MUNDUS BISHOP

JOHN MEADE PARK

CURRENT CONDITIONS REPORT

Submitted to:

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Date:

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CURRENT CONDITIONS REPORT

BACKGROUND AND OBJECTIVE

John Meade Park (the Site), located 10 miles south of Denver, in Cherry Hills Village, is situated at 2450 E. Quincy Avenue, next to the Cherry Hills Village Center and the Joint Public Safety Building. It is immediately south of the Alan Hutto Memorial Commons, which will be incorporated into the park design. Cherry Hills Village initiated a Site Master Plan in 2014 (THK, 2015) with the intent to reinvigorate the Site and make the park a focal point for the community.

The goals of the Site Master Plan are to:

- Create a gathering place;
- Create a connection between park users and the natural environment;
- Create a community appropriate Performance Area within the John Meade Park and Alan Hutto Memorial Commons;
- Maintain/increase current floodplain capacities;
- Increase park usage and accessibility; and
- Create a park that is maintenance friendly.

The objective of the Site evaluation was to gain an understanding of the current conditions, including the existing plant communities and observed visitor and wildlife use to better inform design alternatives that could enhance the current ecological condition of the Site.

METHODOLOGY

Prior to conducting the site evaluation, Great Ecology reviewed the Natural Resources Conservation Service Web Soil Survey (2016), United States Fish & Wildlife Service Information for Planning and Conservation Website (2016), as well as other publicly available information, including GIS maps of the Site. This preliminary research helps inform our assessment priorities and recommendations. We completed our initial Site evaluation on May 3, 2016 by conducting a walking tour of the Site beginning at the parking lot near the equestrian ring and moving west around the Site. We evaluated the area around the playground, circumnavigated the ponds and wetlands, and ended our evaluation at the Allen Hutto Memorial Commons. We performed a follow-up evaluation on June 3, 2016 to discuss our findings with Chris Loftus of Mundus Bishop. Our site assessment includes ocular estimates of plant cover and diversity to document the vegetation community and direct observation or reported observation of wildlife species. Our evaluation includes information obtained from a conversation with a local resident and her son that were passing through the park at the time of the evaluation.

OVERALL FINDINGS

As expected, there is little discernable difference in plant community composition, aside from the cattail (*Typha spp.*) wetlands. At the time of the May 3rd site visit, all upland herbaceous species were mowed to approximately 3 inches, making species level identification difficult; however, most plants fell into one of three categories: upland, wetland, or noxious species. There are also several different tree species onsite with varying degrees of vigor. FIGURE 1 depicts the current site conditions of the plant communities. TABLE 1 lists the species that were identifiable to at least the genus level. ATTACHMENT A includes photographs documenting conditions on both days of the evaluation. The vegetation had regrown by our follow-up visit in June, so we were able to verify some plant species as well as identify others that were not discernable on the initial visit. These species have been added to TABLE 1.

The intent of the site visit was not to document all wildlife species utilizing the Site, but we did document what species were observed either by us or local residents we spoke to. The majority of wildlife were utilizing the pond or wetland systems. This is likely because there is limited hiding cover

or other suitable habitat for wildlife in the upland areas aside from roosting habitat in the trees. TABLE 2 below provides a full list of wildlife species observed or reported for the Site.

The following sections provide more specific details to the observed conditions of John Meade Park and Allan Hutto Memorial Commons. Additionally, we offer possible recommendations that could provide enhanced native plant communities, ecological functions, and user experiences for the Site.

VEGETATION OVERVIEW

Overall, we estimate total plant cover at approximately 85%, with a range of 0-95% plant cover. There are several areas near the upper pond and the west side of the wetland, which have small patches of salt crusted soil with no plant cover. Over the course of the two Site visits, were able to determine at least 43 different plants. More species are present, but were unidentifiable. The identified plant list (TABLE 1) includes 10 trees or shrubs, 15 forbs, and 18 grasses or grass-like species. Included in this list are several state-listed noxious weeds, including:

- Canada Thistle (*Cirsium arvense*) (B)*
- Common Burdock (*Arctium minus*) (C)
- Field Bindweed (*Convolvulus arvensis*) (C)*
- Poison Hemlock (*Conium maculatum*) (C)
- Redstem Filaree (*Erodium cicuarium*) (C)*

*Denotes widespread presence throughout the site.

(B) or (C) indicates what noxious weed classification by the State of Colorado.

NOXIOUS WEEDS

Canada thistle (List B species) needs to have a weed management plan developed to stop the continued spread of this species (CDoA, 2016a). If Cherry Hills Village has plans developed, they need to be implemented as soon as possible. Regular mowing helps keep the Canada thistle controlled, but herbicide or physical removal would help ensure these individuals are not able to set seed and increase the seed bank within the topsoil. There is no state mandate to control the spread of List C species, but it is encouraged (CDoA, 2016a). One species of specific concern for a park space is poison hemlock. All parts of this plant are poisonous and can be lethal if consumed in large enough quantities (CDoA, 2016b). Ingestion of as little as 0.25-0.3% of an animal's body weight can lead to death. This species is present in the southern part of the Site along the drainage leading into the upper pond. It is strongly recommended that this species be removed immediately to prevent any unnecessary risk to children or pets. See FIGURE 1 for an approximate location of the poison hemlock and common burdock. The other List C species are found throughout the site and control efforts will require a complete site survey.

UPLAND VEGETATION

Upland vegetation refers to plant species that are not directly associated with streams or wetland areas. These species constituted the majority of the vegetative biodiversity on the Site and were composed of a mixture of native and non-native grasses and forbs. The only area of the park that had a noticeable majority of native grasses was to the south of the current maintenance building, where a former parking area had been restored to a mixture of warm and cool season native grasses. The rest of the lawn areas are a mixture of non-native bunch grasses and sod forming grasses, which have performed fairly well. All but three of the 15 forbs are weedy species and several of these are abundant throughout the Site. Three of the noxious weeds listed above, as well as dandelions (*Taraxacum officinale*), were the most common forbs. The seed bank in the topsoil likely contains a high number of weed seeds and any efforts to control weeds prior to topsoil salvage is encouraged. Trees in the uplands are generally healthy, but several pine trees appear to have been planted in areas with a high water table and has resulted in diminished vigor. If these trees are to be salvaged, they would likely benefit from being moved to an area where their roots are less likely to be saturated by ground water.

LEGEND

1. Floodway
2. Floodplain
3. Existing Trail
4. Existing Parking
5. Existing Building
6. Equestrian Facility
7. Manicured Turf Grass
8. Cattail Wetlands (fringe of native sedges and rushes)
9. Warm | Cool Season Native Grass Mix
10. Salt Grass - *Distichlis spicata*
11. Mix of Native | Non Native Grasses

    Kentucky bluegrass - *Poa pratense*

    Smooth brome - *Bromus inermis*

    Crested wheatgrass - *Agropyron cristatum*

    Western wheatgrass - *Pascopyrum smithii*

    Rocky Mountain fescue - *Festuca saximontana*

0 50 100 North

TABLE 1: VEGETATION AT JOHN MEADE PARK AND ALAN HUTTO MEMORIAL COMMONS

Common Name	Scientific Name	Nativity	Notes
Trees and Shrubs			
Eastern Redbud	*Cercis canadensis*	Introduced	
Juniper	*Juniperus spp.*	Native	
Pine	*Pinus spp.*	Both	Multiple species
Cottonwood	*Populus spp.*	Native	
American Plum	*Prunus americana*	Native	
Chokecherry	*Prunus virginiana*	Native	
Rose	*Rosa spp.*	Both	
Willow	*Salix spp.*	Native	Multiple species
Lilac	*Syringa spp.*	Introduced	
Siberian Elm	*Ulmus pumila*	Introduced	
Forbs			
Common Yarrow	*Achillea millefolium*	Native	
Garlic Mustard	*Alliaria petiolata*	Introduced	
Common Burdock	*Arctium minus*	Introduced	C-list Noxious Weed
Showy Milkweed	*Asclepias speciosa*	Native	
Shepherd's Purse	*Capsella bursa-pastoris*	Introduced	
Canada Thistle	*Cirsium arvense*	Introduced	B-list Noxious Weed
Poison Hemlock	*Conium maculatum*	Introduced	C-list Noxious Weed
Field Bindweed	*Convolvulus arvensis*	Introduced	C-list Noxious Weed
Redstem Filaree	*Erodium cicuarium*	Introduced	C-list Noxious Weed
Kochia	*Bassia scoparia*	Introduced	
Alfalfa	*Medicago stavia*	Introduced	
Cinquefoil	*Potentilla spp.*	Both	
Curly Dock	*Rumex crispus*	Introduced	
Common Dandelion	*Taraxacum officinale*	Introduced	
Clover	*Trifolium spp.*	Both	
Grasses and Grass-likes			
Crested wheatgrass	*Agropyron cristatum*	Introduced	
Wheatgrass	*Agropyron* spp.	Both	
Buffalograss	*Bouteloua dactyloides*	Native	
Blue grama	*Bouteloua gracilis*	Native	
Smooth brome	*Bromus inermus.*	Introduced	
Sedge	*Carex spp.*	Native	
Orchardgrass	*Dactylis glomerata*	Introduced	
Inland Saltgrass	*Distichlis spicata*	Native	
Spikerush	*Eleocharis* spp.	Native	
Slender wheatgrass	*Elymus trachycaulus*	Native	
Rocky Mountain Fescue	*Festuca saximontana*	Native	
Arctic rush	*Juncus arcticus*	Native	
Western wheatgrass	*Pascopyrum smithii*	Native	
Kentucky bluegrass	*Poa pratensis.*	Introduced	
Common threesquare	*Schoenoplectus pungens*	Native	
Bulrush	*Scirpus* spp.	Native	
Cattail	*Typha* spp.	Introduced	
Six weeks fescue	*Vulpia octoflora*	Native	

WETLAND VEGETATION

Wetland vegetative species are those plants that grow well in saturated soil conditions, at least part of the year. Wetland vegetation also includes plants found in the riparian areas around the creek and ponds. At the Site, cattails (*Typha* spp.) comprised the majority of wetland vegetation and have formed a monoculture within the wetland between the upper and lower pond. We did not perform a functional assessment of the wetland, but cattail wetlands are not typically considered to be highly functioning wetlands. They do not provide much wildlife habitat and prevent native species establishment from taking place. There is a nice assortment of native sedges (*Carex* spp.) and rushes (*Scripus* spp., *Eleocharis* spp., and *Juncus* spp.) around the cattail wetland on the higher elevation areas, but they will never be able to outcompete the cattails without intervention.

The grassy areas around the upper pond were mainly comprised of inland saltgrass (*Distichlis spicata*), a native species adapted to alkaline, salty soils. The water table around the ponds and wetlands appear to be creating a situation where salts are affecting the soil, so our planting palette around these features may need to be limited to species that can handle more alkaline systems. It may be worth the investment to have the soils tested for basic soil parameters, including soil texture, pH, electrical conductivity, sodium absorption ratio, and nutrient availability.

There is a nice variety of tree and shrub species around the ponds and along the drainages, including chokecherry (*Prunus virginiana*), American plum (*Prunus americana*), willow (*Salix* spp.), cottonwood (*Populus* spp.), and rose (*Rosa* spp.). These areas could still be enhanced to provide more of a buffer around the waterways on the Site, which would provide water quality benefits as well as enhance wildlife habitat and wildlife viewing opportunities.

OBSERVED WILDLIFE

The primary objective of the site assessment was not to capture wildlife usage of the Site, but we documented the species we observed. The May 3, 2016 site visit took place in the afternoon, which is not typically a time when wildlife are particularly active and can influence wildlife sightings. Several birds and two muskrats (*Ondatra zibethicus*) were observed on the Site. Additionally, we heard from residents at the park about the presence of coyotes *(Canis latrans*) onsite. While this was not visually confirmed, the presence of a Canada goose (*Branta Canadensis*) carcass implies a predator of some kind is active in the area. TABLE 2 lists the wildlife and fish species observed or reported to be active at the John Meade Park and Alan Hutto Memorial Commons.

TABLE 2 WILDLIFE SPECIES OBSERVED OR REPORTED TO BE ACTIVE AT JOHN MEADE PARK

Common Name	Scientific Name
Red-winged Blackbird	*Agelaius phoeniceus*
Mallard	*Anas platyrhynchos*
Canada Goose	*Branta canadensis*
Coyote	*Canis latrans*
Sunfish	*Centrachinae spp.*
Bass	*Microterus spp.*
Muskrat	*Ondatra zibethicus*
American Robin	*Turdus migratorius*

RECOMMENDATIONS

After reviewing the existing site conditions, and with an understanding of the Master Plan (THK, 2015), Great Ecology proposes the following recommendations to increase native biodiversity, wildlife habitat, park usage, and park accessibility while decreasing overall maintenance:

- Removal of noxious weeds;
- Increasing native upland plants;
- Restoring riparian and wetland vegetation; and
- Placement of bat boxes and signage.

REMOVAL OF NOXIOUS WEEDS

As stated previously, the Site has several noxious weed species, some of which are prevalent throughout the Site. Great Ecology recommends that a strategy to eradicate B-listed noxious weeds be developed if one is not presently in place, and the implementation of control measures for C-listed noxious weeds to curb the continued spread of these species. These strategies should be implemented by Cherry Hills Village as soon as possible. FIGURE 1, above, depicts approximate locations where specific populations of noxious weeds should be removed. Species that are more widespread throughout the Site will need a more thorough control effort. Additionally, the private property upstream of the Site, has many Russian olive (*Elaeagnus angustifolia*) trees that are a seed source for this B Listed Noxious weed. Efforts to coordinate with the landowner to remove these species is encouraged.

NATIVE UPLAND PLANTS

Native plants provide rich habitat and forage for a variety of species, and generally require less irrigation and maintenance compared to non-native species. By planting a mix of native grasses and forbs with a variety of heights and inflorescence types, we can create a more visually dynamic and appealing landscape that provides a variety of habitat types and offers improved sustainability and ecological resiliency. Non-programmed areas can have reduced mowing schedules to allow the native species to establish and provide a more natural feel to the area. Additionally, native grasses rely on a system of deep roots, which can help stabilize the soil during flood events and reduce irrigation needs.

Native wildflowers attract a variety of native pollinators, which can, in turn, attract a greater variety of bird species. Native wildflowers, which are specifically adapted to this region, require less watering and maintenance than annuals, which often require more care. A selection of perennial wildflowers in a pollinator garden will add visual appeal to the site, and unlike annuals, do not need to be replanted each year. A pollinator garden, filled with native wildflowers, also provides an ideal site for outdoor education.

RESTORED RIPARIAN AND WETLAND VEGETATION

The riparian and wetland systems of the Site are degraded and could be enhanced with additional plantings and minor earthwork. Riparian vegetation requires minimal maintenance and can help control flooding, stabilize banks and substrate, and provide additional wildlife habitat. Increasing the vegetation cover and diversity around the ponds and wetland will increase the buffer area, which can improve water quality by filtering out suspended sediment and other contaminants. Diverse riparian vegetation can provide shading on the water surface to help control water temperatures and improve instream conditions for aquatic wildlife. Additionally, riparian vegetation provides habitat for a variety of wildlife known to live in Arapahoe County, including:

- Red-winged blackbirds, black-crowned night herons (*Nycticorax nycticorax*), American dippers (*Cinclus mexicanus*), mallards, American coots (*Fulica americana*), double-crested cormorants (*Phalacrocorax auritus*);
- Northern leopard frogs (*Lithobates pipiens*)*, Woodhouse toads (*Anaxyrus whoodhousii*), Great Plains toads (*Bufo cognatus*);
- Common garter snakes (*Thamnophis sirtalis*)*, Western painted turtles (*Chysemys picta belli*), ornate box turtles (*Terrapene ornata ornate*); and
- Striped Meadowhawk dragonflies (*Sympertrum pallipes*), paddle-tailed darner dragonflies (*Aeshna palmata*).

*State-listed species of most concern.

The additional vegetation can also be used to create controlled access points around the water features to help limit bank degradation. Controlling access points to the water features provides

opportunities to include signage about either the riparian vegetation or animals that frequent the area to provide park users with passive environmental education and wildlife viewing opportunities.

Although cattails are beneficial for removing excess phosphorus from the soil and water, too many cattails can lead to a decrease in biodiversity and ecological function in a waterway. Removal of cattails from the wetland would significantly improve the function and aesthetic of this feature. Cattails have dense root systems that prefer saturated conditions and tend not to grow on steep banks of a pond or waterway. Cattails also prefer to grow in less than 20" of water (Gucker, 2008). Therefore, Great Ecology recommends a multi-pronged strategy to remove the cattails and prevent their immediate return. First, the pond should be dredged to remove the root mat of the cattails. This will require a Clean Water Act Section 404 permit, but should be easily attainable as a nationwide permit (NWP) because this is a restoration project (NWP 27). Once the root mat is removed, we can place clean fill material in the wetland area at an elevation that would prevent the standing water that cattails prefer while creating two stream channels through the area that would be deep enough to prevent cattails from establishing, but still allow proper water conveyance. The area should then be planted with diverse native wetland species, including grasses, forbs, and shrubs that are adapted to the new hydrologic conditions. Decreasing the presence of cattails will improve pond accessibility for a variety of wildlife and enhances opportunities for pond recreation.

Performing a wetland functional assessment on the wetland would allow a quantitative measurement of the health of the system. This could also create an opportunity for the restoration of the wetland to be funded as part of a mitigation project for impacts to wetlands in other areas of the city or county. The United States Army Corps of Engineers would have to agree that this restoration could count as mitigation on a separate project, but it could be an opportunity worth exploring.

PLACEMENT OF BAT BOXES & SIGNAGE

The Site contains large areas of standing water, which are suitable breeding grounds for mosquitoes. Great Ecology recommends the addition of bat boxes to encourage residence by bats, which eat mosquitoes, and will reduce a public nuisance during evening performances at the amphitheater. Since some stigma exists around bats, we also recommend the addition of signage to explain the bat boxes, and the importance of bats to the ecosystem.

CONCLUSION AND PATHWAY FORWARD

John Meade Park and Alan Hutto Memorial Commons present multiple opportunities for enhanced park spaces without increased maintenance requirements. The hydrology and floodplain restrictions, while not discussed in this report, are the single biggest constraint on the redesign of the Site. The upland areas near the existing playground can be enhanced with some additional native plantings and weed control, but overall this area appears to require the least amount of enhancement. The area is dominated by non-naitve species, but functionally this area is stable. The focus should be on the wetland restoration and the riparian buffer. If the budget allows, we also recommend that a small set of soil samples be collected and analyzed to inform our recommended plant list for each area. Our recommendation for the enhancement of the wetland area needs to be reviewed and vetted by RESPEC's engineers to ensure that there will not be impacts to the floodplain or floodway. Additionally, CORVUS should review our recommendation to ensure the proper permits can be acquired in the time frame necessary to complete the project on schedule. Finally, the team should complete a cost estimate on these actions to ensure it can be completed within the approved budget for this project.

LITERATURE CITED

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Gucker, Corey L. 2008. Typha latifolia. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. [website accessed May 10, 2016 http://www.fs.fed.us/database/feis/].

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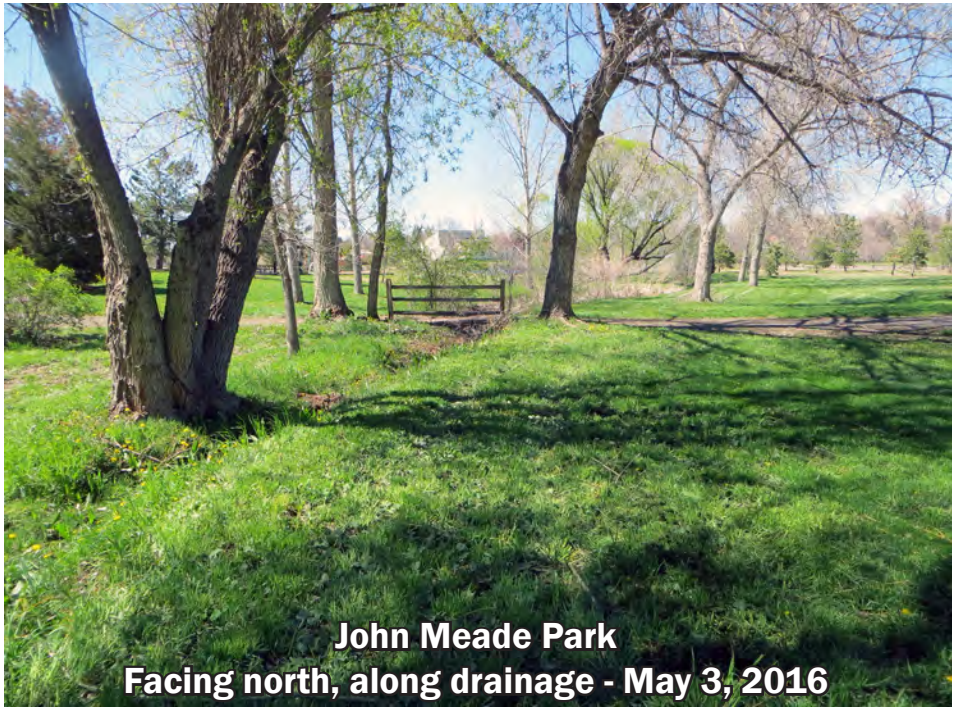
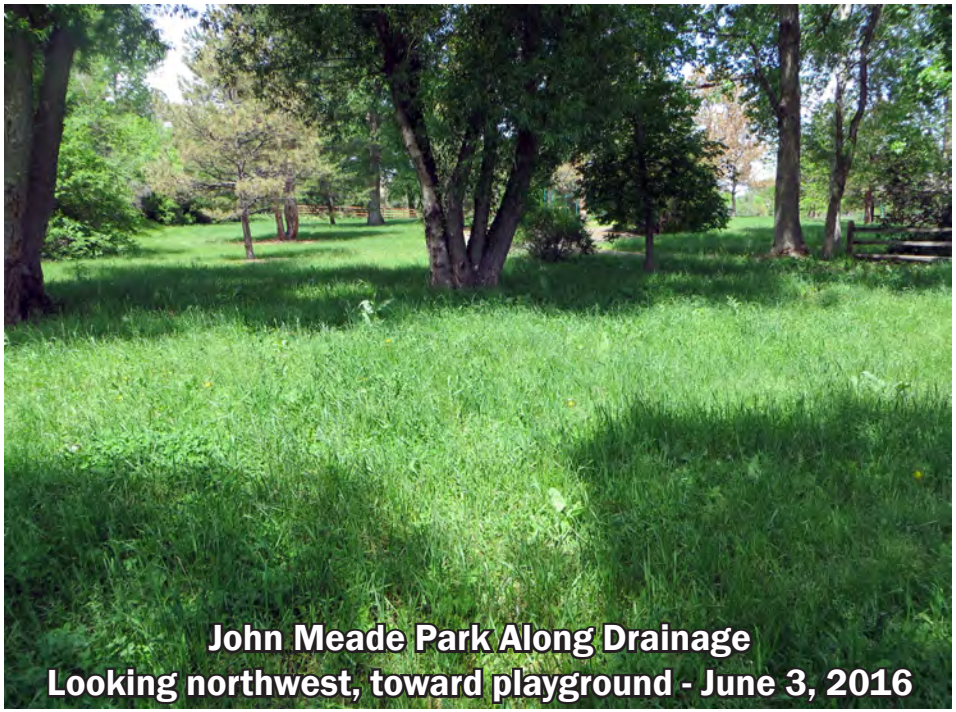
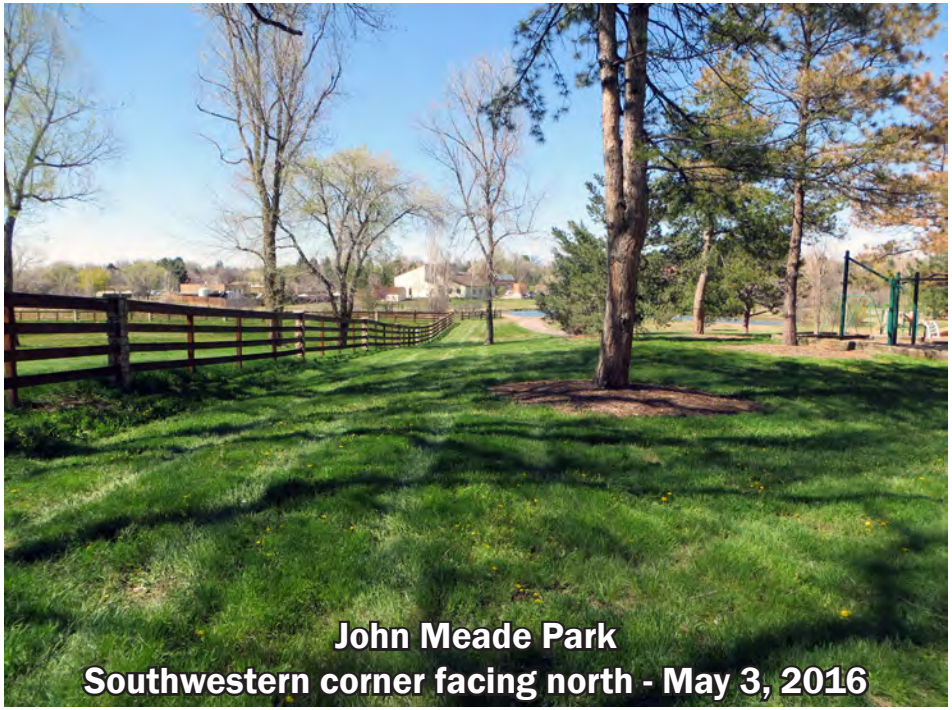
Attachment A -
Site Photos from May 3, 2016 and June 3, 2016



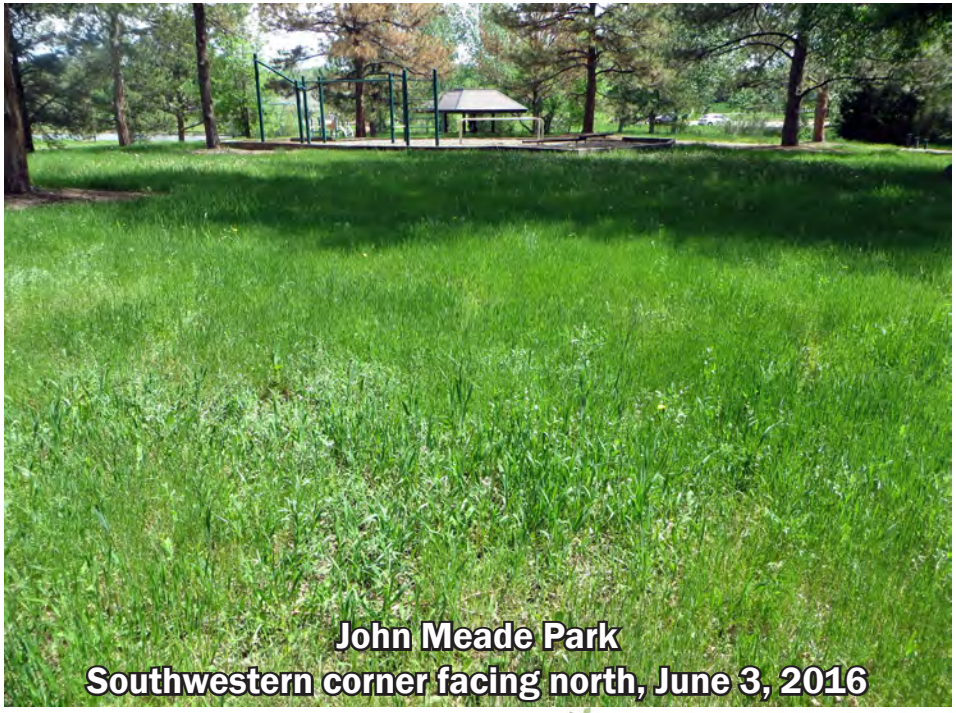
John Meade Park
Facing north, along drainage - May 3, 2016



John Meade Park Along Drainage
Looking northwest, toward playground - June 3, 2016

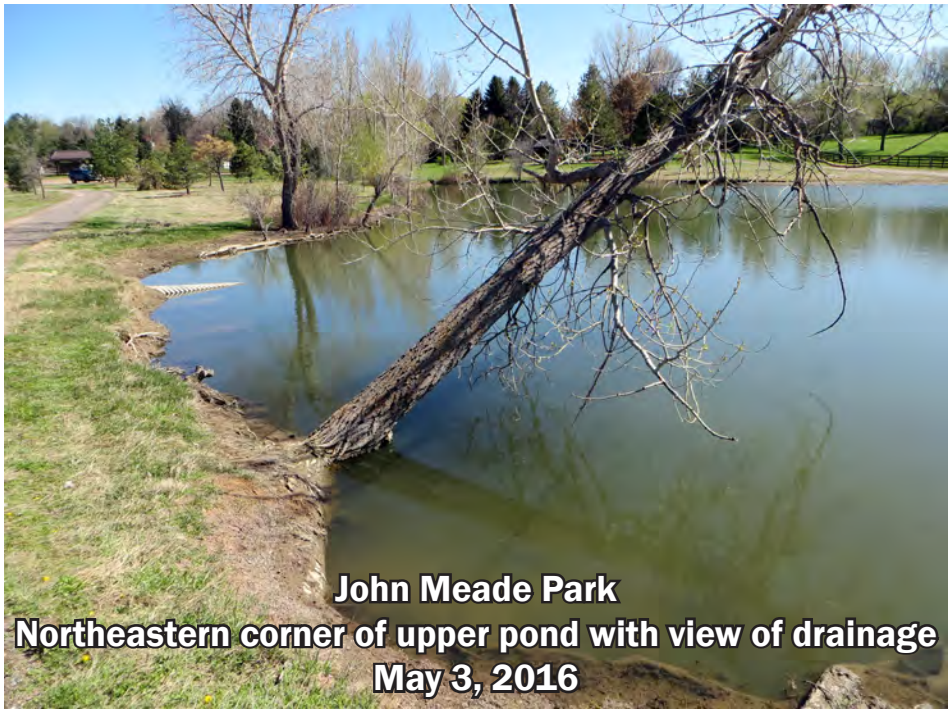


John Meade Park
Southwestern corner facing north - May 3, 2016

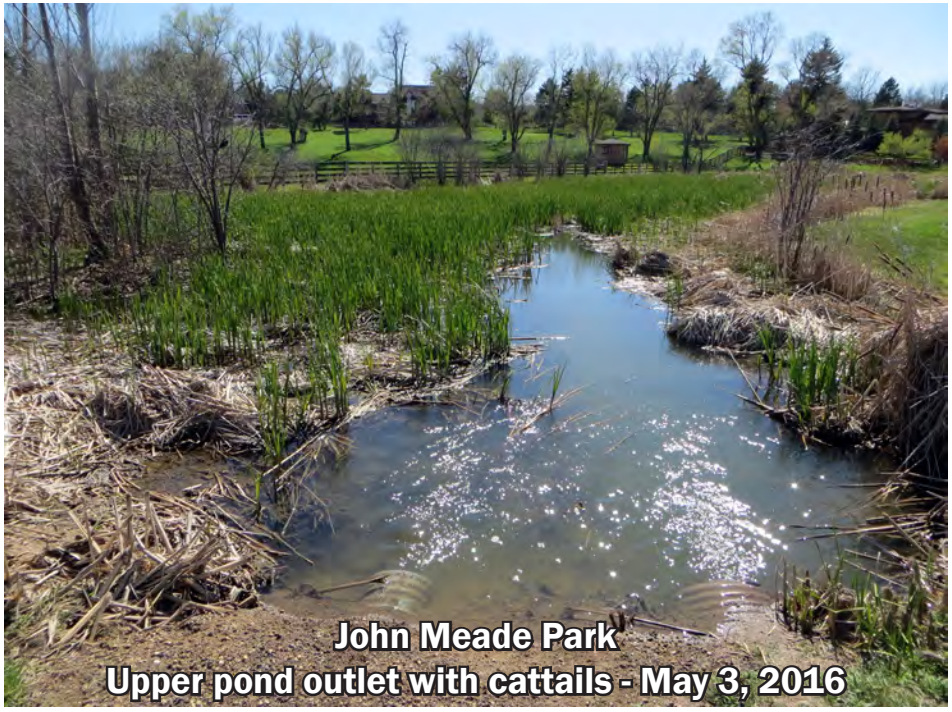


John Meade Park
Southwestern corner facing north, June 3, 2016

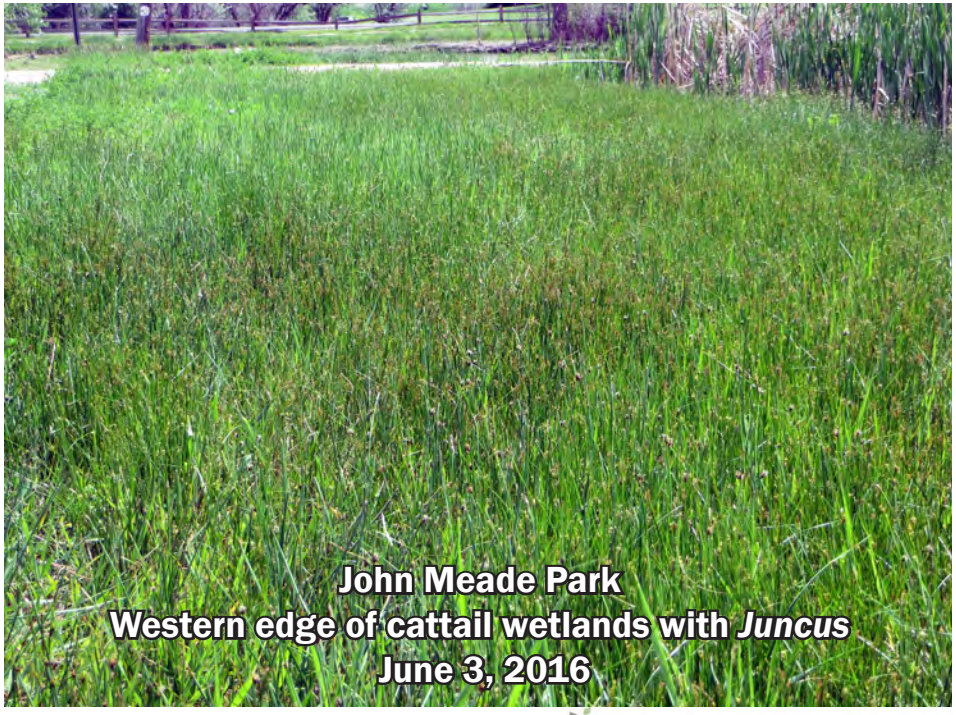
John Meade Park
Near equestrian center - June 3, 2016



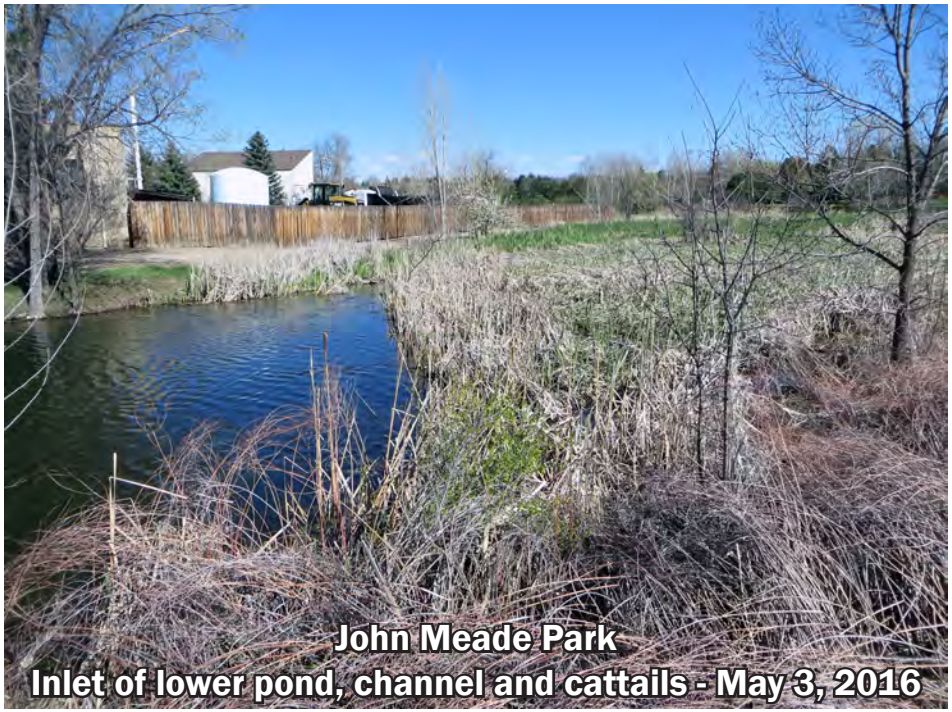
John Meade Park
Northeastern corner of upper pond with view of drainage
May 3, 2016



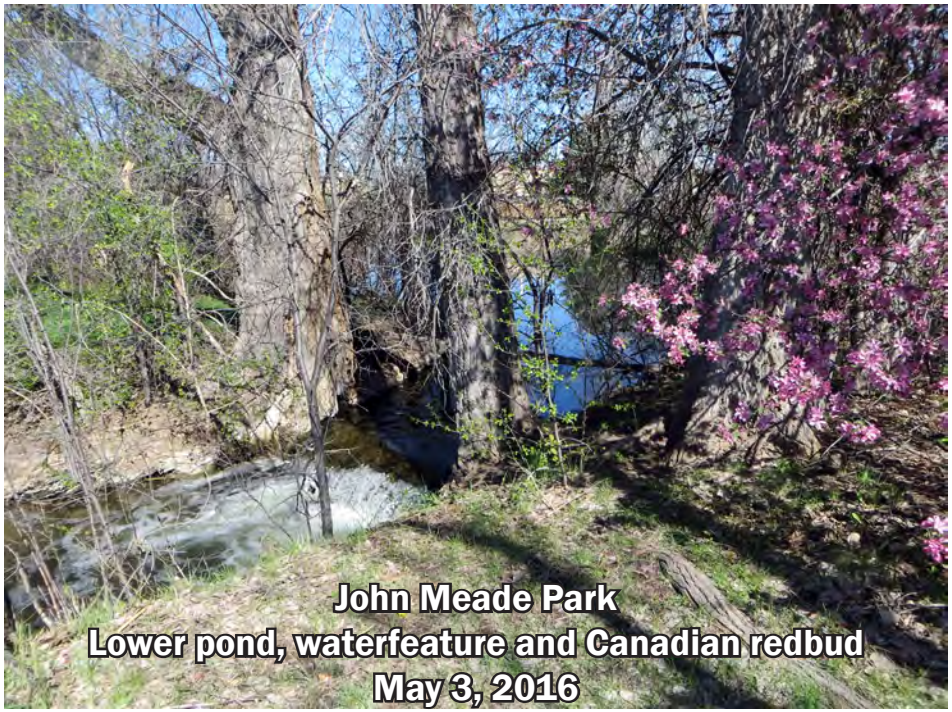
John Meade Park
Upper pond outlet with cattails - May 3, 2016



John Meade Park
Western edge of cattail wetlands with *Juncus*
June 3, 2016

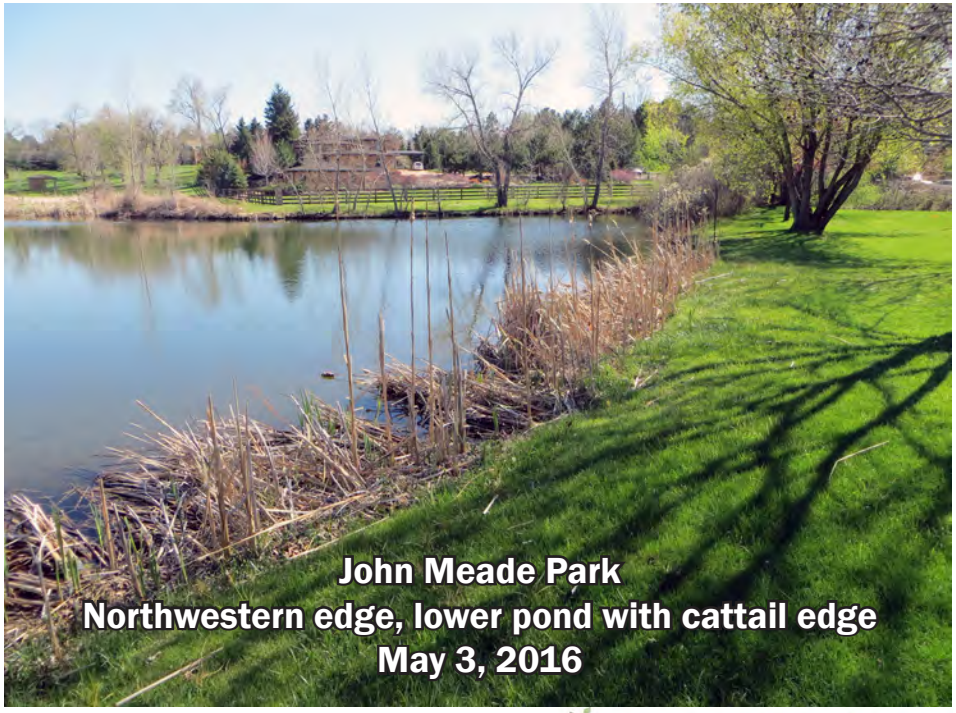


John Meade Park
Inlet of lower pond, channel and cattails - May 3, 2016

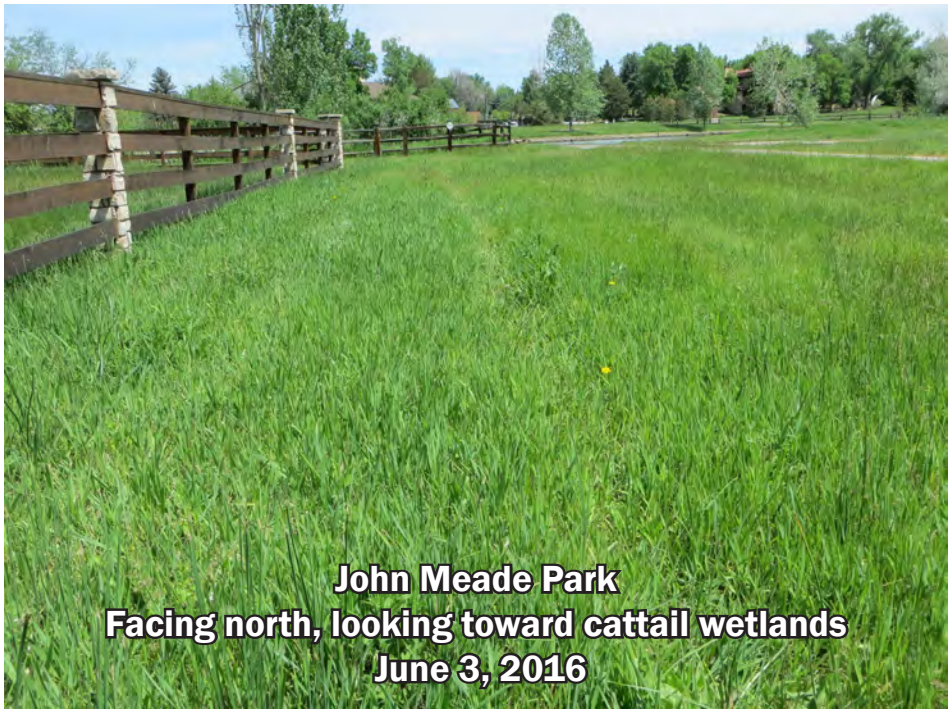


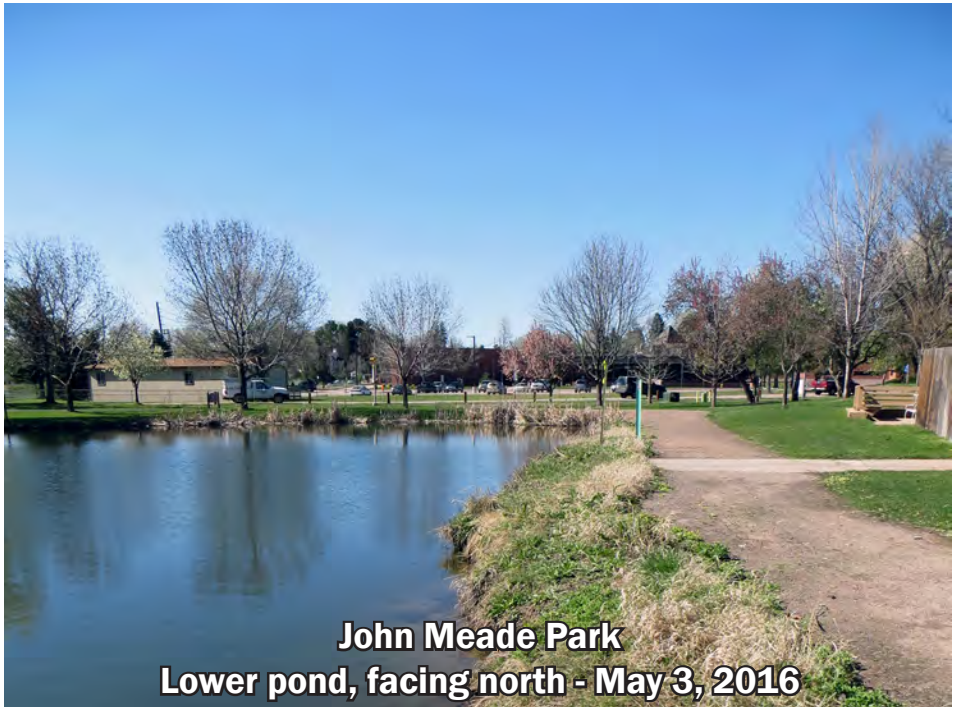
John Meade Park
Lower pond, waterfeature and Canadian redbud
May 3, 2016

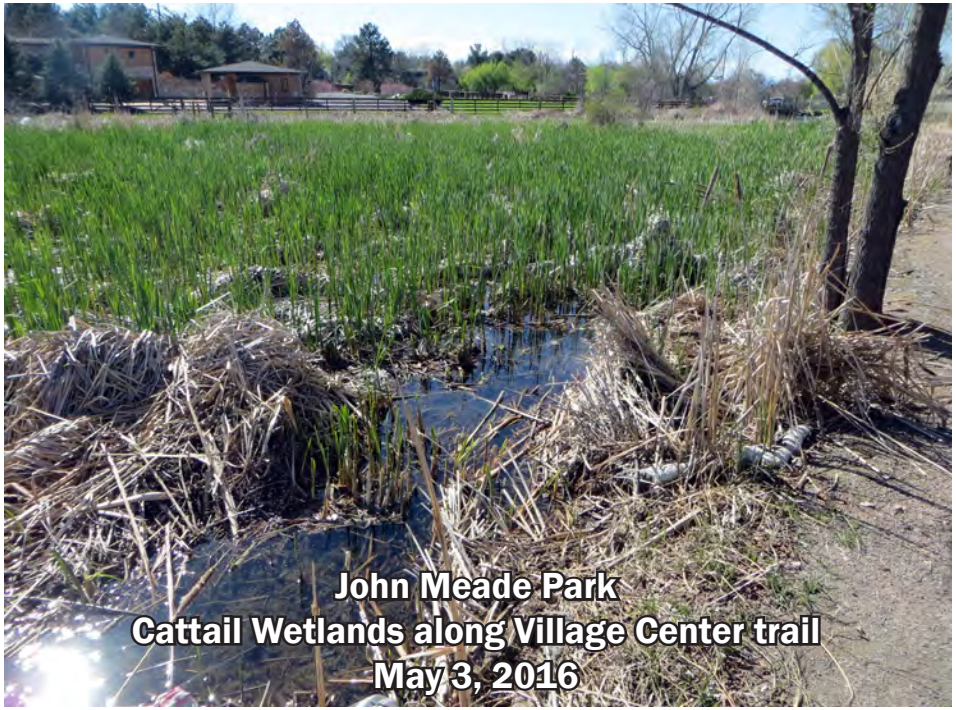
John Meade Park
View of Village Center from western side of lower pond
May 3, 2016

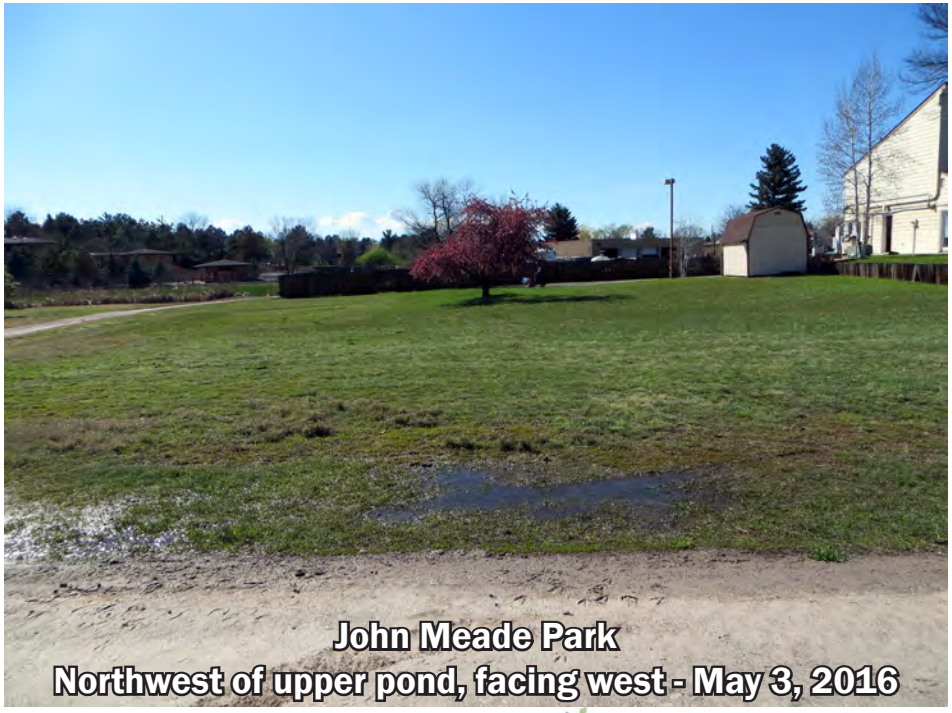


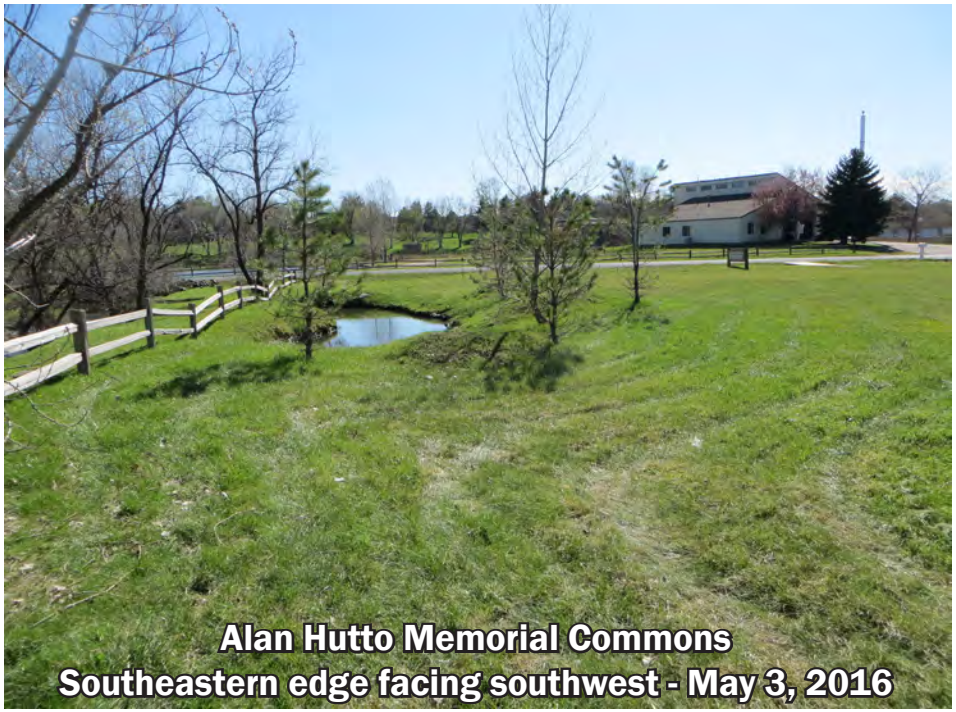
John Meade Park
Northwestern edge, lower pond with cattail edge
May 3, 2016


John Meade Park
Facing north, looking toward cattail wetlands
June 3, 2016

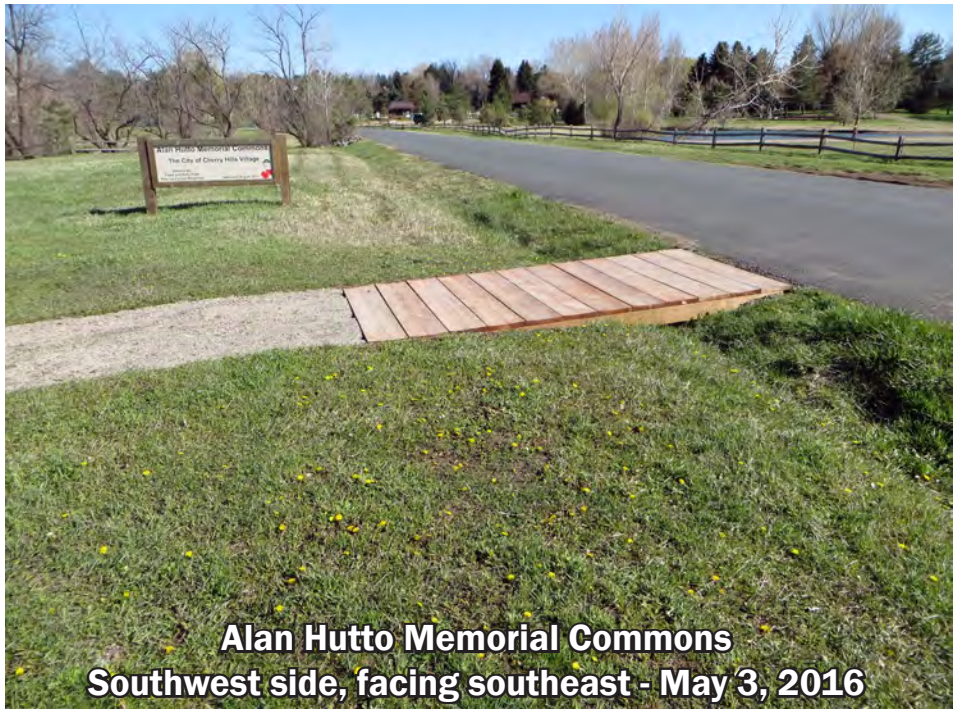

John Meade Park
Lower pond, facing north - May 3, 2016


John Meade Park
Cattail Wetlands along Village Center trail
May 3, 2016

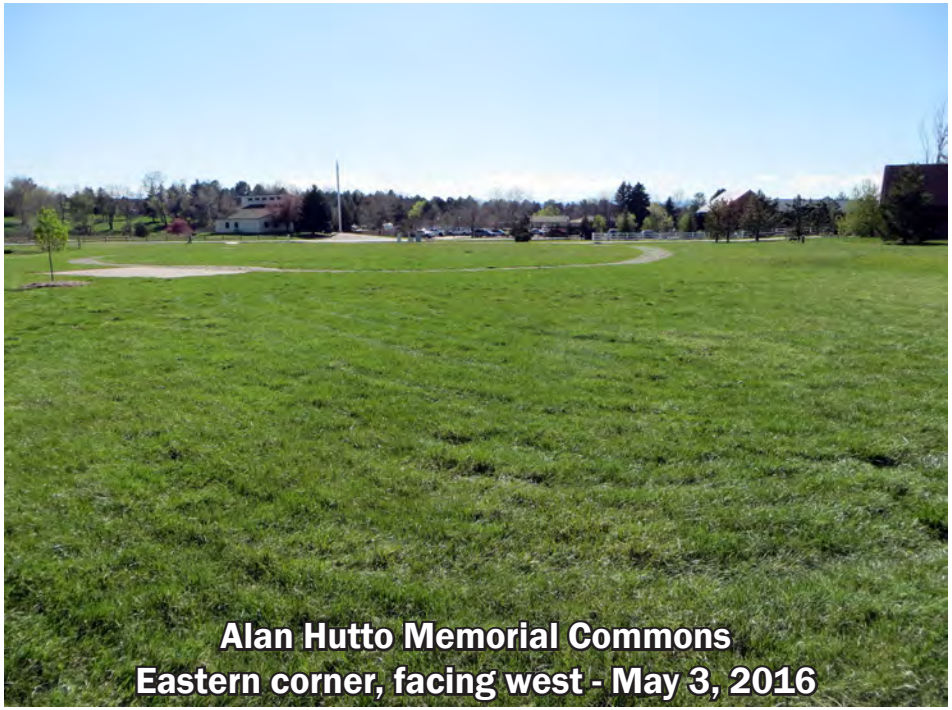

John Meade Park
Northwest of upper pond, facing west - May 3, 2016



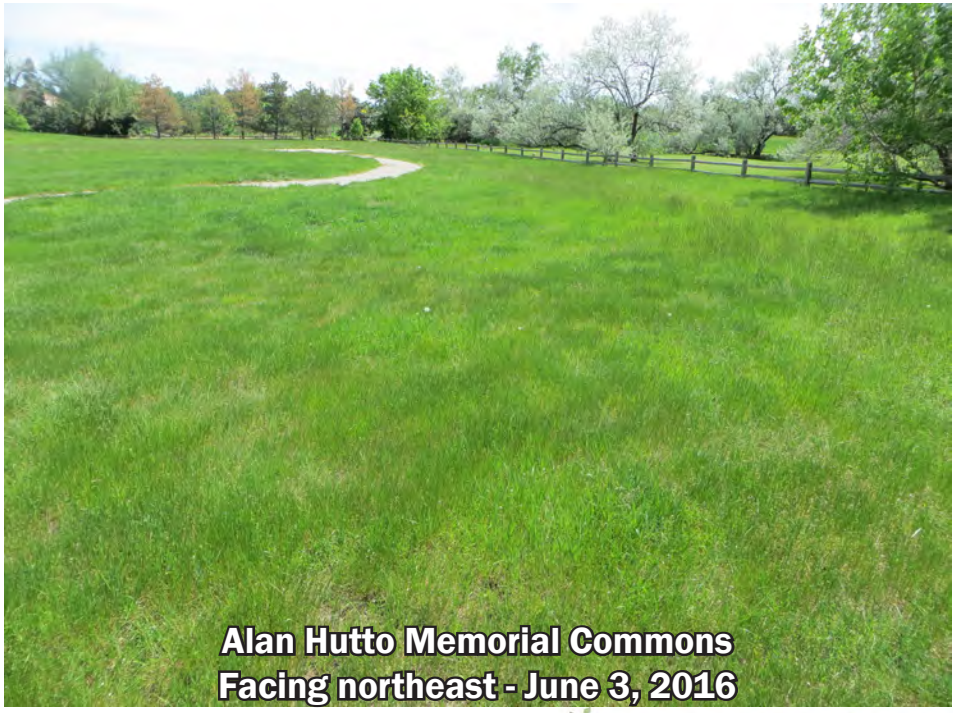
Alan Hutto Memorial Commons
Southeastern edge facing southwest - May 3, 2016



Alan Hutto Memorial Commons
Southwest side, facing southeast - May 3, 2016



Alan Hutto Memorial Commons
Eastern corner, facing west - May 3, 2016



Alan Hutto Memorial Commons
Facing northeast - June 3, 2016