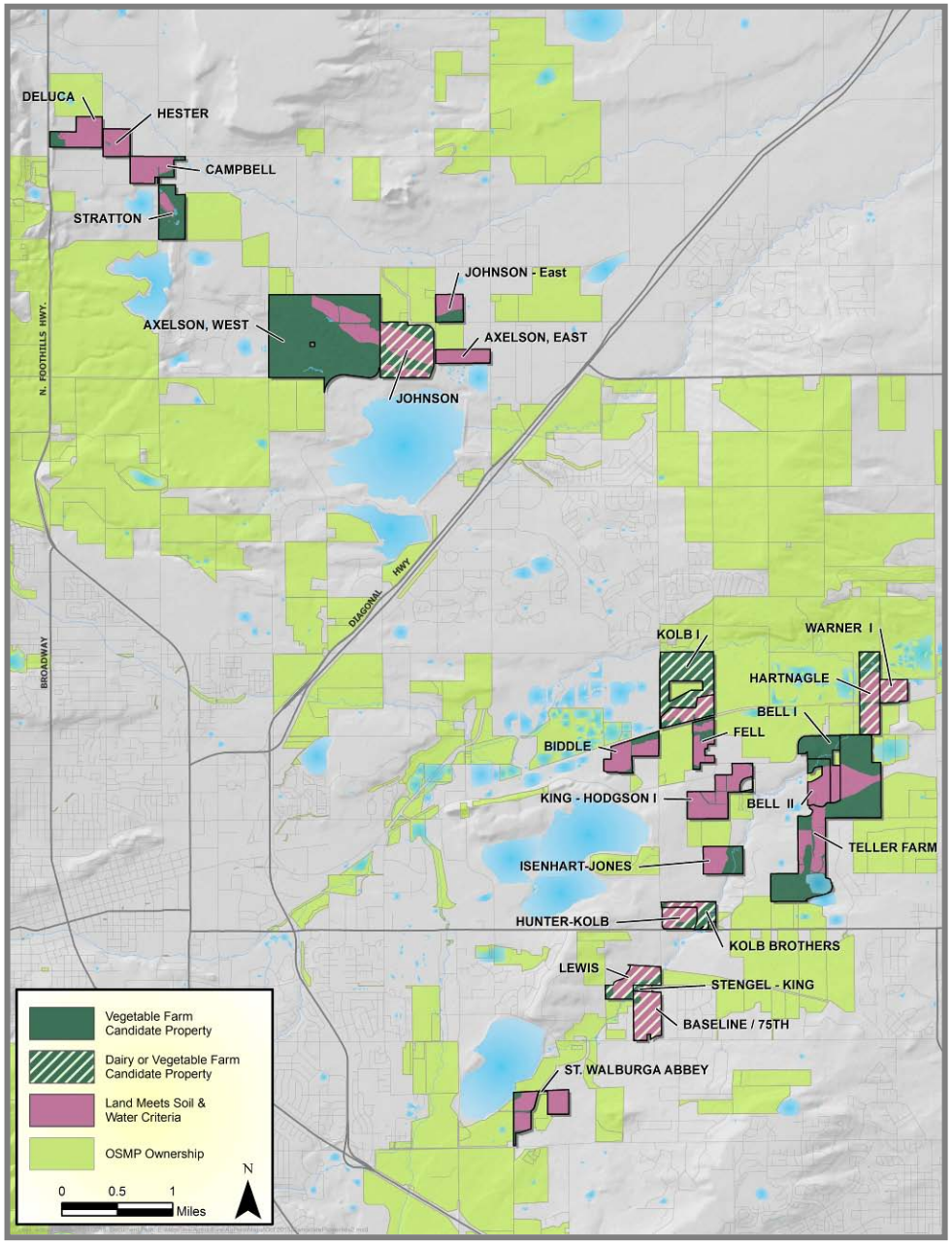

Figure 1: Candidate Properties

[1] All of the properties with the infrastructure to support micro-dairies are located on properties that meet the soil and water requirements.

Phase I Evaluation Criteria: Essential Agricultural Characteristics

Infrastructure

Diversified vegetable farming requires outbuildings suitable for prospective lessees/farmers to process and store their products. It is also customary for farmers to reside on the property, for reasons of convenience and efficiency, and as evidenced by the existence of residences on all of the properties with outbuildings. In addition, on-site housing is often necessary to attract qualified lessees. For this first phase of analysis, staff identified all OSMP properties with outbuildings and a residence to support diversified vegetable farming. Recognizing that some OSMP lands could be used to expand existing farms, some properties lacking infrastructure were also retained as candidates if they were within 0.5 miles of an existing vegetable farm and met the soil and water eligibility requirements. [2]

Soil Type

The ability to use a property to cultivate vegetables is dependent on having a suitable soil type. Suitable soil types have the right combination of physical and chemical characteristics such as texture, slope, pH and permeability. Good agricultural soils cannot be excessively erodible because annual vegetable fields are dominated by bare ground for much of the year and are prone to erosion. Poorly drained soils that are frequently waterlogged are also not well-suited for vegetable cultivation.

In order to identify OSMP properties with suitable soils, staff referenced the local soil survey report. [3] *The survey identifies the types and locations of soils found in eastern Boulder County, and groups soils into Capability Classes based upon their suitability for agricultural production. As the Capability Class increases, so does the soils type's limitations for agriculture. Appendix A lists the soils in the various Capability Classes and identifies the corresponding limiting factors.*

Staff determined properties comprised principally of soils in Capability Classes I through III were suitable for diversified vegetable farming, when managed with appropriate conservation practices. Properties dominated by soils in Capability Classes IV, V, and VI pose severe cultivation limitations, such as being highly erodible, stony, or excessively wet. Staff determined these were not suitable for diversified vegetable farming. [4]

Staff also set a minimum size requirement of 16 acres (equating to 8 acres tilled at one time). This size addresses the relationship of farm size to income generating potential and also ensures the farmer can adequately rotate and rest fields from cultivation.

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[2] Properties without infrastructure are dependent on the presence of a qualified lessee looking for property to expand their existing operations.

[3] Moreland D. and R. Moreland, 1975. Soils survey of Boulder County Area, Colorado. United States Department of Agriculture Soil Conservation Service in cooperation with the Colorado Agricultural Experiment Station.

[4] Capability classes VII and VIII exist, however none of the properties with the necessary infrastructure are comprised of soils in these classes. In addition soils in capability classes VII and VIII have such severe limitations they are unsuited to cultivation.

Water Availability

A reliable and adequate water supply is necessary to support diversified vegetable farming. Both the volume of water available, as well as the timing and duration of water availability were used to evaluate a property's potential for diversified vegetable farming.

All of the properties with the necessary infrastructure and appropriate soils were evaluated to determine which met the water availability criterion. Local agronomists recommend at least 1.5 acre-feet of water per acre for vegetable farming. All of the properties with appropriate infrastructure and soils met the minimum criterion for water volume. Diversified vegetable farming uses less water than the current existing hay and pasture operations due to the reliance upon more efficient drip and overhead irrigation systems than the flood irrigation used for hay/forage operations.[5]

In addition to requiring a minimum amount of water, diversified vegetable farming also requires that water be available throughout the growing season, which is typically longer for diversified vegetable production than for growing hay or pasture grasses. Staff identified those properties which in addition to having sufficient water, have a long enough average duration of irrigated water to support vegetable farming. Staff chose 100 consecutive days of water as the criterion for water duration. This was based upon the water requirement for growing tomatoes. Tomatoes are one of the most popular vegetables grown on diversified vegetable farms and take anywhere from 65 to 120 days to reach maturity which is representative or longer than the maturation time for most other types of vegetables grown in the Boulder Valley.

Findings

Twenty-three OSMP individual properties, meet the criterion for infrastructure, soils and water necessary for diversified vegetable farming (Figure 1). The infrastructure, soils and water supply for each of the candidate properties are described in greater detail in the individual Property Assessments.

[5] Byelich, B, Cook J., and Rowley, C. Small Acreage Irrigation Guide. Colorado State University and USDA Natural Resources Conservation Service. June 2013.

Phase II Evaluation Criteria

Management Area Designations

The Visitor Master Plan (VMP) categorizes OSMP lands under one of four management area designations: Agricultural, Passive Recreation, Natural and Habitat Conservation. These designations provide the foundation for determining what types of opportunities/activities are allowed and the level of resource protection. The management area designation and corresponding goals (Appendix B) of the candidate property and adjacent areas were evaluated for compatibility with diversified vegetable farming.

While diversified vegetable farming may be a more obvious potential fit for properties designated as Agricultural Areas, properties with other management area designations were also evaluated to determine whether vegetable farming or micro-dairies would be compatible with the area's management objectives.

Visitor Infrastructure/Resources

Existing OSMP trails and conceptual trails identified in the Boulder Valley Comprehensive Plan were considered, to the degree they crossed or approached candidate sites. While visitor infrastructure or the associated activities may not preclude a property from being used for vegetable farming or as a micro-dairy, it may be necessary to implement management actions to mitigate potential conflicts.

Prairie Dog Colony Management Designation and Occupation History

Prairie dogs can dramatically modify the landscapes where they live, most noticeably by their burrowing and feeding (grazing), such activities are typically incompatible with irrigated agricultural production and agricultural water management. Irrigation and related agricultural practices associated with diversified vegetable farming are likewise incompatible with the life requirements of prairie dogs.

The OSMP Grassland Ecosystem Management Plan (Grassland Plan) identified management area designations for prairie dogs and associated species. The management area designations were determined by evaluating factors such as prairie dog habitat suitability, block size, urbanization, recreational activities, irrigated agriculture and adjacent land management goals. The prairie dog management area designations are Grassland Preserves, Multiple Objective Areas, Prairie Dog Conservation Areas, Transition Areas and Removal Areas. The candidate properties were evaluated for compatibility with the management area designation of the property and surrounding lands. Appendix C describes the management objectives of the various prairie dog management area designations.

In addition to the prairie dog management area designation, historical (maximum extent) and current prairie dog occupation were also considered as prairie dogs will likely attempt to re-colonize lands previously occupied. Where candidate properties or adjacent lands are or have been occupied, management costs and actions to prevent re-colonization were considered and included in the recommendations.

Bobolink Management Areas

The majority of the candidate properties are currently irrigated hayfields or pastures. By virtue of historic irrigation, mowing and grazing practices, some of these semi-native hayfields and pastures support wildlife not commonly found elsewhere on OSMP lands such as bobolinks. Bobolinks are grassland songbirds thought to be undergoing a non-cyclical population decline due to a variety of factors including habitat destruction. Conservation of bobolink habitat has been part of OSMP's land management since the 1980s.

The Grassland Plan identified the goal of establishing or continuing agricultural management practices that support habitat for bobolinks by designating Bobolink Management Areas (Class A and Class B). Converting a candidate property to a diversified vegetable farm or micro-dairy would preclude managing that portion of the property for bobolink habitat as it would no longer be an irrigated hayfield or pasture. Several of the candidate properties were designated as Class B Bobolink Management Areas through a parallel process.

Other Sensitive Species

The presence of sensitive species and/or habitat on a candidate property was considered in determining the property's suitability for diversified vegetable farming. The sensitive species/habitats considered were:

- *Northern leopard frog habitat*
- *Nesting raptors*
- *Rare and state tracked plant populations and communities*
- *Federally threatened or endangered species including Preble's meadow jumping mouse occupied habitat and Ute ladies' tresses (Spiranthes) orchid.*

Noxious Weeds

Like other landowners in Colorado, OSMP is required to eliminate state "A-listed" and certain B-listed noxious weeds. Management may include the application of pesticides or herbicides. While the presence of state noxious weeds required for elimination may not preclude a property from being converted to vegetable farming, it may affect the timeline for organic

certification since in order to be certified, land must be pesticide free for at least three years. A noxious weed infestation may also limit the quantity and quality of forage available for grazing.

Cultural Resources

Many of the candidate properties include historic structures or structures eligible for historical designation. Staff determined that diversified vegetable farming is compatible with and in some cases may improve the condition of these cultural resources, as long as any improvements to the structures are done in accordance with the applicable preservation policies and laws.

In addition to the structures, staff evaluated the candidate properties to determine if other cultural resources (prehistoric and historic archeological and paleontological) are present or known to exist on the candidate farms that would preclude the conversion of the property to a diversified vegetable farm. Staff found none. However, some of the properties have not been adequately surveyed. For these properties the individual Property Assessments identify the need for a cultural resource survey. If the survey identifies significant cultural resources that would or could be adversely affected by the conversion of the property, the agricultural management of the property will need to be revaluated and the property may be removed from consideration.

Recommendations Summary

When evaluating the individual properties during the Property Assessments, staff determined that in some instances, evaluating multiple adjacent properties as one site better reflected on-the-ground conditions and the true number of sites available for operators. The 23 individual properties were grouped into 13 potential sites for the assessments.

Staff determined that nine sites, comprised of 11 properties, were suitable for a diversified vegetable farm, dairy, or either. (Figure 2)

Vegetable Farm and Micro-Dairy Recommendations		
Site	**Vegetable Farm**	**Micro-Dairy**
Johnson, Axelson East		
Bell, Teller		
Hartnagle, Warner		
Hunter Kolb, Kolb Brothers		
Isenhart – Jones		
King Hodgeson		
Kolb		
St. Walburga Abbey		
Lewis, Stengel-King, Baseline & 75th		
Not Recommended: Axelson West, Biddle, Deluca, Campbell, Hester, Stratton, Fell (4 sites)		

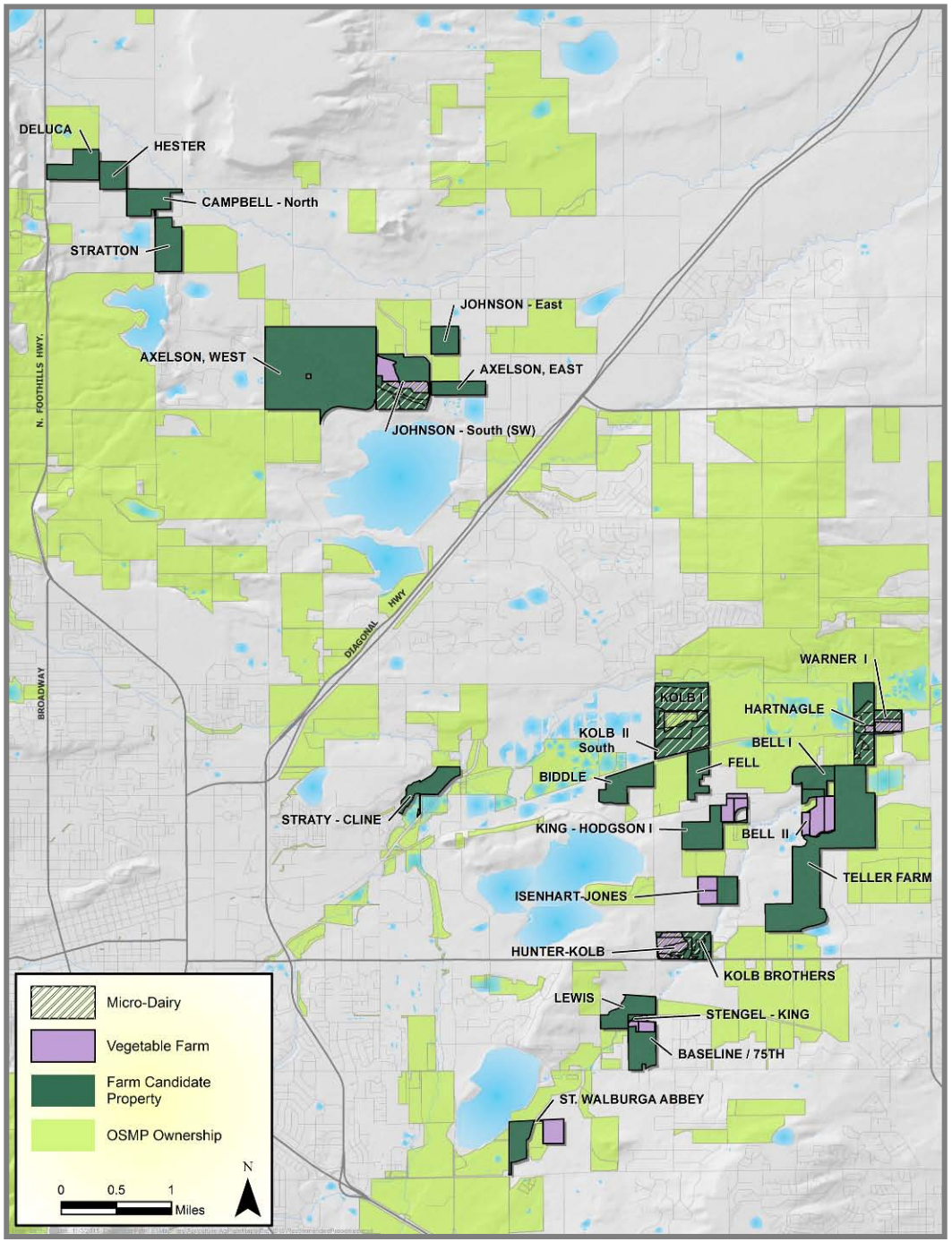

Figure 2: Vegetable Farm and Micro-Dairy Recommendations

Overarching Recommendations

- *Sites will be converted at a rate of one per year, or less according to demand. This is due to a desire to not "flood" the market and to avoid establishing more vegetable farms than can be supported. In addition, all of the farms sites require substantial improvements to get the site ready to be leased.*

- *Kolb, the only property recommended solely for a micro-dairy only (no vegetables) shall be converted first (if demand exists) so that additional demand for micro-dairies can be assessed.*

- *Sites recommended for both vegetable farming and a micro-dairy shall only be converted to a micro-dairy if Kolb is leased and additional demand exists.*

- *The four properties without infrastructure and recommended for vegetable farming will be converted opportunistically, as they rely on an existing farmer within 0 .5 miles desiring to expand operations. Interested farmers wishing to expand will apply through an application process with similar criteria to the open bid process for other properties in an agricultural lease.*

- *State listed A and B noxious weeds, and rhizomatous perennial invasive plant species shall be considered a high priority for treatment on fields recommended for diversified vegetable farming or pasture for a micro-dairy.*[6] *Early treatment may allow for some areas to transition to organic sooner or increase forage availability.*

- *The conversion of areas to diversified vegetable farms shall not adversely affect or impact rare or sensitive plant communities, wetlands, or riparian areas.*

Vegetable Farming and Dairy Recommendations At a Glance;

Nine sites, comprised of 11 properties are recommended for vegetable farming, a micro-dairy, or either.

Five of the recommended nine sites have the infrastructure necessary to establish a new diversified vegetable operation or micro-dairy. The remaining four do not have infrastructure and can solely be used for expanding a nearby existing operation.

Future potential operations may vary in size. If demand exists along with a sufficient number of qualified lessees, it is possible that all eight vegetable sites could be converted to vegetable farms. If this were to happen, the range of acres converted would be 80-253 acres, with only half tilled or in production at a given time (40-127acres).

[6] Treatment of these properties will need to be prioritized against all other Integrated Pest Management activities.

Kolb

Essential Agricultural Characteristics Summary:

197 Total Acres, 39 Suitable Acres[1]

Water

Source	Availability
Green Ditch	*May 27 – September 20 ~117 days*
Butte Irrigation and Milling Ditch	*May 19 – August 17 ~90 days*
Jones and Donnelly Ditch	*May 6 - October 28 ~175 days*
Domestic well[2]	*N/A*

Soils

Type	Slope	Capability Class
Loveland Soils	*0-1%*	*III*

Infrastructure

residence ● large barn (formerly used for milking and storage) ● shed ● two pole barns

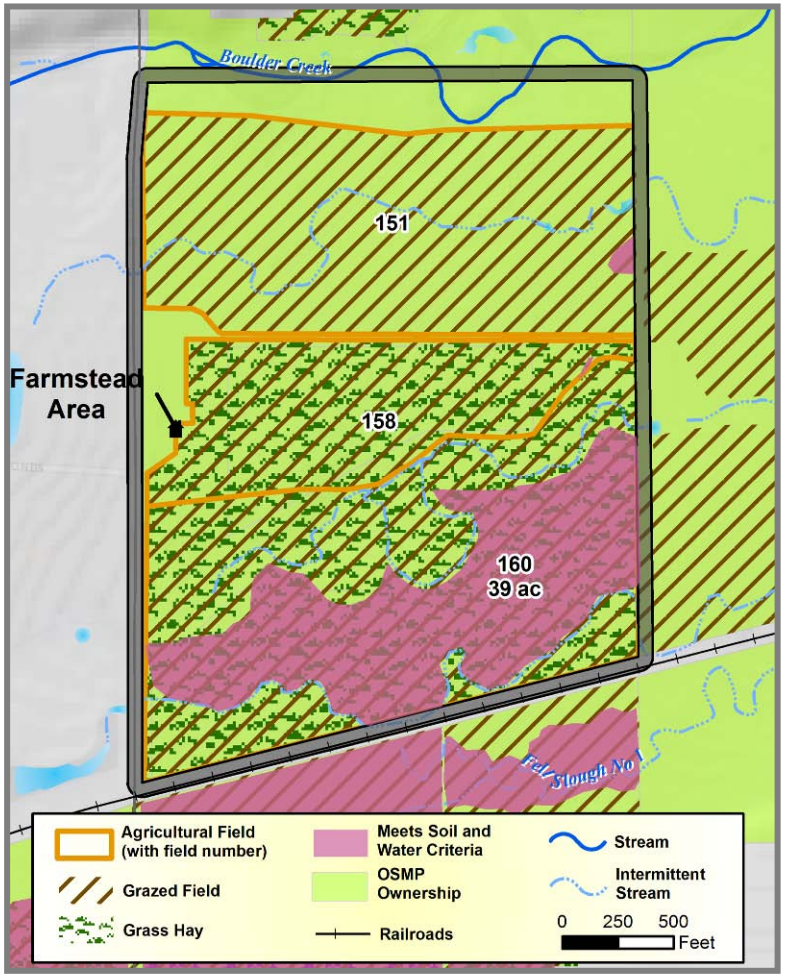

Figure 3: Kolb Suitable Lands

[1] "Suitable Acres" refers to land that meets the soil and water requirements for diversified vegetable farming; does not include land suitable for pasture.
[2] Colorado Water Laws allow domestic wells to be used for livestock water as well as for irrigation up to one acre of land.

Kolb

Compatibility with Natural Resources and Management Goals:

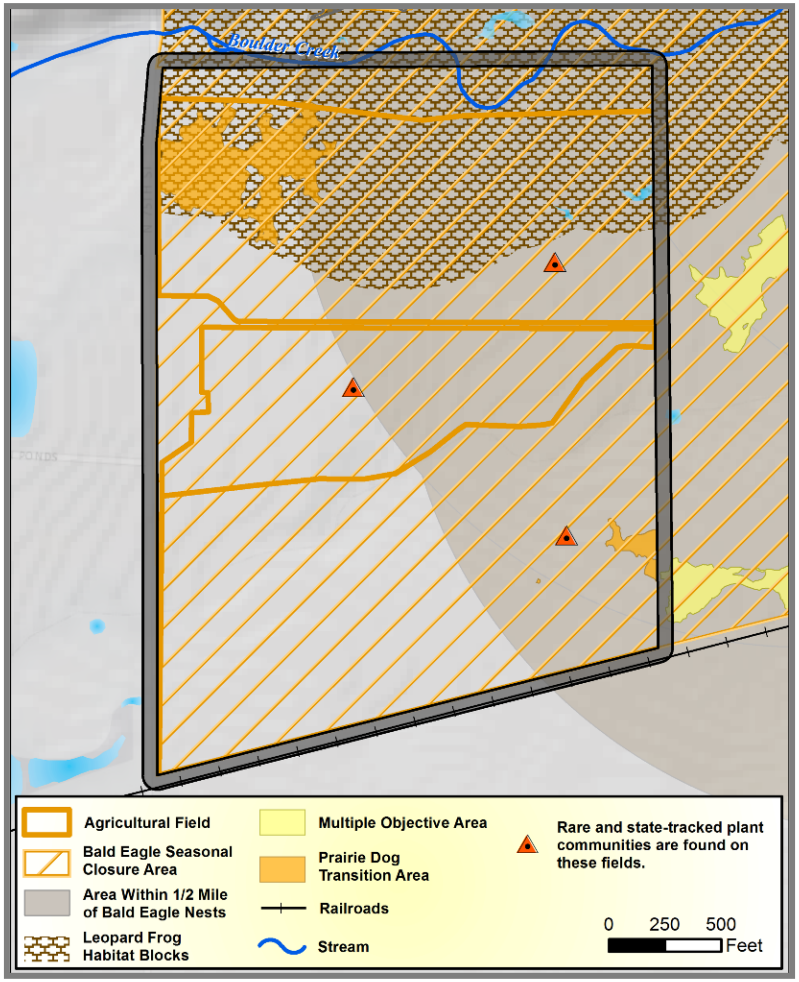

Figure 4: Kolb Natural Resources

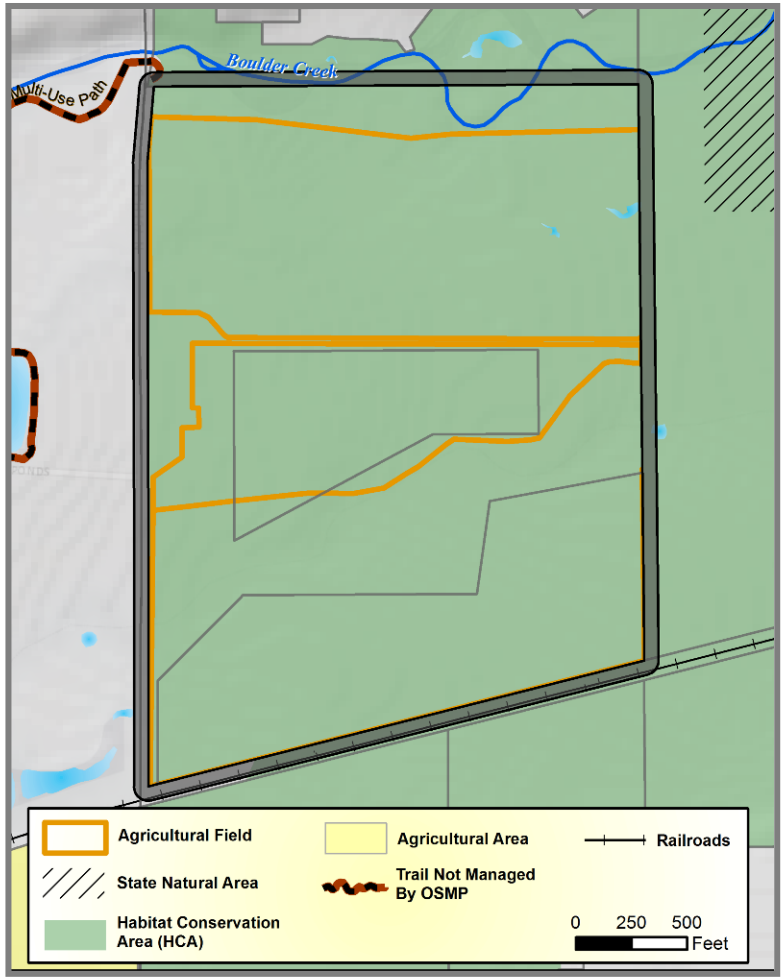

Figure 5: Kolb Trails, Management Area Designations, and Weeds

Kolb

Recommendation and Rationale:

Maximum Extent (Acres)	
Micro-Dairy Pasture	*80*

Provided demand, this property is recommended solely for a micro-dairy; the property is not recommended for diversified vegetable farming.

The entirety of the property is in a bald eagle closure. The intensive agricultural activities associated with diversified vegetable farming are not compatible with, and likely to disturb, the nesting eagles. Just as the existing livestock operation exists, the grazing that would occur as part of a pasture-based dairy could occur here without disturbing the eagles or affecting the ecological values associated with the property and surrounding HCA. The pasture-based dairy will change the temporal grazing of the property from winter grazing to year round; temporarily restricting portions of the property to grazing activities can mitigate any impacts associated with the year long grazing.

The maximum extent for a micro-dairy is approximately 80 acres. The location of the pasture area will be determined on an annual basis, and may change from year to year according to the vegetation management goals, which currently use prescriptive grazing to achieve the desired vegetation cover, and the location of the eagles.

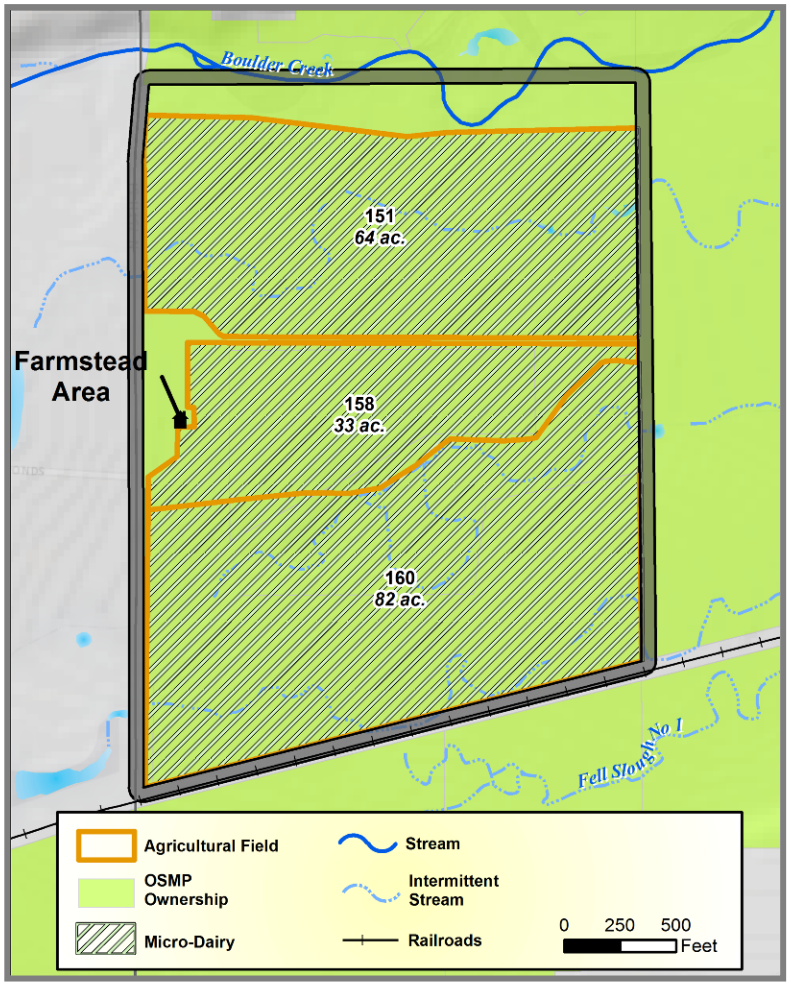

Figure 6: Kolb Recommendations

Kolb

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up property	*$ 10,000*
Assess the residence and outbuildings to determine if they are historically significant	*$10,000*
Rehabilitate residence	*$250,000*
Rehabilitate existing barns and outbuildings	*$100,000*
Renovate the milking barn[3]	*$50,000*
Perform site-specific mapping and evaluation of rare or sensitive plan communities, wetlands, and riparian areas	*$0*

Total Cost Estimate: $420,000

[3] Subject to local, state and federal oversight via Boulder County Public Health, Colorado Department of Agriculture and the U.S. Food and Drug Administration

Hunter-Kolb, Kolb Brothers

Essential Agricultural Characteristics Summary:

57 Total Acres, 42 Suitable Acres

Water

Source	Availability
Enterprise Ditch	*May 16 – August 8 ~84 days*
Cottonwood # 2 Ditch	*May 16 – September 12 ~119 days*
Two domestic wells	*N/A*

Soils

Type	Slope	Capability Class
Ascalon sandy loam	*1-3%*	*II*

Infrastructure

residence ● four outbuildings ● milking barn ● loafing shed ● tower silo ● grain bin ● livestock shelter

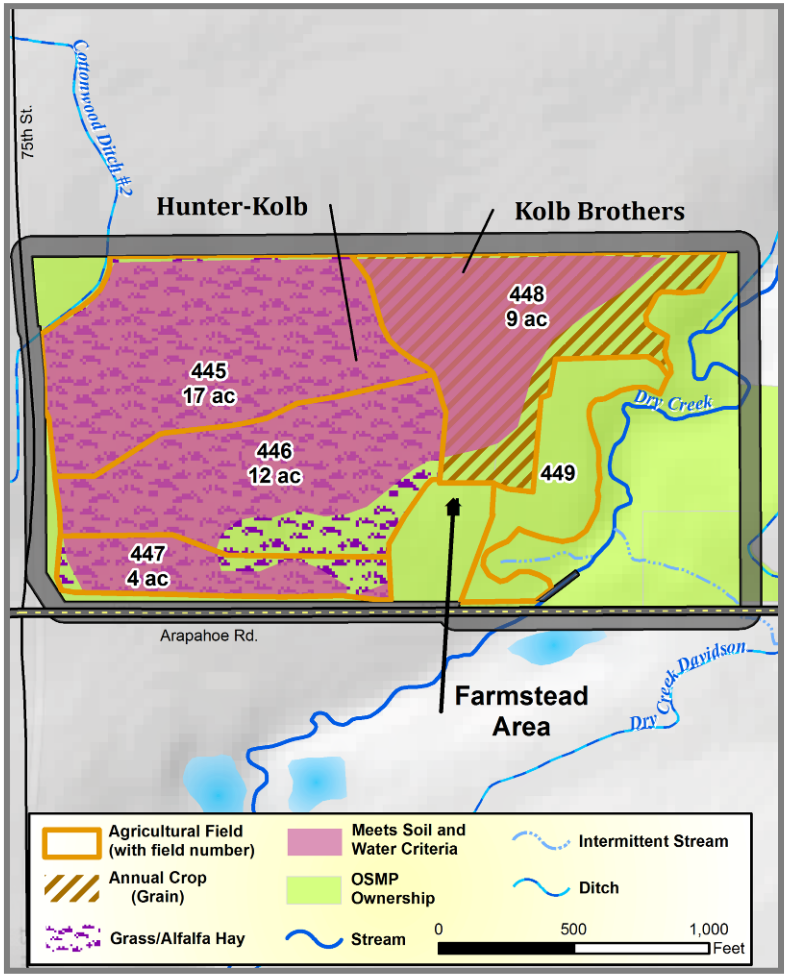

Figure 7: Hunter-Kolb, Kolb Brothers Suitable Lands

Hunter-Kolb, Kolb Brothers

Compatibility with Natural Resources and Management Goals:

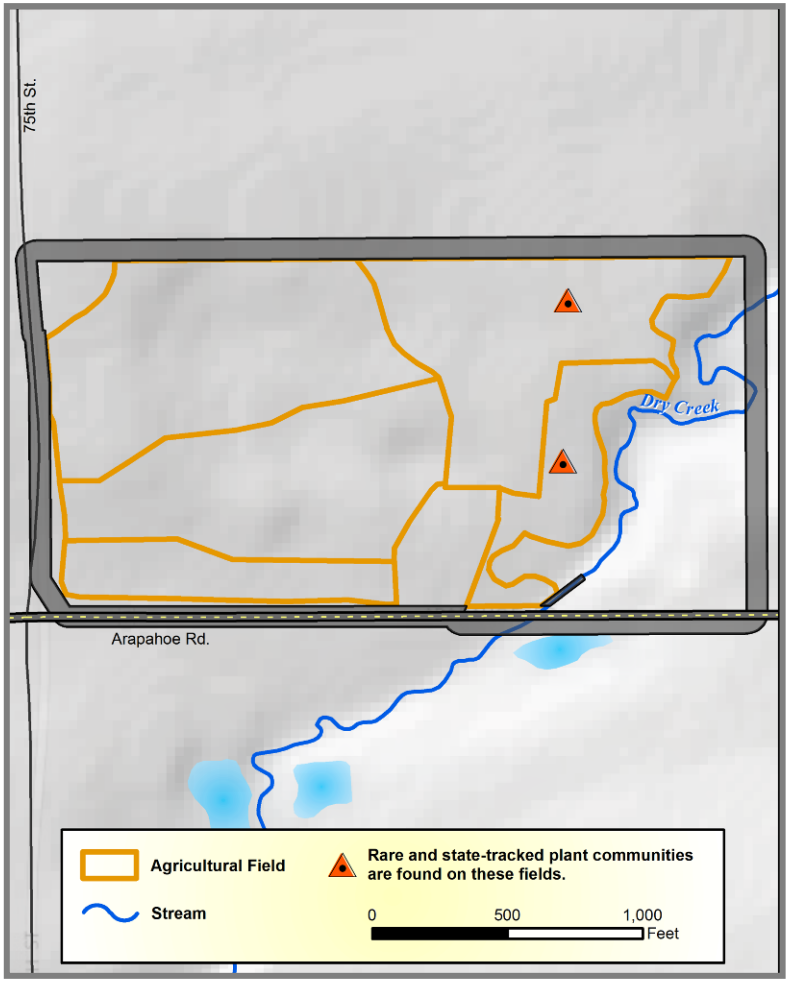

Figure 8: Hunter-Kolb, Kolb Brothers Natural Resources

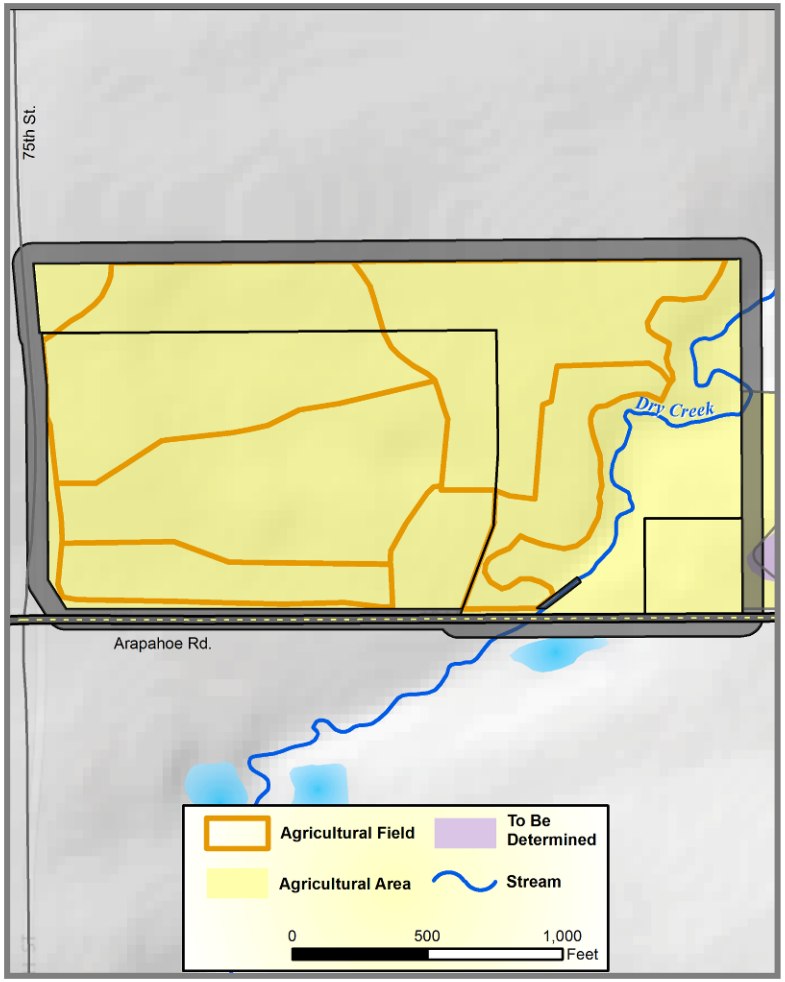

Figure 9: Hunter-Kolb, Kolb Brothers Trails, Management Area Designations, and Weeds

Hunter-Kolb, Kolb Brothers

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*42* *21 in production*
Micro-Dairy Pasture	*47*

Provided demand, this property is recommended for a diversified vegetable farm, or micro-dairy. The recommended area avoids sensitive natural resources and is in an Agricultural Area. This property is only to be considered for a micro-dairy if Kolb, which is solely suitable for a micro-dairy operation, is leased.

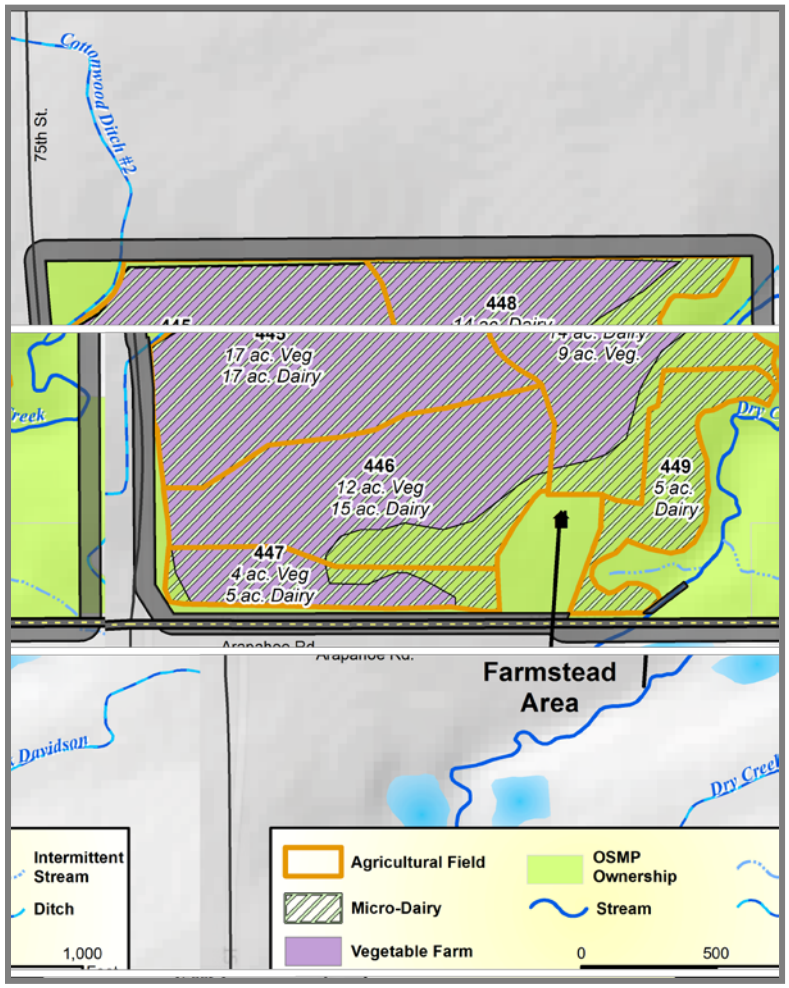

Figure 10: Hunter-Kolb, Kolb Brothers Recommendations

Hunter-Kolb, Kolb Brothers

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up property	*$ 15,000*
Rehabilitate residence[1]	*$250,000 - $350,000*
Perform a historic structures assessment on the outbuildings	*$5,000*
Rehabilitate or reconstruct the outbuildings	*$80,000*
Rehabilitate or reconstruct an outbuilding to accommodate a cooler and wash area	*$30,000*
Construct a small (1/10 acre-foot) irrigation pond near the Cottonwood #2 headgate to facilitate delivery of irrigation water to any planting beds	*$5,000*
Construct interior fence to separate vegetable fields from grazing areas.	*$10,000*
Construct interior fence to protect the riparian area and rare plant communities surrounding Dry Creek from potential grazing activity (The necessity of this management action is dependent on whither a micro-dairy operation is selected for the property)	*$0 -$10,000*
Renovate the milking barn. (The necessity of this management action is dependent on whether a micro-dairy operation is selected for the property)	*$ 0 -$50,000*
Perform site specific mapping and evaluation of rare or sensitive plan communities, wetlands, and riparian areas on field 448	*$0*

Total Cost Estimate: $395,000 - $555,000

[1] A historic structures assessment was completed in 2014 and identified critical work to stabilize the house. This work was completed in 2015 at a cost of $30,000.

DeLuca, Campbell, Hester, Stratton

Essential Agricultural Characteristics Summary:

242 Total Acres, 138 Suitable Acres

Water

Source	Availability
Left Hand Ditch	*April 1 – October 31 ~210 days*

Soils

Type	Slope	Capability Class
DeLuca		
Valmont clay loam	*1-3%, 3-5%*	*III*
Hester, Campbell, Stratton		
Valmont clay loam	*1-3%*	*III*

Infrastructure

residence ● attached garage ● two outbuildings ● small storage shed ● two small barns (Campbell)

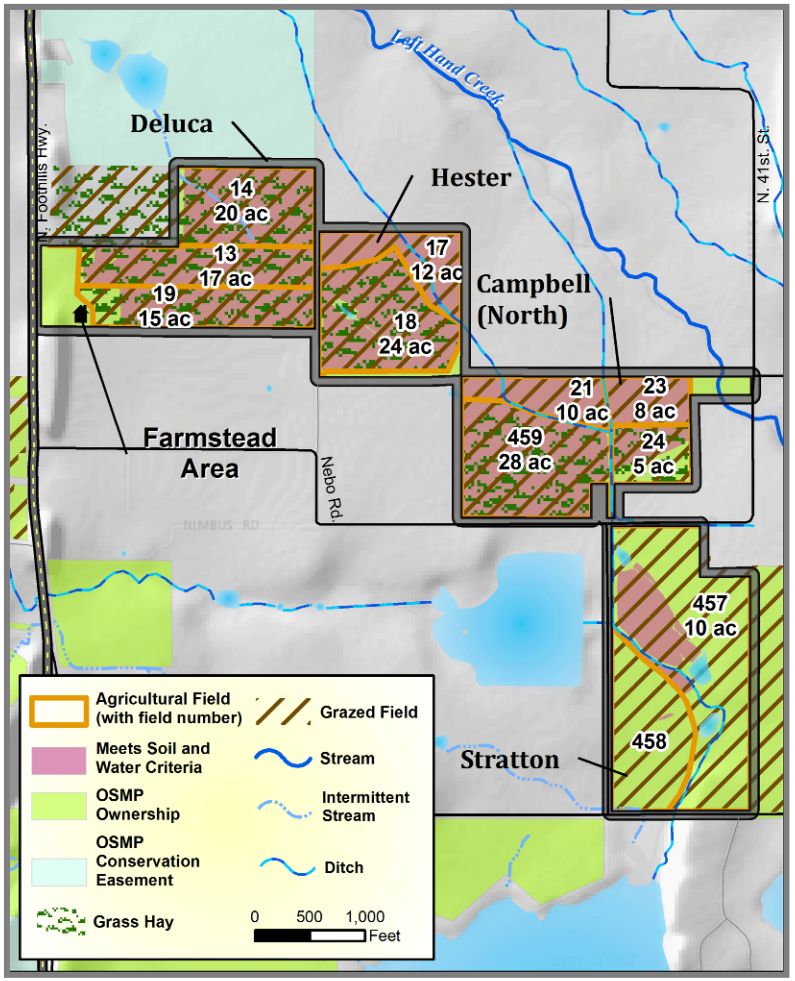

Figure 11: DeLuca, Campbell, Hester, Stratton Suitable Lands

DeLuca, Campbell, Hester, Stratton

Compatibility with Natural Resources and Management Goals:

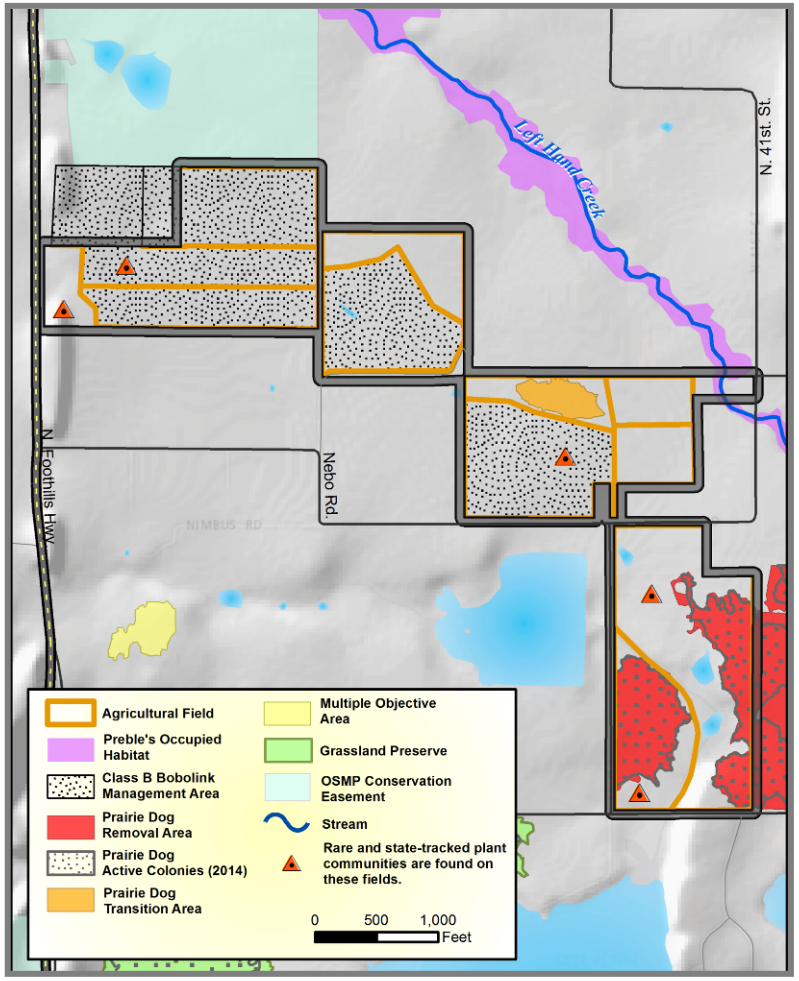

Figure 12: DeLuca, Campbell, Hester, Stratton Natural

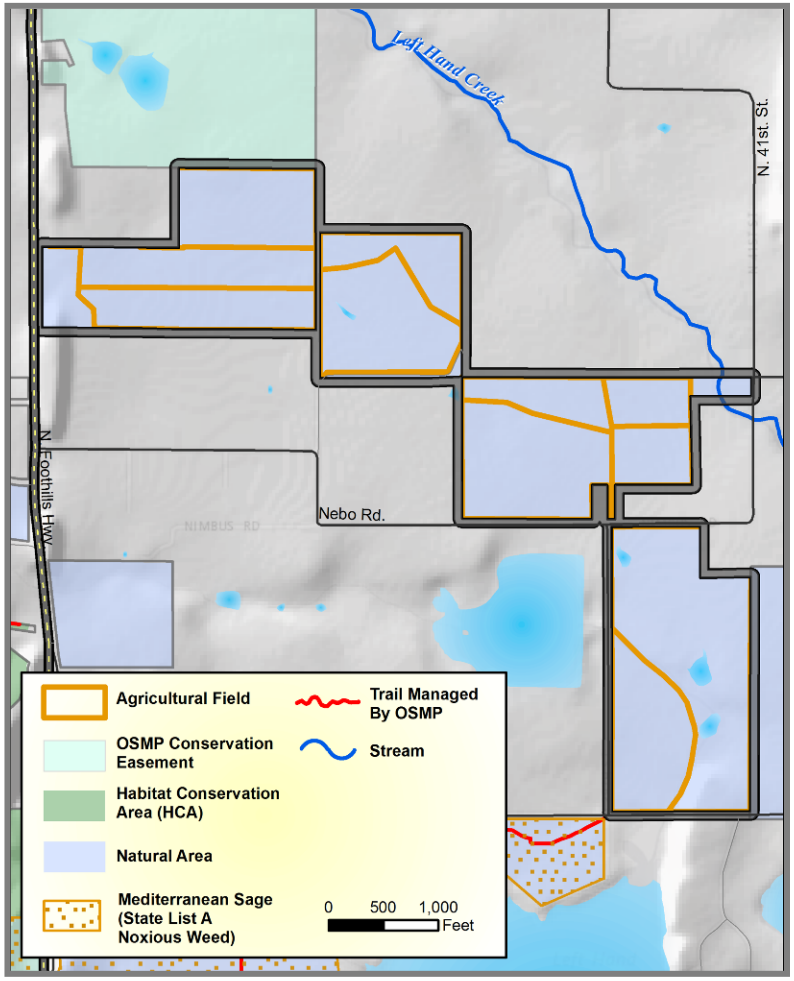

Figure 13: DeLuca, Campbell, Hester, Stratton Trails, Management Area Designations, and Weeds

DeLuca, Campbell, Hester, Stratton

Recommendation and Rationale:

This property is not recommended for a diversified vegetable farm, or micro-dairy.

This property supports high numbers of breeding bobolinks and was designated as a Class B Bobolink Management Area (through a parallel Ag Plan process), necessitating the retention of the current agricultural use, hay production. Both diversified vegetable production and the grazing associated with a micro-dairy are incompatible with the management actions associated with the Class B Bobolink Management Area designation and habitat needs of bobolinks.

Hartnagle, Warner

Essential Agricultural Characteristics Summary:

84 Total Acres, 80 Suitable Acres

Water

Source	Availability
1/3 interest in the storage water rights to Teller Lake #5	*Not a reliable water source (junior water rights)*
Hartnagle	
Dry Creek Davidson Ditch	*May 21 – September 1 ~103 days*
Domestic Well	*N/A*
Warner	
Leyner Cottonwood #2 Ditch	*May 2 – September 18 ~139 days*

Soils

Type	Slope	Capability Class
Hartnagle fields 167, 173, 175		
Manter sandy loam	*1-3%*	*III*
Hartnagle fields 169, 176		
Ascalon sandy loam	*1-3%*	*II*
Warner, Hartnagle fields 154, 159, 161, 163		
Ascalon sandy loam	0-1%	*I*

Infrastructure

residence ● six outbuildings ● large barn(formerly used for hay storage, milking and livestock shelter)

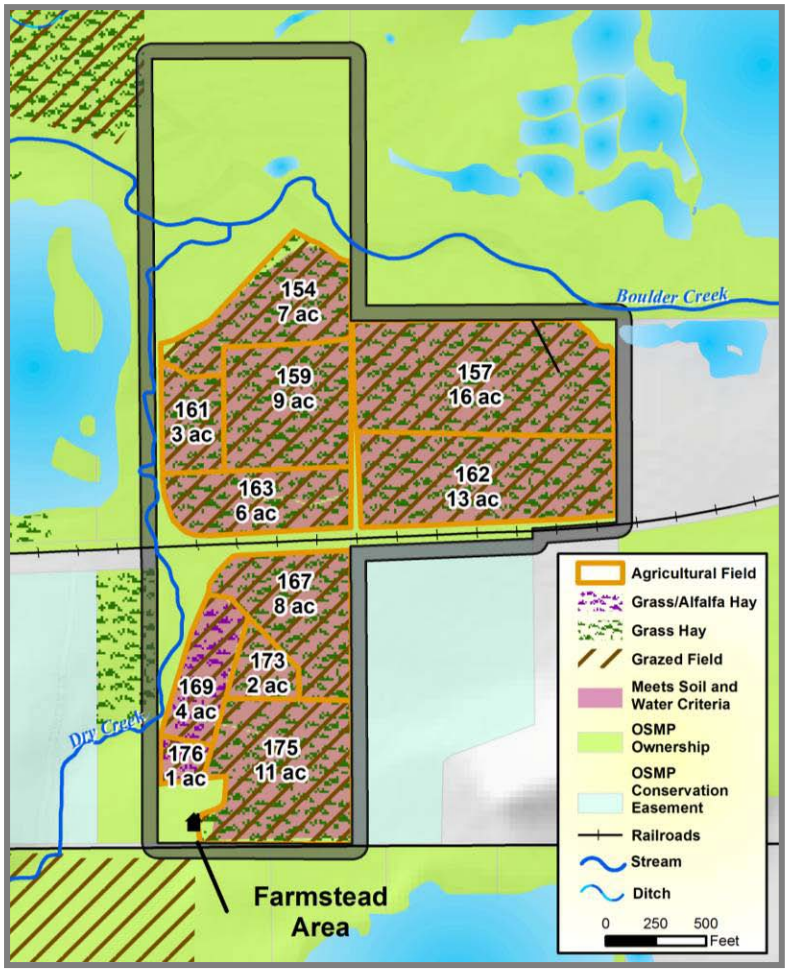

Figure 14: Hartnagle, Warner Suitable Lands

Hartnagle, Warner

Compatibility with Natural Resources and Management Goals:

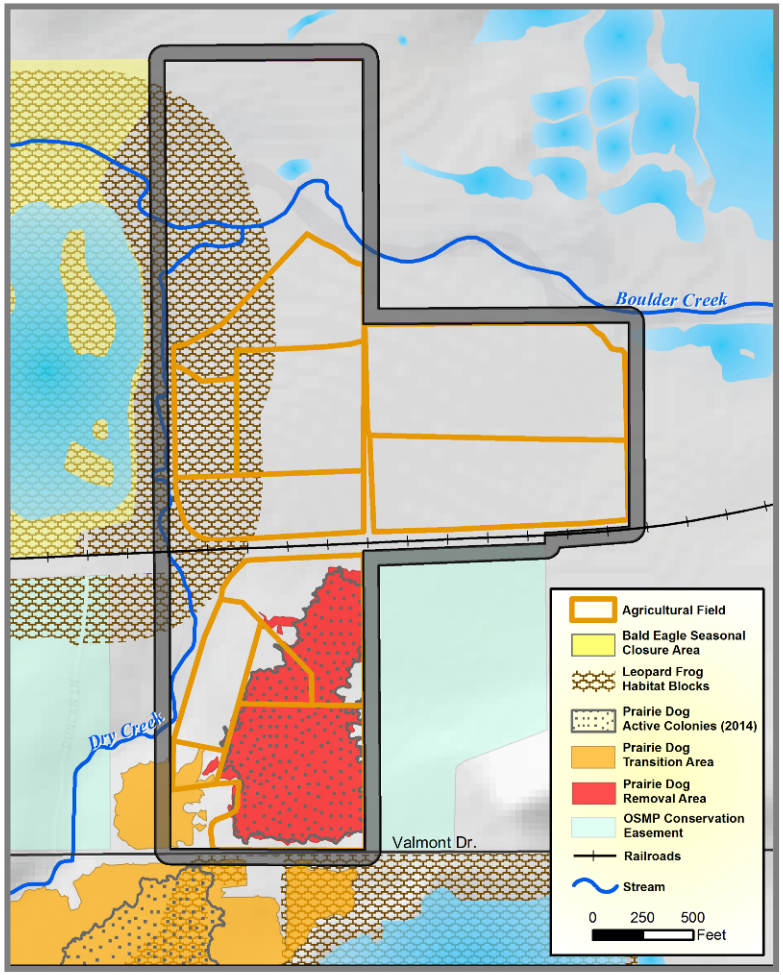

Figure 15: Hartnagle, Warner Natural Resources

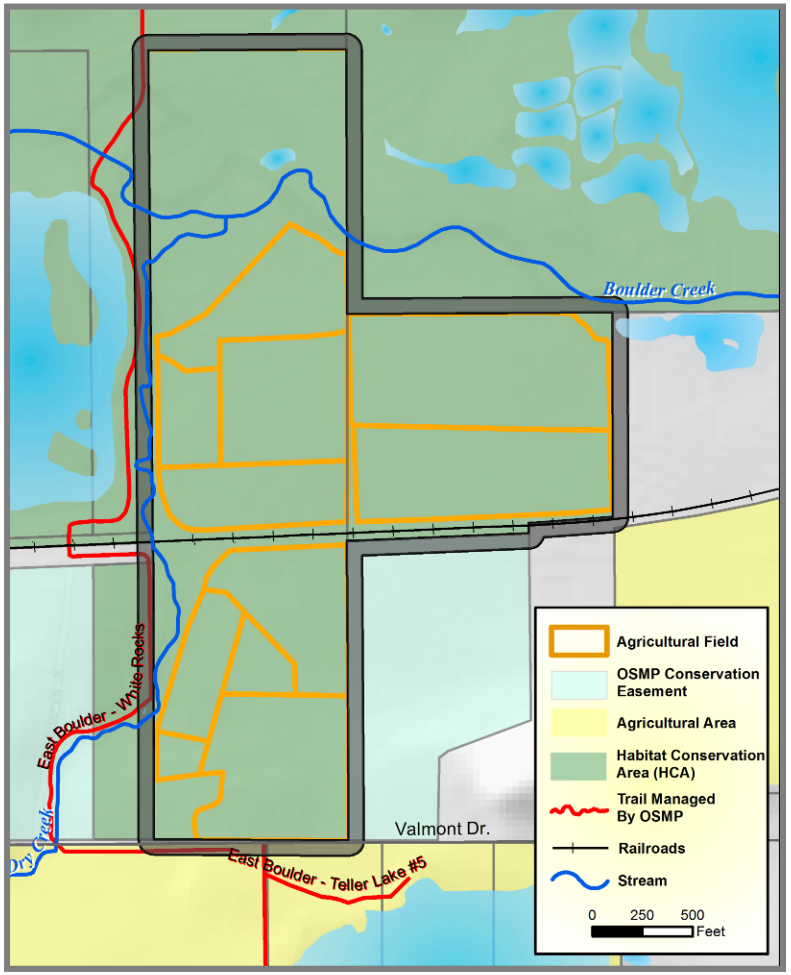

Figure 16: Hartnagle, Warner Trails, Management Area Designations, and Weeds

Hartnagle, Warner

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*20* *10 in production*
Micro-Dairy Pasture	*80*

Provided demand, this property is recommended for a small diversified vegetable farm, or micro-dairy. This property is only to be considered for a micro-dairy if Kolb, which is solely suitable for a micro-dairy, is leased. This property is in the Lower Boulder Creek HCA. Just as the existing livestock operation exists, a small diversified vegetable farm or micro-dairy could operate here without significantly affecting the ecological values associated with the property and surrounding HCA.

This property was historically tilled farmland, and contains some of the soils most well suited to vegetable farming anywhere in the OSMP land system. The long-term recommendation is to concentrate the more intensive agricultural activities associated with diversified vegetable farming in the area south of the railroad tracks and nearest to the infrastructure. However, that area is currently occupied by prairie dogs, but designated a prairie dog removal area.

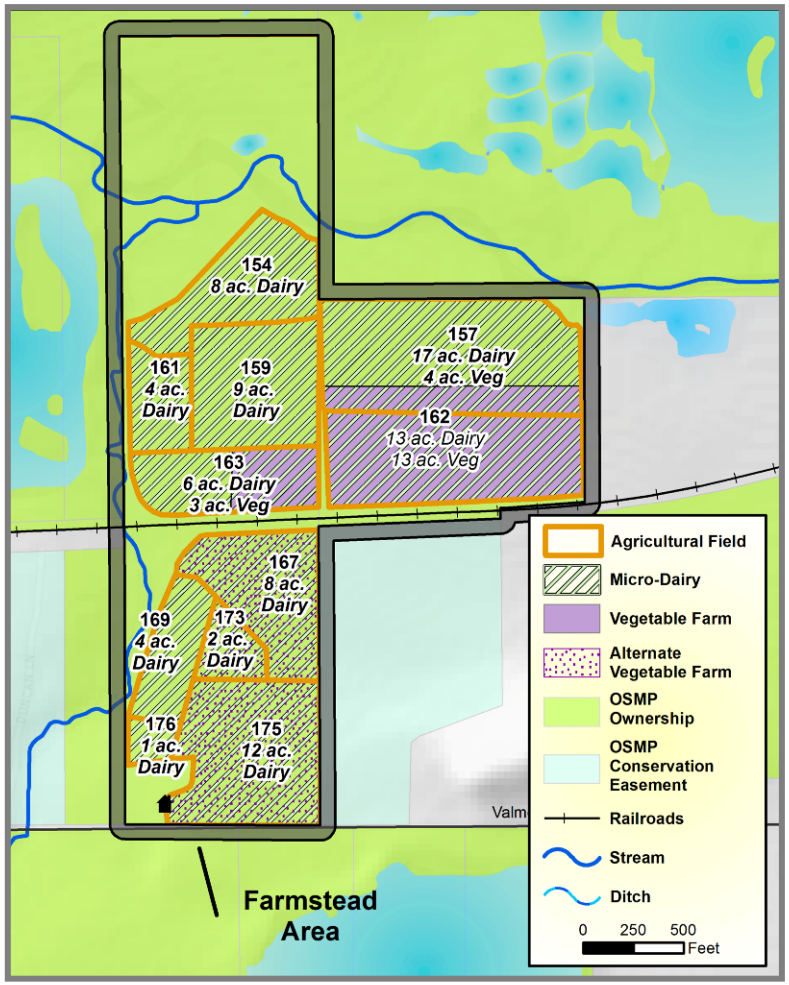

Figure 17: Hartnagle, Warner Natural Resources

Hartnagle, Warner

Recommendation and Rationale Cont:

The area would require an estimated 3-5 year recovery period after prairie dog relocation before it would be suitable for a vegetable farm or dairy pasture. Staff recommends establishing a diversified vegetable farm on 20 acres, north of the railroad tracks in the interim. This farm area would be converted back to native grass/hay after the diversified vegetable farm was relocated south of the railroad tracks.

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up Hartnagle property	*$ 15,000*
Rehabilitate residence	*$250,000 - $450,000*[1]
Repair or reconstruct the outbuildings	*$80,000*
Repair or reconstruct an outbuilding to accommodate a cooler and wash area	*$30,000*
Construct one small (1/10 acre-foot) irrigation pond to vegetable cultivation areas to facilitate delivery of irrigation water to any planting beds.	*$10,000*
Remove prairie dogs	*$60,000*
Construct a prairie dog fence along western boundary[2]	*$40,000*
Renovate the milking barn (The necessity of this management action is dependent on a micro-dairy operation being selected for the property)	*$40,000*
Domestic well testing and repairs	*$30,000*

Total Cost Estimate: $515,000 - $715,000

[1] An historic structures assessment was completed in 2014. $50,000 was spent in 2015 on exterior stabilization and an interior retaining wall.
[2] Prairie dogs in the surrounding landscape may create ongoing management challenges.

Axelson West

Essential Agricultural Characteristics Summary:

481 Total Acres, 68 Suitable Acres

Water

Source	Availability
Left Hand Ditch via Starr lateral	*April 1 – October 31 ~210 days*
Domestic well	*N/A*

Soils

Type	Slope	Capability Class
Valmont clay loam	*1-3%*	*III*

Infrastructure

residence[1] ● *small outbuilding/garage* ● *grain bin* ● *quonset hut (northern building site)* ● *two-car garage (northern building site)* ● *two loafing sheds (northern building site)* ● *corrals (northern building site)* ● *hay storage (northern building site)* ● *milking barn (northern building site)*

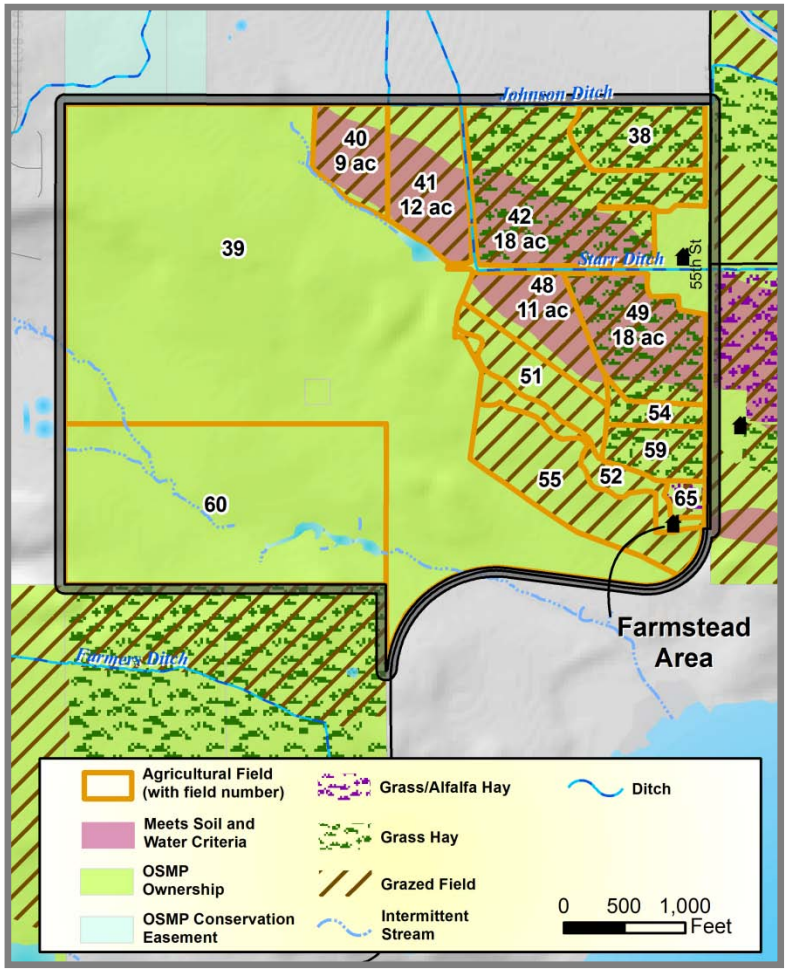

Figure 18: Axelson West Suitable Lands

[1] There are two residences/building sites; Due to the small size and poor condition of the residence on the northern building site it, is not being considered as a viable residential option. However, the other buildings/infrastructure on the northern building site may be used in conjunction with the southern residence.

Axelson West

Compatibility with Natural Resources and Management Goals:

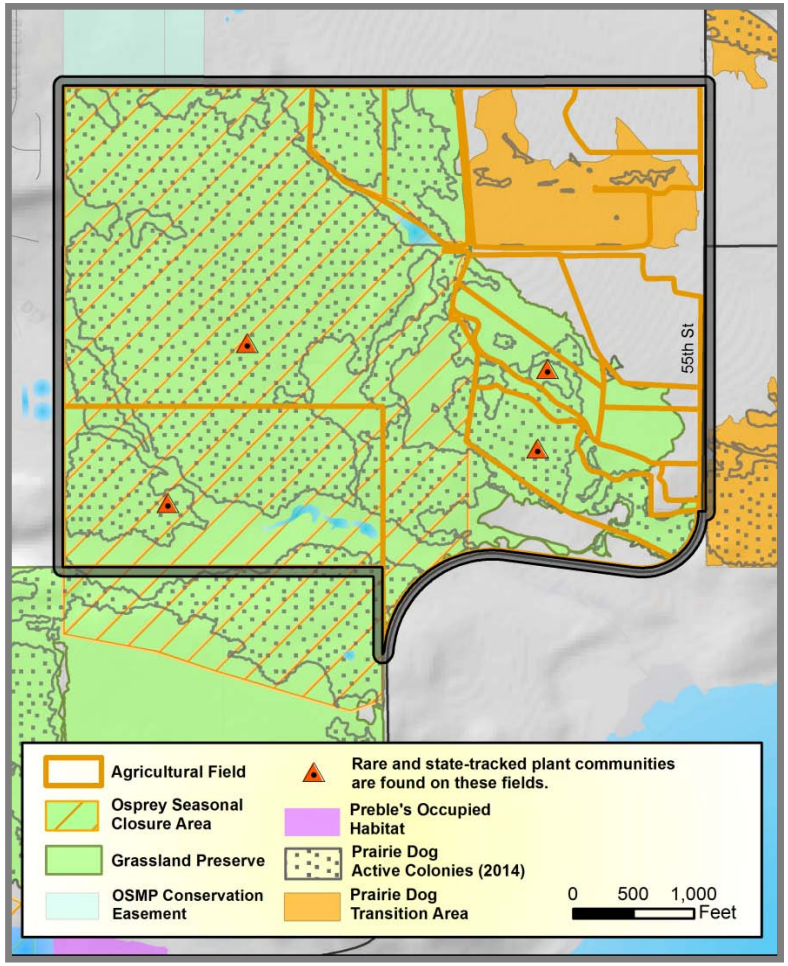

Figure 19: Axelson West Natural Resources

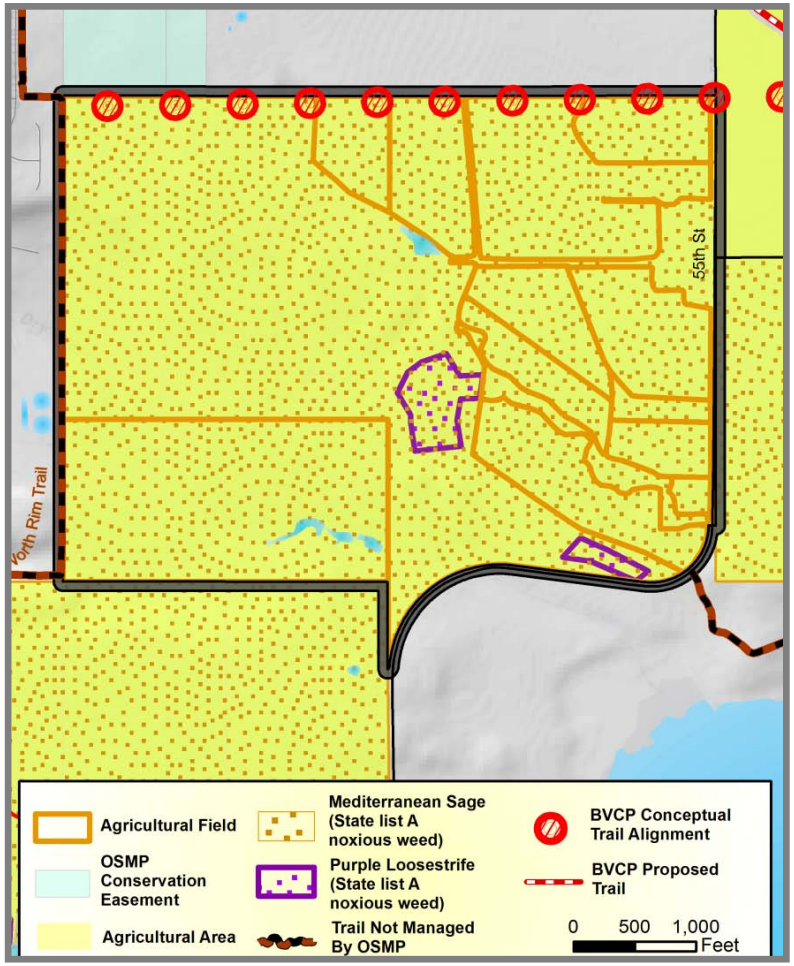

Figure 20: Axelson West Trails, Management Area Designation, and Weeds

Axelson West

Recommendation and Rationale:

This property is not recommended for a diversified vegetable farm or micro-dairy.

The Grassland Preserve designation and associated and likely ongoing prairie dog activity on most of the property is incompatible with vegetable farming. Among other things, prairie dog activities result in a reduction of forage, making the majority of the property also incompatible with a micro-dairy.

The western portion of the property is home to a pair of nesting Osprey. The increased activities associated with a diversified vegetable farm or micro-dairy along the closure boundary area could disturb the nesting raptors.

Johnson, Axelson East

Essential Agricultural Characteristics Summary:

219 *Total Acres, 145 Suitable Acres*

Water

Source	Availability
Left Hand Ditch via Starr lateral	*April 1 – October 31 ~210 days*
Domestic Well	*N/A*

Soils

Type	Slope	Capability Class
Johnson, Axelson East		
Valmont clay loam	*1-3%*	*III*
Johnson, Field 66		
Valmont clay loam	*1-3%*	*III*
Nunn clay loam	*1-3%*	*II*

Infrastructure

Johnson, Axelson East *residence*[1] ● *milking barn (Johnson South)*

Axelson West *residence* ● *small outbuilding/garage* ● *grain bin* ● *quonset hut (northern building site)* ● *two-car garage (northern building site)* ● *two loafing sheds (northern building site)* ● *corrals (northern building site)* ● *hay storage (northern building site)* ● *milking barn (northern building site)*

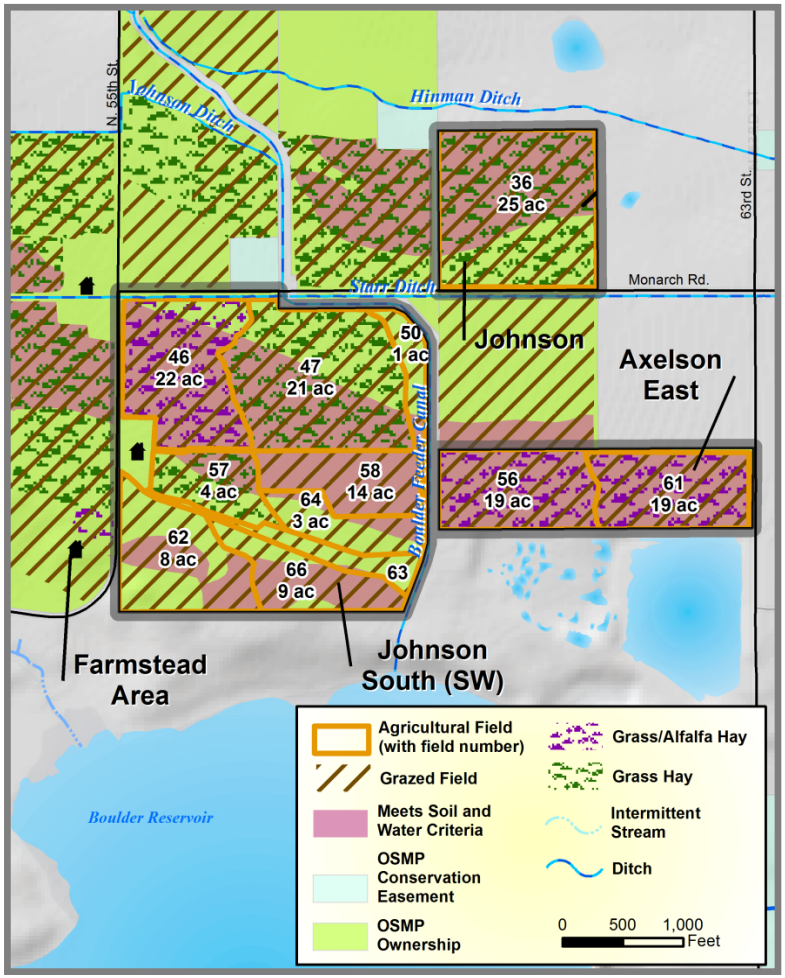

Figure 21: Johnson, Axelson East Suitable Lands

[1] The residence is not being considered for housing because it supports a large colony of big brown bats (approximately 130), a species of special concern in Boulder County. The bats have been roosting in the house for approximately 10 years. The residence on the adjacent Axelson West property is near enough to be considered "on-site".

Johnson, Axelson East

Compatibility with Natural Resources and Management Goals:

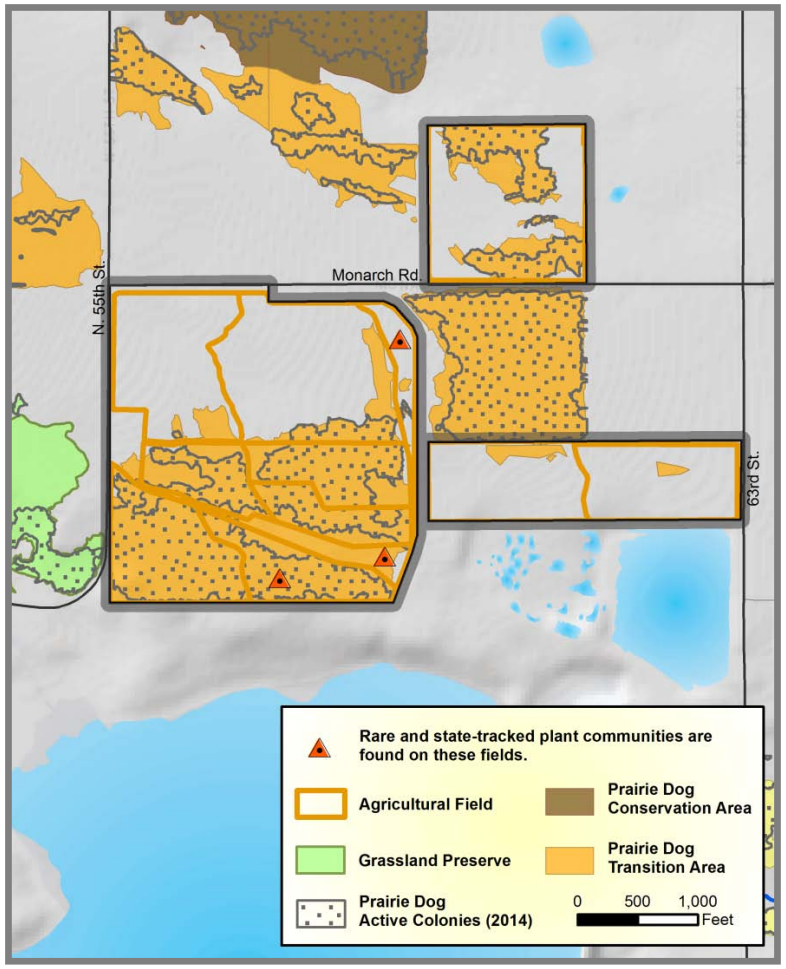

Figure 22: Johnson, Axelson East Natural Resources

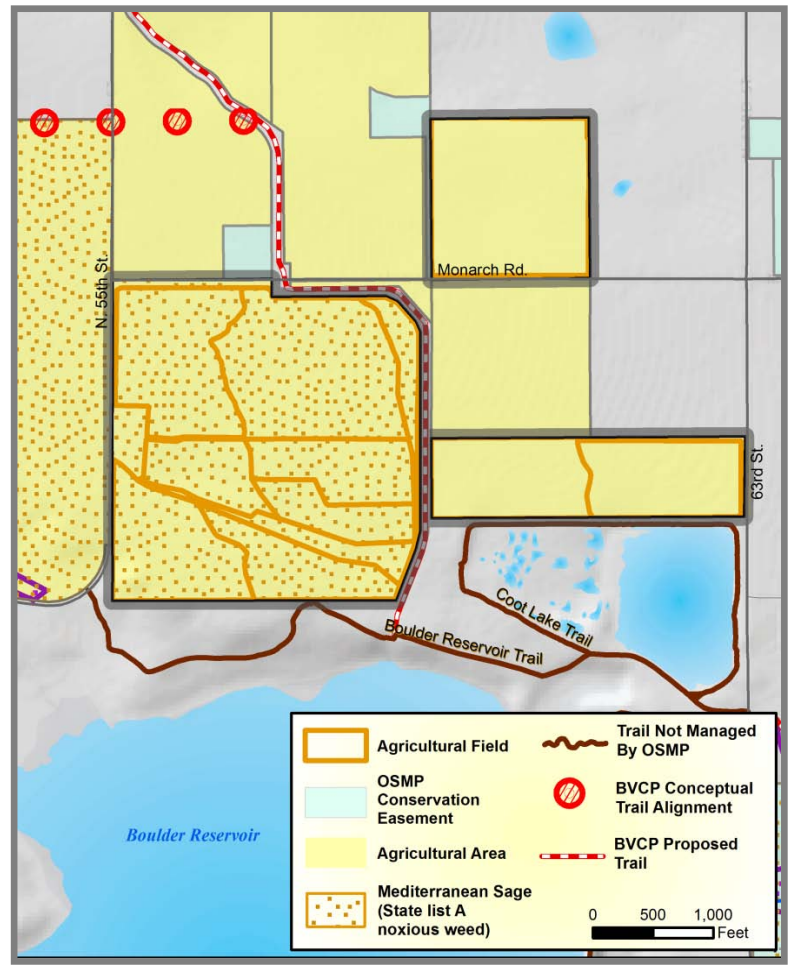

Figure 23: Johnson, Axelson East Trails, Management Area Designations, and Weeds

Johnson, Axelson East

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*40* *20 in production*
Micro-Dairy Pasture	*73*

Provided demand, this property is recommended for a diversified vegetable farm, or micro-dairy. This property is only to be considered for a micro-dairy if Kolb, which is solely suitable for a micro-dairy operation is leased.

Historic prairie dog activity throughout the Johnson property has resulted in the loss of top soil. Fields 57, 58, 64, 63, 66, and 62 would require an estimated 3-5 year recovery period after prairie dog relocation before they would be suitable for a vegetable farm or pasture dairy. While the current occupation of prairie dogs on this property presents a management challenge, the Transitional Area designation indicates the precedence of other resources and management goals.

The majority of the property is infested with a large population of Mediterranean sage, limiting the forage available for a pasture dairy. Staff estimates that the vegetation conditions of this property may not support a pasture based dairy for an estimated 10 or more years. When the vegetation conditions meet OSMP standards the property may be considered for a pasture based dairy.

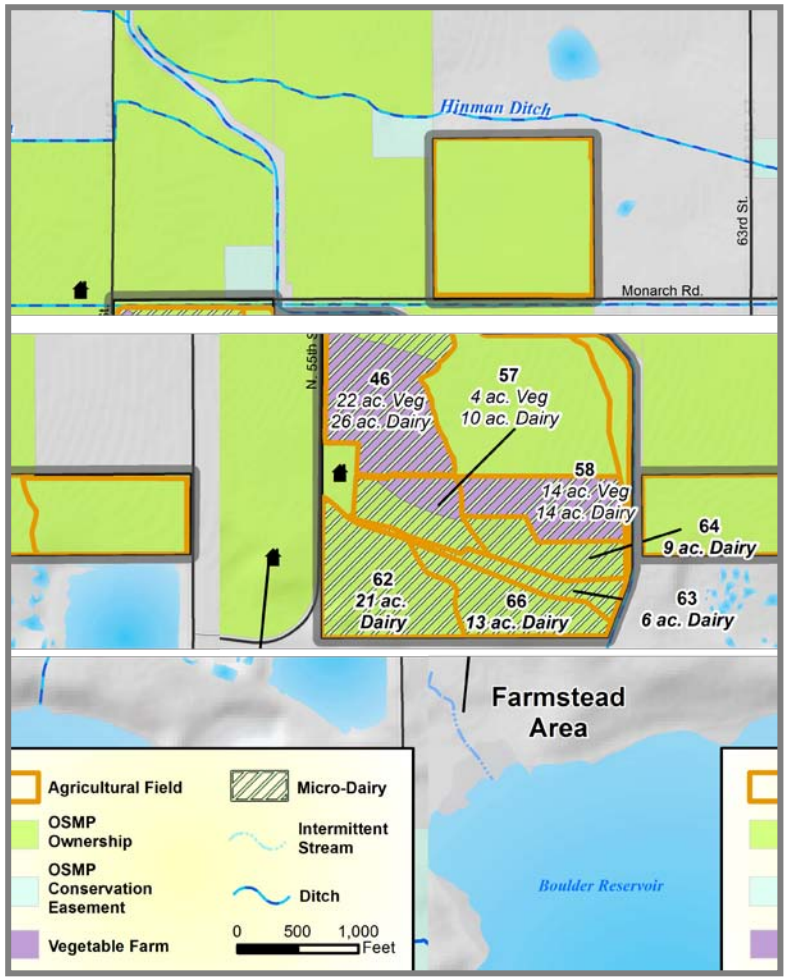

Figure 24: Johnson, Axelson East Recommendations

Under the current conditions, only 22 acres would be available for diversified vegetable farming.

Johnson, Axelson East

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up properties	*$ 10,000*
Update outbuilding to accommodate a cooler and wash area (Axelson West or Johnson)	*$20,000*
Repair or reconstruct a livestock pole barn (Axelson West or Johnson)	*$40,000*
Repair or reconstruct milking barn	*$20,000*
Construct a small (1/10 acre-foot) irrigation pond near the vegetable cropping areas to facilitate the delivery of irrigation water to any planting bed	*$5,000*
Construct a fence to separate the fields for diversified vegetable farming from the rest of the property which may be grazed	*$10,000*
Construct a prairie dog fence to separate prairie dog colonies from the portion of property suitable for vegetable farming[2]	*$30,000*
Passive relocation of prairie dogs on fields 57 and 58. (This is dependent on a lessee desiring to expand beyond the 22 acres on field 46.) Alternatively, expansion could occur only after the prairie dogs have left the fields	*$ 0 - 50,000*

Total Cost Estimate: $135,000 - $185,000

[2] Prairie dogs in the surrounding landscape are likely to create an ongoing management challenge.

Lewis, Stengel-King, Baseline & 75th

Essential Agricultural Characteristics Summary:

117 Total Acres, 99 Suitable Acres

Water

Lewis

Sources	Availability
Enterprise Ditch	*May 16 – August 4 ~80 days*
Cottonwood #2 Ditch	*May 16 – September 12 ~119 days*

Stengel-King and Baseline & 75th

McGinn Ditch	*April 29 – October 10 ~164 days*

Soils

Type	Slope	Capability Class
Lewis, field 245		
Nunn Sandy clay loam	*1-3%*	*II*
Lewis, fields 244, 251, 256		
Nunn Sandy clay loam	*1-3%*	*III*
Ascalon-Otero Complex	*3-5%*	*III*
Stengel- King, Baseline & 75th fields 267, 280, 283, 285		
Ascalon sandy loam	*1-3%*	*II*
Baseline & 75th field 265		
Ascalon sandy loam	*1-3%*	*II*
Ascalon-Otero Complex	*3-5%*	*III*

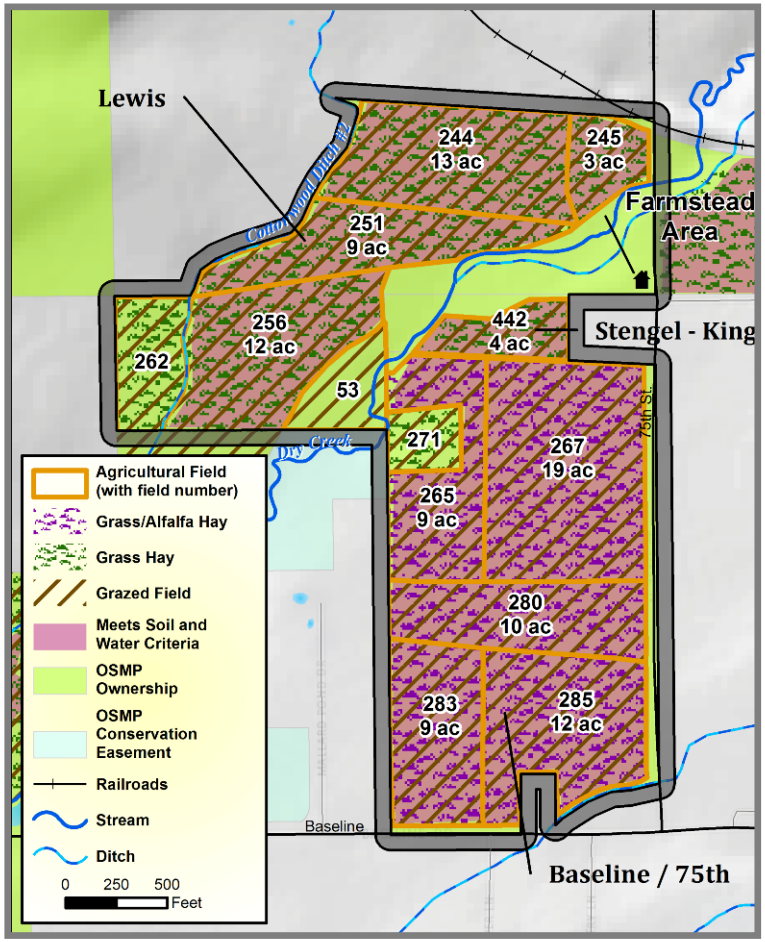

Figure 25: Lewis, Stengel-King, Baseline & 75th Suitable Lands

Infrastructure *residence ● three bay garage ● pole barn for covered hay storage ● four sheds*

Lewis, Stengel-King, Baseline & 75th

Compatibility with Natural Resources and Management Goals:

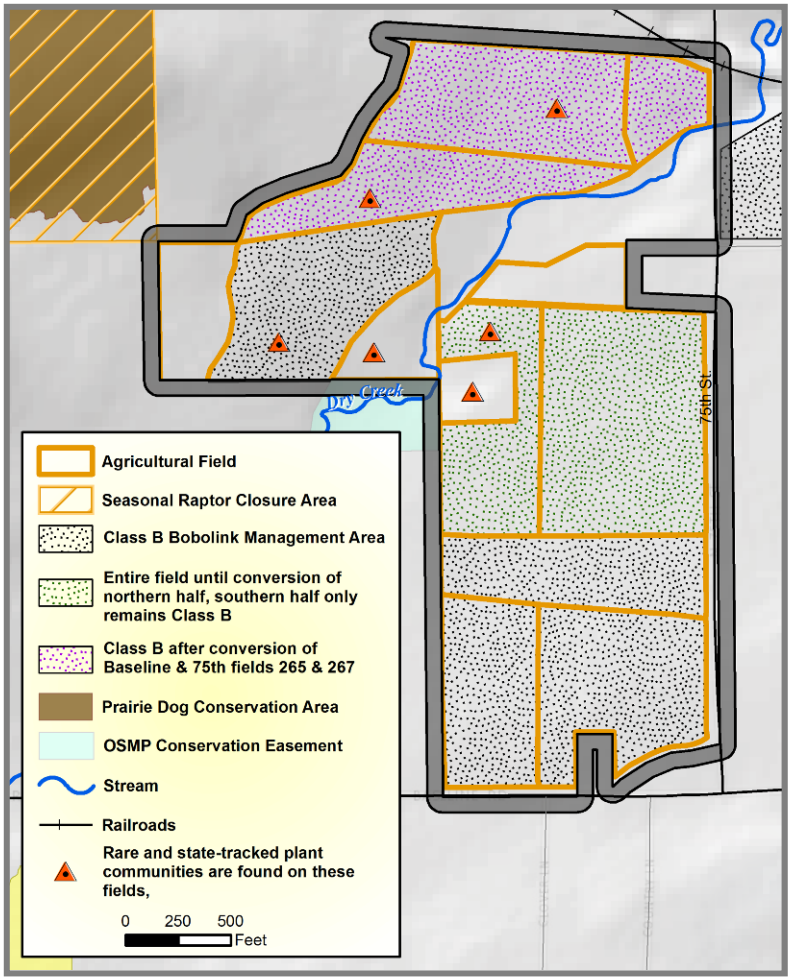

Figure 26: Stengel-King, Baseline & 75th Natural Resources

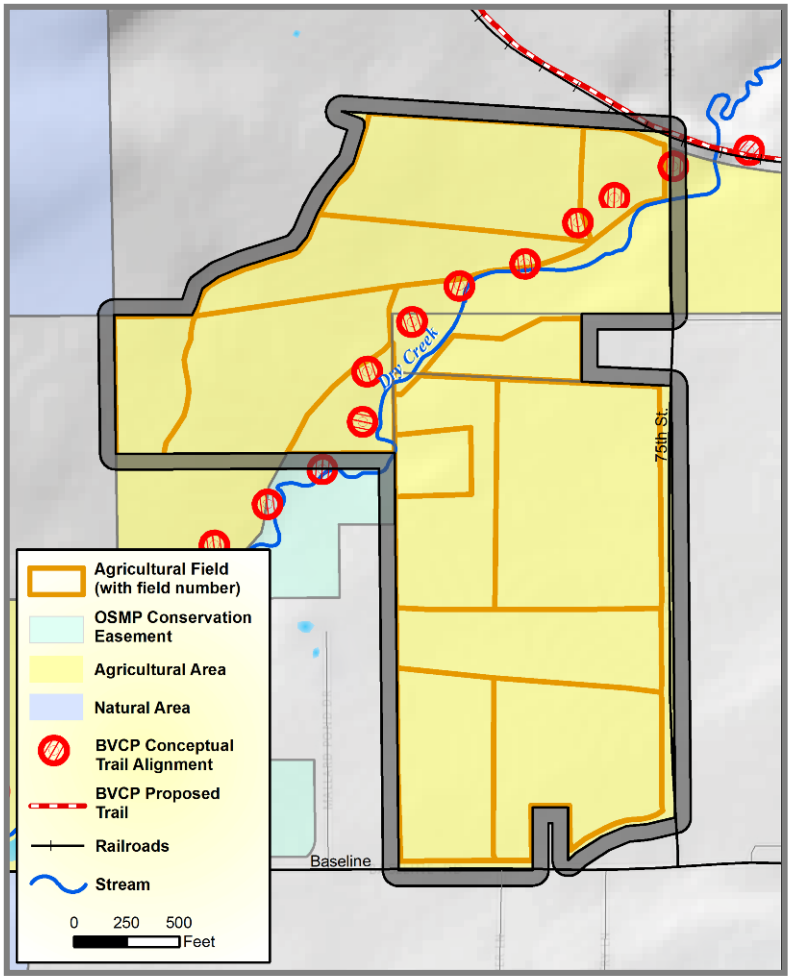

Figure 27: Stengel-King, Baseline & 75th Trails, Management Area Designation, and Weeds

Lewis, Stengel-King, Baseline & 75th

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*16* *8 in production*

Provided demand, this property is recommended for a small diversified vegetable farm. This property is not recommended for a micro-dairy.

This property supports large numbers of nesting bobolinks, therefore the majority of the property was identified to be managed as Class B Bobolink Management Area (through a parallel Ag Plan process). In order to continue to provide habitat for nesting bobolinks the size of the area being recommended for diversified vegetable farming was limited to the minimum size required, 16 acres total, 8 in production at a given time.

The area recommended for diversified vegetable production is recommended to be managed as a Class B Bobolink Management Area prior to conversion. Upon conversion of the 16 acres, additional fields on Lewis will be managed as Class B Bobolink Management Areas.

This recommendation maintains and enhances a relatively large block of contiguous bobolink nesting habitat, while also taking advantage of the existing infrastructure and favorable agricultural characteristics to provide an opportunity for diversified vegetable production.

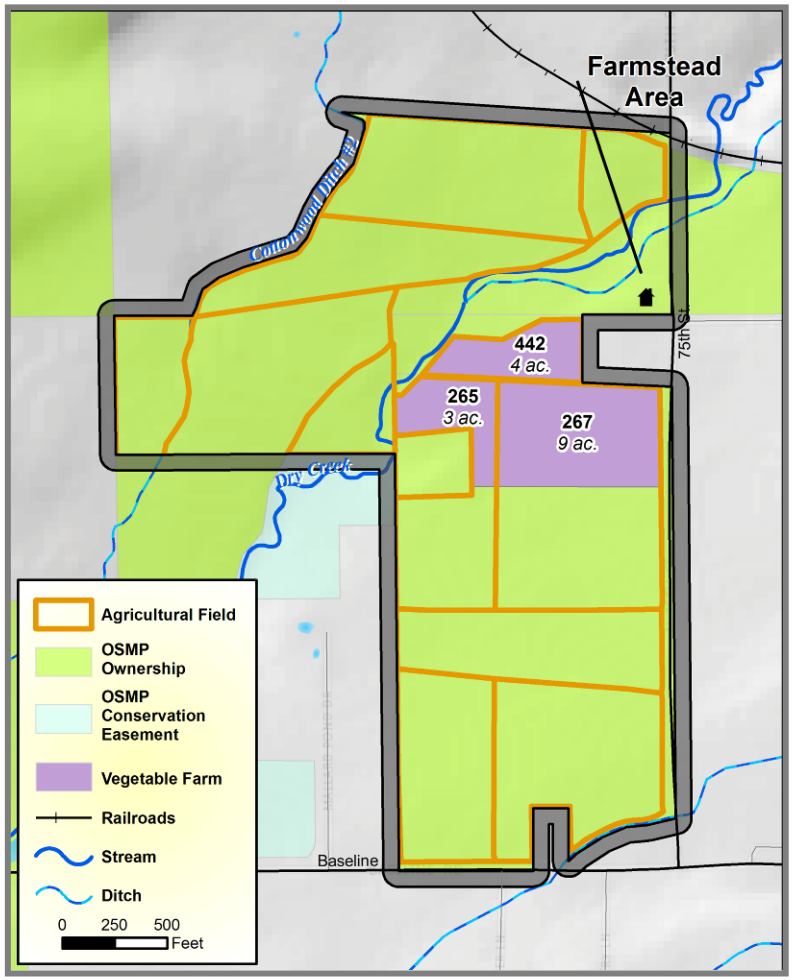

Figure 28: Lewis, Stengel-King, Baseline & 75th Recommendations

This property was not recommended for a micro-dairy operation because the associated grazing is not compatible with the management actions associated with Class B Bobolink designation.

Lewis, Stengel-King, Baseline & 75th

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up properties	*$ 15,000*
Perform a historic structures assessment on the house, barn, and outbuildings	*$15,000*
Rehabilitate residence	*$300,000 - $400,000*
Repair or reconstruct barn and other outbuildings	*$100,000*
Update outbuilding to accommodate a cooler and wash area	*$30,000*
Construct one small (1/10 acre-foot) irrigation pond near the vegetable cropping areas to facilitate the delivery of irrigation water to any planting beds.	*$10,000*
Cultural resource survey for Stengel-King	*$0 - $3,000*
Upon conversion designate Lewis 245, 244, 251, and 256 as Class B Bobolink Management Areas	*$0*
Upon conversion perform site-specific mapping and evaluation of rare or sensitive plant communities, wetland, and riparian areas	*$0*

Total Cost Estimate: $470,000 - $573,000

Bell I, Bell II, Teller

Essential Agricultural Characteristics Summary:

401 Total Acres, 137 Suitable Acres

Water

Source	Availability
Bell I and II	
Leyner Cottonwood Ditch	*May 2 – September 18 ~139 days*
Cottonwood # 2 Ditch	*May 6 – September 12 ~129 days*
Teller	
Leyner Cottonwood Ditch	*May 2 – September 18 ~139 days*
Marshallville Ditch	*May 4 – September 5 ~124 days*
Dry Creek Ditch	*May 21 – September1 ~103 days*

Soils

Type	Slope	Capability Class
Bell I		
Manter sandy loam	*1-3%, 3-9%*	*III*
Ascalon sandy loam	*1-3%*	*II*
Bell II		
Manter sandy loam	*1-3%, 3-9%*	*III*
Ascalon sandy loam	*1-3%*	*II*
Ascalon sandy loam	*3-5%*	*III*
Teller		
Manter sandy loam	*1-3%, 3-9%*	*III*
Hargreave fine sandy loam	*1-3%*	*III*
Ascalon sandy loam	*0-1%*	*I*
Ascalon sandy loam	*1-3%*	*II*
Ascalon sandy loam	*3-5%*	*III*

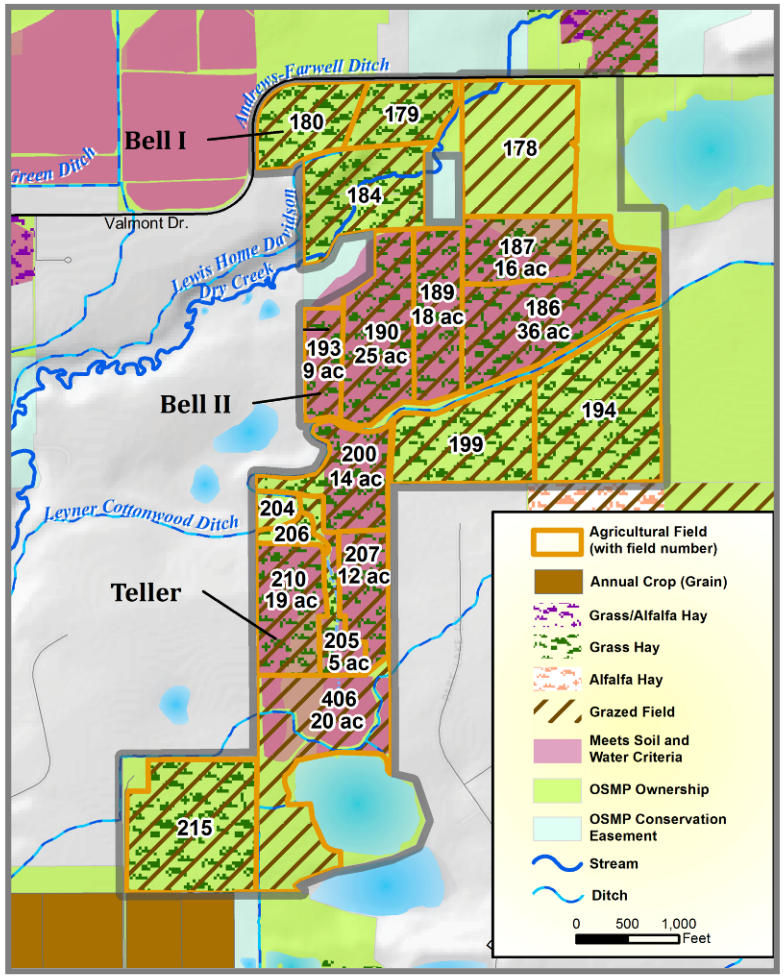

Figure 29: Bell I, Bell II, Teller Suitable Lands

Bell I, Bell II, Teller

Compatibility with Natural Resources and Management Goals:

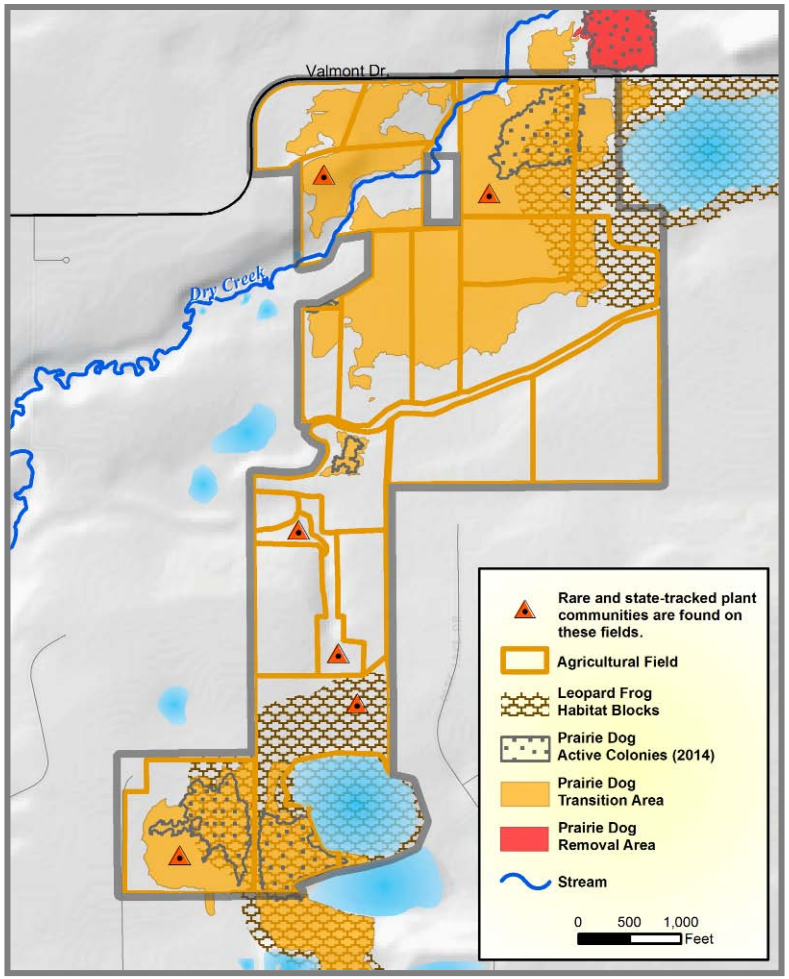

Figure 30: Bell I, Bell II, Teller Natural Resources

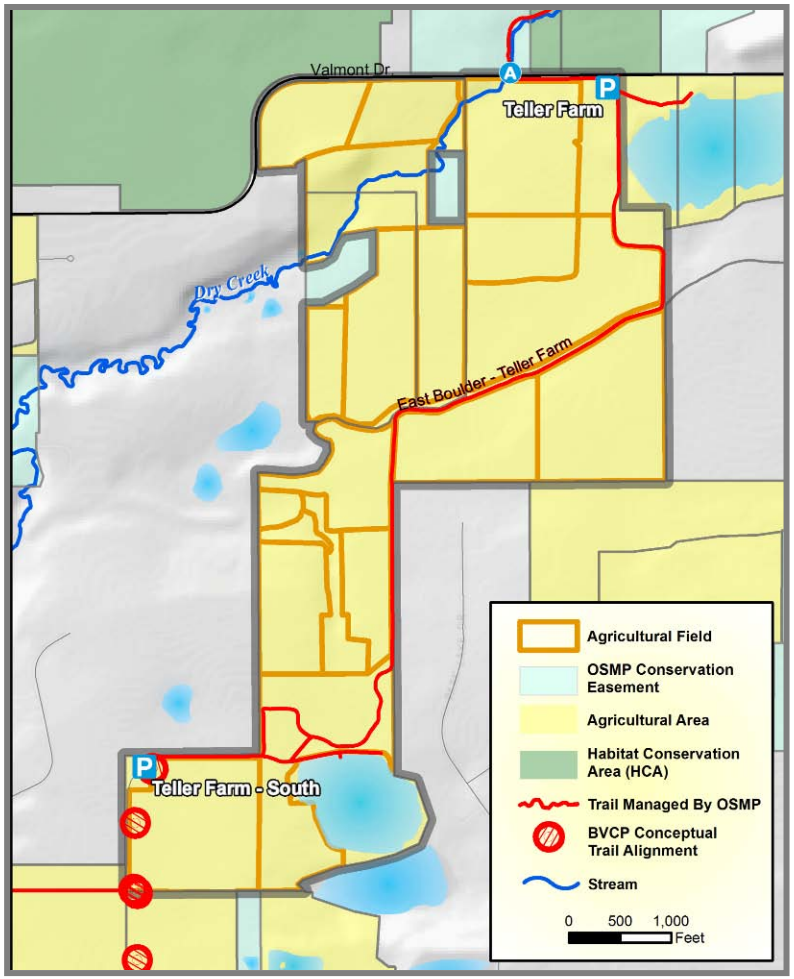

Figure 31: Bell I, Bell II, Teller Trails, Management Area Designations, and Weeds

Bell I, Bell II, Teller

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*52* *26 in production*

Provided demand, this property is recommended for an expansion of a nearby diversified vegetable farm. The recommended area avoids sensitive natural resources. This property is not recommended for a micro-dairy operation due to the lack of infrastructure.

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up property	*$5,000*
Construct a small (1/10 acre-foot) irrigation pond to facilitate the delivery of irrigation water to any planting beds	*$5,000*
Construct a fence to separate the cropping area of a diversified vegetable farm from the rest of the property which will continue to be hayed/ grazed	*$15,000*

Total Cost Estimate: $25,000

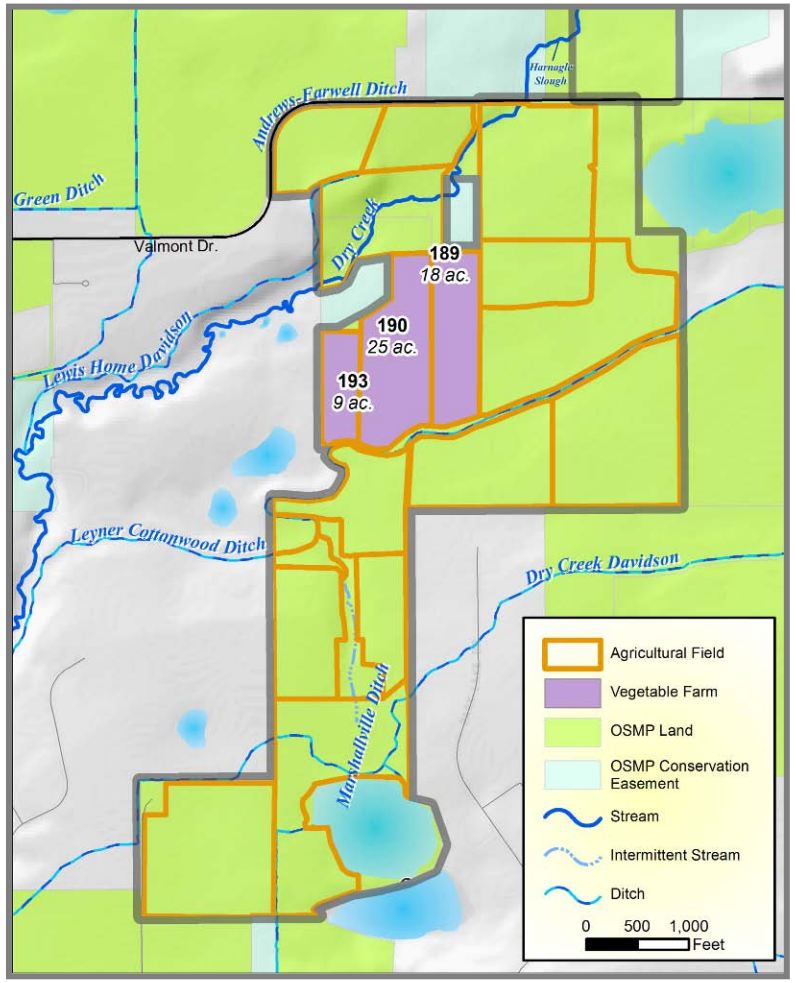

Figure 32: Bell I, Bell II, Teller Recommendations

Biddle

Essential Agricultural Characteristics Summary:

52 Total Acres, 50 Suitable Acres

Water

Source	Availability
Green Ditch	*May 27 – September20 ~116 days*
Butte Irrigation and Milling	*May 19 – August 17 ~ 90 days*
Jones and Donnelly Ditch	*May 6 – October 28 ~175 days*

Soils

Type	Slope	Capability Class
Manter sandy loam	*0-1%*	*III*
Loveland soils	*0-1%*	*III*

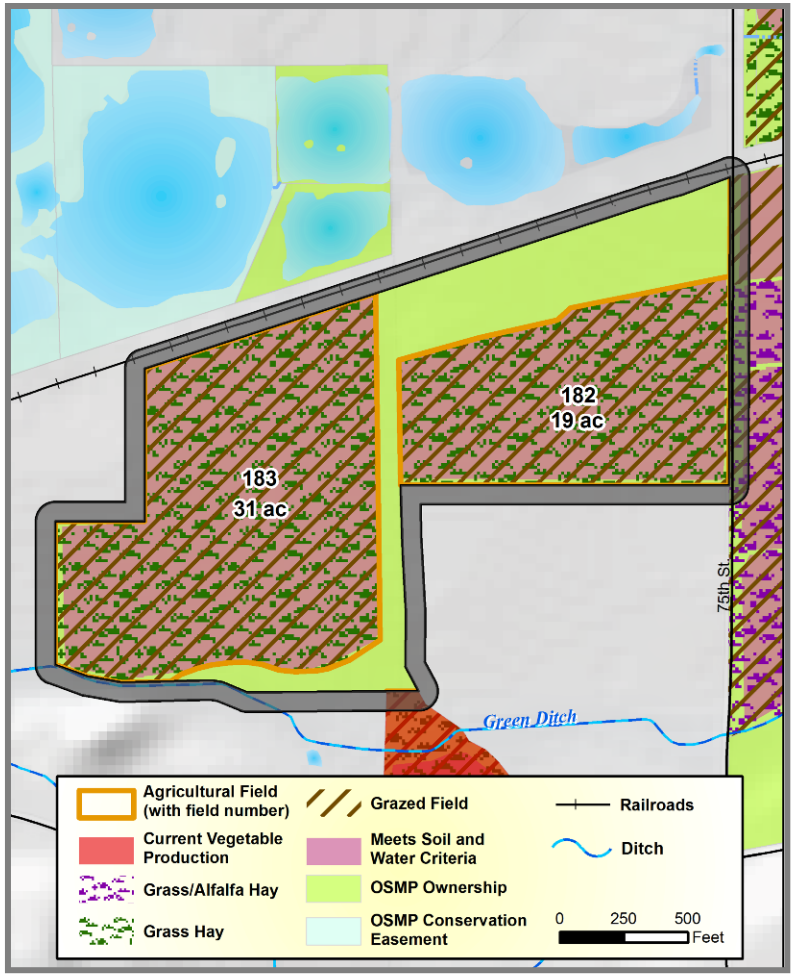

Figure 33: Biddle Suitable Lands

Biddle

Compatibility with Natural Resources and Management Goals:

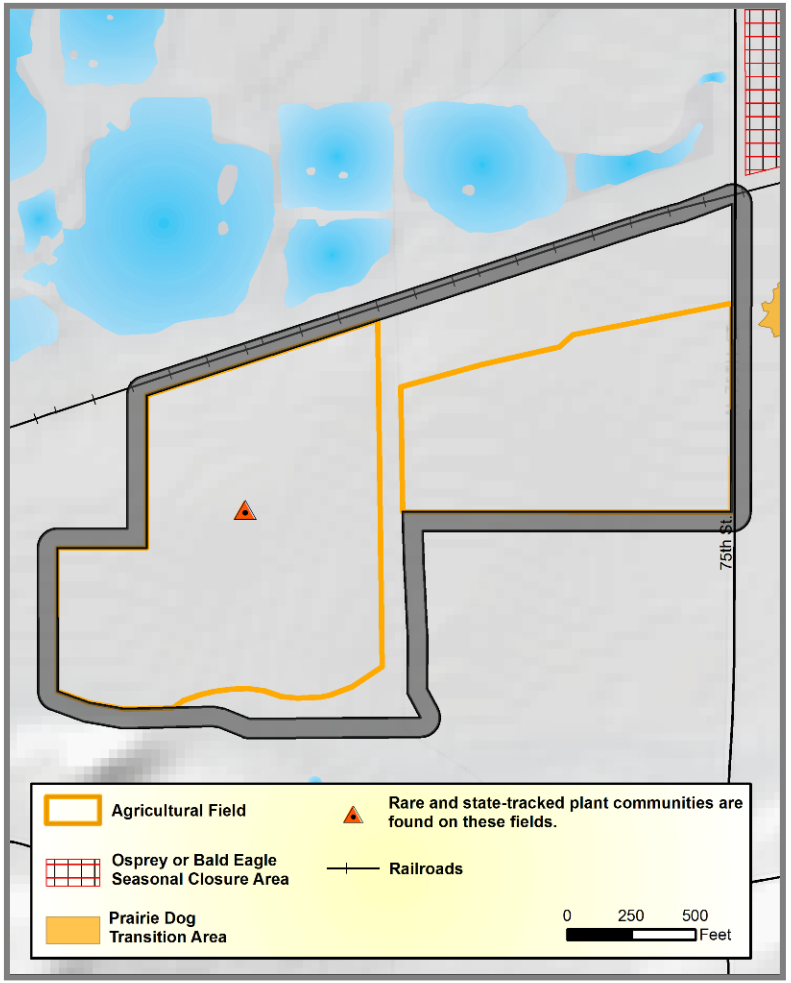

Figure 34: St. Biddle Natural Resources

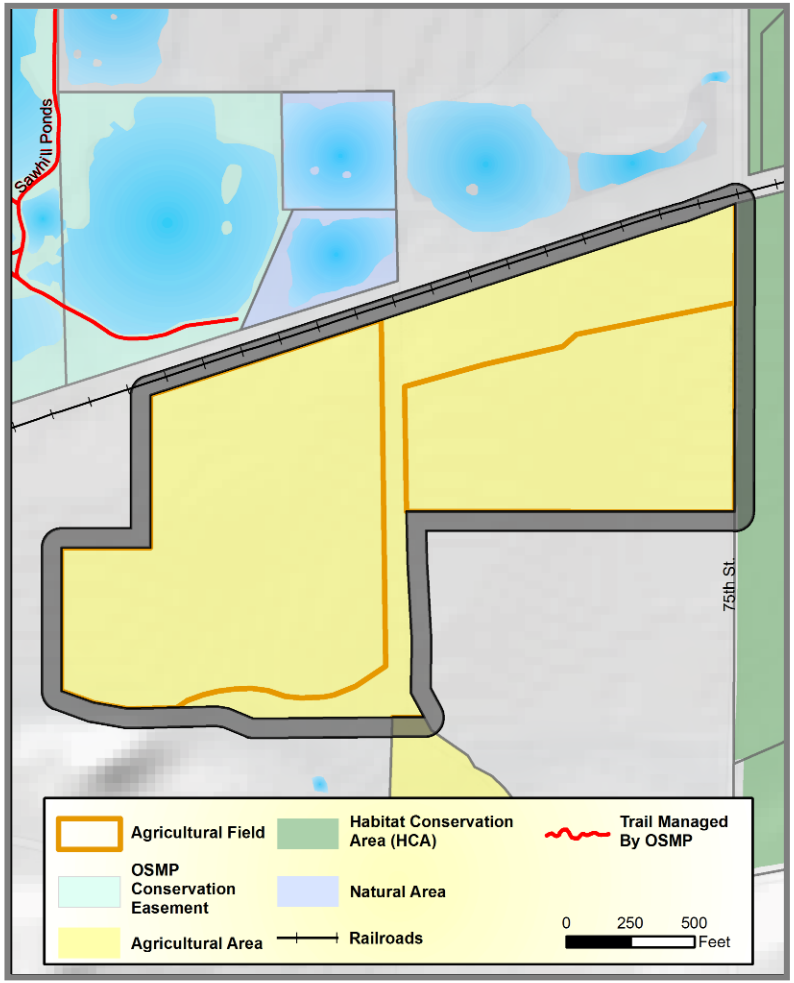

Figure 35: St. Biddle Trails, Management Area Designations, and Weeds

Biddle

Recommendation and Rationale:

This property is not recommended for an expansion of a nearby diversified vegetable farm, or for a micro-dairy operation.

This property (along with the neighboring Manchester and Fell properties) supports significant wetlands on the northern portion of the property. The current flood irrigation practices necessary to support the current hay operations also help support these wetlands. Transferring to more efficient irrigation practices associated with diversified vegetable production could negatively affect the wetlands.

The current hay/graze operations will continue, as this property is designated as an Agricultural area, and the activities enhance the wetlands and associated natural resource values.

Fell

Essential Agricultural Characteristics Summary:

45 Total Acres, 29 Suitable Acres

Water

Source	Availability
Green Ditch	*May 27 – September20 ~117 days*
Butte Irrigation and Milling	*May 19 – August 17 ~90 days*
Jones and Donnelly Ditch	*May 6 – October 28 ~175 days*

Soils

Type	Slope	Capability Class
Manter sandy loam	*0-1%*	*III*
Manter sandy loam	*1-3%*	*III*
Loveland soils	*0-1%*	*III*

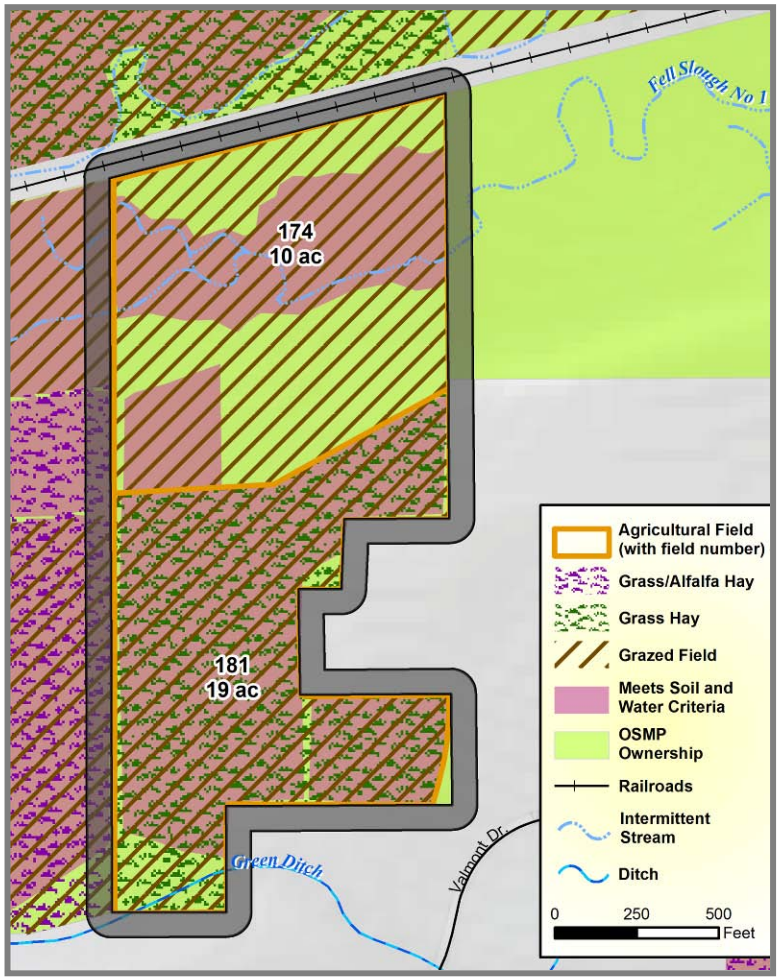

Figure 36: Fell Suitable Lands

Fell

Compatibility with Natural Resources and Management Goals:

Figure 37: Fell Natural Resources

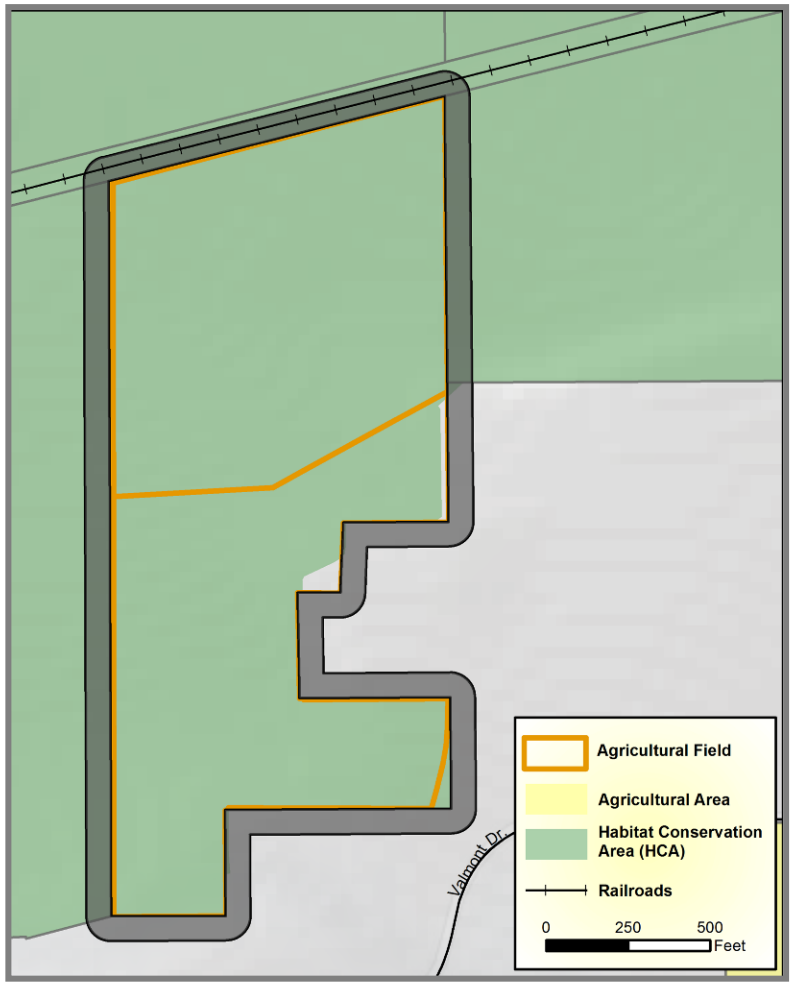

Figure 38: Fell Trails, Management Area Designations, and Weeds

Fell

Recommendation and Rationale:

This property is not recommended for an expansion of a nearby diversified vegetable farm, or for a micro-dairy operation.

This property (along with the neighboring Manchester and Biddle properties) supports significant wetlands on the northern portion of the property. The current flood irrigation practices necessary to support the current hay operations also help support these wetlands. Transferring to more efficient irrigation practices associated with diversified vegetable production could negatively affect the wetlands.

In addition, this property is designated as a HCA, where one of the goals is to maintain or enhance ecological systems. The current hay/graze operations will continue as the associated irrigation activities enhance the wetlands and natural resource values.

Isenhart - Jones

Essential Agricultural Characteristics Summary:

57 Total Acres, 31 Suitable Acres

Water

Source	Availability
Cottonwood #2 Ditch	*May16 –September 12 ~119 days*

Soils

Type	Slope	Capability Class
Ascalon sandy loam	*1-3%*	*II*
Ascalon-Otero complex	*3-5%*	*III*
Loveland soils	*0-1%*	*III*

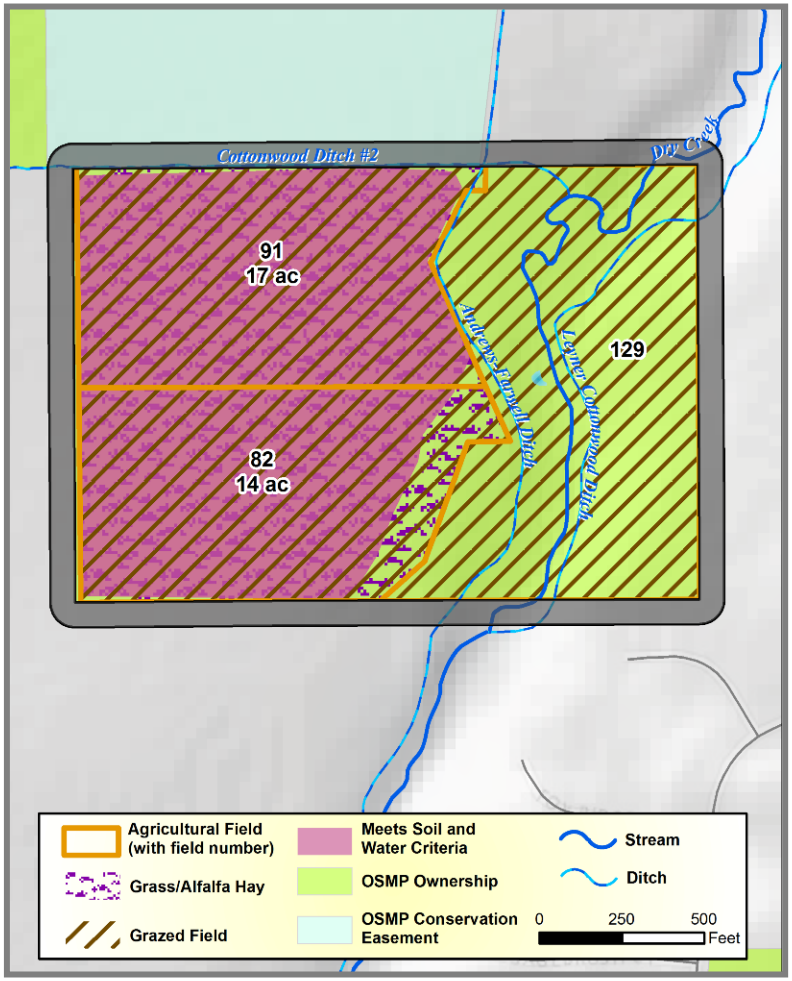

Figure 39: Isenhart - Jones Suitable Lands

Isenhart - Jones

Compatibility with Natural Resources and Management Goals:

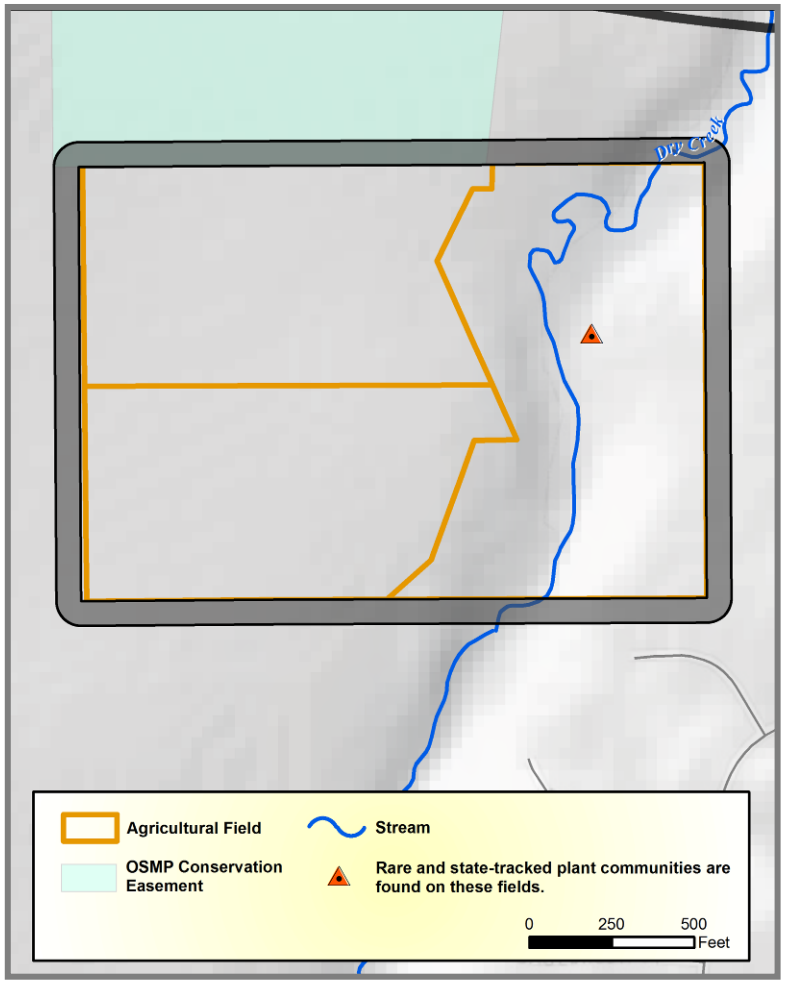

Figure 40: Isenhart - Jones Natural Resources

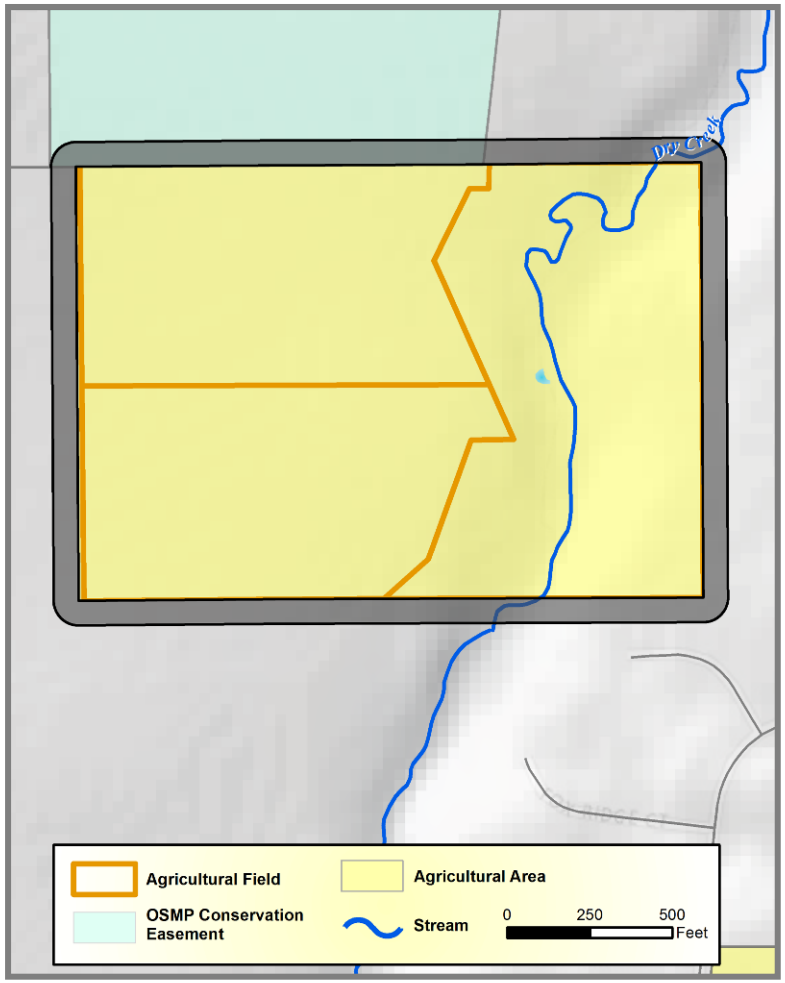

Figure 41: Isenhart - Jones Trails, Management Area Designations, and Weeds

Isenhart - Jones

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*28* *14 in production*

Provided demand, this property is recommended for an expansion of a nearby diversified vegetable farm. The recommended area avoids sensitive natural resources and is in an Agricultural Area. This Property is not recommended for a micro-dairy operation.

The area proposed for possible diversified vegetable farming was concentrated in the western portion of the property to provide a buffer to the wetlands and rare plant communities found on the eastern portion of the property.

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up property	*$ 5,000*
Construct a small (1/10 acre-foot) irrigation pond to facilitate the delivery of irrigation water to any planting beds	*$5,000*
Construct a fence to separate the cropping area of a diversified vegetable farming operation from the rest of the property which may be hayed/ grazed	*$15,000*

Total Cost Estimate: $25,000

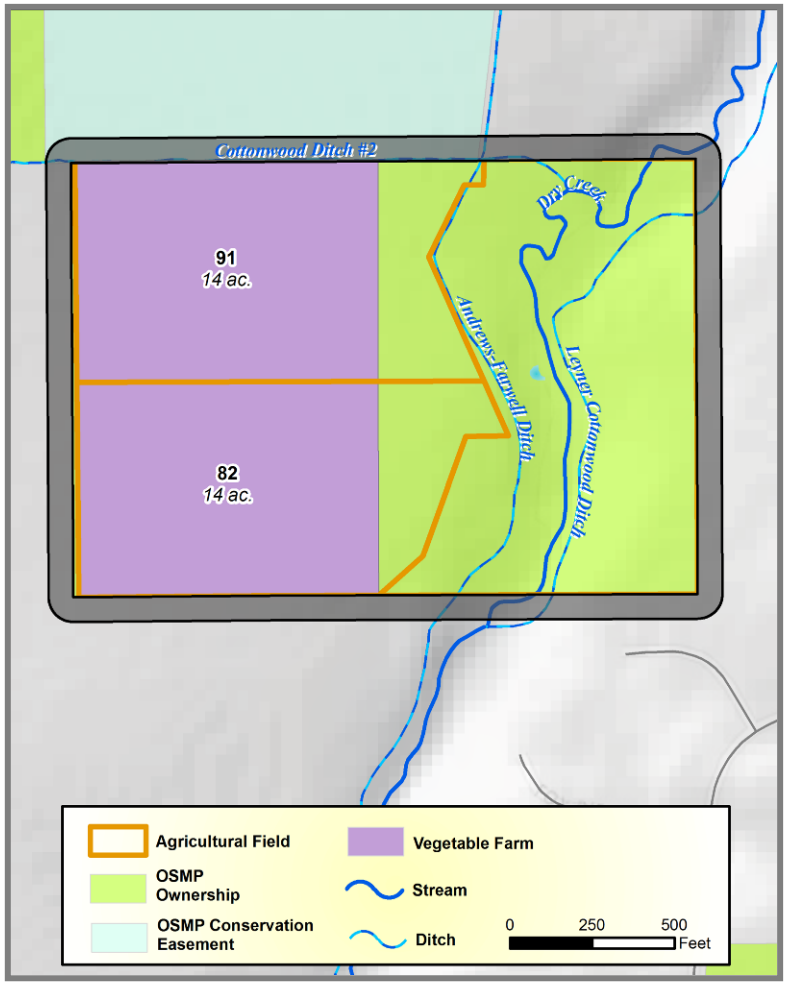

Figure 42: Isenhart - Jones Recommendations

King Hodgson

Essential Agricultural Characteristics Summary:

96 Total Acres, 88 Suitable Acres

Water

Lewis

Sources	Availability
Butte Irrigation and Milling ditch	*May 6 – August 17 ~103 days*
Cottonwood #2 Ditch	*May 19 – September 12 ~116 days*

Soils

Type	Slope	Capability Class
Fields 185, 188, 192, 197, 432		
Ascalon sandy loam	*1-3%*	*II*
Field 198		
Ascalon sandy loam	*1-3%*	*II*
Ascalon-Otero Complex	*3-5%*	*III*

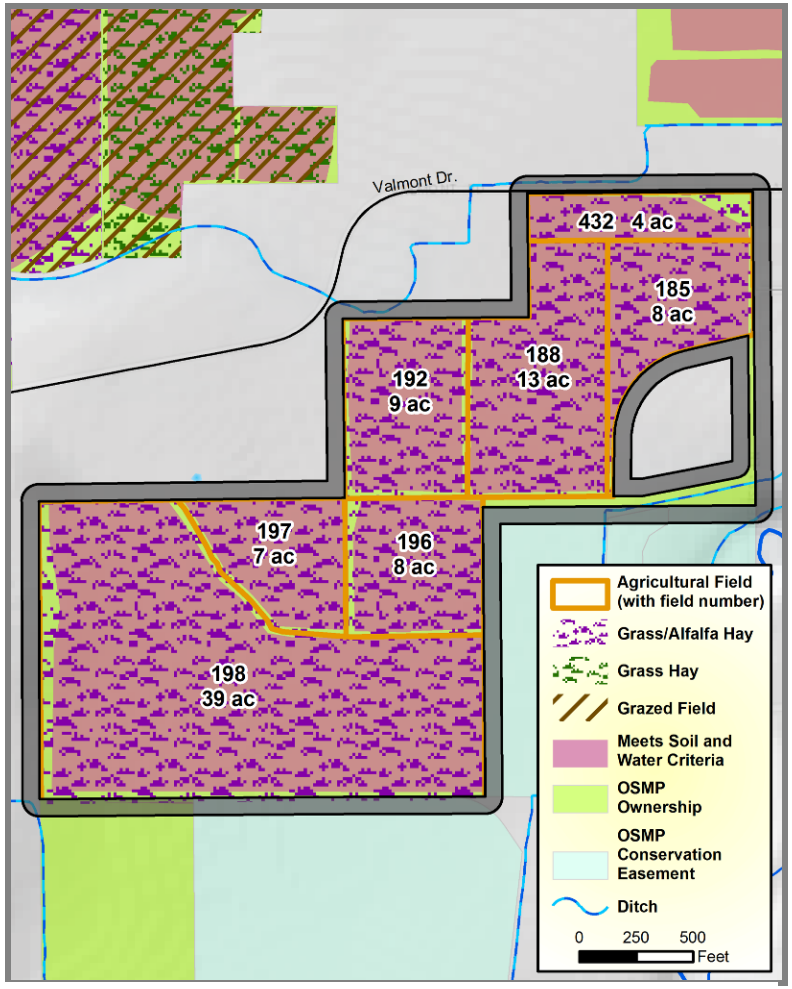

Figure 43: King Hodgson Suitable Lands

King Hodgson

Compatibility with Natural Resources and Management Goals:

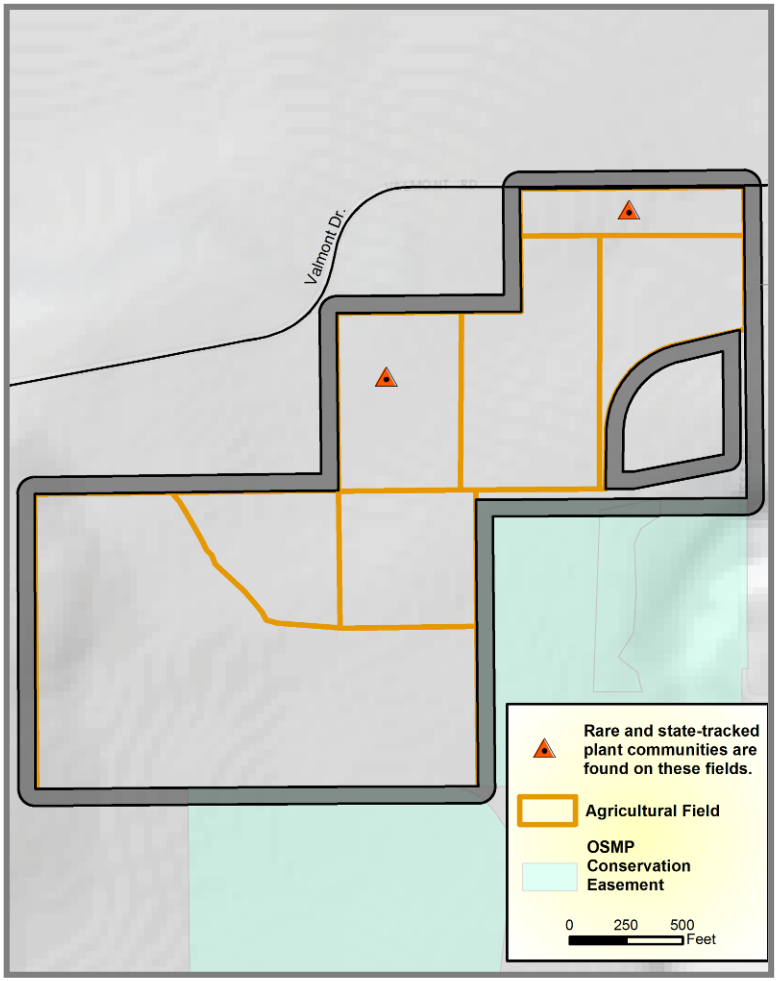

Figure 44: King Hodgson Natural Resources

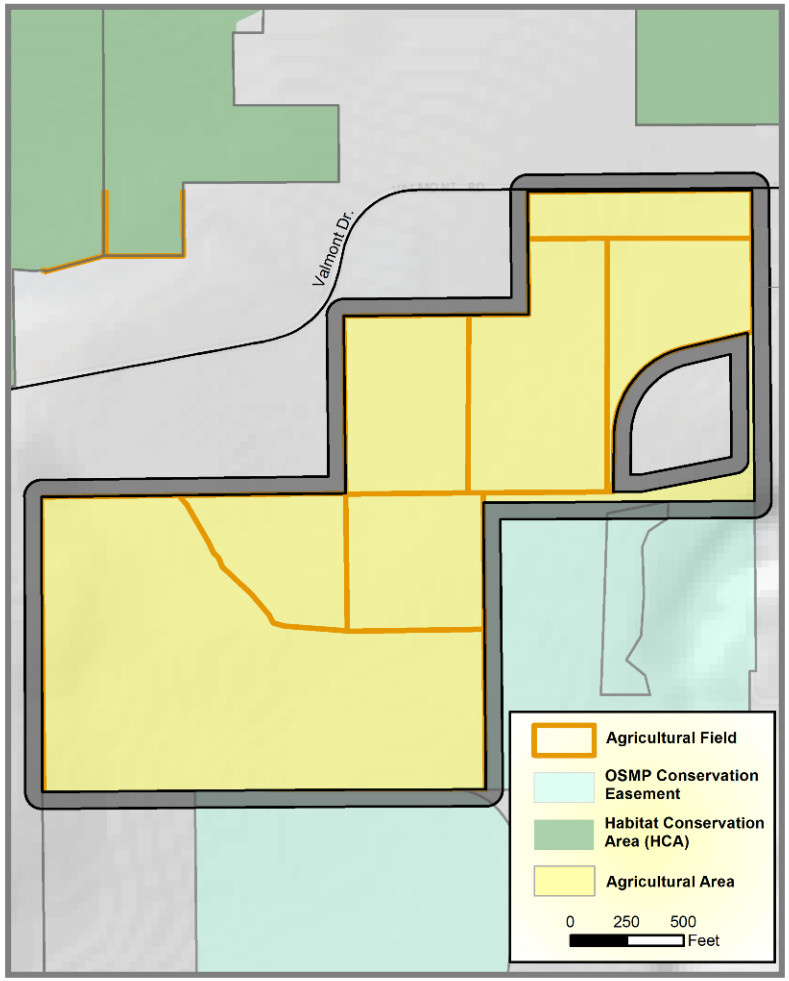

Figure 45: King Hodgson Trails, Management Area Designation, and Weeds

King Hodgson

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*27* *14 in production*

Provided demand, this property is recommended for an expansion of a nearby diversified vegetable farm. Diversified vegetable farming can occur in the recommended area and avoid sensitive resources. This property is not recommended for a micro-dairy operation due to a lack of infrastructure. The identified fields were selected in order to maintain a contiguous block of grass/hay on the remainder of the property.

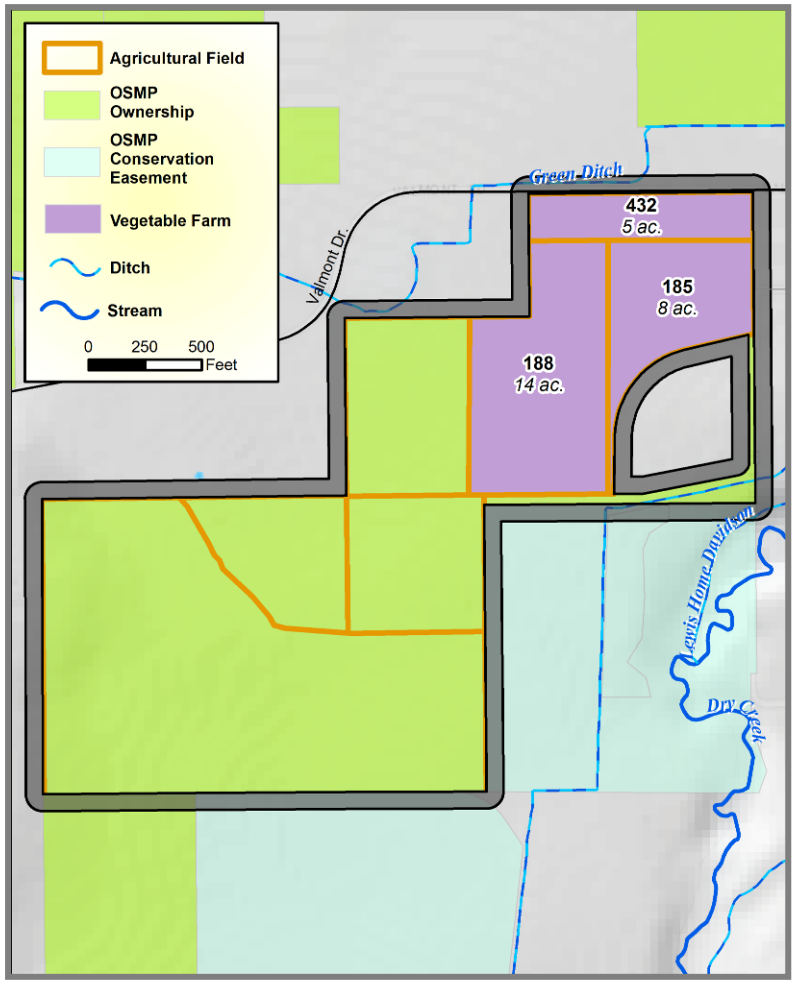

Figure 46: King Hodgson Recommendations

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up property	*$ 5,000*
Construct a small (1/10 acre-foot) irrigation pond to facilitate the delivery of irrigation water to any planting beds	*$5,000*
Construct a fence to separate the cropping area of a diversified vegetable farm from the rest of the property which may be hayed/ grazed	*$15,000*
Cultural Resource Survey	*$0 -$15,000*
Perform site-specific mapping and evaluation of rare or sensitive plant, communities, wetlands, and riparian areas	*$0*

Total Cost Estimate: $25,000 - $40,000

St. Walburga Abbey

Essential Agricultural Characteristics Summary:

69 Total Acres, 58 Suitable Acres

Water

Source	Availability
McGinn Ditch	*April 29 – October 10 ~164 days*

Soils

Type	Slope	Capability Class
Field 302		
Nunn sandy clay loam	*0-1%*	*I*
Field 303		
Nunn sandy clay loam	*0-1%*	*I*
Valmont clay loam	*1-3%*	*III*
Field 308		
Valmont clay loam	*1-3%*	*III*

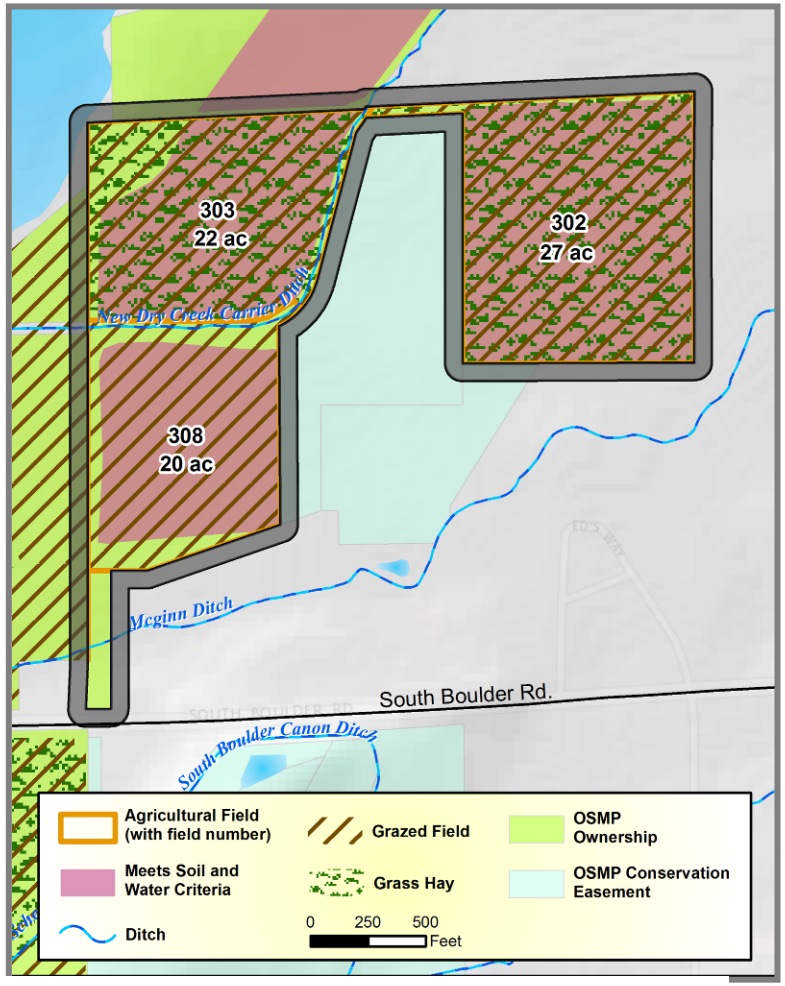

Figure 47: St. Walburga Abbey Suitable Lands

St. Walburga Abbey

Compatibility with Natural Resources and Management Goals:

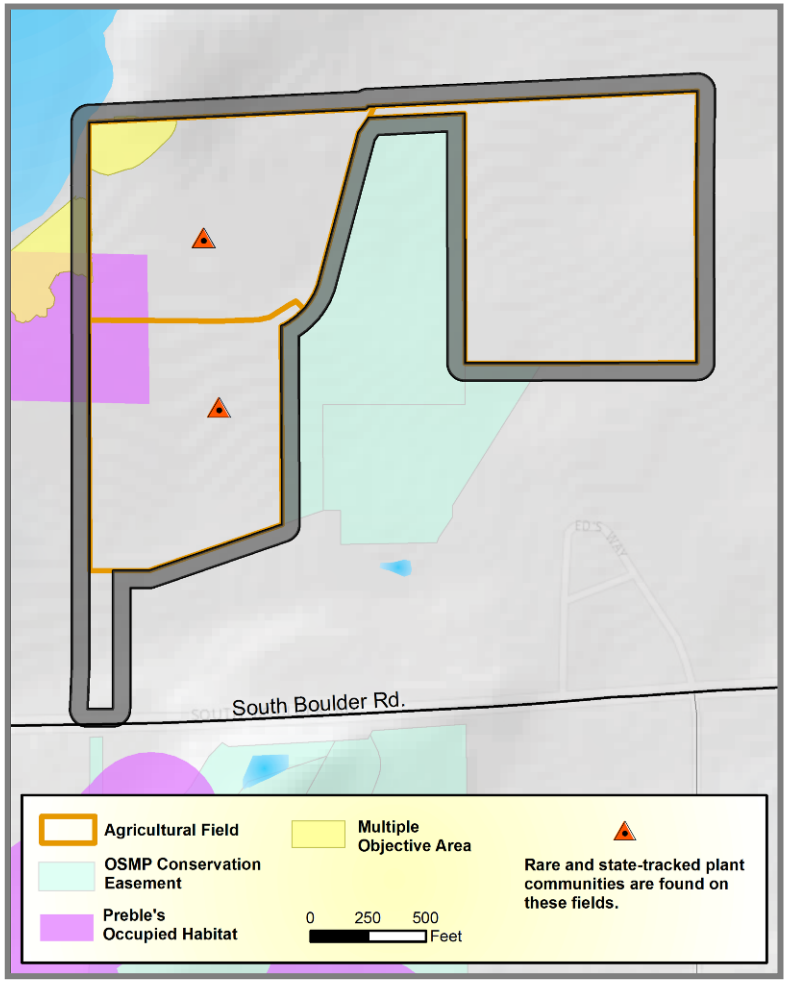

Figure 48: St. Walburga Abbey Natural Resources

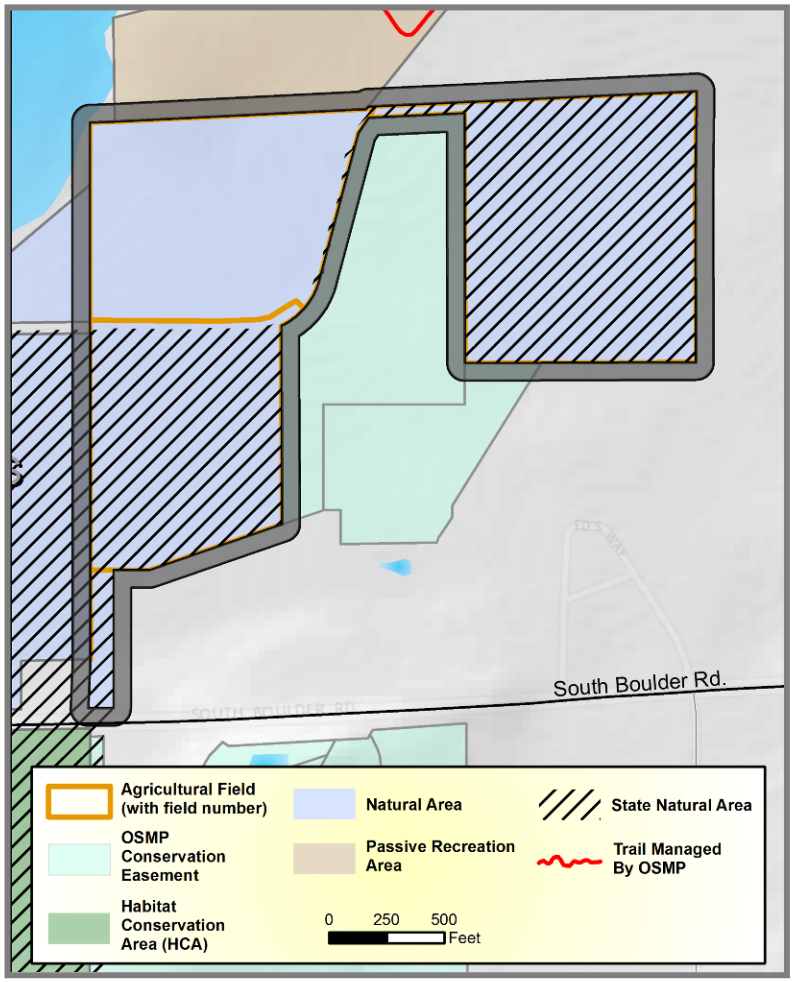

Figure 49: St. Walburga Abbey Trails, Management Area Designations, and Weeds

St. Walburga Abbey

Recommendation and Rationale:

Maximum Extent (Acres)	
Diversified Vegetable Farm	*27* *14 in production*

Provided demand, this property is recommended for an expansion of a nearby diversified vegetable farm. The recommended area avoids sensitive natural resources. This property is not recommended for a micro-dairy operation due to the lack of infrastructure.

This property contains some of the most suitable soils and water in the OSMP system for diversified vegetable farming.

In order to offset the loss of bobolink habitat, the remaining portion of the property is recommended to be enhanced for bobolink habitat through more consistent application of irrigated waters.

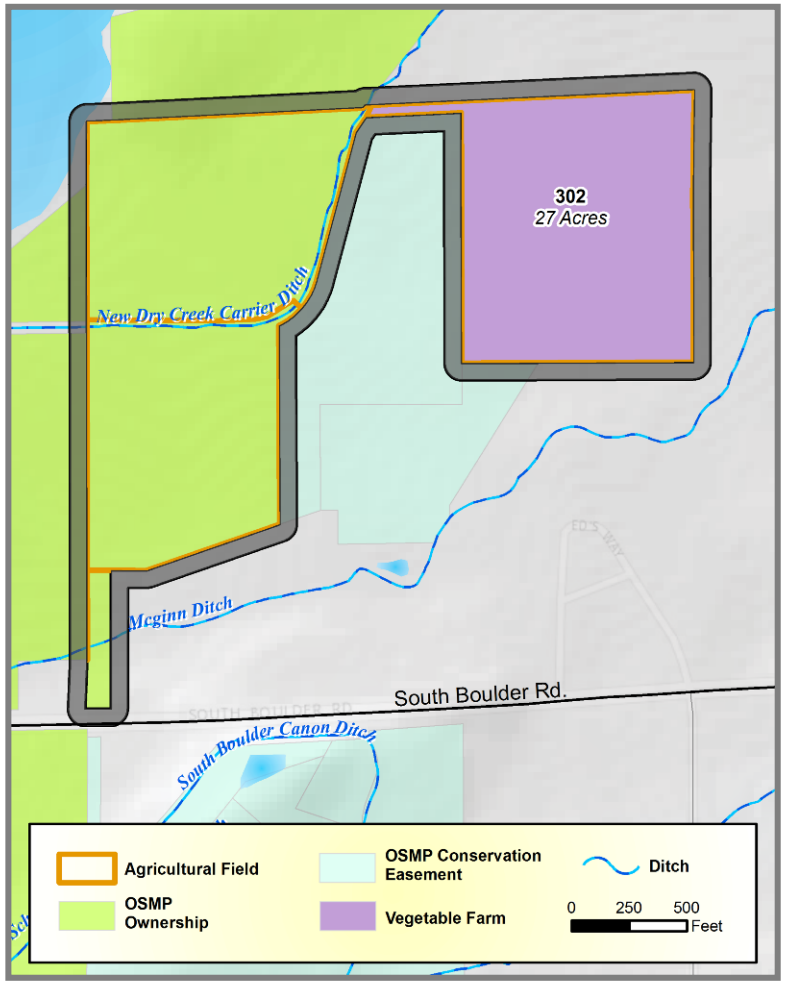

Figure 50: St. Walburga Abbey Recommendations

St. Walburga Abbey

Management Actions and Cost Estimate for Conversion:

Management Action	Cost Estimate
Clean up property	*$ 5,000*
Construct a small (1/10 acre-foot) irrigation pond to facilitate the delivery of irrigation water to any planting beds	*$5,000*
Construct a fence to separate the cropping area of a diversified vegetable farming operation from the rest of the property which may be hayed/ grazed	*$15,000*
Enhance the bobolink habitat on fields 303 and 308 through consistent irrigation	*N/A*

Total Cost Estimate: $25,000

Appendix A: Soil Capability Classes

Capability Class I: soils have slight limitations that restrict their use.
NnA: Nunn Sand clay loam, 0-1 percent slopes
AcA: Ascalon sandy loam, 0-1 percent slopes

Capability Class II: soils have moderate limitations that reduce the choice of plants or require
moderate conservation practices.
NuA: Nunn clay loam, 0-1 percent slopes (shallow, droughty, or stony[7])
NnB: Nunn sandy clay loam, 1-3 percent slopes (erosion)
NuB: Nunn clay loam, 1-3 percent slopes (shallow, droughty, or stony)
WIA: Weld loam, 0-1 percent slopes (shallow, droughty, or stony)
WeB: Weld fine sandy loam, 1-3 percent slopes (erosion)
AcB: Ascalon sandy loam, 1-3 percent slopes (erosion)
AoB: Ascalon-Otero complex, 0-3 percent slopes (erosion)
WIB: Weld loam, 1-3 percent slopes (erosion)
CsB: Colby silty clay loam, 0-3 percent slopes (excess water)
Mm: McClave clay loam, 0-1 percent slopes (excess water)
NuC: Nunn clay loam, 3-5 percent slopes (erosion)
CaA: Calkins sandy loam, 0-1 percent slopes (excess water)
CaB: Calkins sandy loam, 1-3 percent slopes (excess water)
CoB: Colby silty clay loam, 1-3 percent slopes (erosion)
Nv: Nunn-Kim complex, 0-3 percent slopes (erosion)
WoB: Weld-Colby complex, 0-3 percent slopes (erosion)
Me: Manvel loam, 1-3 percent slopes (erosion)
HeB: Heldt Clay, 0-3 percent slopes (erosion)

Capability Class III: soils have severe limitations that reduce the choice of plants or require
special conservation practices or both.
MdA: Manter sandy loam, 0-1 percent slopes (erosion)
MdB: Mater sandy loam, 1-3 percent slopes (erosion)
WdB: Weld loamy sand, 1-4 percent slopes (erosion)
AcC: Ascalon sandy loam, 3-5 percent slopes (erosion)
AoC: Ascalon-Otero complex, 3-5 percent slopes (erosion)
VaB: Valmont clay loam, 1-3 percent slopes (erosion)
HaB: Hargreave fine sandy loam, 1-3 percent slopes (erosion)
Lv: Loveland soils, 01- percent slopes (excess water)
MdD: Manter sandy loam, 3-9 percent slopes (erosion)
VaC: Valmont lcay loam, 3-5 percent slopes (erosion)

Capability Class IV: soils have very severe limitations that restrict the choice of plants or require very careful management or both.
AcD: Ascalon sandy loam, 5-9 percent slopes (erosion)
AoD: Ascalon-Otero complex, 5-9 percent slopes (erosion)
WoC: Weld-Colby complex, 3-5 percent slopes (erosion)
GaB: Gaynor silty clay loam, 1-3 percent slopes (shallow, droughty, or stony)
KuD: Kutch clay loam, 3-9 percent slopes (erosion)
RnB: Renohill silty clay loam, 1-3 percent slopes (shallow, droughty, or stony)
RnD: Renohill silty clay loam, 3-9 percent slopes (erosion)
GaD: Gaynor silty clay loam, 1-3 percent slopes (erosion)

[7] Limitations listed in parenthesis

Capability Class V: soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
VcC: Valmont cobbly clay loam, 1-5 percent slopes (shallow, droughty, or stony)

Capability Class VI: soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
ReD: Renohill loam, 3-9 percent slopes (erosion)

Class VII: soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.
Te: Terrace Escarpments, (shallow, steep, stony, erosion)

Class VIII: soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for esthetic purposes.

Appendix B: Visitor Master Plan Management Area Goals

Agricultural Area Goals:

- Maintain the efficiency of agricultural production and operation.
- Manage agricultural production and operation to ensure safety for operators and visitors in the vicinity.
- Provide, where appropriate, public access and passive recreational opportunities that have minimal impacts on agricultural production and operation or other resources.
- Manage visitor access in areas of intensive agricultural production or operation to ensure visitor safety.
- Eliminate undesignated trails when they are redundant or damaging to resources.

Passive Recreation Area Goals:

- Provide a high level of public access to destinations and connection through designated trails.
- Maintain or improve passive recreational and educational opportunities, while protecting and preserving natural lands and resources.
- Accommodate high levels of visitor use with appropriate management, trails and trailheads, and services.
- Reduce conflicts among visitor activities.
- Minimize the number of undesignated or “social trails,” eliminate undesignated trails when they are duplicative or damaging to resources.

Natural Areas Goals:

- Accommodate low-impact visitor activities where adequate trails exist or can be built, and resource impacts can be minimized.
- Provide opportunities for passive recreational and educational activities that require topographic relief or a natural setting.
- Protect the quality of natural and agricultural resources (especially where high value resources exist).
- Eliminate undesignated trails when they are redundant or damaging to resources.

Habitat Conservation Areas (HCA) Goals:

- Maintain, enhance, and/or restore naturally functioning ecological systems.
- Maintain, enhance, and restore habitat for species of concern identified in the Boulder County and the Boulder Valley Comprehensive Plans.

- Provide public access and passive recreational opportunities that foster appreciation and understanding of ecological systems and have minimal impacts on native plant communities and wildlife habitats or other resources.
- Eliminate all undesignated trails, unless they are made part of the designated trails system or provide specialized access to appropriate low-use destinations.
- Where sustainable infrastructure exists, continue to allow public access to appropriate destinations.

Appendix C: Prairie Dog Colony Management Area Designations

Grassland Preserves

Grassland Preserves are areas where prairie dogs and their associated species are part of large and ecologically diverse grassland habitat blocks. These areas are considered the best opportunity to conserve prairie dogs and their associated species. In most cases, prairie dogs will be allowed to persist without removal in Grassland Preserves. However, removal will be allowed for the purposes of maintaining existing irrigation facilities such as headgates, ditches, lateral ditches, reservoirs and irrigated fields. In addition, to ensure protection of habitat within Grassland Preserves, the need for limited removal from a Grassland Preserve will be assessed if prairie dogs occupy more than 26% of the Grassland Preserve (i.e. viability drops below "Good") and indicators of vegetation composition fall below thresholds identified in the Grassland Plan. Inactive, previously occupied colonies within Grassland Preserves could serve as relocation receiving sites (where there is an existing burrow infrastructure) and if the area meets relocation criteria (identified in the Grassland Plan). However, prairie dogs will not be relocated into irrigated fields nested within Grassland Preserves. Following a die-off or other disappearance of prairie dogs from an area, they could be excluded to allow for habitat restoration or to protect existing habitat restoration projects.

Multiple Objective Areas

In Multiple Objective Areas, preservation of prairie dogs and their associated community is one of several management objectives. Prairie dogs will be allowed to persist without removal except for the purpose of maintaining existing irrigation facilities such as headgates, ditches, lateral ditches, reservoirs or irrigated fields. Multiple Objective Areas will not be used as receiving sites for relocated prairie dogs. Exclusion of prairie dogs attempting to re-colonize a Multiple Objective Area could occur to allow habitat recovery.

Prairie Dog Conservation Areas

Prairie Dog Conservation Areas are areas where the conservation of the prairie dog is the primary management objective and are managed opportunistically for associated species. These areas would serve as receiving sites for relocation with the requirements described in the Grassland Plan. No removal of prairie dogs would occur in Prairie Dog Conservation Areas except for the purpose of maintaining an existing irrigation facility such as a headgate, ditch, lateral ditch, reservoir or irrigated field. Prairie dogs will not be relocated into irrigated agricultural fields within Prairie Dog Conservation Areas.

Transition Areas

Transition Areas are grassland areas where the preservation of resources other than the prairie dog and associated community takes precedence. Prairie dogs may inhabit transition areas, but will be relocated away from the property when feasible (i.e. relocation receiving site is available). Following relocation, die-off or other natural events such as dispersal that leads to a reduction of the population and result in

uninhabited areas, re-colonization could be prevented or discouraged using barriers, re-seeding, grading, burrow destruction, passive relocation or other methods available to the department. After efforts are made to trap and relocate all remaining prairie dogs, removal through lethal control will be allowed in accordance with applicable regulations and policies, and if numbers do not exceed 20 individuals. Removal would be allowed at any time for maintenance of existing irrigation facilities such as a headgate, ditch, lateral ditch, reservoir or irrigated field. Continued irrigation will also be allowed in irrigated fields regardless of prairie dog occupancy.

Removal Areas

In removal areas, prairie dogs are incompatible with OSMP management objectives. The designation of a property as a Removal Area provides the option to remove prairie dogs from the property in accordance with applicable regulations and policies. Following removal, efforts would occur to prevent re-colonization including restoration or irrigation of the property, destruction of burrow system, exclusion structures, etc. Continued irrigation will be allowed in irrigated fields regardless of prairie dog occupancy.