
Vegetation Assessment

Haymeadow Project

Eagle County, Colorado

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1.0 Introduction

Newman Realty Holding, LLC is evaluating plans to construct a residential development on the 660 acre Haymeadow property, located in Sections 2, 3, 4, 9, 10, and 11 of Township 5 South and Range 84 West in Eagle County, Colorado, just east of the Town of Eagle (Figure 1). To document the existing resources of the project site and to provide information for project planning, a Vegetation Assessment was completed.

This report describes the existing vegetation communities of the project site; evaluates the potential presence of federal threatened, endangered, and candidate plants and one U.S. Forest Service (USFS) and Bureau of Land Management (BLM) Listed Sensitive Plant Species known to occur in the area; and provides preliminary estimates of vegetation impacts to these resources based on a sketch development plan. Please note, all Figures are included with the text or inside the back cover, Tables are included in Section 7.0, and Photos are in Section 8.0.

2.0 Environmental Setting

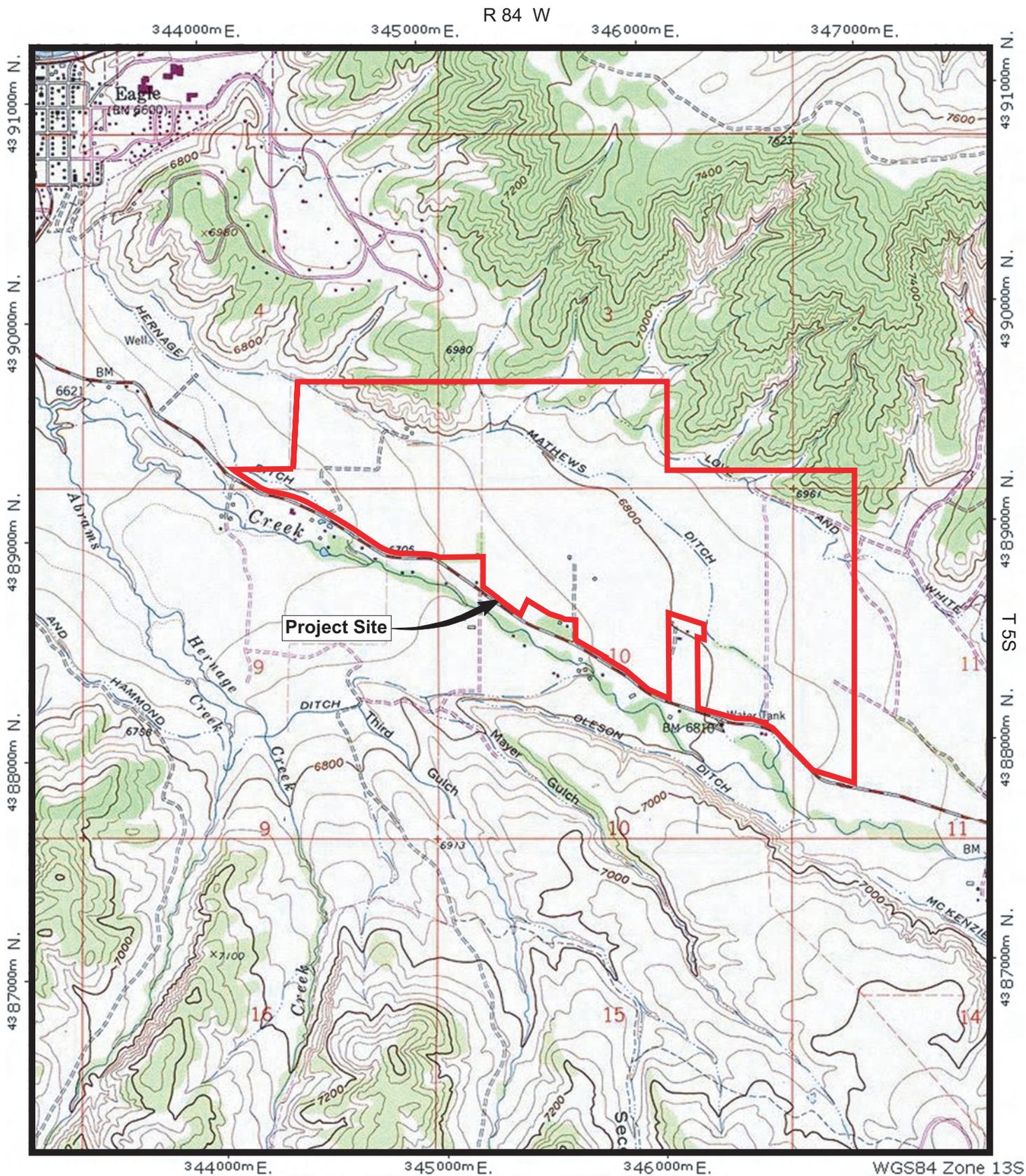
The 660 acre, irregularly shaped Haymeadow property is located southeast of the Town of Eagle, Colorado in the Brush Creek Valley. The property is bounded to the south by Brush Creek Road, to the west by undeveloped agricultural property and the Eagle Pool & Ice Rink, by BLM and undeveloped private lands to the north, and by agricultural lands on the Adam's Rib property to the east.

The Haymeadow property encompasses a broad, gently sloping terrace north of Brush Creek, and portions of a steep south to southwest slope along the northern property boundary. The broad, flat bottoms of six ephemeral swales enter the Haymeadow property from the slopes to the north. These swales seldom contain flowing water and are crossed by the Mathews and the Love and White ditches. Brush Creek, a perennial tributary of the Eagle River, is located just south of the project site across Brush Creek Road. Elevations of the Haymeadow property range from a high of approximately 6,954 feet on the hillside in the northeastern corner, to a low of approximately 6,658 feet along Brush Creek Road at the southern boundary.

The project site has had an agricultural land use history. For more than 100 years, it has been flood irrigated and used for hay production and cattle grazing. Most of the native vegetation has been removed from the project site and replaced by large pastures and hayfields dominated by introduced grasses and forbs. An extensive network of irrigation laterals has been constructed in the pastures, which is fed by the Mathews and the Love and White ditches, both diversions from Brush Creek. In addition, there is a high groundwater table on the terrace which, coupled with irrigation tailwater runoff, has fostered the development of several large wetlands in the southern portion of the project site.

Vegetation communities on the hillside to the north of the pasture have also been altered by land use practices. Livestock grazing has altered the vegetation structure and composition, reducing the cover of native grasses and forbs, and fostering the spread of noxious and undesirable weeds. Along several of the unnamed ephemeral drainages, stands of sagebrush shrubland have been mechanically eliminated, creating a disturbed community with low vegetative cover and extensive stands of noxious weeds. These areas are labeled sagebrush eradication areas on the Vegetation Type Map (Figure 2).

There is one unoccupied residence in the northeastern portion of the project site and several unpaved roadways and two-track roads throughout the pasture. These developed areas and roadways comprise approximately 34 acres of the project site.



BASE: USGS 7.5 Minute Eagle, Colorado Quadrangle
 Photorevised: 1987

**FIGURE 1. Project Location Map
 Haymeadow**



Scale 1" = 2000'
 Contour Interval = 10'

3.0 Methods

Vegetation types of the Haymeadow project site were surveyed by Heather Houston of Western Ecological Resource, Inc. on June 22 and 27, 2006. Using site reconnaissance and aerial photography, a Vegetation Type Map was developed for the project area. Next, the Vegetation Type Map and a sketch development plan were used to estimate vegetation impacts of the proposed development.

The U.S. Fish and Wildlife Service's listing of federal threatened, endangered and candidate plants was also reviewed to determine if any of the listed species could potentially occur on the project site. In addition, the potential presence of Harrington penstemon (*Penstemon harringtonii*), a USFS and BLM Sensitive Plant Species known to occur in the area, was evaluated.

4.0 Vegetation Communities

Vegetation communities identified on the project site include pinyon-juniper woodlands, sagebrush shrublands, gypsum hills, riparian habitats, wetlands, agricultural grasslands, sagebrush eradication areas, and disturbed habitats. The distribution and abundance of each vegetation community is illustrated by Figure 2, the Vegetation Type Map, and each is described below. Table 1 lists the vascular plant species observed on the Haymeadow property during field reconnaissance.

4.1 Pinyon-Juniper Woodlands

Pinyon-juniper woodlands are common on the hillsides in the northern portion of the project site, comprising approximately 45 acres of the 660 acre property (Photo 1). This community is characterized by an open canopy layer which is co-dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus edulis*), with a variable understory based on soil moisture, slope, and aspect. In the shrub layer, big sagebrush (*Artemisia tridentata*) is common, but its density is reduced in the drier, more exposed sites with a steeper topography. In these drier areas, the sub-shrubs winterfat (*Krascheninnikovia lanata*) and snakeweed (*Gutierrezia sarothrae*) are abundant, and green rabbitbrush (*Chrysothamnus viscidiflorus*) is also common. In the herbaceous understory, the cover of native grasses and forbs varies with the level of disturbance. In the easternmost stand of pinyon-juniper woodland, native grasses and forbs are well represented, although the herbaceous cover is fairly low. The dominant grass throughout the pinyon juniper woodland is the native perennial Indian ricegrass (*Oryzopsis hymenoides*), which is well adapted to the dry, exposed slopes. Other common grasses in this community include needle-and-thread (*Hesperostipa comata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), squirrel tail (*Elymus elymoides*), and junegrass (*Koeleria macrantha*), all native perennials, and the introduced perennial basin wild rye (*Elymus cinereus*). The noxious weed cheatgrass (*Bromus tectorum*) is also common. Prickly pear cactus (*Opuntia phaeacantha*), a native succulent, is scattered throughout the pinyon-juniper woodland. In addition, many native forbs are present, particularly in the eastern stand which is less disturbed. Common species include roughseed cryptanth (*Oreocarya flavoculata*), Rollins' twinpod (*Physaria rollinsii*), fringed sage (*Artemisia frigida*), desert prince's plume (*Stanleya pinnata*), rayless tansyaster (*Machaeranthera grindelioides*), white sand verbena (*Abronia elliptica*), Patterson milkvetch (*Astragalus pattersonii*), yellow Indian paintbrush (*Castilleja flava*), and mountain peppergrass (*Lepidium montanum* var. *coloradense*). In addition, the USFS and BLM-listed Sensitive Species Harrington penstemon is common in some areas of the pinyon-juniper woodland, particularly in the easternmost stand (Photo 2). Other common forbs include the noxious weeds whitetop (*Cardaria draba*), flixweed (*Cardaria draba*), and Russian knapweed (*Acroptilon repens*).

In more disturbed, grazed stands of pinyon-juniper woodland, there is sparse cover of the native grasses and forbs described above, and the overall vegetation cover is reduced. In these areas, the

understory supports a reduced cover of winterfat and Indian ricegrass, with scattered snakeweed and big sagebrush. The noxious weeds cheatgrass, flixweed, and Russian knapweed are also common.

4.2 Sagebrush Shrublands

Sagebrush shrublands vegetate approximately 27 acres of the Haymeadow project site, and are located primarily in the bottoms of ephemeral swales, where soil depth and moisture are increased relative to the adjacent pinyon-juniper woodland (Photos 3 & 4). Historically, sagebrush shrublands occupied all of the ephemeral swales on the project site, but the sagebrush has been mechanically removed from large portions of the swales, which are now dominated by weeds (See Section 4.6 below). Existing sagebrush shrublands are dominated by dense stands of big sagebrush reaching approximately 2-5 feet high and spaced 2-5 feet apart. Common shrub associates include green rabbitbrush, snakeweed and winterfat. In general, the sagebrush shrublands of the project site have a sparse herbaceous cover that contains few forbs. The dominant grasses include the natives Indian ricegrass, western wheatgrass (*Pascopyrum smithii*), and cheatgrass, a noxious weed. Other less abundant natives include squirrel tail, bluebunch wheatgrass, junegrass, and needle-and-thread. The introduced grasses basin wild rye and smooth brome (*Bromus inermis*) are also present. As a whole, native forbs are sparsely represented. Widely scattered individuals of roughseed cryptanth and fleabane (*Erigeron sp.*), are present, and the native succulent prickly pear cactus is common in many areas. In addition, the noxious weeds Russian knapweed and whitetop also occur in the sagebrush shrublands. One Harrington penstemon plant was observed in the sagebrush shrublands during field reconnaissance on June 22, 2006.

4.3 Gypsum Hills

The eroded hillsides that dominate the northern portion of the project site have been mapped by the USDA Soil Conservation Service (1992) as Gypsum land-Gypsiorthids Complex, which are characterized by soils with a high gypsum content and exposed parent material with a very high gypsum content. Much of this soil type is vegetated by pinyon-juniper woodlands and sagebrush shrublands, however areas with the highest gypsum content and exposed parent material, which are also characterized by steep south to southwest slopes, have a specialized vegetation community herein called the gypsum hills. On the Haymeadow project site, this community is restricted to the northwestern corner of the project site, and covers approximately 25 acres (Photos 5 & 6). As a whole, vegetation cover is low in this community. Trees are largely absent from the gypsum hills, however very few widely scattered pinyon pine and Utah juniper occur. Winterfat and fourwing saltbush (*Atriplex canescens*) are the dominant shrubs, and snakeweed is also common. Indian ricegrass is the dominant grass, where it grows with a number of native specialized forbs. These include roughseed cryptanth, manystem blazingstar (*Nuttallia multicaulis*), Patterson milkvetch, Rollins' bladderpod, white sand verbena, mountain peppergrass, spearleaf buckwheat (*Eriogonum lonchophyllum*), and the succulent prickly pear cactus.

4.4 Riparian Habitats

Riparian habitats on the Haymeadow project occur along the Mathews Ditch, the Love and White Ditch, and smaller irrigation laterals, and total approximately 7 acres (Photos 7 & 8). Native narrowleaf cottonwood (*Populus angustifolia*) trees dominate the overstory along the Mathews and Love and White ditches, but the introduced crack willow (*Salix fragilis*) is the dominant tree along an irrigation lateral in the central portion of the project site (Photo 7). Stands of the native shrub sandbar willow (*Salix exigua*) are common along the ditches, and Woods' rose (*Rosa woodsii*) is occasional. The herbaceous understory is somewhat variable, with herbaceous wetlands in some areas and introduced upland pasture grasses in others. In wetland areas, common graminoids include reed canarygrass (*Phalaris arundinacea*), American mannagrass (*Glyceria grandis*), meadow foxtail (*Alopecurus pratensis*), and Baltic rush (*Juncus arcticus ssp. ater*). In drier soils, the introduced grasses smooth brome, orchard grass (*Dactylis glomerata*), and basin wild rye are the dominant species. Common forbs in the understory of the riparian habitat include Canada

goldenrod (*Solidago canadensis*) and showy milkweed (*Asclepias speciosa*) in wetter soils, and the noxious weeds burdock (*Arctium minus*), musk thistle (*Carduus nutans ssp macrolepis*) and Russian knapweed in drier areas.

4.5 Herbaceous Wetlands

Herbaceous wetlands generally occur in the southern portion of the project site, where natural springs, irrigation tailwater runoff, and the high groundwater table associated with the alluvial aquifer of Brush Creek enhance soil moisture to create a wetland hydrology (Photo 9). In addition, some of the irrigation ditches and laterals support a narrow band of wetland vegetation along their banks (Photo 8). The approximate boundary of wetlands on the Haymeadow site is illustrated by Figure 2, with the exception of the narrow wetlands associated with some of the irrigation ditches. The illustrated boundary is an estimation based upon prior wetland mapping on the site, field reconnaissance, and examination of aerial photography. Because the original wetland mapping is expired, a revised and updated wetland delineation will be completed during the 2006 growing season. The estimated wetland area illustrated by Figure 2 totals approximately 12.65 acres.

Dense growth of native and introduced graminoids characterizes the wetlands of the Haymeadow site, which have a similar species composition. The narrow wetlands along irrigation ditches have an overstory of narrowleaf cottonwood trees, and stands of sandbar willow and scattered Woods' rose are also present in some areas. The most common herbaceous wetland species in these areas include reed canarygrass, American mannagrass, meadow foxtail, and the forbs Canada goldenrod and showy milkweed.

The most extensive wetlands onsite occur in the pasture and are generally herbaceous, but small stands of sandbar willow are also present. In the shallow emergent habitat, the most abundant graminoids include the native perennials woolly sedge (*Carex lanuginosa*) and beaked sedge (*Carex utriculata*), and the introduced grasses reed canarygrass and meadow foxtail. The native forb watercress (*Nasturtium officinale*) forms dense mats on the surface of the shallow water, and a few stands of broadleaf cattails (*Typha latifolia*) also occur. The saturated soil habitat supports large stands of clustered field sedge (*Carex praegracilis*), Baltic rush (*Juncus arcticus ssp. ater*), fowl bluegrass (*Poa palustris*), woolly sedge (*Carex lanuginosa*), and Nebraska sedge (*Carex nebrascensis*), all native perennials. The introduced grass redtop (*Agrostis alba*) is occasional. Common forbs in the saturated soils include willow-leaved dock (*Rumex triangulivalvis*), water speedwell (*Veronica catenata*), marsh sow thistle (*Sonchus arvensis ssp. uglinosus*), Canada goldenrod, and the noxious weed Canada thistle (*Cirsium arvense*).

4.6 Sagebrush Eradication Areas

Sagebrush Eradication Areas occur where the native sagebrush shrubland in the bottoms of ephemeral swales has been eliminated and only remnants of the native vegetation remain (Photo 10). These areas have a low vegetative cover that contains a high proportion of troublesome and noxious weeds, and comprise approximately 15 acres of the Haymeadow project site. Very few scattered sagebrush and green rabbitbrush shrubs occur in these disturbed draw bottoms. The most abundant species in these areas are noxious weeds, particularly the rhizomatous perennial Russian knapweed, which forms large stands visible on the aerial photograph, whitetop, and the annual grass cheatgrass. Other common plants in the weedy draws include crested wheatgrass (*Agropyron cristatum*), smooth brome, which is stunted due to water stress, the noxious weed musk thistle, and scattered needle-and-thread and Indian ricegrass plants.

4.7 Agricultural Grasslands

Agricultural grasslands occur in the irrigated pasture that dominates the Haymeadow property and encompasses approximately 475 acres (Photo 11). During field reconnaissance, much of the pasture had not yet been irrigated and contained somewhat stunted, water-stressed vegetation. Smooth brome is the dominant grass, however some orchard grass and basin wild rye are also

present. In wetter areas near the margins of wetlands and irrigation ditches, meadow foxtail, streambank wheatgrass (*Elymus lanceolatus*), and reed canarygrass are common. The most abundant forb is alfalfa (*Medicago sativa*). Other common forbs include dandelion (*Taraxacum officinale*), red clover (*Trifolium pratense*), and the noxious weeds field bindweed (*Convolvulus arvensis*), Russian knapweed, and white top.

4.8 Disturbed Habitats

Disturbed habitats are characterized by largely weedy vegetation and have low vegetative cover that contains many noxious weeds (Photo 12). Four large areas on the Haymeadow property classified as disturbed total approximately 19 acres. These are located surrounding an unoccupied residence in the northeastern portion of the project site, southeast of the residence, just north of Brush Creek Road in the central portion of the project site, and in the northwestern corner of the property, in an area of the pasture that is no longer irrigated. Common weeds in these areas include white top, tumble mustard (*Sisymbrium altissimum*), flixweed, hound's tongue (*Cynoglossum officinale*), and musk thistle, which are all on the State of Colorado's noxious weed list. Grasses present in the disturbed habitats include smooth brome, basin wild rye, crested wheatgrass, and the noxious weed cheatgrass.

5.0 Rare Plants

5.1 Federal Threatened, Endangered, and Candidate Plants

As shown by Table 2, there are 18 federally listed threatened, endangered, and candidate plant species for the State of Colorado. However, none of these plants is known from Eagle County.

5.2 Harrington Penstemon

Harrington penstemon (*Penstemon harringtonii*) is a species of concern in Eagle County that is included on the USFS and BLM list of sensitive species. This herbaceous perennial primarily occurs in open stands of big sagebrush (*Artemisia tridentata*), or less commonly pinyon-juniper (*Pinus edulis-Juniperus scopulorum* and *J. utahensis*) woodlands or mountain mahogany (*Cercocarpus montanus*) shrublands at elevations between 6,800-9,200 feet. Within the sagebrush shrubland, Harrington penstemon is most often observed on windswept ridgetop habitats with an open shrub layer and reduced vegetative cover. Harrington penstemon is known from the Eagle River Valley from Avon westward and from the Roaring Fork River Valley. It is known from Eagle, Garfield, Grand, Pitkin, Routt, and Summit Counties (Spackman, et al., 1997).

As described above, more than 50 Harrington penstemon plants were observed in the easternmost stand of pinyon-juniper woodland in the northeastern corner of the project site (Photo 2). Only one other Harrington penstemon plant was observed in sagebrush shrublands elsewhere on the project site, however a detailed survey was not conducted. To accurately quantify the distribution of Harrington penstemon populations on the project site, a Harrington penstemon survey is recommended.

6.0 Vegetation Impacts

6.1 Vegetation Types

Figure 3 illustrates parcel boundaries of the preliminary sketch plan for the Haymeadow project. This plan would impact approximately 17.69 acres of native vegetation and 509 acres of disturbed, weedy, and introduced vegetation. Specifically, all of the 475 acres of agricultural grassland, 15 acres of sagebrush eradication areas, and 19 acres of disturbed habitats would be eliminated when the development is constructed. Because the sagebrush eradication areas and

disturbed habitats are vegetated by noxious weeds, elimination of these vegetation types is a positive impact.

The 17.35 acres of impact to native vegetation types would consist of 7.37 acres of sagebrush shrubland, 5.58 acres of pinyon juniper woodland, 2.36 acres at the base of the gypsum hills, 1.36 acres of riparian habitat, and approximately 1.02 acres of wetlands.

Please note, a portion of the 1.02 acre wetland impact is for the extension of the existing Ouzel Lane from Eagle Ranch to create a four-way intersection with Brush Creek Road, and the roadway could not be relocated to avoid this impact. Moreover, all estimated wetland impacts are based on an expired wetland delineation that may not reflect current conditions. Due to changes in flood irrigation practices and a long-term drought, the current mapping may overestimate the area of wetland impact. Additionally, any impacts to jurisdictional wetlands must be approved by the U.S. Army Corps of Engineers, who typically require the creation of new wetlands to offset any permitted losses.

Riparian impacts totaling 1.36 acres all occur along man-made irrigation ditches that generally lack a native understory. In several areas, totaling approximately 0.21 acre, the impact results from the removal of isolated trees from irrigation laterals rather than the elimination of well-developed riparian habitat. To enhance the aesthetics and wildlife habitat value of the proposed development, irrigation water will be used to construct many small streams through 100- and 200-foot-wide open space corridors, and these will be planted with native riparian vegetation. Hence, the project will likely result in a net increase in riparian habitat.

Nearly half of the impact to sagebrush shrubland would be in the easternmost stand, which is the most highly disturbed and has the fewest native understory species. Impacts to pinyon-juniper woodlands are generally located in the most disturbed areas, along the northern boundary of the pasture. The 2.36 acre impact in the gypsum hills is on a disturbed area at the base of the slopes, and the highest quality habitat is avoided.

All of the native vegetation types to be impacted are common in western Colorado, particularly in the vicinity of the Haymeadow property.

Impacts to native plant communities will be mitigated by establishing native vegetation in 100- and 200-foot-wide open space corridors to be constructed throughout the development. These will include meandering streams supported by irrigation water and will be planted with native riparian vegetation. Adjacent upland habitats will also include native seedlings.

6.2 Rare Plants

More than 50 Harrington penstemon plants were observed onsite in the easternmost stand of pinyon-juniper woodland during field reconnaissance on June 22. One additional individual was seen in a stand of sagebrush shrubland in the north-central portion of the project site. However, a thorough field survey has not yet been completed. The population in the northeast corner of the project site is not likely to be impacted by the proposed sketch plan. However, a few individual plants may need to be relocated. Due to the increased level of grazing disturbance on the remainder of the project site, it is likely that only scattered Harrington penstemon plants occur. This is consistent with field observations during site reconnaissance on June 22. To fully quantify the potential impacts to Harrington penstemon, a formal survey is recommended.

7.0 Tables

TABLE 1
Vascular Plant Species List
Haymeadow Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>	<u>Origin*</u>	<u>Wetland Status**</u>
Trees				
<i>Juniperus osteosperma</i>	Utah juniper	Cupressaceae	N	NL
<i>Pinus edulis</i>	Pinyon pine	Pinaceae	N	
<i>Populus angustifolia</i>	Narrowleaf cottonwood	Salicaceae	N	FAC*
<i>Salix fragilis</i>	Crack willow	Salicaceae	I	FAC
Shrubs				
<i>Amelanchier alnifolia</i>	Serviceberry	Rosaceae	N	FACU-
<i>Artemisia tridentata</i>	Big sagebrush	Asteraceae	N	
<i>Atriplex canescens</i>	Fourwing saltbush	Chenopodiaceae	N	UPL
<i>Cercocarpus montanus</i>	Mountain mahogany	Rosaceae	N	NL
<i>Chrysothamnus viscidiflorus</i>	Green rabbitbrush	Asteraceae	N	
<i>Gutierrezia sarothrae</i>	Snakeweed	Asteraceae	N	NL
<i>Krascheninnikovia lanata</i>	Winterfat	Chenopodiaceae	N	NL
<i>Rosa woodsii</i>	Wood rose	Rosaceae	N	FAC-
<i>Salix exigua</i>	Sandbar willow	Salicaceae	N	OBL
<i>Symphoricarpos rotundifolius</i>	Snowberry	Caprifoliaceae	N	NL
Perennial Graminoids				
<i>Agropyron cristatum</i>	Crested wheatgrass	Poaceae	I	NL
<i>Agrostis gigantea</i> (<i>A. alba</i>)	Redtop	Poaceae	I	FACW
<i>Alopecurus pratensis</i>	Meadow foxtail	Poaceae	I	NI (FACW)
<i>Bromus inermis</i>	Smooth brome	Poaceae	I	NL
<i>Carex lanuginosa</i>	Woolly sedge	Cyperaceae	N	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	Cyperaceae	N	OBL
<i>Carex praegracilis</i>	Clustered field sedge	Cyperaceae	N	FACW
<i>Carex utriculata</i> (<i>C. rostrata</i>)	Beaked sedge	Cyperaceae	N	OBL
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	I	FACU
<i>Elymus cinereus</i>	Basin wild rye	Poaceae	I	NI
<i>Elymus elymoides</i>	Squirrel tail	Poaceae	N	NL
<i>Elymus lanceolatus</i>	Streambank wheatgrass	Poaceae	N	NL
<i>Festuca arundinacea</i>	Tall fescue	Poaceae	I	FACW-
<i>Glyceria grandis</i> (<i>G. maxima</i>)	American mannagrass	Poaceae	N	OBL
<i>Hesperostipa comata</i>	Needle-and-thread	Poaceae	N	NL
<i>Juncus arcticus ssp. ater</i> (<i>J. balticus</i>)	Baltic rush	Juncaceae	N	FACW
<i>Koeleria macrantha</i>	Junegrass	Poaceae	N	NL
<i>Oryzopsis hymenoides</i>	Indian ricegrass	Poaceae	N	UPL
<i>Pascopyrum smithii</i>	Western wheatgrass	Poaceae	N	FACU
<i>Phalaris arundinacea</i>	Reed Canarygrass	Poaceae	I	OBL

TABLE 1
Vascular Plant Species List
Haymeadow Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>	<u>Origin*</u>	<u>Wetland Status**</u>
<i>Phleum pratense</i>	Timothy	Poaceae	I	FACU
<i>Poa palustris</i>	Fowl bluegrass	Poaceae	N	FACW
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	I	FACU
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass	Poaceae	N	UPL
<i>Typha latifolia</i>	Broadleaf cattail	Typhaceae	N	OBL
Perennial Forbs				
<i>Abronia elliptica</i>	White sand verbena	Nyctaginaceae	N	NL
<i>Acroptilon repens</i>	Russian knapweed	Asteraceae	I+	NL
<i>Adenolinum lewisii</i> (<i>Linum</i>)	Wild flax	Linaceae	N	NL
<i>Artemisia frigida</i>	Fringed sage	Asteraceae	N	NL
<i>Asclepias speciosa</i>	Showy milkweed	Asclepiadaceae	N	FACW
<i>Astragalus pattersonii</i>	Patterson milkvetch	Fabaceae	N	NL
<i>Cardaria draba</i>	White top	Brassicaceae	I+	NL
<i>Castilleja flava</i>	Yellow Indian paintbrush	Fabaceae	N	NL
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	I+	FACU
<i>Convolvulus arvensis</i>	Field bindweed	Convolvulaceae	I+	NL
<i>Eriogonum lonchophyllum</i>	Spearleaf buckwheat	Polygonaceae	N	NL
<i>Lepidium montanum</i> var. <i>coloradense</i>	Mountain pepperweed	Brassicaceae	N	NI
<i>Machaeranthera grindelioides</i>	Rayless tansyaster	Asteraceae	N	NL
<i>Malva neglecta</i>	Common mallow	Malvaceae	I	NL
<i>Medicago sativa</i>	Alfalfa	Fabaceae	I	NL
<i>Nasturtium officinale</i>	Water cress	Brassicaceae	N	OBL
<i>Nuttallia multicaulis</i>	Manystem blazingstar	Loasaceae	N	NL
<i>Opuntia phaeacantha</i>	New Mexican prickly-pear	Cactaceae	N	NL
<i>Oreocarya flavoculata</i>	Roughseed cryptanth	Boraginaceae	N	NL
<i>Penstemon harringtonii</i>	Harrington penstemon	Scrophulariaceae	N	NL
<i>Physaria rollinsii</i>	Rollins' twinpod	Brassicaceae	N	NL
<i>Plantago major</i>	Common plantain	Plantaginaceae	I	FAC
<i>Psoralidium tenuiflorum</i>	Slender scurfpea	Fabaceae	N	NL
<i>Rumex triangulivalvis</i>	Willow-leaved dock	Polygonaceae	N	FACW
<i>Solidago canadensis</i>	Canada goldenrod	Asteraceae	N	FACU
<i>Stanleya pinnata</i>	Desert prince's plume	Brassicaceae	N	NL
<i>Taraxacum officinale</i>	Dandelion	Asteraceae	I	FACU+
<i>Trifolium pratense</i>	Red clover	Fabaceae	I	FACU
<i>Trifolium repens</i>	White Dutch clover	Fabaceae	I	FACU
<i>Veronica catenata</i>	Water speedwell	Scrophulariaceae	N	OBL
Ferns & Fern Allies				
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	N	FAC+
Annual/Biennial Graminoids				
<i>Bromus tectorum</i>	Cheatgrass	Poaceae	I+	NL

TABLE 1
Vascular Plant Species List
Haymeadow Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>	<u>Origin*</u>	<u>Wetland Status**</u>
Annual/Biennial Forbs				
<i>Arctium minus</i>	Common burdock	Asteraceae	I+	NL
<i>Carduus nutans</i> <i>ssp. macrolepis</i>	Musk thistle	Asteraceae	I+	NL
<i>Chenopodium incanum</i>	Mealy goosefoot	Chenopodiaceae	N	NL
<i>Cynoglossum officinale</i>	Houndstongue	Boraginaceae	I+	NL
<i>Descurainia sophia</i>	Flixweed	Brassicaceae	I+	NI
<i>Sisymbrium altissimum</i>	Tumble mustard	Brassicaceae	I	FACU-
<i>Sonchus arvensis</i> <i>ssp. uglinosus</i>	Marsh sow thistle	Asteraceae	I+	FACU

* Origin

N = Native
 I = Introduced
 I+ = Colorado State Noxious Weed

** Wetland Status

OBL = Obligate Wetland
 FACW = Facultative Wetland
 FAC = Facultative
 FACU = Facultative Upland
 UPL = Obligate Upland

TABLE 2
Federal Threatened, Endangered, and Candidate Plants of Colorado

<u>Scientific Name</u>	<u>Common Name</u>	<u>Federal Status</u>	<u>Colorado Distribution</u>	<u>Habitat</u>
<i>Astragalus humillimus</i>	Mancos milkvetch	Endangered	Montezuma	Rock ledges in pinyon-juniper woodland
<i>Astragalus osterhoutii</i>	Osterhout milkvetch	Endangered	Grand	Seleniferous clay soils in big sagebrush shrubland
<i>Astragalus tortipes</i>	Sleeping Ute milk-vetch	Candidate	Montezuma	Desert scrub -Mancos shale
<i>Botrychium lineare</i>	Slender Moonwort	Candidate	Boulder, El Paso	Grassy slopes among medium-height grasses, along edges of streamside forests
<i>Eriogonum pelinophilum</i>	Clayloving wild buckwheat	Endangered	Delta, Montrose	Mancos shale badlands in saltbrush shrubland
<i>Eutrema penlandii</i>	Penland alpine fen mustard	Endangered	Park, Summit	Moist calcareous alpine habitats
<i>Gaura neomexicana</i> <i>ssp. coloradensis</i>	Colorado butterfly plant	Threatened	Boulder, Douglas, Larimer, Weld	Sub-irrigated, alluvial soils of drainage bottoms
<i>Lesquerella congesta</i>	Dudley bluffs bladderpod	Threatened	Rio Blanco	Barren, white shale outcrops of the Green River and Uinta Formations
<i>Pediocactus knowltonii</i>	Knowlton cactus	Endangered	La Plata	Alluvial deposits in pinyon-juniper and big sagebrush
<i>Penstemon grahamii</i>	Graham beardtongue	Candidate	Rio Blanco	Talus slopes, knolls -Green River Formation
<i>Penstemon penlandii</i>	Penland beardtongue	Endangered	Grand	Barrens -Troublesome Formation

TABLE 2
Federal Threatened, Endangered, and Candidate Plants of Colorado

<u>Scientific Name</u>	<u>Common Name</u>	<u>Federal Status</u>	<u>Colorado Distribution</u>	<u>Habitat</u>
<i>Penstemon scariosus albifluvis</i>	White River beardtongue	Candidate	Rio Blanco	Mixed desert shrub, pinyon-juniper, in shales of Green River Formation
<i>Phacelia formosula</i>	North Park phacelia	Endangered	Jackson	Barrens-sandstone outcrops Coalmont Formation
<i>Phacelia submutica</i>	DeBeque phacelia	Candidate	Garfield, Mesa	Sparsely vegetated steep slopes in clay of Wasatch Formation
<i>Physaria obcordata</i>	Dudley Bluffs twinpod	Threatened	Rio Blanco	Barrens -Green River Formation
<i>Sclerocactus glaucus</i>	Uinta Basin hookless cactus	Threatened	Delta, Garfield, Mesa, Montrose	Desert shrub
<i>Sclerocactus mesae-verdae</i>	Mesa Verde cactus	Threatened	Montezuma	Shale or adobe clay badlands
<i>Spiranthes diluvialis</i>	Ute ladies' tresses orchid	Threatened	Boulder, Jefferson	Sub-irrigated, alluvial soils along streams

Source: U.S. Fish & Wildlife Service Threatened and Endangered Species System (TESS), downloaded January 6, 2004.
http://ecos.fws.gov/tess_public/TESSWebpageUsaLists?state=CO
http://ecos.fws.gov/tess_public/TESSWebpageUsaLists?usMap=1&status=candidate&state=CO

8.0 Photos



Photo 1. Pinyon-juniper woodlands dominate the hillside north of the pasture, with sagebrush shrublands in the drainage swale. (6/22/06).



Photo 2. More than 50 Harrington penstemon plants were identified in the easternmost stand of pinyon-juniper woodland. (6/22/06).

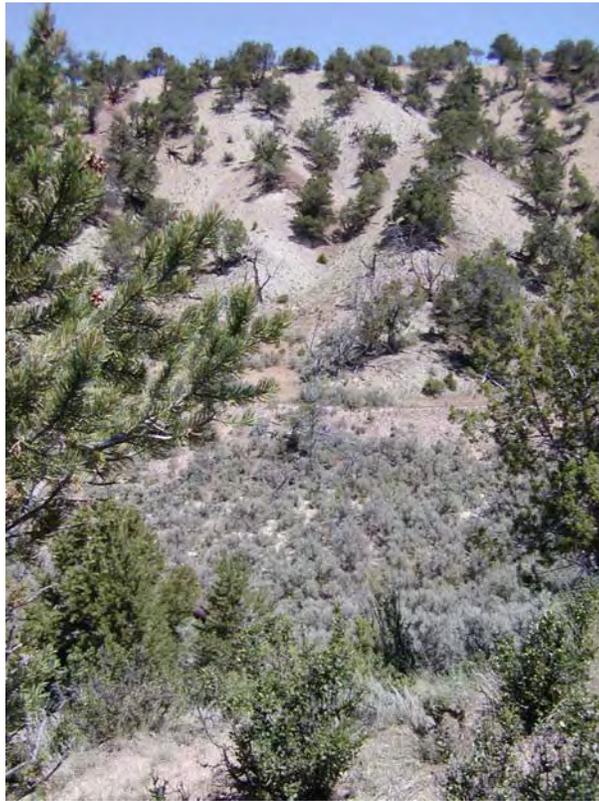


Photo 3. Sagebrush shrublands occur in the broad, level bottoms of ephemeral swales where soil moisture and depth are increased. (6/22/06).



Photo 4. Sagebrush shrubland. (6/22/06).



Photo 5. Agricultural grassland (foreground) with the poorly vegetated gypsum hills in the background. (6/22/06).



Photo 6. The gypsum hills habitat is dominated by winterfat and fourwing saltbush and has low vegetation cover. (6/22/06).



Photo 7. Riparian habitat along an irrigation lateral with an overstory of non-native crack willow trees and an upland understory of smooth brome. (6/22/06).



Photo 8. Riparian habitat with a wetland understory located on the Love and White Ditch. (6/22/06).



Photo 9. Large herbaceous wetland just north of Brush Creek Road in the western portion of the project site. (6/22/06).



Photo 10. Ephemeral swales have been cleared of the native sagebrush shrubland and are now dominated by noxious weeds. (6/22/06).



Photo 11. The agricultural grassland in the pasture is dominated by the introduced perennial smooth brome. (6/22/06).

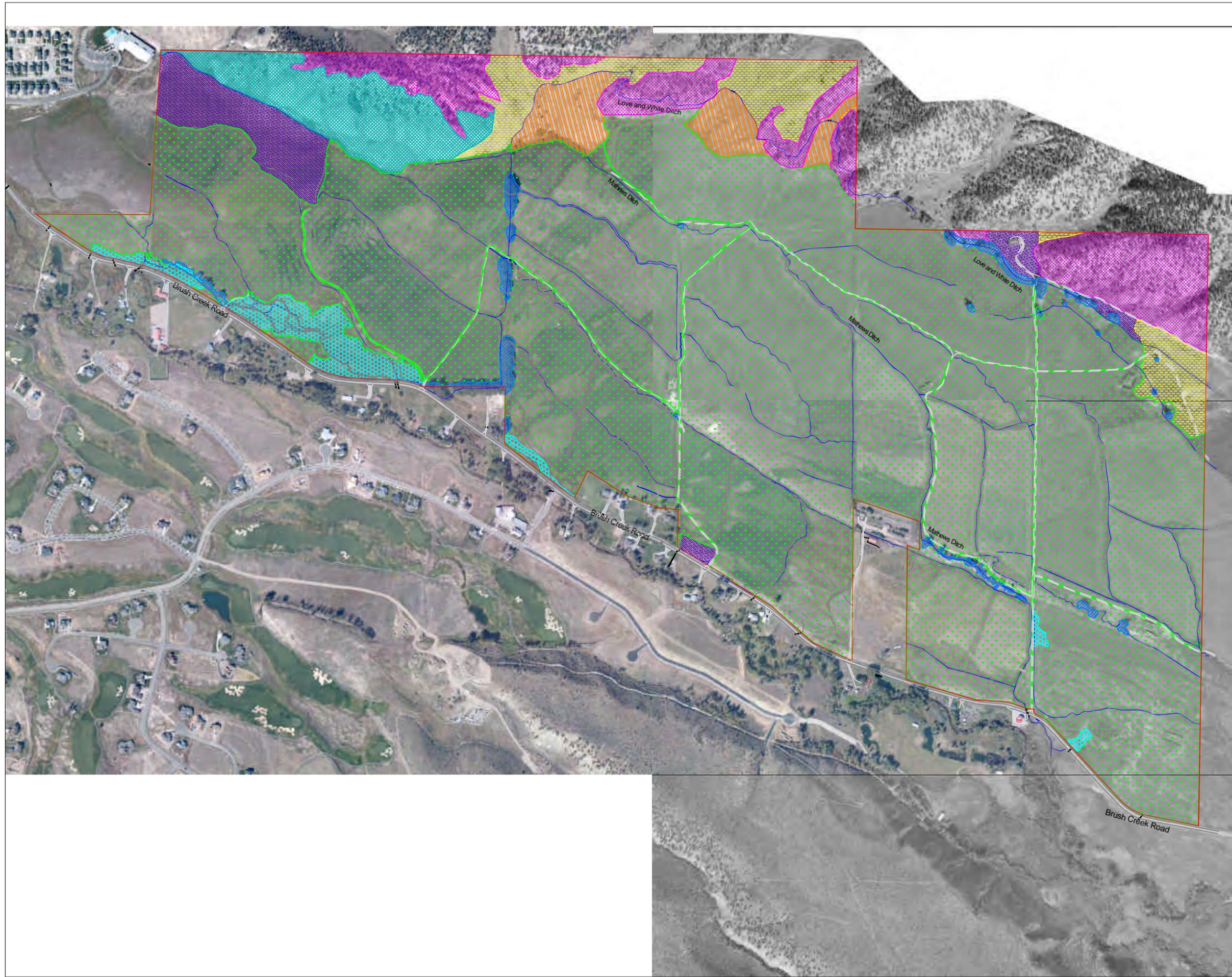


Photo 12. Disturbed habitat near the unoccupied residence in the northeastern corner of the project site that is dominated by noxious weeds. (6/22/06).

9.0 References

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Figure 2.
Vegetation Type Map
Haymeadow Project



Legend:

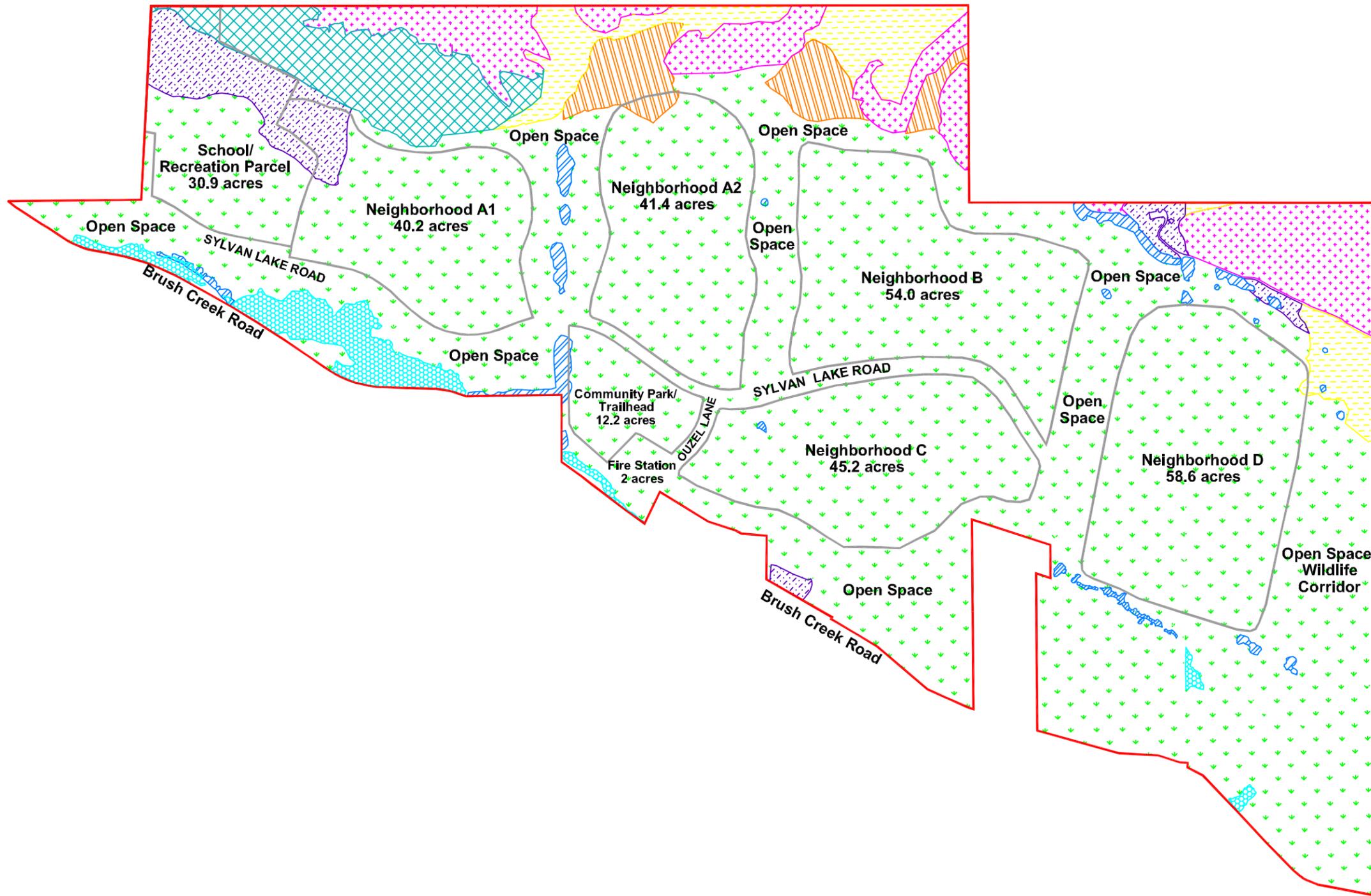
-  Pinyon-Juniper Woodlands
-  Sagebrush Shrublands
-  Gypsum Hills
-  Sagebrush Eradication Areas
-  Riparian Habitats
-  Wetlands*
-  Agricultural Grasslands
-  Disturbed Habitats
-  Irrigation Ditches & Laterals
-  Project Boundary

* Please note, illustrated wetland boundaries are approximations based upon a prior delineation and examination of aerial photography. An updated and revised wetland delineation will be completed during the 2006 growing season.

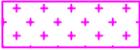
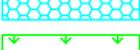
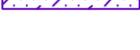


Date: July 2006
 Scale: 1 in = 325 ft

**Figure 3. Development Plan Map
Haymeadow Project**



Legend:

-  Pinyon-Juniper Woodlands
-  Sagebrush Shrublands
-  Gypsum Hills
-  Sagebrush Eradication Areas
-  Riparian Habitat
-  Wetlands
-  Agricultural Grassland
-  Disturbed Habitat



Scale: 1 in = 800 ft

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