Natural Features, Wetland, Wildfire, Noxious Weeds & Wildlife Report
for
North Bay at Lake Woodmoor in El Paso County, Colorado

September 1, 2016

Prepared for:

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Project Number: 2016-11-1

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LIST OF ACROYNMS AND ABBREVIATIONS

AMSL	above mean sea level
CDA	Colorado Department of Agriculture
CNHP	Colorado Natural Heritage Program
COGCC	Colorado Oil and Gas Conservation Commission
CPW	Colorado Parks and Wildlife
CWA	Clean Water Act
Ecos or ecos	Ecosystem Services, LLC
JD	jurisdictional under the Clean Water Act
Non-JD	non- jurisdictional under the Clean Water Act
PMJM	Preble's meadow jumping mouse
Project	North Bay at Lake Woodmoor (formerly The Cove at Woodmoor)
Report	Natural Features and Wetland Report
Site	Project site
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Ecosystem Services, LLC (Ecos or ecos) was retained by Morgan Hester of Woodmoor Lake Development, Inc. to perform a natural resource assessment for the North Bay at Lake Woodmoor project (Project), a proposed development at the north end of Woodmoor Lake, and to prepare this Natural Features, Wetland, Wildfire, Noxious Weeds and Wildlife Report (Report). Please note that the Project was formerly known as The Cove at Woodmoor.

The contact information for the Woodmoor Lake Development, Inc. and ecos representatives for this Report is provided below:

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1.1 Purpose

The purpose of this Report is to identify and document the natural resources, ecological characteristics and existing conditions of the Project site (Site); identify potential ecological impacts associated with Site development; and provide current regulatory guidance related to potential development-related impacts to natural resources. The specific resources and issues of concern addressed in this Report are in conformance with the El Paso County requirements (refer to Section 2.0), and include:

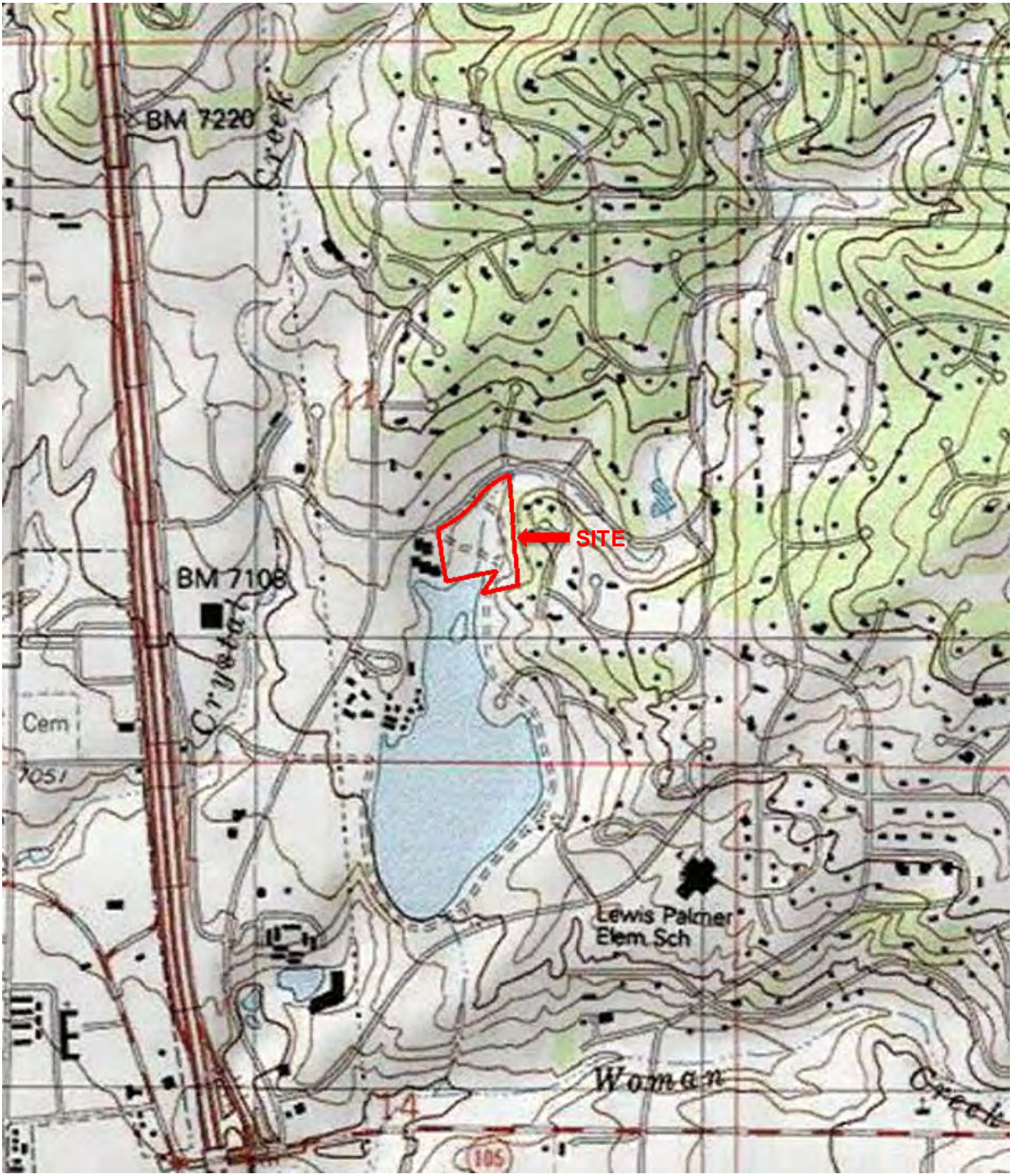
- Mineral and Natural Resource Extraction;
- Vegetation;
- Wetland Habitat and Waters of the U.S.
- Noxious Weeds;
- Wildfire Hazard;
- Wildlife;
- Federal and State Listed Candidate, Threatened and Endangered Species; and
- Raptors and Migratory Birds.

1.2 Site Location and Project Description

The Site is located approximately 0.7-mile northeast of Monument in El Paso County, Colorado. It is situated east of I-25, south of Deer Creek Road, west of Autumn Way, and it abuts the northern end of Woodmoor Lake. The Site is bounded on the north by Deer Creek Road, on the south by Deer Creek Road, and on the west by the Waterfront Townhomes. The Site is specifically located within Section 11, Township 11 South, Range 67 West in El Paso County, Colorado (refer to Figure 1).

The Applicant proposes to develop the Site as a planned community of 28 new townhomes units that recognizes and respects the distinctive character of the existing community and the adjacent ecosystem of Woodmoor Lake, including low density, spaciousness, open

atmosphere, uncluttered environments, natural terrain and vegetation, and a tranquil setting. In 1972, an approved plan for the Project proposed 110 units on 11.4 acres which resulted in a density of 9.6 dwelling units per acre. Throughout the '70s, two parcels were platted off of the overall, which included the existing Cove at Woodmoor Condos (20 units) and Waterside Condos (40 units). Lake Woodmoor Holdings acquired the land and if no changes to the original plan are made, the remaining 50 units could be developed as approved by the 1972 Development Plan. Because the desire is to maintain the character of the property and not develop within the floodway/plain, as well as the zoning in place being obsolete, the project proposes an attached townhome product with 28 units. Two points of access off of Deer Creek Road are proposed – one marrying up to Burning Oaks Way and the second at the northwest corner of the property that will utilize a bridge to cross the narrowest section of floodplain (refer to Figure 2).



USGS 7.5 min. Quad: Monument
Section 11, Township 11 South, Range 67 West
Latitude: 39.104922° N, Longitude: -104.856074° W

Figure 1 USGS SITE LOCATION MAP

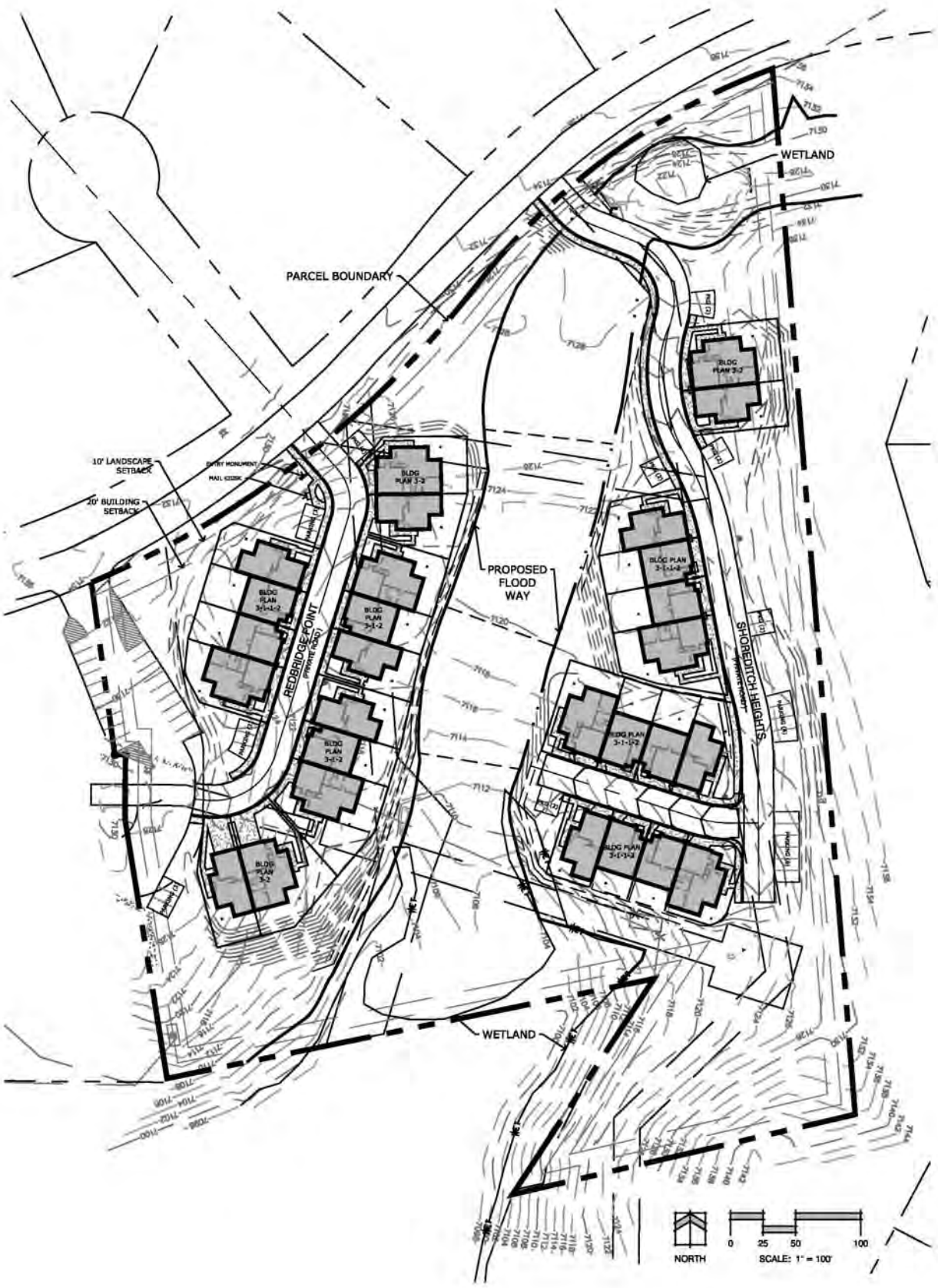


Figure 2 SITE PLAN

2.0 METHODOLOGY

Ecos performed an office assessment in which available databases, resources, literature and field guides on local flora and fauna were reviewed to gather background information on the environmental setting of the Site. We consulted several organizations, agencies, and their databases, including:

- Colorado Department of Agriculture (CDA) Noxious Weed List;
- Colorado Natural Heritage Program (CNHP);
- Colorado Oil and Gas Conservation Commission (COGCC) GIS Online;
- Colorado Parks and Wildlife (CPW);
- El Paso County 2000 Tri-Lakes Comprehensive Plan.
- Google Earth current and historic aerial imagery;
- Survey of Critical Biological Resources, El Paso County, Colorado;
- Survey of Critical Wetlands and Riparian Areas in El Paso and Pueblo Counties, Colorado;
- U.S. Army Corps of Engineers (USACE) 1987Corps of Engineers Wetlands Delineation Manual;
- USACE 2008 Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Great Plains Region;
- U.S. Fish and Wildlife Service (USFWS) Region 6;
- USFWS National Wetland Inventory (NWI);
- U.S. Geological Survey (USGS);
- Other pertinent references (refer to Section 8.0).

Ecos reviewed, and incorporated the requirements of the following regulations into, this Report:

1) El Paso County Land Development Code (circa 1991 - 1995) – The county still utilizes this old version as they have not yet updated current codes. Applicable Sections include:
    a. Section 35.13 – Development Requirements for Mineral and Natural Resource Extraction Operations: The developer must include a statement that no resource extraction will occur during the development of the Project;
    b. Section 51.5 – Wildlife Hazard and Vegetation Reports; and
    c. Section 51.6 – Streams, Lakes, Physical Features and Wildlife Habitats.
2) Current El Paso County Land Development Code (available on their website). Applicable Sections include:
    a. Chapter 6 General development Standards:
        i. Section 6.3.3 – Wildfire Mitigation;
        ii. Section 6.3.7 - Noxious Weeds;
        iii. Section 6.3.8 – Wetlands; and
        iv. Section 6.3.9 – Wildlife.
    b. Chapter 8 Subdivision Design, Improvements and Dedications:
        i. Section 8.4.2 Environmental Considerations:
            1. Item A.4. – Threatened and Endangered Species Compliance; and

2. Item B.1. - Hazards
    a. 100-year floodplain as identified by the applicant, review agency, or the Floodplain Administrator; and
    b. Wildfire hazards as identified on the County and State wildfire hazard inventory or maps.

3) El Paso County, Draft Procedures Manual (unpublished, provided by Kari Parsons). Applicable Sections include:
    a. Procedure # R-RE-002-08 – Wetlands Analysis Report;
    b. Procedure # R-RE-003-08 – Hazards Report (Floodplains and Wildfire information only); and
    c. Procedure # R-RE-004-08 – Wildlife Report.

Following the collection and review of existing data and background information, ecos conducted a field assessment of the Site on May 3, 2016. The purpose of the assessment was to compare background information with present-day conditions, ascertain the physical/ecological characteristics and conditions of the Site, identify potential environmental constraints associated with development improvements, and determine the presence/absence and approximate extent of the following features:

- Wildfire hazards pursuant to County and State definitions;
- Wetland habitat and other waters of the U.S. (i.e., lakes, ponds, streams) regulated under the Clean Water Act;
- Wildlife habitat:
    - CPW wildlife and sensitive wildlife habitat; and
    - USFWS listed threatened and endangered species habitat regulated under the Endangered Species Act;
- Significant topographic features;
- Noxious weed stands; and
- Vegetation Communities.

The office and onsite assessment data, the pertinent El Paso County regulations outlined above, and Natural Resource Assessment and Wetland report examples used in previous County land development review submittals (provided by Kari Parsons) were used in the preparation of the Report.

3.0 ENVIRONMENTAL SETTING

A review of the El Paso County 2000 Tri-Lakes Comprehensive Plan (El Paso County, 2000) revealed that the Site is within the Woodmoor Planning Area (Sub-Area #7). The Site contains no Colorado Natural Heritage Conservation Areas or Potential Conservation Areas according to the CNHP (CNHP, 2016), no Preservation Areas designated in the El Paso County 2000 Tri-Lakes Comprehensive Plan (El Paso County, 2000), and no Wildlife Refuges or Hatcheries according to the USFWS IPaC Trust Resources Report (USFWS, 2016a).

3.1 Topography

The topography of the Site trends is formed by two gentle ridges along the east and west sides of the Site, which forma natural drainage depression in the central portion of the Site that drains southward to Woodmoor Lake. It ranges from a high elevation of 7,140 feet above mean sea level (AMSL) in the southeastern corner to a low elevation of 7,098 AMSL along the south-central border of the Site.

3.2 Soils

Ecos utilized the U.S. Department of Agriculture, Natural Resource Conservation Service Web Soil Survey (USDA, NRCS, 2016) to determine if hydric soils are present within the Site, as this data assist in informing the presence/absence of potential wetland habitat regulated under the Clean Water Act. The soils data were also utilized to supplement the field observations of vegetation, as the USDA provides correlation of native vegetation species by soils types. Please refer to Appendix A.

The Site is comprised of the following soil types:

Map Unit Symbol & Name

- 1 – Alamosa loam, 1 to 3 percent slopes
- 41 - Kettle gravelly loamy sand, 8 to 40 percent slopes
- 71 - Pring coarse sandy loam, 3 to 8 percent slopes
- 111 - Water

Pursuant to the 2015 National Hydric Soil List for Colorado (USDA, NRCS, 2015) the Alamosa loam is listed by as a hydric soil; and the Kettle gravelly loamy sand and Pring coarse sandy loam contain hydric components that are frequently ponded for long duration or very long duration during the growing season that:

a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or;
b. Show evidence that the soil meets the definition of a hydric soil.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS, 1994) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in *Field Indicators of Hydric Soils in the United States* (USDA, NRCS, 2010).

3.3 Vegetation

The Site is located in a transitional area on west facing slopes between the ponderosa pine (*Pinus ponderosa*) woodlands of the Black Forest to the east and more grassland dominated

communities in lower areas to the west along I-25. The Black Forest region includes relict eastern American prairie and woodland plant communities with species otherwise unknown in Colorado except for some protected canyons in the outer Front Range (Weber, 2012). This hilly region supports pine- Gambel oak (*Quercus gambelii*) woodlands interspersed with native grasslands. Well-developed riparian communities occur along drainages that support plains cottonwood (*Populus deltoides*), narrowleaf cottonwood (*Populus angustifolia*), crack willow (*Salix fragilis*) and sandbar willow (*Salix exigua*), sedges, rushes and grasses. The area has historically been used for rangeland; however, residential development is increasing.

The Site has been almost entirely disturbed by previous development with remnant patches of native vegetation along the edges of the otherwise open, non-native grassland. Therefore, many of the species native to the region are absent or present in remnant stands.

3.3.1 Non-native Grassland Community

The majority of the Site is comprised of weedy non-native grassland. This area appears to have been cleared of native vegetation, disturbed by installation of infrastructure (culvert, utilities, access road, etc.), and re-vegetated. Vegetation appears to have been mowed at least once since the past growing season. The dominant species is smooth brome (*Bromus inermis*), a non-native grass commonly used for re-vegetation. Diffuse knapweed (*Centaurea diffusa*), a noxious weed, is abundant. Two other common noxious weeds are leafy spurge (*Euphorbia esula*) and common mullein (*Verbascum thapsus*). All noxious weed species observed onsite are discussed in more detail in the relevant section below. Other non-native species include alyssum (*Alyssum simplex*), clover (*Trifolium* sp.), and dandelion (*Taraxacum officinale*). Native species cover is less than five percent and includes curlycup gumweed (*Grindelia squarrosa*) and pussytoes (*Antennaria* sp.). There are small (10 to 15 feet tall) ponderosa pines scattered throughout the grassy area that appear to have been planted.

3.3.2 Native Foothills Ponderosa Pine Scrub

The eastern edge of the Site is vegetated with native Foothills Ponderosa Pine Scrub (pine-oak woodland). These dense, brushy areas are good habitat for wildlife. Woody overstory vegetation consists of ponderosa pine (~40% cover) and Gambel's oak (~30% cover). The herbaceous understory is dominated by a variety of native species including kinnikinnick (*Arctostaphylos uva-ursi*), field sagewort (*Oligosporus* pacificus (formerly *Artemisia campestris*)), vetch (*Astraglaus* sp.), and several species of grasses and asters. Smooth brome, a non-native grass, appears to be spreading from the adjacent grassland area and is common (~ 10% cover).

3.3.3 CNHP Vegetation Communities

Ecos reviewed the CNHP database and sorted the data for the Monument, Colorado 7.5-minute quadrangle, as that quadrangle includes the Site. We reviewed the Monument quadrangle data to determine the probability of the presence/absence of significant natural communities, rare plant areas, or riparian corridors that may be within the range of, and/or within, the Site and summarized them in Table 1 below. Based on this data and our onsite

assessment, and ecos has provided our professional opinion regarding the probability that these species may occur within the Site and their probability of being impacted by the Project.

TABLE 1 – CNHP VEGETATION COMMUNITIES POTENTIALLY IMPACTED BY THE PROJECT			
Species	**Status**	**Presence and Location**	**Probability of Impact by Project**
PLANT COMMUNITIES			
Montane Riparian Shrubland: Alnus incana / Mesic Graminoids Shrubland	State Rank: S2 (State imperiled)	This plant community does not occur within the Site	This plant community will not be impacted by the Project.
Xeric tallgrass prairie: Andropogon gerardii - Sporobolus heterolepis Western Foothills Herbaceous Vegetation	State Rank: S1 (State critically imperiled)	This plant community does not occur within the Site	This plant community will not be impacted by the Project.
Foothills Ponderosa Pine Savannas: Pinus ponderosa/ Carex inops ssp. heliophila Woodland	State Rank: S1 (State critically imperiled)	This plant community does not occur within the Site	This plant community will not be impacted by the Project.

TABLE 1 – CNHP VEGETATION COMMUNITIES POTENTIALLY IMPACTED BY THE PROJECT			
Species	**Status**	**Presence and Location**	**Probability of Impact by Project**
Foothills Ponderosa Pine Scrub Woodlands: Pinus ponderosa /Quercus gambelii Woodland	State Rank: S5 (State demonstrably secure)	Occurs along the north and northeastern fringes of the Site.	Certain Ponderosa pine trees and Gambel oak shrubs will likely be impacted by the Project.
Mixed Mountain Shrublands: Quercus gambelii - Cercocarpus montanus / (Carex geyeri) Shrubland	State Rank: S3 (State rare or uncommon)	This plant community does not occur within the Site	This plant community will not be impacted by the Project.
Mesic Oak Thickets: Quercus gambelii / Carex inops Shrubland	State Rank: SU (Unrankable; status cannot be determined at this time)	This plant community does not occur within the Site	This plant community will not be impacted by the Project.
Coyote Willow/Mesic Graminoid: Salix exigua / Mesic Graminoids Shrubland	State Rank: S5 (State demonstrably secure)	Jurisdictional wetland/waters dominated by Salix exigua occur along the eastern side of the Site adjacent to Woodmoor Lake (refer to Figure 5).	The jurisdictional wetland/waters along the eastern side of the Site adjacent to Woodmoor Lake have been delineated and will be avoided (i.e., no impact).
Snowberry Shrubland: Symphoricarpos occidentalis Shrubland	State Rank: S4 (State apparently secure)	This plant community does not occur within the Site	This plant community will not be impacted by the Project.

3.4 Wetland Habitat and Waters of the U.S.

3.4.1 Methodology

Ecos utilized the National Wetland Inventory (NWI), Wetlands Mapper (USFWS 2016c), the Survey of Critical Wetlands and Riparian Areas in El Paso and Pueblo Counties, Colorado (CNHP, 2001), the El Paso County Wetland Map (El Pas County 2016), historic and current Google Earth aerial photography, the USGS 7.5-minute topographic mapping (COGCC, 2016), and detailed Project topographic mapping to screen the Site for potential wetland habitat and waters of the U.S. The Site contains no Wetland and Riparian Conservation Areas or Potential Wetland and Riparian Conservation Areas according to the CNHP (CNHP, 2001).

The mapping data above were compiled onto the base topographic map for the Site (i.e., all potential wetland habitat and waters were located via their topographic signature and outlined), then proofed during the filed assessment to determine the presence/absence of potential wetland habitat and waters of the U.S. Once a feature was verified to be present, ecos determined whether it is a jurisdictional wetland/waters under the Clean Water Act (CWA) and delineated the jurisdictional boundaries (Figure 5). The U.S. Army Corps of Engineers, wetland delineation methodology was employed to document the 3 field indicators (parameters) of wetland habitat (i.e., wetland hydrology, hydric soils and a predominance of hydrophytic vegetation as explained in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and supplemented by the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Great Plains Region* (USACE, 2008).

3.4.2 Field Assessment Findings

The data review above revealed the presence of two (2) potential areas of wetland habitat (Figure 5). Ecos assessed the two areas and determined they are jurisdictional wetland habitat under the CWA as they are tributary to the jurisdictional waters of Monument Creek (via Dirty Woman Creek) on the west side of I-25. Therefore, these natural features meet the criteria that the Corps uses to assert jurisdiction, as they are:

- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and
- Wetlands that directly abut such tributaries.

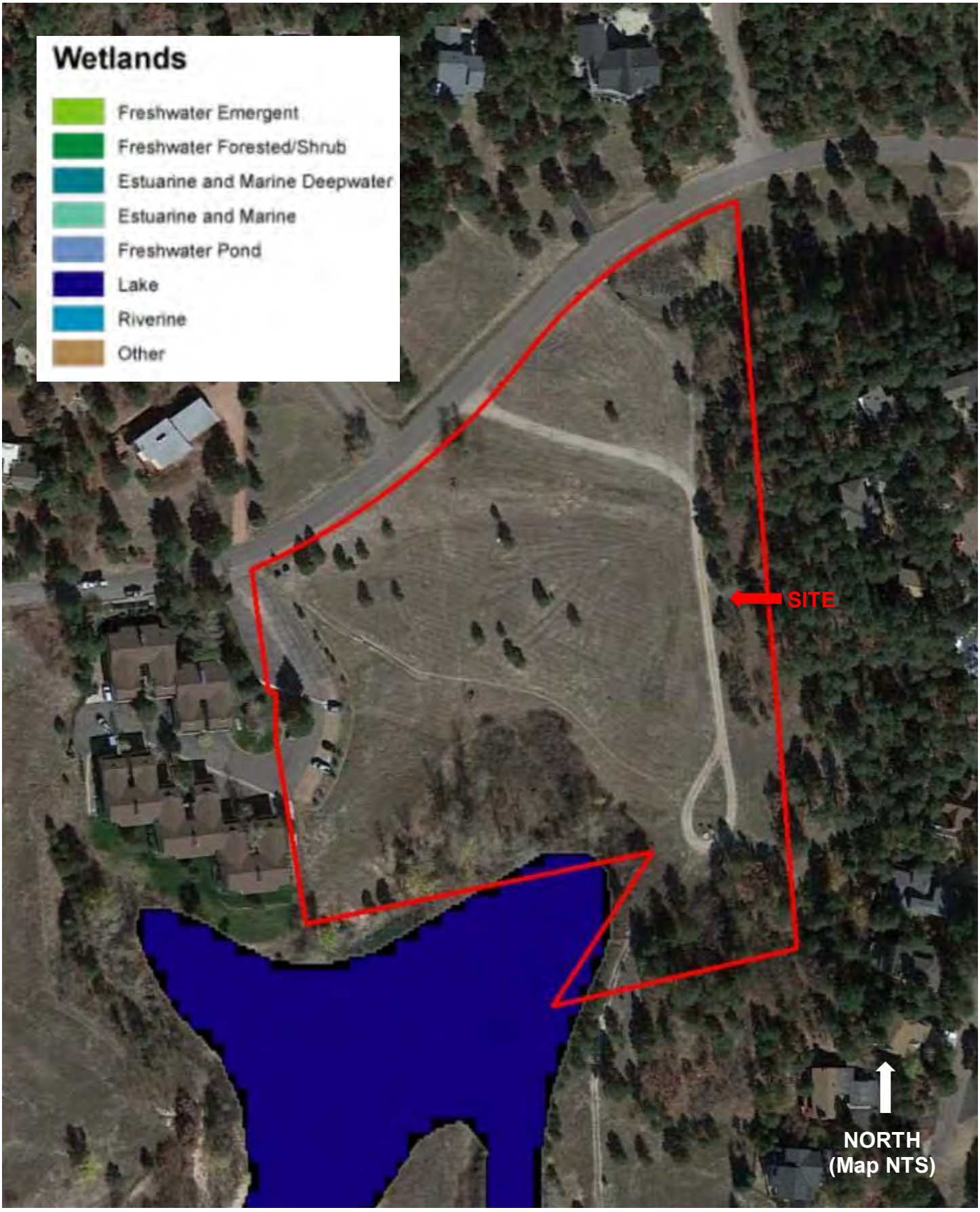
The jurisdictional wetland area data is summarized below, with an explanation of the field indicators (parameters) of wetland habitat that were observed and documented.

1) Jurisdictional wetland habitat and waters of the U.S. – There are two wetland areas on Site, a small detention basin and a wetland fringe along the north shore of Woodmoor Lake (1a. and 1b. below). These features are jurisdictional, as they are tributary to Monument Creek (via Dirty Woman Creek), a documented, jurisdictional waters of the U.S.

a. PFO1/PEM northeast detention basin – There is a small detention basin located in the northeast corner of the Site, immediately south of Deer Creek Road. The dominant species are sandbar willow and American yellowrocket (*Barbarea orthoceras*). Most of the willows are dead, likely due to occasional prolonged flooding. Field indicators of hydric soils were observed at sampling point (SP) WD5-W as follows: 7.5 YR 4/1 clay loam with 7.5YR 5/1 depletions from 0-3 inches and 7.5 YR 3/2 sandy clay with 7.5YR 3/1 depletions and 5YR 4/6 concentrations from 3-7 inches. The predominantly clay soils have a red-parent material that does not match the mapped soil type and may have been imported for construction of the basin. The basin appears to have been constructed along an historic minor drainage (constructed prior to 1999 based on aerials reviewed). Surface flow provides the primary sustaining hydrology; and groundwater likely still flows into the basin, as evidenced by willows growing along the north bank of the detention basin. The basin drains to the west via a culvert (24" CMP) that is set in a headwall approximately 24" above the bottom of the basin. The culvert continues west, then turns south, and flows into Woodmoor Lake. During the Site visit, there was no surface water in the basin, but sustaining wetland hydrology was evident as soil saturation at 10-inches and water marks extending 24" up the headwall. This area meets all 3 parameters for jurisdictional wetland habitat.

b. PSS/PF01/PEM wetland complex adjacent to Woodmoor Lake – There is a well-developed area of riparian vegetation along the north edge of Woodmoor Lake. This structurally diverse vegetation is excellent wildlife habitat, particularly for birds. The area is characterized by dense palustrine scrub-shrub vegetation with approximately 65 percent cover of sandbar willow and five percent cover of Rocky Mountain willow (*Salix monticola*). The tree canopy consists of plains cottonwood with approximately 20% cover. There are also a few ponderosa pines on the upland edges. There is a small cluster of non-native Russian olive (*Elaeagnus angustifolia*) trees on the lake shore and slightly south of the Site boundary. The dense willows limit the growth of herbaceous vegetation. The wettest areas along the shore have fewer willows and more herbaceous plants; emergent wetland species are common including cattail (*Typha latifolia*), Nebraska sedge (*Carex nebrascensis*), water sedge (*C. aquatilis*) and Emory's sedge (*C. emoryii*). Soil samples indicate the presence of field indicators of hydric soils. Observed soils at SP W1 -W were 10YR 5/1 silty sand from 0-6 inches and 10YR 6/1 silty clay with sand from 6-18 inches. Soils at SP W23-W were 10YR 3/2 silty sand from 0-10 inches and 10YR 4/1 silty sand from 10-16 inches. Sustaining hydrology for this wetland comes from Woodmoor Lake, the culvert from the northeast detention basin, and water from the slopes to the north. At SP W1-W, the lake provides sustaining hydrology and soil was saturated at a depth of six inches. At SP W23-W, the source of water is drainage from adjacent slopes and soil was saturated at a depth of 4 inches. This area meets all 3 parameters for jurisdictional wetland habitat.

Figure 3 COUNTY WETLAND MAP



Source: U.S fish and Wildlife Service

Figure 4 NATIONAL WETLAND INVENTORY MAP

C:\Users\Jon Dauzvardis\Documents\0-EcoS\0-Projects\2016-11-1 La Plata - The Cove\Mapping\CAD\ecos_thecove_basemap_5-16-16.dwg

FIGURE 5

NORTH BAY AT LAKE WOODMOOR
ECOLOGICAL ASSESSMENT

WETLAND SURVEY MAP

NO:	REVISIONS:	DATE:	BY:
#1			
#2			
#3			
#4			

DRAWN BY:
CHECKED BY:
DATE: 5-16-16
PROJECT NO: 2016-11-1

ecos ecosystem services
1455 Washburn Street
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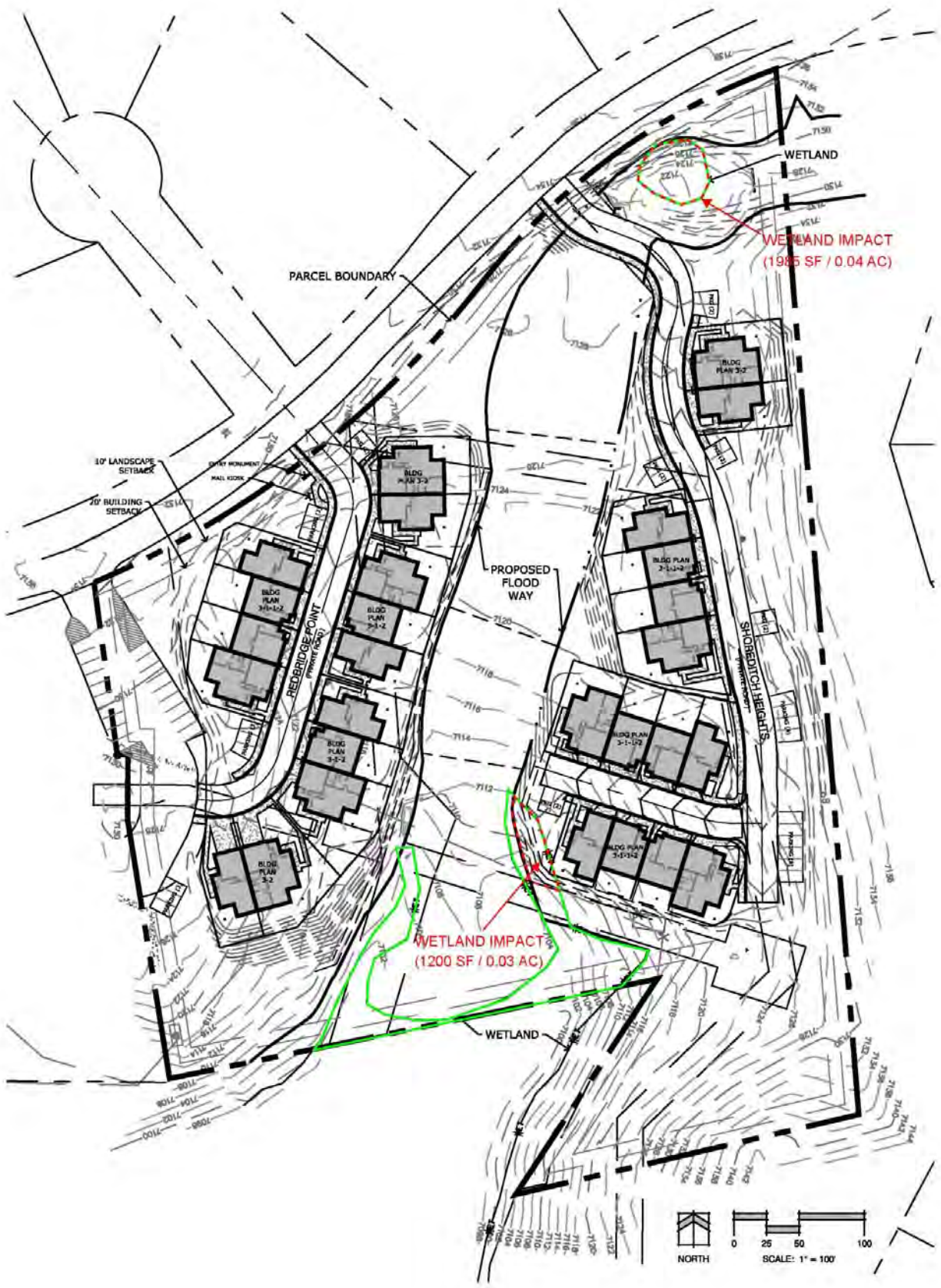


Figure 5B

WETLAND SURVEY with SITE PLAN

3.5 Noxious Weeds

3.5.1 Regulatory Background

The Colorado Department of Agriculture maintains a list of noxious weed species (CDA, 2016) and works with counties to manage noxious weeds. Weeds management on Site must follow County requirements, including the "El Paso County Noxious Weeds and Control Methods" report (El Paso County, 2015b).

There are four CDA categories of noxious weeds:

- List A: Rare species that are designated for eradication.
- List B: Species with limited distribution that have management plans designed to stop their continued spread. Control measures vary depending on location.
- List C. These species are well-established in Colorado. Species management plans are designed to support the efforts of local governing bodies to facilitate more effective integrated weed management. The goal of such plans is not to stop the continued spread of these species, but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.
- Watch List Species are those may pose a potential threat to the agricultural productivity and environmental values. The Watch List is intended to serve advisory and educational purposes only. Its purpose is to encourage the identification and reporting of these species to the Commissioner in order to assist in determining which species should be designated as noxious weeds.

3.5.2 Noxious Weed Survey Results

Noxious weeds were abundant in the non-native grassland and common in the wetland areas (Figure 6). No noxious weeds were observed in the pine-oak woodlands. Diffuse knapweed was the most abundant weed species with many large patches throughout the Site, typically in moderately moist open areas such as swales in the grassland areas and on upland slopes adjacent to wetlands. Leafy spurge occurs in similar habitat, but is less common. Common mullein is the second most common noxious weed, occurring in low density throughout relatively dry areas. Canada thistle is present in the detention basin and at the downstream culvert outfall near Woodmoor Lake. The remaining weed species were only observed in isolated areas. Field bindweed is limited to a small area along Deer Creek Road. There is a small patch of perennial sowthistle (*Sonchus arvensis*) near the detention basin. There is a large patch of musk thistle near the center of the Site. A stand of Russian olive is present on the lake shore, along the south edge of the Site. Weeds diversity is highest in open areas in or near wetlands. Additional weeds will likely be observable later in the growing season.

No noxious weed species on the Colorado Department of Agriculture List A or the Watch List were observed on the Site (CDA 2016).

Five List B noxious weed species (CDA 2016) were observed on the Site (listed in order of abundance):

- diffuse knapweed (*Centaurea diffusa*);

- leafy spurge (*Euphorbia esula*)
- Canada thistle (*Cirsium arvense*);
- Russian-olive (*Elaeagnus angustifolia*); and
- musk thistle (*Carduus nutans*).

Three List C noxious weed species (CDA 2016) were observed on Site (listed in order of abundance):

- common mullein (*Verbascum thapsus*);
- perennial sowthistle (*Sonchus arvensis*); and
- field bindweed (*Convolvulus arvensis*).

3.5.2 Noxious Weed Management Plan

Per the El Paso County Noxious Weed and Control Methods document (El Paso County, 2015b): "*The most effective way to control noxious weeds is through Integrated Pest Management (IPM). IPM incorporates weed biology, environmental information, and available management techniques to create a management plan that prevents unacceptable damage from pests, such as weeds, and poses the least risk to people and the environment. IPM is a combination of treatment options that, when used together, provide optimum control for noxious weeds; however, IPM does not necessarily imply that multiple control techniques have to be used or that chemical control options should be avoided.*

- *Prevention: The most effective, economical, and ecologically sound management technique. The spread of noxious weeds can be prevented by cleaning equipment, vehicles, clothing, and shoes before moving to weed free areas; using weed-free sand, soil, and gravel; and using certified weed free seed and feed.*
- *Cultural: Promoting and maintaining healthy native or other desirable vegetation. Methods include proper grazing management (prevention of overgrazing), re-vegetating or re-seeding, fertilizing, and irrigation.*
- *Biological: The use of an organism such as insects, diseases, and grazing animals to control noxious weeds; useful for large, heavily infested areas. Not an effective method when eradication is the objective, but can be used to reduce the impact and dominance of noxious weeds.*
- *Mechanical: Manual or mechanical means to remove, kill, injure, or alter growing conditions of unwanted plants. Methods include mowing, handpulling, tilling, mulching, cutting, and clipping seedheads.*
- *Chemical: The use of herbicides to suppress or kill noxious weeds by disrupting biochemical processes unique to plants."*

The majority of the Site will be disturbed during construction and then landscaped. This includes areas where weeds are most abundant (the non-native grassland and northeast detention pond) (Figure 6). Native pine-oak woodland would be preserved along the eastern edge and riparian vegetation would be preserved along the southern edge. The Site development plan should include measures to prevent introducing new weeds and spreading existing weeds during construction (see prevention measures above). Soil from areas with

existing weeds, such as the grassy uplands and the detention basin, should not be pushed into the natural areas along the Site perimeter.

Noxious weeds are most likely to become established in areas where the native vegetation and soil have been disturbed by construction. Thus, restoring and maintaining desirable vegetation should always be a priority for weed control. Desirable vegetation may consist of native plant communities or landscaped areas. Within the preservation areas, all areas of noxious weeds and other non-native species should be removed, these areas should then be seeded or planted with native species. Repeated mowing/cutting and applications of herbicide may be needed to eliminate weeds prior to planting. Re-vegetation and landscaping should be completed as soon as possible following construction so that weeds do not become established. Following construction, the Homeowner's Association (HOA) will be responsible for weed control.

Weed management recommendations for the species observed on the Site are summarized in Table 2. Refer to the El Paso County "Noxious Weed and Control Methods" booklet for additional detail (El Paso County, 2015b).

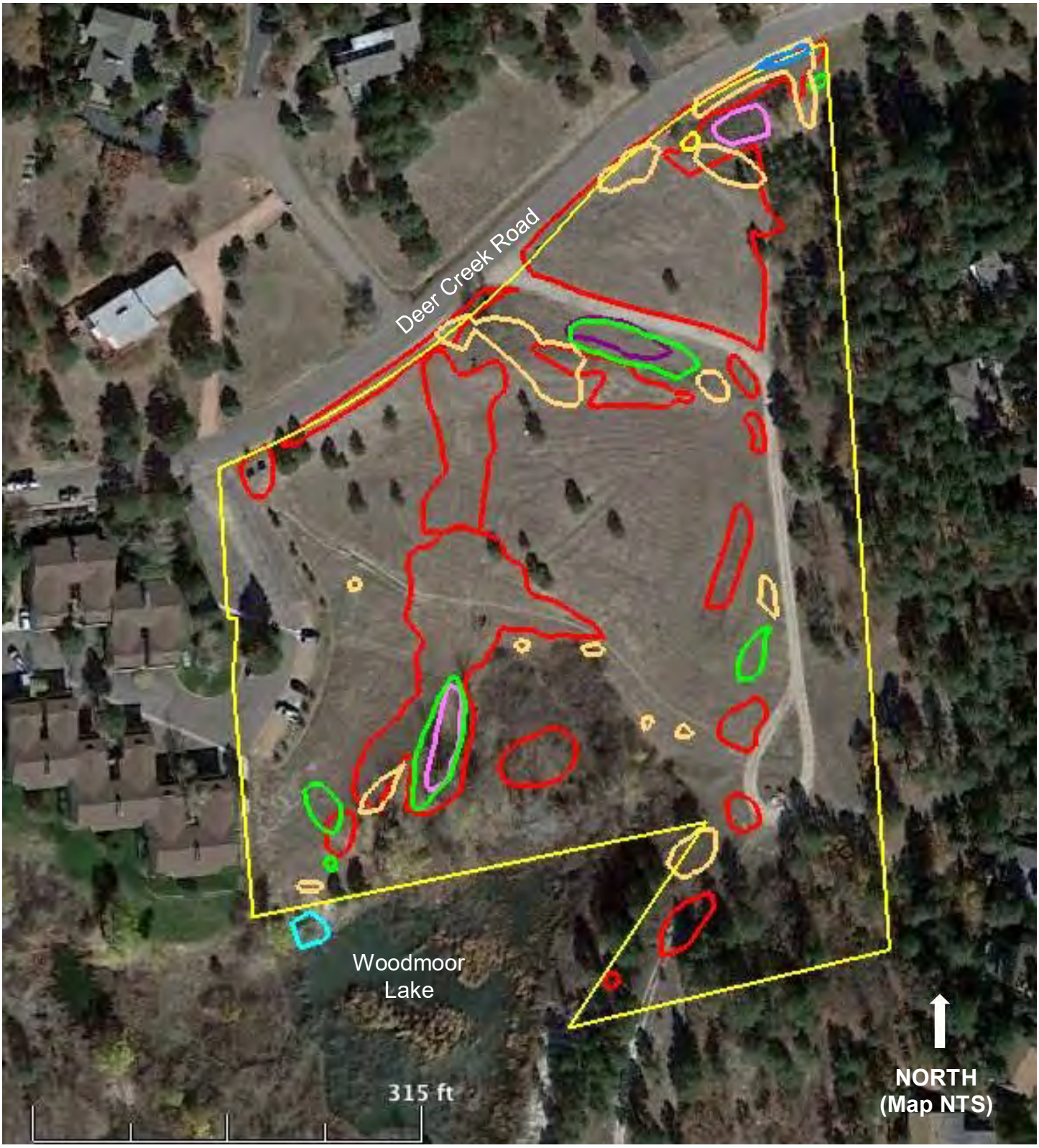
TABLE 2 – NOXIOUS WEED MANAGEMENT SUMMARY

Species	Occurrence	Management[1,2]
LIST B		
Canada thistle (*Cirsium arvense*)	Uncommon. Present in two moderately wet habitats, the detention basin and below the downstream outflow culvert near Woodmoor Lake.	Mowing combined with herbicide treatment. Mow every 10 to 21 days during the growing season to prevent seeding. Only use herbicides and formulations approved for use near water.
Diffuse knapweed (*Centaurea diffusa*)	Abundant. Many large patches throughout, generally in relatively moist areas.	Mowing can reduce seed production, and revegetation with other species can reduce knapweed. Some herbicide treatment is typically required for total control. Only use herbicides and formulations approved for use near water. Biological control is available but takes 3 to 5 years.
Leafy spurge (*Euphorbia esula*)	Common. Scattered throughout in relatively low-lying, moist areas.	Herbicide treatment is most effective. Only use herbicides and formulations approved for use near water. Mowing can reduce seed production. Biological control using flea beetles is available.

TABLE 2 – NOXIOUS WEED MANAGEMENT SUMMARY		
Species	**Occurrence**	**Management[1,2]**
Musk thistle (*Carduus nutans*)	Uncommon. One moderate sized patch observed in the northeast portion of the Site.	This species may be totally removed by construction. Severing the root below the soil surface is effective. Mowing is most effective at full bloom, but flowering plant parts must be disposed of properly to prevent seed development. Spring herbicide treatment is also effective.
Russian-olive (*Elaeagnus angustifolia*)	Uncommon. One small cluster of trees on the bank of Woodmoor Lake, may not extend onto the Site.	Cut any trees within the Site boundaries, then immediately treat stumps with herbicide to prevent re-sprouting. Only use herbicides and formulations approved for use near water.
LIST C		
Common mullein (*Verbascum thapsus*)	Common. Scattered throughout, generally in low density and in drier areas.	Establish other vegetation and minimize disturbance to prevent existing seeds from sprouting in bare soil. Mow to prevent bolting and flowering. Use herbicide to kill existing rosettes.
Field bindweed (*Convolvulus arvensis*)	Uncommon. Only observed in one area along Deer Creek Drive.	Do not spread soils where this species occurs to other parts of the Site. Herbicide treatment after full bloom and/or in fall. Early and aggressive control is recommended to prevent this tenacious species from spreading.
Perennial sowthistle (*Sonchus arvensis*)	Uncommon. One small patch observed near the detention pond.	Mowing to prevent seeding combined with herbicide treatment to kill existing plants. Only use herbicides and formulations approved for use near water.

[1]Refer to the El Paso County "Noxious Weed and Control Methods" booklet for additional detail (CDA, 2015b).

[1]When using herbicides, always read and follow the product label to ensure proper use and application.



LEGEND:

- Canada thistle (*Cirsium arvense*)
- Diffuse knapweed (*Centaurea diffusa*)
- Leafy spurge (*Euphorbia esula*)
- Musk thistle (*Carduus nutans*)
- Russian olive (*Elaeagnus angustifolia*)
- Common mullein (*Verbascum thapsus*)
- Field bindweed (*Convolvulus arvensis*)
- Perennial sowthistle (*Sonchus arvensis*)

Figure 6 ECOS NOXIOUS WEED MAP

3.6 Wildfire Hazard

One stated purpose and intent of the "El Paso County Development Standards" for "Fire Protection and Wildfire Mitigation" is implementation of wildfire hazard reduction in new development (El Paso County, 2015a). The Site was evaluated for wildfire hazards based on two references:

1) The El Paso County Fire Hazard Classification Map (El Paso County, 2007) (Figure 7) is based on the Colorado Vegetation Classification Project data. The two fire hazard classifications are:
    a. "Low Hazard – Non Forested (No vegetation, Grass and Brush)"; and
    b. "High Hazard – (Deciduous and Conifer/Evergreen)."

    Most of the Site consists of non-native weedy grassland that is mapped as Low Hazard. The forested areas along the east and south sides of the Site are mapped as High Hazard. The mapping is general and does not correspond exactly with the current Site conditions.

2) The El Paso County "Forest Health and Ecology Guide" (El Paso County, 2016) "Wildfire Mitigation" section outlines recommendations to protect homes from wildfire based on three zones. County recommendations for each zone are summarized below, followed by Site-specific information. The initial landscaping plan generally complies with the zone requirements. As the landscaping is refined, the zone requirements should be incorporated more consistently. See the "Forest Health and Ecology Guide" for additional information.

    - *Zone 1 is the area nearest the home, and requires the greatest hazard reduction. Most flammable vegetation should be removed a minimum of 15 to 30 feet from the structure.*

      All but one of the proposed new buildings would be constructed in grassy, landscaped areas. Portions of most buildings along the east side of the property would be close to pine-oak woodland, but buffered from them by a road and parking spaces. The northeastern-most building would be constructed within the pine-oak woodland area, but the area immediately surrounding the building would be cleared and graded. Zone 1 in front of each building typically consists of paved areas (sidewalk and road). Unit owners would be responsible for landscaping and maintaining their own back- and side-yards which extend up to 30 feet from the buildings. The Zone 1 fire hazard requirements should be included in the Home Owner's Association (HOA) covenant. Maintenance of common areas of the Site would be the responsibility of a property management company.

    - *The Zone 2 wildfire mitigation area reduces potential fire hazards for a distance of 30 to 100 feet from any structures. In this zone any stressed, diseased, dead or dying trees and shrubs should be removed. Trees should be thinned to a distance of at least 10 feet apart* (average) *from one another (crown to crown). All tree branches should be pruned 10 feet above the ground. Grasses should be mowed to a height of 6 inches or less during the fire season and in the fall.*

      The native forested areas along the east and south edges of the Site are valuable habitat for native wildlife and plants. Thus, thinning these areas would negatively impact

native plant and wildlife species. Additionally, much of the vegetation in Zone 2 will be removed by grading. Thus Zone 2 mitigation should primarily be addressed by limiting new plantings and removing non-native species. Removal of native vegetation should be limited.

Most of the native forested habitat along the east side of the Site is separated from buildings by a road and parking spaces. However, Zone 2 mitigation should be completed around the northeastern building to a minimum distance of 55 feet. Periodic cutting of native herbaceous species prior to fire season is recommended for the pine-oak woodland. This will mimic the natural removal of vegetation by wildfires and can be beneficial to native plants. This should be done on an annual basis around the northeastern-most building and every two to three years in other areas. Any dead shrubs or trees should be removed at this time.

Zone 2 mitigation along the south edge of the Site should be implemented on any of the drier sloped areas below the buildings to a distance of 85 feet. Within flat or wetland areas, the Zone 2 mitigation should be reduced to the minimum distance of 30 feet.

- *Zone 3 is the gradual transition from defensible space to natural forested area that extends from Zone 2 to the property lines. Trees of various ages, sizes, and species should be cultivated with varying density. Ladder fuels such as logs, branches, wood chips, pine needles, leaves and grasses should be minimized under tree canopies. It is not necessary to mow grasses in Zone 3. Dead trees, or snags, can be left either standing or fallen to provide habitat for wildlife.*

  This type of area occurs only in the southern-most portion of the Site, in the riparian vegetation and wetlands adjacent to Woodmoor Lake. Non-native species such as Russian olive, smooth brome, and diffuse knapweed, should be eliminated and replaced with native species to prevent establishment of more weeds. Removal of ladder fuels in this area should be limited to removal of non-native vegetation and any highly flammable brush piles or debris.

A second purpose of the Fire Protection and Wildfire Mitigation standards is to ensure that adequate fire protection in new development (El Paso County, 2015a). The North Bay at Lake Woodmoor development will be provided fire protection services by the Tri-Lakes Monument Fire Protection District (TLMFPD). TLMFPD provides fire, rescue and emergency medical services, and public education to the Tri-Lakes and Monument regions of Northern El Paso County. The TLMFPD is career fire department and has approximately 50 firefighter/emergency medical technicians (EMTs)/paramedics. Fire Marshal John Vincent of the TLMFPD provided a *Commitment Letter to Provide Fire and Emergency Services* to the Project (formerly known as The Cove at Woodmoor) (Appendix B).

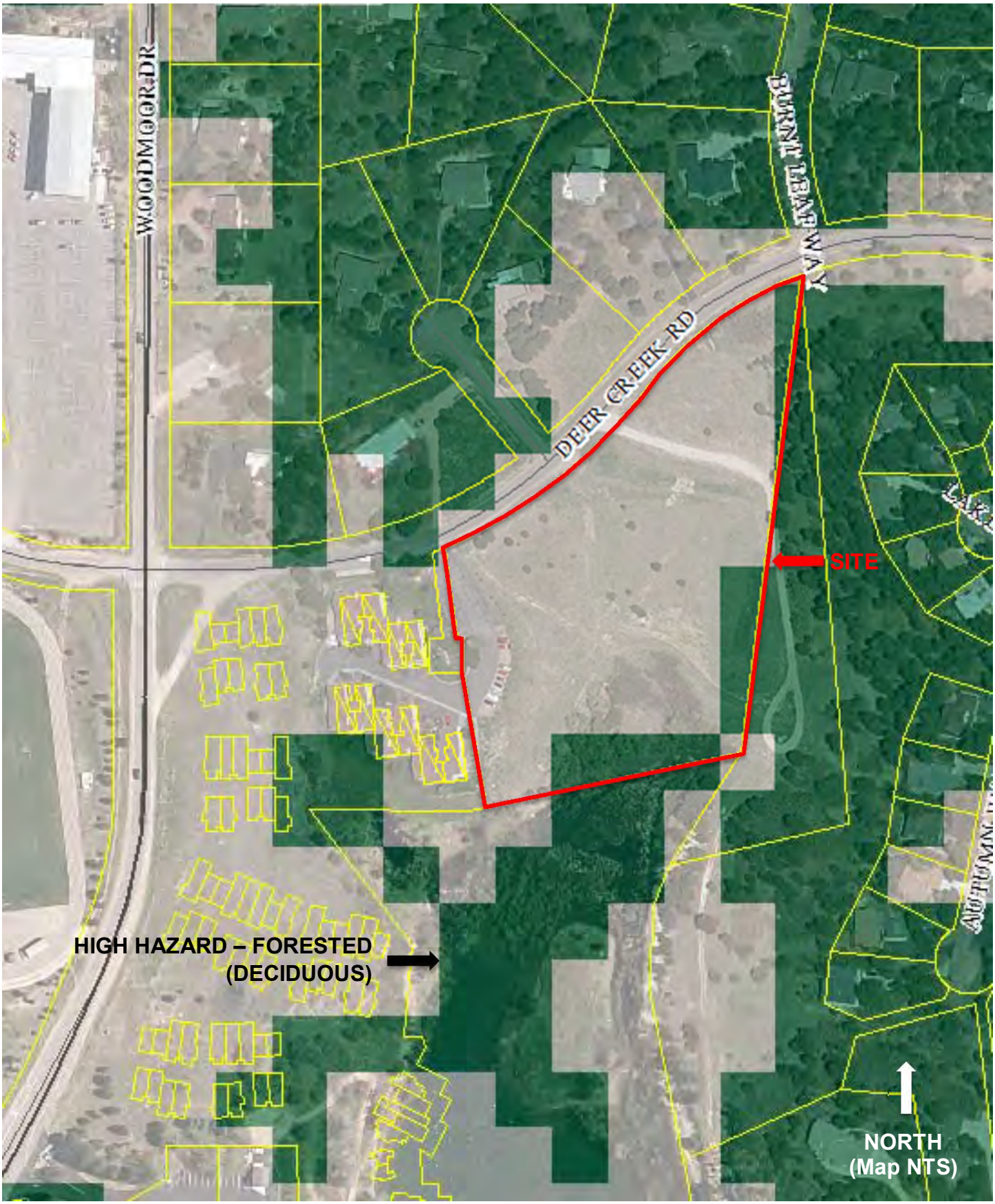
The TLMFPD stations include:

- Station 1, 18650 Highway 105, Monument, CO 80132
- Station 2, 18460 Roller Coaster Road, Monument, CO 80132
- Station 3 1855 Woodmoor Dr., Monument, CO 80132

The Project is located less than ½ mile from Station 3.

TLMFPD has an ISO insurance rating of 3 for all hydrant community properties located within 5 miles from one of their Stations and within 1,000 feet of a fire hydrant. Cistern-supported areas with fire hydrants can qualify for a Class 3 rating provided there is a minimum of 30,000 gallons of water in the cistern. All other properties are insurance rating Class 3Y. TLMFPD is supported by a levy on local property tax bills.

TLMFPD also participates in the "North Group." The North Group is a collection of fire departments within and around El Paso County, dedicated to assisting each other and providing resources during large incidents such as wildland fires, structure fires, hazardous material incidents etc.



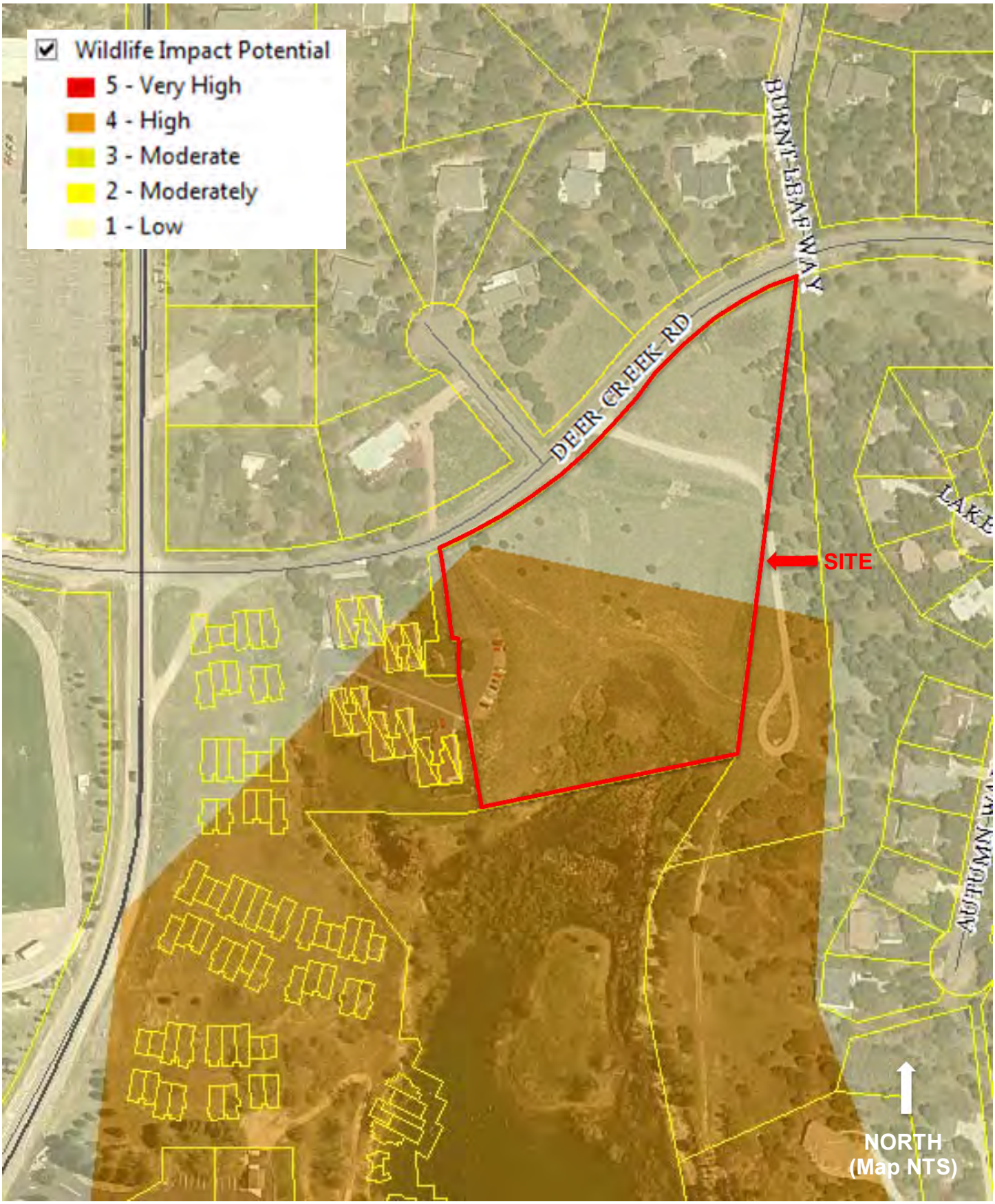
Source: El Paso County

Figure 7 COUNTY FIRE HAZARD CLASSIFICATION MAP

3.7 Wildlife Communities

The stated purpose and intent of the "El Paso County Development Standards" wildlife section is to ensure that proposed development is reviewed with consideration of the impacts to wildlife and wildlife habitat, and to implement the provisions of the Master Plan (El Paso County, 2015a). Based on the GIS mapping provided by El Paso County, the "Wildlife Impact Potential" for portions of the Site near Woodmoor Lake is classified as high (Figure 8). This includes all of the wetland and riparian habitat and most of the pine-oak woodland on the Site. This classification is generally consistent with the current Site conditions except that it extends farther north and west than the existing high quality wildlife habitat. Excluded from the mapping is a strip of high to moderate quality pine-oak woodland habitat along the northeast edge of the Site.

The pine-oak woodlands and riparian habitat are high quality habitat for birds. The Site also provides habitat for mammals including rodents, deer, and carnivores. The area is suitable year-round range for mule deer. The Site also provides habitat for predators such as coyote and red fox. A large beaver lodge is located in Woodmoor Lake near the southern edge of the Site and there were signs of beavers feeding near Woodmoor Lake.



Source: El Paso County

Figure 8 COUNTY WILDLIFE IMPACT POTENTIAL MAP

4.0 STATE, CNHP AND FEDERAL LISTED SPECIES

A number of species that occur in El Paso County are listed as candidate, threatened or endangered by the USFWS (USFWS 2016a and 2016b) and the CPW (CPW, 2016). Ecos compiled the special status species for the Site in Table 3 based on the data sources listed above, as well as the Site-specific, USFWS IPaC Trust Resources Report we ran for the Project (Appendix C); the CNHP data we compiled for the Monument, Colorado 7.5-minute quadrangle (CNHP, 2016); and our onsite assessment. Ecos has provided our professional opinion regarding the probability that these species may occur within the Site and their probability of being impacted by the Project.

The likelihood that the Project would impact any of the species listed below is low to none. Most are not expected occur in the project area and no downstream impacts are expected. The Preble's mouse is discussed in more detail below because there is USFWS designated Critical Habitat nearby. Since there is low potential for the project to impact CNHP-listed plants, this group of species is also discussed in more detail.

TABLE 3 - STATE AND FEDERAL PROTECTED SPECIES POTENTIALLY IMPACTED BY THE PROJECT

Species	Status	Habitat Requirements and Presence	Probability of Impact by Project
FISH			
Arkansas darter (*Etheostoma cragini*)	Federal: Candidate State: Threatened	Shallow, clear, cool water, sand or silt bottom streams with spring-fed pools and abundant rooted aquatic vegetation. During late summer low-water periods when streams may become intermittent, populations persist in large, deep pools.	None. Suitable habitat does not occur on Site and downstream impacts are not expected.
Flathead chub (*Platygobio gracilis*)	State: Special Concern	Turbid flowing (moderate to strong current) waters in main channels of small to large rivers; in shallow to fairly deep water over mud, rock, or sand. May move into smaller streams to spawn	None. Suitable habitat does not exist on the Site.
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	Federal: Threatened State: Threatened	Cold, clear, gravely headwater streams and mountain lakes that provide an abundant food supply of insects.	None. Suitable habitat does not exist on the Site.
Pallid sturgeon (*Scaphirhynchus albus*)	Federal: Endangered	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed project is not in the watershed for any of the listed river basins.

TABLE 3 - STATE AND FEDERAL PROTECTED SPECIES POTENTIALLY IMPACTED BY THE PROJECT			
Species	**Status**	**Habitat Requirements and Presence**	**Probability of Impact by Project**
REPTILES AND AMPHIBIANS			
Northern leopard frog (*Rana pipiens*)	State: Special concern State Rank: Vulnerable to Extirpation (S3)	Wet meadows and the banks and shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	Low. The proposed project would mostly avoid impacts to onsite wetland habitat.
BIRDS			
Bald eagle (*Haliaeetus leucocephalus*)	Federal: Delisted State: Threatened	Reservoirs and rivers are the typical habitat, but may nest in large trees in uplands. In winter, they may also occur locally in semi-deserts and grasslands, especially near prairie dog towns.	Very Low: No nests or winter roost areas are mapped within one mile of the Site on the COGCC database (2016). Impacts to Woodmoor Lake, a potential foraging area, would be minimal.
Least tern (*Sternula antillarum*)	Federal: Endangered State: Endangered	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed project is not in the watershed for any of the listed river basins.
Mexican spotted owl (*Strix occidentalis lucida*)	Federal: Threatened State: Threatened	Mature, old-growth forests of white pine, Douglas fir, and ponderosa pine; steep slopes and canyons with rocky cliffs. The closest USFWS designated Critical habitat is over 5 miles southwest of the Site in mountainous terrain (USFWS, 2016b).	None. Suitable habitat does not exist on the Site.
Peregrine falcon (*Falco peregrinus anatum*)	State: Special Concern	Breed in open landscapes with cliffs (or skyscrapers) for nest sites. During migration and in winter they occur in nearly any open habitat, but with a greater likelihood closer to the mountains or water bodies.	None. No suitable nesting habitat on Site.

TABLE 3 - STATE AND FEDERAL PROTECTED SPECIES POTENTIALLY IMPACTED BY THE PROJECT			
Species	**Status**	**Habitat Requirements and Presence**	**Probability of Impact by Project**
Piping plover (*Charadrius melodus*)	Federal: Threatened State: Threatened	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed project is not in the watershed for any of the listed river basins.
Western burrowing owl (*Athene cunicularia*)	State: Threatened	Occurs in grasslands in, or near, prairie dog towns.	None. Suitable habitat does not exist on the Site.
Whooping crane (*Grus americana*)	Federal: Endangered State: Endangered	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed project is not in the watershed for any of the listed river basins.
MAMMALS			
Black-tailed prairie dog (*Cynomys ludovicianus*)	State: Special Concern	Form large colonies or "towns" in shortgrass or mixed prairie.	None. No prairie dogs were observed on the Site.
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	Federal: Threatened State: Threatened State Rank: Critically Imperiled (S1)	Inhabits well-developed riparian habitat with adjacent, relatively undisturbed grassland communities, and a nearby water source. Well-developed riparian habitat includes a dense combination of grasses, forbs and shrubs; a taller shrub and tree canopy may be present. Has been found to regularly use uplands at least as far out as 100 meters beyond the 100-year floodplain.	Very low. No USFWS Critical Habitat or CPW mapped occupied range on the Site. The Site is physically separated from Critical Habitat along Dirty Woman Creek by existing development, and there are no viable travel corridors to the Site. This species is unlikely to occur on the Site.

TABLE 3 - STATE AND FEDERAL PROTECTED SPECIES POTENTIALLY IMPACTED BY THE PROJECT			
Species	**Status**	**Habitat Requirements and Presence**	**Probability of Impact by Project**
Swift fox (*Vulpes velox*)	State: Special Concern	Shortgrass and midgrass prairies over most of the Great Plains. In northeastern Colorado, the swift fox appears to be most numerous in areas with relatively flat to gently rolling topography.	Very Low. Unlikely to occur on the Site due to lack of habitat and development.
PLANTS			
Dwarf false indigo (*Amorpha nana*)	State Rank: Imperiled (S2)	Dry prairies and rocky hillsides on rocky and sandy soils. Scattered populations from Boulder to the Black Forest.	Very low. Unlikely to occur on the Site due to lack of habitat and past disturbance.
Frostweed (*Crocanthemum bicknellii*)	State Rank: Critically Imperiled (S1)	Infrequent or rare at the base of the outer foothills of the Front Range and Black Forest.	Low. Unlikely to occur onsite due to degraded native vegetation.
Gay-feather or Rocky mountain blazing star (*Liatris ligulistylis*)	State Rank: Imperiled (S2)	Wet meadows.	Low. Unlikely to occur on the Site due to degraded native vegetation.
New England aster (*Virgulus novae-angliae*)	State Rank: Critically Imperiled (S1)	Prairie habitat in Boulder-Denver area. Known from Roxborough State Park. Relict population or introduced.	Low. Unlikely to occur on Site due to distance from known populations and degraded vegetation.
Prairie violet (*Viola pedatifida*)	State Rank: Imperiled (S2)	Prairies, open woodlands, and forest openings; rocky sites, outwash mesas. Elevation 5800-8800	Very low. Unlikely to occur on the Site due to lack of habitat and past disturbance.
Small-headed rush (*Juncus brachycephalus*)	State Rank: Critically Imperiled (S1)	Wetlands within relict tall grass prairie communities in the Black Forest region.	Very low. Unlikely to occur on the Site due to lack of habitat and past disturbance.

TABLE 3 - STATE AND FEDERAL PROTECTED SPECIES POTENTIALLY IMPACTED BY THE PROJECT			
Species	**Status**	**Habitat Requirements and Presence**	**Probability of Impact by Project**
Southern Rocky Mountain cinquefoil (*Potentilla ambigens*)	State Rank: Imperiled (S2)	Open meadows or grasslands. Often near, but not in, forests dominated by ponderosa pine. Soils are typically alluvial or colluvial, coarse-textured, and often gravelly.	Very low. Unlikely to occur onsite due to degraded native vegetation.
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Federal: Threatened	Primarily occurs along seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels or valleys, and lakeshores. May also occur along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside borrow pits, reservoirs, and other human-modified wetlands.	None. Wetland areas on Site are poor quality habitat for this species and will not be impacted.
Yellow stargrass (*Hypoxis hirsuta*)	State Rank: Critically Imperiled (S1)	Wetlands within relict tall grass prairie communities.	Very low. Unlikely to occur and suitable habitat would not be impacted.
Western prairie fringed orchid (*Platanthera praeclara*)	Federal: Threatened	Occurs in tallgrass prairie in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and Oklahoma. Upstream depletions to the Platte River system in Colorado and Wyoming may affect the species in Nebraska.	None. The proposed project will not alter or deplete flows to the South Platte.

4.1 Preble's meadow jumping mouse

4.1.2 Natural History

The Preble's meadow jumping mouse (PMJM) is a small mammal approximately 9-inches in length with large hind feet adapted for jumping, a long bicolor tail (which accounts for 60% of its length), and a distinct dark stripe down the middle of its back, bordered on either side by gray to orange-brown fur (USFWS, 2016d). This largely nocturnal mouse lives primarily in the foothills of southeastern Wyoming, and south to Colorado Springs, along the eastern edge of the Front Range of Colorado. PMJM are true hibernators. They usually enter into hibernation in September or October and emerge in May of the following spring.

The preferred habitat of the PMJM is well-developed plains riparian vegetation with a nearby water source. These riparian areas include a relatively dense combination of grasses, forbs, and shrubs. PMJM regularly range into adjacent uplands to feed, hibernate, and avoid flooding.

Therefore, the riparian habitat needs to be in close proximity to relatively undisturbed upland communities. PMJM typically prefers grassy upland habitats with scattered trees and shrubs.

4.1.2 Threats

Threats to PMJM and their habitat include habitat alteration, degradation, loss, and fragmentation resulting from human land uses including urban development, flood control, water development, and agriculture. Habitat destruction may impact individual PMJM directly or by destroying nest sites, food resources, and hibernation sites; by disrupting behavior; or by forming a barrier to movement. Invasive non-native and noxious weeds can alter habitat and decrease its value.

4.1.3 Critical Habitat

Critical habitat is specific areas identified by the USFWS as being essential to the conservation of PMJM (USFWS, 2016d). In determining which areas to designate as critical habitat, the USFWS must use the best scientific and commercial data available and consider physical and biological features (primary, constituent elements) that are essential to conservation of the species, and that may require special management consideration and protection. The primary constituent elements for the PMJM include those habitat components essential for the biological needs of reproducing, rearing of young, foraging, sheltering, hibernation, dispersal, and genetic exchange. Thus critical habitat includes riparian areas located within grassland, shrub land, forest, and mixed vegetation types where dense herbaceous or woody vegetation occurs near the ground level, where available open water exists during their active season, and where there are ample upland habitats of sufficient width and quality for foraging, hibernation, and refugia from catastrophic flooding events. Section 7 of the Endangered Species Act prohibits destruction or adverse modification of a critical habitat by any activity funded, authorized, or carried out by any Federal agency, and Federal Agencies proposing actions affecting areas designated as critical habitat must consult with the USFWS on the effects of their proposed actions, pursuant to Section 7(a)(2) of the Act.

The closest PMJM Critical Habitat is 0.7 mile south of the Site (USFWS, 2016d) (Figure 10). This is part of Critical Habitat Unit 11 (established in 2010) includes the portions of Dirty Woman Creek south of 2nd Street/Highway 105. Woodmoor Lake and a developed area along Lake Woodmoor Drive are between the Site and the Critical Habitat. Most of the area around Woodmoor Lake is residential development or mowed grass, therefore native riparian vegetation and shrub vegetation are sparse and discontinuous. Thus it is unlikely that PMJM would disperse from Dirty Woman Creek to the Site (refer to Appendix E for the *PMJM Clearance Letter*).

4.1.4 Occupied Range

In addition to the USFWS Critical Habitat, Colorado Parks and Wildlife (CPW) has designated areas of PMJM "occupied range" (CPW, 2005). The occupied range is based on known occurrences of PMJM (i.e., trapping data) and historic riparian vegetation (i.e., potential habitat that was not necessarily trapped or verified). For each known PMJM location, a one-mile buffer is applied to riparian areas both upstream and downstream. This includes both the

main channel and side channels. Additionally, a 100-meter lateral buffer is applied which, in general, represents foraging and hibernaculum habitat. This buffer serves as a general guideline. Site specific topographic and vegetative features may increase or decrease the area considered locally as foraging and hibernaculum habitat. Where riparian vegetation maps don't exist, the stream centerline is buffered laterally by 100 meters.

It should be noted that the CPW "mapped riparian vegetation" data upon which a significant portion of this "occupied range" mapping is based was not necessarily verified in the field. As such it should only be used for planning purposes and must be field verified.

CPW has designated occupied PMJM habitat south of the Site along Dirty Woman Creek that generally corresponds with the mapped critical habitat (CPW, 2005) (Figure 11). Additionally, the CPW mapped occupied range extends upstream (north and west) from Dirty Woman Creek along multiple drainages, most of which currently lack riparian vegetation due to development impacts that have occurred. This area of "occupied range" designation appears to be based on a PMJM capture within the Critical Habitat along Dirty Woman Creek. The closet CPW mapped occupied range is 0.33 mile south of the southern Site boundary, along the south shore of Woodmoor Lake. This mapping appears to be based on the historic condition of two drainages that have mostly been impacted by development such that the riparian habitat is now absent; therefore, there is no existing riparian corridor connecting Dirty Woman Creek to Woodmoor Lake to allow PMJM to disperse this far north. Therefore, ecos is confident that the CPW occupied range designation is inaccurate in this area. Thus it is unlikely that PMJM would disperse from Dirty Woman Creek to the Site (refer to Appendix E for the *PMJM Clearance Letter*).

Source: El Paso County

Figure 9 COUNTY PMJM POTENTIAL HABITAT MAP

Source: U.S. Fish and Wildlife Service (USFWS)

Figure 10 USFWS 2010 PMJM CRITICAL HABITAT MAP

Source: Colorado Parks and Wildlife (CPW)

Figure 11 CPW 2005 PMJM OCCUPIED RANGE MAP

4.2 CNHP-Listed Rare Plants

The CNHP-listed rare plants includes many species that are listed due to the presence of relict plant communities in the Black Forest region that typically only occur much farther east in the United States, often in tall grass prairies. Upland species include gay-feather or Rocky mountain blazing star (*Liatris ligulistylis*), prairie violet (*Viola pedatifida*), and New England aster (*Virgulus novae-angliae*). Wetland species are small-headed rush (*Juncus brachycephalus*) and yellow stargrass (*Hypoxis hirsuta*). All of these species typically occur in fairly open habitat. Most of the remnant native vegetation on Site has a dense overstory of trees and shrubs. Thus none of the CNHP-listed plants are likely to be present.

5.0 RAPTORS AND MIGRATORY BIRDS

Raptors and most birds are protected by the Colorado Nongame Wildlife Regulations, as well as by the federal Migratory Bird Treaty Act. No raptor nests have been mapped within one mile of the Site (COGCC 2016). The Site provides foraging and wintering habitat for raptors. A red-tailed hawk (*Buteo jamaicensis*) was observed during the Site visit. The riparian habitat near Woodmoor Lake is high quality nesting habitat for raptors; however, no existing nest sites for any raptors were noted during the Site visit.

There is suitable habitat for nesting birds within the Study Area, primarily in the pine-oak woodland and riparian habitat. Birds were the most common wildlife observed by ecos during the Site visit. Species diversity was high and included some species common in developed areas along with many others that are characteristic of high quality natural habitats. Species observed that are common in suburban developed areas included mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), northern flicker (red-shafted) (*Colaptes auratus*), blue jay (*Cyanocitta cristata*), and American crow (*Corvus brachyrhynchos*). Observed species that typically occur in more natural areas were the western bluebird (*Sialia mexicana*), broad-tailed hummingbird (*Selasphorus platycercus*), downy woodpecker (*Picoides pubescens*), Stellar's jay (*Cyanocitta stelleri*), chipping sparrow (*Spizella passerina*), and spotted towhee (*Pipilo maculatus*).

Multiple species of birds were observed that are associated with wetlands. Canada geese (*Branta canadensis*) were nesting on a beaver dam just south of the Site. An American coot and a sora (Porzana carolina) were foraging on the north edge of the lake. A pair of snowy egrets (*Egretta thula*) flew over the Site. Songbirds included red-winged blackbirds (*Agelaius phoeniceus*) and a yellow-rumped warbler (*Setophaga coronata*).

6.0 SUMMARY OF IMPACTS

6.1 Mineral and Natural Resource Extraction

The El Paso County Master Plan for Mineral Extraction (El Paso County, 1996) does not identify the Site as having any significant mining resources of note nor is there any existing mining activity on the Site. Therefore, the proposed development would not limit or impact any proposed future commercial mineral resource extraction operations.

The proposed land use does not permit the use of any area containing a commercial mineral deposit in a manner which would intentionally or unreasonably interfere with the present or future extraction of such deposit unless acknowledged by the mineral rights owner.

Morgan Hester researched the records of the El Paso County Clerk and Recorder and established that there was not a mineral estate owner on the Site (Appendix D). No Mineral or Natural Resource Extraction will occur as a part of this Project.

6.2 Vegetation

The majority of the Site is vegetated with non-native grassland. Most of the Site appears to have been cleared in the past and planted with smooth brome. There are signs of subsequent disturbance to construct utilities and weeds are common throughout the grassy areas. There is also a small, weedy detention basin in the northeast corner of the Site. A grassy swale/floodway extends from the detention pond towards Woodmoor Lake. Native plant communities on Site are limited to a narrow strip of pine-oak woodland along the east side and riparian vegetation adjacent to Woodmoor Lake. The proposed Project would construct condominiums on the majority of the Site. Most of the riparian habitat and approximately half of the oak-woodland habitat would be preserved.

The native preservation areas would be modified during construction and then maintained by the HOA. In order to reduce overall direct impacts to vegetation, existing native vegetation should be preserved as much as possible and all re-planting should consist of native species from the same ecosystem. Fire hazard mitigation in the pine-oak woodland should mimic natural fire cycles by cutting herbaceous species during the growing season.

The preliminary grading and landscaping plans do not include details for the floodway areas. This area is an opportunity for planting native vegetation. Placement of several low (approximately 6") check dams that are curved across the slope would create shallow ponded areas were native wetland and mesic vegetation could be planted. These ponded and planted areas would filter the water flowing into Woodmoor Lake.

Control of noxious weeds and non-native species in all areas should be a priority during construction and as part of the HOA maintenance plan. If native vegetation is preserved and weeds are managed, then the loss of native vegetation would be offset by the native plantings, ongoing weed management, long-term preservation, and potential improvement of the floodway.

6.3 Wetland Habitat and Waters of the U.S.

There are two wetland areas on the Site, a small detention basin and a wetland fringe along the north shore of Woodmoor Lake (refer to Section 3.4.2). These features are jurisdictional, as they are tributary to Monument Creek (via Dirty Woman Creek), a documented, jurisdictional waters of the U.S.

Ecos delineated the jurisdictional boundaries of these jurisdictional wetland areas to assist the developer in Site planning. Based on the current Site Plan grading associated with the proposed bridge will impact a portion of the 0.04-acre detention basin wetland; and grading associated with the southeastern building will impact approximately 0.03 acre of the wetland

fringe along the north shore of Woodmoor Lake (refer to Figure 5B). The Project Team will, however look into wetland impact avoidance and minimization measure as the design process proceeds. If the impacts remain as proposed in the current Site Plan, the Project will require a 404 permit. If a 404 Permit is required, it is likely that both impact areas can be authorized under Nationwide Permit 29 for Residential Developments.

6.4 Noxious Weeds

The weediest portions of the Site will mostly be developed and landscaped. Weed management should be implemented for all of the preserved natural areas, thus the Project will have a positive impact on the Site and in nearby areas by decreasing weeds and particularly noxious weeds.

6.5 Wildfire Hazard

The El Paso County Wildfire Hazard Map (El Paso County, 2007) classifies most of the Site as having low wildfire hazard. The forested areas along the east and south sides of the Site are mapped as High Hazard.

The project would result in slight decrease in wildfire hazard potential. Developed areas would be landscaped and irrigated. Small portions of the forested areas would be removed and ladder fuels within remaining areas would be reduced per the El Paso County "Forest Health and Ecology Guide" (El Paso County, 2016) "Wildfire Mitigation" section.

6.6 Wildlife Communities

The impact to wildlife is similar to that for vegetation. Elimination of the non-native grassland areas, removal of some forested habitat, and development and loss of open space would have a negative impact on wildlife species. However, the highest quality habitats on the Site would be preserved as open space. Additional habitat areas may be created along the floodway through the center of the Site. Management priorities would include weed control and enhancement of native vegetation. Thus the negative impact to wildlife communities would be mostly mitigated.

6.7 State, CNHP and Federal Listed Species

6.7.1 State T&E Species and Species of Concern

State-listed T&E species within Colorado are identified on the Colorado Parks and Wildlife's list of Threatened and Endangered Species (CPW, 2016). The CPW's T&E Species list also includes Species of Concern as summarized in Section 4.0, Table 3 of this Report. The following state-listed species may be affected by the Project, but the impacts are considered negligible:

northern leopard frog – The probability of impact to this species is low. The wetlands along Woodmoor Lake are good habitat for northern leopard frog. The Project would directly impact a very small area of these wetlands that is away from the open water where leopard frogs occur. Conversion of the Site to a residential development will probably result in increased use of fertilizers and herbicides that can harm amphibians. If the floodway includes check dams and

naturalized areas, this could offset potential impacts to the frog by improving water quality and possibly increasing habitat.

6.7.2 CNHP Rare Species

The Black Forest area includes many plant communities that are typically only found much farther east; and the CNHP list of rare plants reflects this. Due to the overall degraded nature of vegetation on the Site however, none of these species are expected to occur. Furthermore, most of the native habitat will be preserved. Thus no impacts are expected.

6.7.3 Federal T&E Species

The Site is not located within any officially designated occupied or critical habitat for federally designated threatened or endangered species, including the Preble's meadow jumping mouse. Therefore, there will be no impacts to federally designated threatened or endangered species and no need to initiate consultation with the USFWS under the ESA.

6.8 Raptors and Migratory Birds

The Project is expected to have a slightly negative impact on raptors and migratory birds since open space would be lost. However, preservation of forested areas and use of native plantings would partially mitigate this impact.

7.0 REGULATIONS AND RECOMMENDATIONS

7.1 Clean Water Act

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the U.S. (including wetland habitat) protected by the Act without a valid permit. Ecos identified jurisdictional wetland habitat and waters of the U.S. along the north side of Woodmoor Lake and within the detention basin (Figure 2). If the Site design proposes impacts to either of these areas, then a Section 404 permit would be required, and the developer must coordinate with the U.S. Army Corps of Engineers prior to implementation of said impacts.

7.2 Endangered Species Act

The Site is not located within any officially designated occupied or critical habitat for federally designated threatened or endangered species, including the Preble's meadow jumping mouse. Therefore, there will be no impacts to federally designated threatened or endangered species and no need to initiate consultation with the USFWS under the ESA.

7.3 Migratory Bird Treaty Act & Bald and Golden Eagle Protection Act

No raptor nests have been mapped within one mile of the Site (COGCC 2016) and no migratory bird nests were observed within the Site. However, ecos recommends a nesting bird survey immediately prior to construction to identify any new nests within the Site or within the CPW recommended buffers of the Site. Construction activities should be restricted during the breeding season near any newly identified migratory bird nest.

7.4 Colorado Noxious Weed Act

Ecos prepared a Weed Management Plan for the Site which should ensure Project compliance with the Act.

8.0 REFERENCES

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Appendix A
USDA Soil Data

Soil Map—El Paso County Area, Colorado
(The Cove)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 13, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1	Alamosa loam, 1 to 3 percent slopes	5.6	68.4%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	0.4	4.5%
71	Pring coarse sandy loam, 3 to 8 percent slopes	2.2	27.0%
111	Water	0.0	0.1%
Totals for Area of Interest		**8.2**	**100.0%**

Appendix B
Mineral Estate Owner Certification

MINERAL RIGHTS CERTIFICATION

I, Morgan Hester, hereby state and certify as follows:

1. I have researched the records of the Clerk and Recorder of El Paso County, Colorado, and have established that there are no mineral estate owners on the real property legally described on Exhibit A attached hereto.

2. No notice of an initial public hearing was mailed to the mineral estate owners, pursuant to §24-65.5-104(4), C.R.S., because there are no such owners and, consequently, there will not be a public hearing.

Dated this 25 day of August, 2016.

Morgan Hester

STATE OF COLORADO)
) ss.
COUNTY OF EL PASO)

The foregoing certification was acknowledged before me this 25th day of August, 2016, by Morgan Hester.

Witness my hand and official seal.

My commission expires: August 4, 2019

DENISE JORDAN WALLACE NOTARY PUBLIC STATE OF COLORADO

[SEAL]

Notary Public

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

PARCEL E (E I & E2): THE COVE

THOSE PORTIONS OF THE COVE AT WOODMOOR AND OF THE SOUTHEAST QUARTER OF SECTION 11, TOWNSHIP 11 SOUTH, RANGE 67 WEST OF THE 6TH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE FOLLOWING DESCRIBED PROPERTY, MONUMENTED AT ITS NORTHERLY END WITH A REBAR & CAP, PLS 2682 AND AT ITS SOUTHEND WITH A #4 REBAR. SAID LINE BEARS SOUTH 04 DEGREES 31 MINUTES 13 SECONDS EAST.

BEGINNING AT THE NORTHWEST CORNER OF LAKE WOODMOOR; THENCE SOUTH 04 DEGREES 31 MINUTES 13 SECONDS EAST ALONG THE WESTERLY LINE OF SAID SUBDIVISION 805.58 FEET TO AN ANGLE POINT IN SAID LINE; THENCE SOUTH 76 DEGREES 52 MINUTES 00 SECONDS WEST CONTINUING ALONG SAID LINE 270.50 FEET TO AN ANGLE POINT IN THE EASTERLY LINE OF THE PARCEL DESCRIBED AT RECEPTION NO. 201088802; THENCE NORTH 33 DEGREES 16 MINUTES 26 SECONDS EAST ALONG SAID EASTERLY LINE 198.00 FEET TO THE SOUTHEAST CORNER OF SAID THE COVE AT WOODMOOR; THENCE SOUTH 78 DEGREES 28 MINUTES 37 SECONDS WEST ALONG THE SOUTH LINE OF SAID THE COVE AT WOODMOOR AND ALONG THE NORTHERLY LINE OF SAID PARCEL DESCRIBED AT RECEPTION NO. 201088802 A DISTANCE OF 381.79 FEET TO THE SOUTHEAST CORNER OF THE COVE AT WOODMOOR CONDOMINIUMS (THE FOLLOW ING FOUR COURSES ARE ALONG THE EASTERLY LINE OF SAID THE COVE AT WOODMOOR CONDOMINIUMS);

1) NORTH 09 DEGREES 11 MINUTES 13 SECONDS WEST, 201.02 FEET;
2) NORTH 00 DEGREES 23 MINUTES 42 SECONDS EAST, 50.00 FEET;
3) NORTH 89 DEGREES 36 MINUTES 18 SECONDS WEST, 8.32 FEET;
4) NORTH 07 DEGREES 40 MINUTES 16 SECONDS WEST, 133.33 FEET TO THE SOUTHERLY LINE OF DEER CREEK ROAD, THE SAME BEING THE NORTHERLY LINE OF SAID THE COVE AT WOODMOOR;

THENCE NORTHEASTERLY ALONG SAID NORTHERLY LINE, ALONG A NON-TANGENTIAL CURVE CONCAVE TO THE NORTHWEST, SAID CURVE HAVING A CENTRAL ANGLE OF 29 DEGREES 10 MINUTES 40 SECONDS, A RADIUS OF 742.00 FEET, FOR AN ARC LENGTH OF 377.86 FEET (THE CENTER OF SAID CURVE BEARS NORTH 23 DEGREES 04 MINUTES 14 SECONDS WEST) TO A POINT OF REVERSE CURVE; THENCE NORTHEASTERLY ALONG A TANGENTIAL CURVE CONCAVE TO THE SOUTHEAST, SAID CURVE HAVING A CENTRAL ANGLE OF 35 DEGREES 08 MINUTES 38 SECONDS, A RADIUS OF 508.69 FEET, FOR AN ARC LENGTH OF 285.38 FEET TO THE POINT OF BEGINNING.

Appendix C
USFWS IPaC Trust Resource Report

U.S. Fish & Wildlife Service

The Cove

IPaC Trust Resources Report

Generated May 02, 2016 12:40 PM MDT, IPaC v3.0.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.

IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

Table of Contents

U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

The Cove

LOCATION

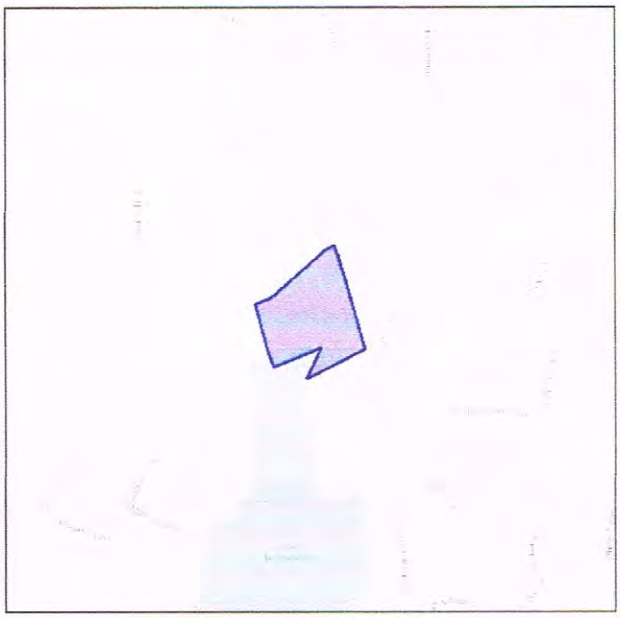
El Paso County, Colorado

DESCRIPTION

Ecological Assessment

IPAC LINK

https://ecos.fws.gov/ipac/project/7R6EO-XZISN-GLRBK-ZOCAE-IFBEDA



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Colorado Ecological Services Field Office
Denver Federal Center
P.o. Box 25486
Denver, CO 80225-486
(303) 236-4773

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Least Tern Sterna antillarum — Endangered

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B07N

Mexican Spotted Owl Strix occidentalis lucida — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B074

Piping Plover Charadrius melodus — Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B079

Whooping Crane Grus americana — Endangered

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B003

Fishes

Arkansas Darter Etheostoma cragini — Candidate

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E06H

Greenback Cutthroat Trout Oncorhynchus clarki stomias — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E00F

Pallid Sturgeon Scaphirhynchus albus — Endangered

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E06X

Flowering Plants

Ute Ladies'-tresses Spiranthes diluvialis — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q2WA

Western Prairie Fringed Orchid Platanthera praeclara — Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q2YD

Mammals

Preble's Meadow Jumping Mouse Zapus hudsonius preblei — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0C2

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black Rosy-finch Leucosticte atrata — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J4

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Cassin's Finch Carpodacus cassinii — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J6

Dickcissel Spiza americana — Bird of conservation concern
Season: Breeding

Ferruginous Hawk Buteo regalis — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06X

Flammulated Owl Otus flammeolus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DK

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Lark Bunting Calamospiza melanocorys — Bird of conservation concern
Season: Breeding

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Prairie Falcon Falco mexicanus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ER

Sage Thrasher Oreoscoptes montanus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ID

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Swainson's Hawk Buteo swainsoni — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Virginia's Warbler Vermivora virginiae — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IL

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Williamson's Sapsucker Sphyrapicus thyroideus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FX

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Lake

L1UBHh 39.1 acres

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

Appendix D
Commitment Letter to Provide Fire and Emergency Services
Professional Qualifications

TRI-LAKES MONUMENT FIRE PROTECTION DISTRICT
15455 Gleneagle Drive, Suite 230
Colorado Springs, CO 80921
Bus: (719) 484-0911 Fax (719) 481-3456

Christopher Truty, Fire Chief

Commitment letter to Provide Fire and Emergency Services.

To Whom It May Concern;

The Tri-Lakes Monument Fire Protection District (TLMFPD) currently provides fire and emergency services to The Cove at Woodmoor.

Further requests for information should be directed to Fire Marshal John Vincent at 719.484.0911 or jvincent@tlmfire.org

John Vincent
Fire Marshal

Appendix E
PMJM Clearance Letter

ecos ecosystem services LLC

PMJM CLEARANCE LETTER

DATE: August 30, 2016

TO: Morgan Hester, La Plata

FROM: Grant Gurneé, PWS, Ecosystem Services, LLC

RE: PMJM Habitat Assessment for the North Bay at Woodmoor Lake development in El Paso County, Colorado

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Ecosystem Services, LLC (Ecos or ecos) was retained by Morgan Hester of Woodmoor Lake Development, Inc. to perform a natural resource assessment for the North Bay at Lake Woodmoor project (Project), a proposed development at the north end of Woodmoor Lake in El Paso County. The purpose of the assessment was to identify and document the natural resources, ecological characteristics and existing conditions of the Project site (Site); identify potential ecological impacts associated with Site development; and provide current regulatory guidance related to potential development-related impacts to natural resources. A portion of the overall assessment focused on the determination of the presence/absence of federal and state-listed, threatened and endangered species.

This memo has been prepared to provide a summary of our findings regarding the specific presence/absence of Preble's meadow jumping mouse (PMJM), a federally listed species per the Endangered Species Act, and their habitat. Please refer to the complete Natural Features and Wetland Report prepared by ecos for the Project for further information.

The Site is located approximately 0.7-mile northeast of Monument in El Paso County, Colorado. It is situated east of I-25, south of Deer Creek Road, west of Autumn Way, and it abuts the northern end of Woodmoor Lake. The Site is bounded on the north by Deer Creek Road, on the south by Deer Creek Road, and on the west by the Waterfront Townhomes. The Site is specifically located within Section 11, Township 11 South, Range 67 West in El Paso County, Colorado.

Critical Habitat Mapping

Critical habitat is specific areas identified by the USFWS as being essential to the conservation of PMJM (USFWS, 2016). In determining which areas to designate as critical habitat, the USFWS must use the best scientific and commercial data available and consider physical and biological features (primary, constituent elements) that are essential to conservation of the species, and that may require special management consideration and protection.

The closest PMJM Critical Habitat mapped by the U.S. Fish and Wildlife Service (USFWS) is 0.7 mile south of the Site (USFWS, 2016). This is part of Critical Habitat Unit 11 (established in 2010) includes the portions of Dirty Woman Creek south of 2nd Street/Highway 105. Woodmoor Lake and a developed area along Lake Woodmoor Drive are between the Site and the Critical Habitat. Most of the area around Woodmoor Lake is residential development or mowed grass, therefore native riparian vegetation and shrub vegetation are sparse and discontinuous. As such, the project area is excluded from the USFWS Critical Habitat for the PMJM.

Colorado Parks & Wildlife (CPW) Occupied Range

CPW has designated PMJM "occupied range" in Colorado (CPW, 2005) based on known occurrences of PMJM (i.e., trapping data) and historic riparian vegetation mapping (i.e., potential habitat that was not necessarily trapped or verified). It should be noted that the CPW "mapped riparian vegetation" data upon which a significant portion of this

"occupied range" designation is based was not necessarily verified in the field. As such it should only be used for planning purposes and must be field verified.

CPW has designated PMJM "occupied" range habitat south of the Site along Dirty Woman Creek that generally corresponds with the USFWS mapped Critical Habitat. Additionally, the CPW occupied range extends upstream (north and west) from Dirty Woman Creek along multiple drainages, most of which currently lack riparian vegetation due to development impacts that have occurred. This area of "occupied range" designation appears to be based on a PMJM capture within the Critical Habitat along Dirty Woman Creek. The closet CPW designated "occupied range" is 0.33 mile south of the southern Site boundary, along the south shore of Woodmoor Lake. This mapping appears to be based on the historic condition of two drainages that have mostly been impacted by development such that the riparian habitat is now absent; therefore, there is no existing riparian corridor connecting Dirty Woman Creek to Woodmoor Lake to allow PMJM to disperse this far north. Therefore, ecos is confident that the CPW occupied range designation is inaccurate in this area.

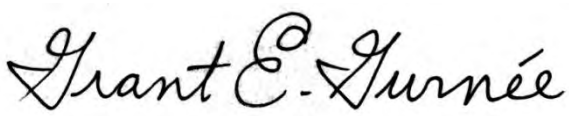
Summary and Conclusions

No federal or state-listed threatened or endangered species or their habitat were found to be present during ecos' onsite assessment. No mapped USFWS Critical Habitat or designated CPW occupied range for PMJM are present within the Site. The Site is physically separated from Critical Habitat along Dirty Woman Creek by existing development, and there are no viable riparian travel corridors to the Site from documented, occupied habitat. Ecos onsite assessment indicates that the majority of the Site is comprised of disturbed and managed landscape. Although natural wetland habitat exists along the north shore of Lake Woodmoor, there are no viable travel corridors to this onsite wetland habitat from documented Critical Habitat or documented, occupied habitat. Therefore, PMJM are unlikely to occur on the Site.

The Site is not located within any officially designated occupied or Critical Habitat for federally-designated threatened or endangered species. Therefore, there will be no impacts to federally designated threatened or endangered species and no need to initiate consultation with the USFWS under the ESA.

If there are any questions concerning this memo, please contact Grant Gurnée at Ecosystem Services, LLC.

Ecosystem Services, LLC



Grant E. Gurnée, P.W.S.
Owner - Restoration Ecologist

References:

CPW, 2005. "Preble's Meadow Jumping Mouse - Colorado Occupied Range 2005." Published by Colorado Division of Wildlife on October 12, 2005.

USFWS, 2016d. US Fish and Wildlife Service Mountain Prairie Region Endangered Species, http://www.fws.gov/mountain-prairie/species/mammals/preble/. Website last accessed May 2, 2016.

Appendix F
Professional Qualifications

ecos ecosystem services LLC

RESUME

Grant E. Gurnée, P.W.S.

Owner/Manager
Senior Restoration Ecologist
Fisheries and Wildlife Biologist
Wetland Ecologist

AREAS OF EXPERTISE:

- Project Management for Complex, Environmental Regulatory and Restoration Projects
- Habitat Assessment, Surveys, Planning, Permitting, Restoration Design, Construction Oversight & Monitoring for:
  - Aquatic, Wetland and Riparian Habitat, and Wildlife Habitat
  - Threatened & Endangered Species, Special Status Species, and Species of Concern
  - Nesting Birds, Raptors and Burrowing Owls
  - Natural Areas, Open Space, Trails and Environmental Education Facilities
  - Conservation and Resource Mitigation Banks
- Natural Resources/Environmental Law Regulatory Compliance
- Grant Funding Support for Conservation and Restoration Projects
- Expert Witness Testimony

EDUCATION:

- MCRP, Environmental Planning and Law Program, Rutgers University, 1994
- Bachelor of Science, Biology, Richard Stockton College of N.J., 1984

EMPLOYMENT HISTORY:

- 2008-Current: Owner, Managing Partner and Senior Restoration Ecologist
  Ecosystem Services, LLC, Erie, Colorado
- 2010-2011: Director Ecological Solutions and Natural Systems Group
  Walsh Environmental Scientists and Engineers, LLC, Boulder, Colorado
- 1999-2010: Ecological Restoration Group Manager
  Walsh Environmental Scientists and Engineers, LLC, Boulder, Colorado
- 1994-1999: Vice President and Consulting Division Manager
  Aquatic and Wetland Company, Boulder, Colorado
- 1987-1994: Ecological Assessment Group Manager
  Killam Associates, Millburn, New Jersey
- 1989 – 1994: Owner and Ecologist, Westhill Environmental, Colonia, NJ
- 1986-1987: Project Manager, Connolly Environmental, Denville, New Jersey
- 1985-1986: Biological Technician/Team Lead, EA Engineering Science and Technology, Forked River Field Station, New Jersey

CONTINUING EDUCATION:

- Stream Functions Pyramid Workshop, Denver, CO - 2014
- Colorado Natural Heritage Program, Wetland Plant Identification - 2014
- Colorado Natural Heritage Program, Ecological Integrity Assessment for Colorado Wetlands - 2013
- FACWet – Functional Assessment of Colorado Wetlands - 2010, 2012 and 2013
- Natural Treatment System Design and Implementation, Southwest Wetlands, Phoenix, AZ - 1995
- Continuing Education in Coastal and Wetland Ecology, Rutgers University, 1985 – 1994

REGISTRATIONS and CERTIFICATIONS:

- Professional Wetland Scientist, Certification (#559), Society of Wetland Scientists Certification Program, 1995
- Certified Wetland Delineator, Army Corps of Engineers Wetland Delineator Certification Program, 1993
- Wetland Mitigation Planning and Design Certification, Environmental Concern, Sparks, MD, 1992
- Certified Ornithologist, Marine Biologist, Aquatic Biologist and Ecologist for the preparation and certification of Environmentally Sensitive Areas Protection Plans, N.J. Dept. of Environmental Protection and Energy, 1988
- Wetland Delineation and Regulatory Certification, National Wetland Science Training Institute, 1988

PROTECTED SPECIES SURVEYS AND HABITAT ASSESSMENTS:

- Ute-ladies' tresses orchid and Colorado butterfly plant
- Preble's meadow jumping mouse
- Nesting raptors and migratory birds, including burrowing owls
- Swift fox and bobcat
- Boreal toad, and Pine Barrens tree frog and grey tree frog
- Native Pine Barrens fish

EXPERIENCE SUMMARY:

Mr. Gurnée is a founder and managing partner of Ecosystem Services, LLC (ecos), a small design-build firm that is the culmination of his life's work and passion for restoring and conserving the natural world. Grant is a certified Professional Wetland Scientist with over 32 years of experience in wetland ecology, restoration ecology, wildlife and fisheries biology, environmental planning, and regulatory compliance. Prior to ecos Grant established the Ecological Restoration Group at Walsh Environmental and was the Vice President in charge of the Consulting & Design Division for Aquatic and Wetland Company, the first design-build-grow firm in Colorado. Mr. Gurnée utilizes his diverse field assessment and hands-on experience to bring a unique and pragmatic, big-picture perspective to projects from conceptual planning through implementation. Grant's environmental planning and law education combined with his regulatory compliance experience make him one of the leading experts in the Intermountain West in Clean Water Act and Endangered Species Act issues. He enjoys teaching and furthering the science and art that comprise the field of restoration ecology. As such, Grant has published and presented papers and technical manuals, and lectured nationally and internationally at educational programs that further the understanding of aquatic, wetland, riparian and T&E species habitat assessment and restoration. Mr. Gurnée has also been called upon to provide expert reports, expert witness testimony and liaison representation in complex regulatory compliance matters.

RELEVANT PROJECT EXPERIENCE:

Habitat Assessment and Regulatory Compliance

- **Bellvue Pipeline Project, Larimer County, CO – ecos was retained by the City of Greeley as Best Management Practices (BMP) Facilitators to provide pre-construction documentation post-construction oversight of pipeline reclamation processes. Essential responsibilities include meeting with landowners prior to construction to facilitate project understanding and post-construction outcomes; to document landowner needs and wants relative to project goals and land use; and to document and monitor pre- and post-construction reclamation and maintenance requirements.**
- **Georgetown Lake, Georgetown, CO –ecos was hired to perform an onsite assessment of ecological resources and prepare a summary report to describe the physical/ecological characteristics of the Project area and evaluate the potential effects of the construction of a loop trail project on environmental issues and species of concern to support a GOCO grant application. Items evaluated and documented, include site location/ownership, general site characteristics, current land use, proposed impacts, possible effects on Federal– and State-listed T&E animal and plant species, unique or important wildlife, water quality, water bodies, wetlands, and floodplains, stormwater runoff, sedimentation, soil erosion, and invasive species. The assessment report also included mitigation measures, project benefits, and environmental compliance recommendations under applicable regulatory programs.**
- **Site Assessments for General Vegetation Cover and T&E Species Presence/Absence** – ecos was retained by JADE Consulting, LLC to perform the assessment of two future development sites located in Lafayette and Yuma, Colorado. We performed a desk-top assessment to identify existing site characteristics and screen the potential presence/absence of federally-listed threatened and endangered (T&E) species, and followed up with onsite assessments to verify our preliminary findings. Our findings and recommendations were summarized in a Technical Memorandum in which we determined that no further assessment or regulatory compliance actions are required.

- **The Cove Assessment & Regulatory Compliance Report, El Paso County, CO** - ecos was retained by Lake Woodmoor Development, Inc.to perform a natural resource assessment for The Cove development, and to prepare a Natural Features Wetland, Wildfire, Noxious Weeds & Wildlife Report (Report) pursuant to El Paso County environmental review regulations. The purpose of the project was to identify and document the natural resources, ecological characteristics and existing conditions of the Site; identify potential ecological impacts associated with Site development; and provide current regulatory guidance related to potential development-related impacts to natural resources, including: Mineral and Natural Resource Extraction; Vegetation; Wetland Habitat and Waters of the U.S.; Noxious Weeds; Wildfire Hazard; Wildlife; Federal and State Listed Candidate, Threatened and Endangered Species; and Raptors and Migratory Birds.
- **Jurisdictional Determination Request for Banning Lewis Ranch, Villages 1 and 2 Residential Development, El Paso County, CO** - ecos was retained by Oakwood Homes, LLC to review a 2014 Jurisdictional Boundary Delineation and determine if a portion of the wetlands and waters within the site could be deemed non-jurisdictional under the Clean Water Act (CWA) based on their "isolated" status. Following data review, ecos arranged a field assessment with the U.S. Army Corps of Engineers (Corps) to review site conditions, and potential offsite, downstream connections to waters of the U.S. (WOUS), and particularly the presence of a Significant Nexus to Traditional Navigable Waters TNW). Ecos and the Corps agreed that several of the intermittent drainages on the suite are not jurisdictional under the CWA, as they are not: 1) a TNW or wetland adjacent to a TNW; 2) a Relatively Permanent Water (RPW) or a wetland directly abutting an RPW with perennial or seasonal flow; 3) a tributary to a TNW; or 4) a direct tributary to a downstream WOUS as the feature loses it bed and banks. The Corps submitted ecos' findings to the U.S. Environmental Protection Agency (EPA) and they concurred and issued an Approved Jurisdictional Determination stating that the drainages were indeed "isolated" features exempt from the CWA.
- **Bellvue Pipeline Project, Larimer County, CO** – ecos was retained by the City of Greeley to provide regulatory and technical support for the preparation and submittal of the CWA, Supplement Pre-Construction Notification (PCN) for the Bellvue Pipeline Project (Project). Ecos scope includes reviewing the Project CWA permitting and review data and history, assessing wetland and riparian habitat within the Project reach of the Cache la Poudre River, preparing a Resources Impact Assessment Report, and assisting the City with discussions and presentations to the Corps during their review and processing of a Minimal Effects Determination for the Project.
- **Appraisal Support Documentation Report for the 1st Bank Parcel, Colorado Springs, CO** - ecos was retained by 1st Bank Holding Company to perform a Preble's meadow jumping mouse (PMJM) habitat assessment, mitigation cost analysis and conceptual lot layout for the approximate 9.4-acre 1st Bank Parcel (Site) situated south of the Gleneagle residential development and north of the current Northgate Open Space along Smith Creek in Colorado Springs, Colorado.
- **South Boulder Canon Ditch Maintenance, Clean Water Act (CWA) Exemption Determination, Erie, CO** – ecos assisted the Town of Erie in exempting their proposed ditch maintenance project by performing an assessment of site conditions, submitting the assessment report to the Corps, and verifying that said project is exempt pursuant to Section 404(f) of the CWA.
- **Endangered Species Act (ESA) Compliance Documentation for the Pinon Lake tributary CLOMR Application, Forest Lakes Filing 2B in El Paso County, Colorado** – ecos performed an assessment to document the absence of federally-listed T&E species and their habitat, and prepared a report for FEMA that documents that the proposed CLOMR action will not result in a "take" of T&E species.
- **Gleneagle Infill Development Assessment & Regulatory Compliance Report, El Paso County, CO** - ecos was retained by G & S Development, Inc. to perform a natural resource assessment for the proposed Gleneagle Infill Development at the former Gleneagle Golf Course, and to prepare a Natural Features and Wetland Report (Report) pursuant to El Paso County environmental review regulations. The purpose of the project was to identify and document the natural resources, ecological characteristics and existing conditions of the Site; identify potential ecological impacts associated with Site development; and provide current regulatory guidance related to potential development-related impacts to natural resources, including: Mineral and Natural Resource Extraction; Vegetation; Wetland Habitat and Waters of the U.S.; Weeds; Wildfire Hazard; Wildlife; Federal and State Listed Candidate, Threatened and Endangered Species; and Raptors and Migratory Birds. As part of the Project, ecos obtained an Approved Jurisdictional Determination from the Corps.
- **North Fork at Briargate Habitat Evaluation and ESA Compliance, Colorado Springs, CO** - ecos performed a habitat evaluation on behalf of High Valley Land Co., Inc. and La Plata Communities to support informal consultation with the U.S. Fish and Wildlife Service (FWS) under the ESA for potential effects to the Federally-listed, threatened PMJM from the proposed North Fork development, Filings 3 through 7 at Briargate.
- **C Lazy U Preserves Natural Resource Inventory and Conservation Easement Documentation, Grand County, CO** – ecos is assisting the C Lazy U Preserves in assessing and documenting the conservation values of the 980-acre site known as

C Lazy U Preserves near Granby, CO such that the site may be protected under Conservation Easements (CE's) held by The Nature Conservancy. The purpose of the CE's is the long-term preservation of the scenic, open space, agricultural, significant natural habitat, native vegetation, rare plant communities, riparian, and wetland values of the Property. ecos staff completed the Easement Documentation Reports Phase 1 of the CE's in 2006, Phase 2 in 2007, and Phase 3 in 2015.

- **Bellvue Transmission Line Project, CWA and ESA Regulatory Negotiation** - Mr. Gurnée assisted the City of Greeley in their negotiations with the Corps to facilitate review and verification of the Northern Segment of the Project under CWA, Nationwide Permit12. Grant provided assistance during Corps meetings, field visits and teleconferences utilizing his relationship with the Corps and extensive experience of CWA regulations, policies and precedents. He assisted Greeley in coordinating with the Corps and the technical experts on the Corps Common Technical Platform (CTP) team, and utilizing the CTP Poudre watershed data to assess the probability of Project-specific impacts.
  Mr. Gurnée also assisted Greeley in their negotiations with the FWS to facilitate review and consultation for the Northern Segment of the Project under Section 7 of the ESA. Grant led the field assessment with FWS, identification and prioritization of potential PMJM habitat mitigation sites, development of a conceptual design for the selected PMJM habitat mitigation sites, and preparation of the Biological Assessment Addendum and Habitat Mitigation Plan. Grant provided assistance during agency review and approval of the FWS Biological Opinion by utilizing his relationships with the FWS, and extensive experience of ESA regulations, policies and precedents.
- **Seaman Water Management Project, Riparian-Wetland Technical Support** - Mr. Gurnée is supporting Greeley in the NEPA EIS process by reviewing riparian and wetland technical reports prepared by the Corps CTP team, and providing comments to assist the City in their formal review and response to the Corps. He is also providing technical and regulatory support for CWA and ESA (PMJM habitat) assessment, consultation, and compensatory mitigation planning and design.
- **ARCO Clark Fork River Basin Anaconda Smelter Superfund Site, Anaconda, MT** – Grant and his Team performed wetland delineation, functional assessments, and impact analysis over a 200 square mile area affected by historic mining practices and current remedial actions required by an EPA consent decree.
- **ARCO Clark Fork River Basin Milltown Reservoir Superfund Site, Missoula, MT** – Mr. Gurnée and his Team performed wetland delineation, functional assessments, and impact analysis of proposed remedial actions that will remove metal laden sediments from the site prior to dam removal.
- **C-Lazy-U and Horn Ranch Environmental Assessments, Granby, CO** – Mr. Gurnée and his Team performed an assessment of ecological opportunities and constraints in the aquatic, riparian, wetland and threatened and endangered species habitat along the Colorado River for the development and enhancement of fishing/resort ranch amenities.
- **Village at Avon, Avon, CO** – Grant and his Team performed a wetland delineation and prepared CWA Section 404 permitting for the town center expansion and low-density ranchette development.

Protected Species Surveys and Habitat Assessments

- **Golden Eagle Monitoring at Meadow Park in Lyons, CO** - ecos was retained by the Town of Lyons (Town) to perform the monthly monitoring of the Golden Eagle (*Aquila chrysaetos*) nest sites at Meadow Park, to prepare monthly Monitoring Summary Memorandum following each event, and to prepare and submit annual reporting to the U.S. Fish and Wildlife Service (USFWS) associated with the *Lyons Federal Fish and Wildlife Permit #MB82833B-0, Eagle Take Associated With But Not The Purpose Of An Activity* (Take Permit).
- **Nesting Birds, Raptors and Burrowing Owls** – Grant has completed over 100 pre-construction nesting surveys and numerous monitoring surveys for raptors and burrowing owls since 1994. His projects include pipeline rights-of-way, housing and commercial development projects, stream and river restoration projects, wind and solar farm projects, and oil and gas projects along the Front Range of Colorado, as well as projects in the Pine Barrens of southern New Jersey. His avian experience includes golden eagle nest monitoring; barred owl roost and nest monitoring, and call playback inventory; and multi-species raptor surveys.
- **Native Plants** - Grant has completed numerous pre-construction and monitoring surveys for Ute ladies' tresses orchid and Colorado butterfly plant since 1994. His projects include pipeline rights-of way, mined land reclamation projects, housing and commercial development projects, stream and river restoration projects, wind and solar farm projects, and oil and gas projects along the Front Range of Colorado.
- **Threatened, Endangered and Candidate Species** – Grant trained with the leading expert, Robert Stoecker, PhD, in 1994 and 1995 to gain an understanding of the newly listed, federally-threatened species, the Preble's meadow jumping mouse; and since that time he has completed numerous surveys, habitat assessments, and ESA consultations. He has also performed night-time Swift fox surveys at windfarm sites in southern CO and Boreal toad surveys in northern CO. Prior to relocating to CO Grant performed numerous surveys in N.J., including bobcat surveys to assist in protecting the Pyramid Rock Natural

Area; Pine Barrens and gray tree frog surveys, and native Pine Barrens fish surveys with his mentor, Dr. Rudy Arndt; and Eastern box turtle surveys. He also assessed migration routes and alternative mitigation measures for sea turtles that were being impacted by the Garden State Parkway.

Wetland Mitigation and Habitat Restoration

- **Front Range Mitigation and Habitat Conservation Bank** – ecos is assisting Restoration Systems, LLC (RS), the Bank Sponsor, with the assessment, planning and design of the Front Range Umbrella Bank for Aquatic Resource Mitigation & Habitat Conservation (Bank). This "umbrella" Bank is intended to provide habitat mitigation for projects along the entire Front Range of Colorado. The **ecos**/RS Team is in the process of securing viable sites in the major watersheds along the Front Range; and recently submitted the Draft Prospectus for the establishment of the Bank to the U.S. Army Corps of Engineers, Albuquerque District, Southern Colorado Regulatory Office and Omaha District, Denver Regulatory Office.
- **Lions Park Poudre River CWA and ESA Mitigation Site** - ecos assisted Greeley in developing and constructing an advance river and wetland mitigation site at Lions Park in LaPorte, Colorado that may be used for future CWA impacts in the Poudre River watershed. We also prepared a conceptual design for Preble's meadow jumping mouse habitat that will be used to support ESA consultation. ecos assessed the site, prepared the designs, and coordinated review with Greeley, Colorado Department of Parks and Wildlife, Larimer County Parks and Open Lands and Larimer County Engineering Department. The mitigation site provides compensatory mitigation for impacts to wetland and waters of the U.S. under the CWA, and will also provide compensation for PMJM habitat under the ESA. This mitigation project entails development of mitigation measures including bioengineered streambank stabilization, fishery habitat enhancement, riparian and wetland habitat restoration and PMJM habitat enhancement.
- **Bellvue Transmission Line Project, Preliminary Compensatory Mitigation Plan (PCMP)** - Mr. Gurnée was the Project Manager for the preparation of the Preliminary Compensatory Mitigation Plan (PCMP) for the Bellvue Transmission Line Project. Built upon preferred strategies in the 2008 Corps Compensatory Mitigation Rules, the PCMP leverages a broad strategy to ensure mitigation success and employs a watershed approach to select and prioritize compensatory mitigation (CM) measures that will best mitigate adverse environmental effects. It is intended to support a Corps determination of minimal adverse effect and allow verification of the Northern Segment of the Project under Nationwide Permit 12. Grant led the Team during the watershed assessment of the Poudre River, identification and prioritization of potential CM and preservation sites, development of a Pilot Watershed Plan, and conceptual design of priority CM sites. The PCMP has been submitted to the Corps for review and approval.
- **Flatirons Parcel Riparian and Wetland Habitat Restoration Project** – Grant assisted Greeley in developing a multiple use project at the Flatirons Parcel, a gravel quarry site in Greeley, Colorado. The site is being decommissioned over the next decade and offers great potential to create a system of ponds connected via a naturalized stream that discharges into the Poudre. The concept design incorporates recreation opportunities that are tied into the Poudre River Trail, a passive park, and the development of wetland, riparian and wildlife habitat.
- **Ruby Pipeline Wetland, Riparian and Waterbody Mitigation and Restoration Plan, WY, UT, NV AND OR** - Mr. Gurnée was the lead restoration ecologist and wetland scientist for the 675-mile, Ruby Pipeline; a natural gas pipeline traversing four states. He was the lead for the preparation of Wetland Mitigation, Riparian and Waterbody Restoration Plans under the CWA, BLM regulations and state equivalent programs. The plans included regulatory guidelines, requirements, and processes; and eco-region specific restoration plans. The plans detailed specifications for the basis of design, construction, and revegetation; outlined performance criteria, maintenance and monitoring methods for the restoration of approximately 460 acres of temporary wetland impacts.
- **River Point, Sheridan, CO** - Mr. Gurnée was the project manager and lead restoration ecologist for the team that assessed, permitted and designed the natural and aesthetic features of this Brownfields project. The project included a naturalized water quality swale and riverfront improvements which complement the aesthetics and ecology of the South Platte River corridor. The swale was designed to mimic the form and function of a tributary stream, providing passive water treatment with native wetland and riparian vegetation, as well as flood attenuation with instream structures and grade control. The project utilized natural, "bio-engineering" and "bio-technical" techniques to repair and maintain channel and stream bank stability, and native vegetation to enhance and restore habitat. This project also addressed the interface of proposed restaurants, a regional greenway trail, and the river through planning and design of nature trails, interpretive nodes and overlooks/access features that will function to both stabilize banks and help connect people with the river.
- **Caribou Peat Bog Restoration, Nederland, CO** – Grant performed the impact assessment, prepared native plant community design, planting cost estimate, and on-the-ground oversight of restoration volunteers to restore a high altitude peat bog disturbed by an illegal off-road-vehicle "mudfest".

- **Opportunity Ponds Operational Unit, Anaconda, MT** - Mr. Gurnée was the project manager and lead restoration ecologist providing technical support to Atlantic Richfield/British Petroleum at a Superfund site in the Upper Clark Fork River basin in Montana between 1995 and 2008. Services included wetland delineation and functional assessment of over 3,000 acres of wetland, stream and pond habitat; design of stream and wetland habitat mitigation projects; and permitting/compliance services. The largest project within the Superfund site was the Opportunity Ponds, a 908-acre wetland, stream and wildlife habitat creation project. The project will result in the largest freshwater mitigation project in the U.S; and is intended to mitigate for historic wetland/waters impacts from Anaconda Mining Company operations and current impacts resulting from remedial actions associated with the Superfund cleanup process.
- **The Club at Flying Horse Golf Course, Colorado Springs, CO** – On behalf of Classic Communities, Grant and his Team conducted an assessment of wetland habitat, recommended impact avoidance and minimization measures, and prepared the Section 404, CWA permit for a 1500-acre mixed use development and Weiskopf golf course. The project aesthetic and mitigation measures included the design of native prairie roughs, meandering stream channels and native wetland meadows within the golf course. Extra wetland mitigation was created to serve as a private mitigation bank for the client.
- **Maloit Park, Minturn, CO** - Grant was the project manager and restoration ecologist for the Maloit Park Restoration Project, which was necessitated by the accidental release of mine slurry that contaminated the soils and vegetation of critical wetland habitat at the confluence of Cross Creek and the Eagle River. The project included the assessment of the site, the collection of native wetland seed (that was adapted to site conditions); the selection of appropriate replacement soil; the design of the restoration grading and planting plans; and oversight during the soil replacement, grading and planting phases. Mr. Gurnée also provided follow-up monitoring and reporting to ensure the successful establishment of the wetland habitat.
- **Department of Energy, Private Mitigation Bank, Westminster, CO** - Mr. Gurnée provided the project assessment, design, permitting, mitigation banking instrument negotiation with the Corps and EPA, and construction supervision of a 12-acre wetland mitigation bank for the Department of Energy in Westminster, CO. The project provides compensatory mitigation for impacts associated with the Rocky Flats clean-up and remediation project. It should be noted that this was the first private mitigation bank negotiated in Colorado, and as such it assisted in setting the precedent for future negotiations.
- **Wetland Mitigation for the Stanley Lake Protection Project, Westminster, CO** - Grant and his Team provided assessment, design, permitting, and construction supervision of an 11-acre wetland and wildlife habitat mitigation project in Westminster, Colorado. The project provides compensatory mitigation for impacts associated with the construction of the Stanley Lake Protection Project.
- **Saudi Arabia Coastal Wetland Restoration** - Mr. Gurnée assisted in the restoration planning for 67 square kilometers (41 square miles) of high salt marsh (sabhka) impacted by Gulf War oil spills.

Aquatic, Wetland, and Riparian Habitat Design

- **Saint Vrain Creek Breaches Restoration, Boulder County, CO** - ecos is part of the Design Team assisting Boulder County Parks & Open Space (BCPOS) with the restoration, repair and enhancement of the reach of the Saint Vrain Creek from Highway 36 downstream to Hygiene Road in rural Boulder County, which was damaged by the 2013 floods. Our role on the project includes: 1) desktop and field assessment to inventory and document the characteristics of the stream reach and riparian corridor (e.g. stream/in-stream features, vegetation, wildlife habitat); identify and locate significant habitat features within the areas of proposed construction; identify potential sources of native plant materials for restoration; and identify areas of opportunity within the breach repair work areas for native vegetation, wetland, PMJM, leopard frog and fishery habitat restoration; and delineate wetland habitat and waters of the U.S. in all areas of proposed/potential construction-related impact; 2) vegetation community and wildlife habitat restoration design; 3) permitting and compliance under the CWA, ESA and NHPA; 4) construction oversight for restoration construction; and 5) monitoring and reporting project success/establishment to BCPOS, stakeholders, the Corps, FWS and the State of Colorado Department of Local Affairs (DOLA) under the (the Grant funding agency under the Community Development Block Grant Disaster Recovery (CDBGDR) Resilience Planning Program grant.
- **Bohn Park Flood Recovery Design, Town of Lyons, CO** – ecos is part of the Design Team assisting the Town with the restoration, repair and enhancement of Bohn Park in Lyons, which was damaged by the 2013 floods. Ecos roles is to assess and design the natural restoration of the vegetation communities and habitat along St. Vrain Creek and riparian corridor; and to support the project design by acquiring permits/approvals and maintaining regulatory compliance under the CWA, ESA and National Historic Preservation Act (NHPA). The final design will address goals and priorities associated with the Parks Flood Recovery Planning Process, FEMA Project Worksheets and Project Scopes, the Lyons Recovery Action Plan (LRAP), associated Program Development Guides (PDG's), existing Town master plans, comprehensive plans and other relevant documentation and studies.

- **James Creek Post-Flood Restoration, Lefthand Watershed Oversight Group (LWOG), Jamestown, CO** – ecos was part of the LWOG and Boulder County Department of Transportation Team responsible for preparing the 30-60% design package for James Creek Reach 16 as identified in the Left Hand Creek Watershed Master Plan. ecos performed pre- and post-flood plant community assessment; developed revegetation goals and objectives, the basis of design, monitoring protocols, and revegetation plans in accordance with Colorado Department of Local Affairs (DOLA), Community Development Block Grant – Disaster Recovery (CDBG-DR) 30% Guidelines. Specific resources and issues of concern addressed by ecos, included federal and state listed candidate, threatened and endangered species, wildlife species of concern (including raptors), fisheries and fish passage, native plant communities, and management of noxious weeds, all in concert with geomorphic, hydrology and hydraulic analysis and design prepared by other team members.
- **Saint Vrain Creek Restoration and Floodplain Resiliency Plan, Lyons, CO** – ecos is part of the design-build team intent on restoring the St. Vrain Creek corridor in the Town of Lyons that was damaged during the September 2013 flood event. The goal of the project is to create a more resilient floodplain and natural channel condition that will alleviate future threats to the community, reestablish floodplain connectivity, stabilize banks, and restore aquatic, wetland and riparian habitat that was wiped out during the flood. Grant is responsible for CWA, ESA, Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act permitting; as well as developing the plant communities and revegetation strategies needed to restore aquatic and riparian structure and functions within the corridor that support fish, wildlife, recreation, and help the town regain the ecological benefits and economic value they receive from outdoor enthusiasts.
- **Bellvue Raw Water Ponds Riverbank Restoration, Bellvue, CO** – The 2013 flood on the Poudre River altered the course of the river and severely eroded a bank nearly causing a breach of the City of Greeley's raw water ponds – their main municipal water supply. The goal of the project was to stabilize the bank to protect the ponds and to create riparian habitat for the Preble's meadow jumping mouse, a federally listed threatened and endangered species. Jon was responsible for preparing bioengineering design plans and specifications that include soil/cobble encapsulated lifts, stream barbs to deflect flows away from the bank, and harder, biotechnical design of soil/riprap and stream bed scour protection measures to prevent erosion and further undermining and sloughing of the bank. Design plans included specification of native plant materials and various techniques to restore cottonwood forest and willow habitat to further stabilize the bank.
- **Poudre River Pipeline Crossing at Kodak, Windsor, CO** – ecos role on the project was to assess restoration potential, techniques, and prepare design plans and performance specifications to reclaim a pipeline corridor across the lower Poudre River where the City of Greely had to replace 3 major water supply lines. Flooding on the Poudre River in 2013 and 2014 temporarily suspended construction of the pipeline. ecos will also oversee site stabilization and restoration measures once all 3 pipelines have been installed.
- **Lions Park Poudre River Restoration Plan, Laporte, CO** – ecos role on the project was to assess habitat conditions; gather, compile and analyze field survey data; and to prepare the mapping and mitigation design plans for the Lions Park PMJM habitat and the Poudre River Bank Stabilization Plans. We designed and executed the technical drawings for the structural components of the habitat, ensuring that the proposed riparian plant community, habitat structures (brush piles), and bioengineered streambank stabilization measures will create the conditions that alleviate the current habitat fragmentation; support the life requisites of the PMJM; and enhance the overall health of the Poudre River fishery.
- **C Lazy U Ranch, Willow Creek Fishery Enhancement Plan, Granby, CO** - Mr. Gurnée was the lead fisheries biologist and wetland ecologist for the assessment and design of this project. The project entailed 2 miles of instream and riparian cover habitat aimed at enhancing water quality through increased bank stability, improving aquatic habitat and angling opportunities, and providing long-term stability to the reach given existing land-use constraints, and ongoing ranching activities. Bank-side improvements included wetland mitigation design to support ranch impacts, detailed seeding and planting plans indicating site-specific plant and seed locations, life zones, and species palettes according to hydrologic, soil, and aspect conditions. Grant was the regulatory lead, consulting with the Corps under Section 404 of the CWA.
- **Edwards Eagle River Restoration Project, Edwards, CO** – Grant was the senior wetland ecologist and fisheries biologist for the Edwards Eagle River Restoration Project (Project); which is roughly 1.5 miles long covering an area of 168 acres of floodplain along the Eagle River in the heart of the Edwards community. The project utilized indigenous materials and methods to naturally integrate habitat structure in the landscape context. He provided grant funding support; stream, riparian, wetland and fisheries habitat assessment, planning and design; and construction oversight services to the Eagle River Watershed Council for the Project. He assisted the ERWC in facilitating the public process associated with developing

stakeholder support and gaining funding through the Eagle Mine Natural Resources Damage Fund. The Project was awarded over $2,000,000 in grant funding; $1,400,000 of which was from the Eagle Mine NRDF. The total project cost is projected at $4,300,000.

- **Gypsum Creek Fisheries Enhancement, Gypsum, CO** - Mr. Gurnée was the lead fisheries biologist and restoration ecologist for the instream and riparian habitat assessment, design, permitting and implementation of habitat improvements along Gypsum Creek. Project treatments included both instream and bankside treatments. Instream treatments served to improve deep-water habitat, create flow separation or concentration zones, increase low flow sinuosity, provide instream cover, improve adult fish habitat, create nursery areas, and enhance spawning opportunities. Bankside treatments for aquatic habitat improvements included creation or enhancement of overhead cover; provision of protective cover; and enhancing shading, cooling, and nutrient cycling functions. Bank protection treatments served to correct localized bank instabilities and reduce bank erosion and the potential for sediment deposition downstream. The Colorado Division of Wildlife (CDOW) commented that, "The Gypsum Creek project was implemented in such a low impact manner that you cannot tell that construction had occurred in the area."
- **Cache La Poudre River Removal Action, Fort Collins, CO** - On behalf of the City of Fort Collins, Mr. Gurnée led negotiations between the EPA, stakeholders and the City regarding riverine, riparian and wetland regulatory and restoration design standards during the removal and remediation of a contaminated reach of the Poudre River. He also provided design review and revision, as well as construction oversight to ensure successful implementation of the instream and streambank restoration along the 0.50 mile, highly visible reach of the river near downtown Fort Collins.
- **TZ Ranch, Elk Hollow Creek Fishery Habitat Enhancement Plan, Saratoga, WY** - ecos performed the assessment and design of the Elk Hollow Creek Project, which included instream and riparian habitat improvements aimed at increasing bank stability, improving aquatic habitat and angling opportunities, and providing long-term stability to the reach. Instream improvements included drop structures, plunge pools, deep pools, riffles and spawning habitat. Bank improvements included seeding and planting plans for native wetland and riparian species. Grant was the regulatory lead, consulting with the Corps under Section 404 of the CWA and the Wyoming Department of Fish and Game. ecos also provided construction oversight and native plant installation services to ensure the successful implementation of the Project.
- **Brush Creek Fishery Enhancement Plans, Saratoga, WY** – Grant assisted in the preparation of access and staging plans, design plans and details, and performed on-site construction oversight of instream and riparian habitat enhancements and bioengineered bank stabilization for a 3-mile reach of Brush Creek. The purpose of the project is to enhance fish, bird and wildlife habitat and use these resources to facilitate education and improve the recreational experience of Ranch guests.
- **Brush Creek Ranch Pond Creation Plans, Saratoga, WY** – ecos provided design-build services including site optimization selection; excavation, grading, drainage and revegetation plans; and construction oversight for a 0.30-acre fishing pond. The pond design included an innovative undercut bank design incorporating a framework of trees supporting transplanted, native sod; which provided excellent fish habitat.
- **Boulder Creek Fishery Enhancement and Pond Creation Project, Boulder, CO** - Grant was the lead fisheries biologist and restoration ecologist for this project along a private reach of South Boulder Creek adjacent to City of Boulder, Eldorado Canyon Open Space. His tasks included instream and riparian habitat assessment, design of instream and pond fishery habitat and riparian enhancement measures, and permitting and consultation. Grant was also the regulatory lead, consulting with the FWS regarding PMJM habitat and with the Corps under Section 404 of the CWA.
- **Stream and Floodplain Restoration at A.T. Massey Coal Mining Facility, KY** - Grant was the Project Manager, fisheries biologist and restoration ecologist for the technical team tasked with assessment and restoration of 26 miles of stream corridor following the accidental release of 250 million gallons of coal slurry into two separate drainages in eastern Kentucky. He was the first ecologist to respond after the spill to ensure that fisheries, stream and riparian habitat restoration objectives were incorporated into the selected cleanup measures. As such, Grant devised a "triage" categorization and remediation system for all affected reaches that minimized impacts to sensitive aquatic and riparian habitat based on the site-specific level of cleanup and remediation required. In addition to instream and bank restoration and stabilization, comprehensive riparian corridor restoration was a major component of the project. Grant was the regulatory and permitting lead and coordinated permits and approval with EPA, Corps and State agencies.
- **Roaring Fork Golf and Fishing Club, Basalt, CO** - Mr. Gurnée was the lead fisheries biologist and restoration ecologist for the assessment, design, permitting and construction supervision of a native trout stream (1 mile) with associated wetland complexes (3 acres). The trout stream was created as an amenity and functional fly-fishing challenge for this fishing component of the Roaring Fork Club; and the associated wetland and riparian habitat were created to naturalize the stream and provide compensatory mitigation for impacts associated with the development of the club facilities. Grant was the regulatory and permitting lead and coordinated permits and approval with Corps and CDOW.

- **Spring Creek Wetland Mitigation, Colorado Springs, CO** – Grant and his team generated wetland and creek creation plans that integrated required mitigation into a high density, "new urban" development. The design emphasized re-utilization of urban storm water to sustain wetlands, use of indigenous plants, construction materials, and natural geomorphic relationships.
- **Tobacco Island Project, Kansas City, MO** - Grant was the lead fisheries biologist and restoration ecologist for the Corps, Tobacco Island Project - a portion of the Missouri River Bank Stabilization and Navigation, Fish and Wildlife Mitigation Project. Project tasks included assessment and conceptual design of measures aimed at reconnecting floodplain and riparian habitat to a reach of the Missouri River near Kansas City. He prepared preliminary designs of channel and backwater wetlands; provided regulatory analysis under Section 404 of the CWA; and assisted in the preparation of an Environmental Impact Statement.
- **San Miguel River Corridor Restoration Plan** - Mr. Gurnée was the lead restoration ecologist, planner and designer for phase 1 of the San Miguel River Corridor Restoration Plan, which included a 1-mile reach through Town. He and his team assisted the Town of Telluride in applying for and winning approximately $500,000 in Natural Resource Damage Assessment Fund money from the State of Colorado. The money, along with other funding, was utilized for final design and construction of the project which included instream habitat, streambank restoration, riparian and wetland restoration, trails and parks. Grant was responsible for all public meetings, regulatory negotiation and permitting; assisted the Town with grant funding; and also provided construction oversight services.
- **High Altitude Stream Restoration at Copper Mountain Resort, CO** - Grant was the lead ecologist for the restoration of an alpine stream and enhancement of associated wetland and riparian habitat situated within tundra habitat atop Union Peak at Copper Mountain Resort. Grant performed the assessment, design, permitting, and construction oversight for one of the highest altitude stream restoration and wetland mitigation projects in Colorado (approximately 11,500 feet above sea level). Innovative bioengineering and construction techniques were designed and adapted to this sensitive environment to minimize construction-related impacts and maximize environmental benefits.

Threatened & Endangered Species Consultation & Habitat Restoration

- **The Farm (formerly Allison Valley Ranch), Colorado Springs, CO** – Mr. Gurnée performed the habitat assessment and mapping; and prepared ESA, Section 7 and CWA, Section 404 consultation documents as required by the FWS and Corps, including mitigation construction documents, specifications, on-site layout of plant communities and construction supervision aimed at restoring wetland and riparian habitat occupied by Preble's meadow jumping mouse. Ecos is currently assisting the owner with construction oversight for habitat restoration and native planting.
- **Advance Mitigation for PMJM Habitat** – ecos is assisting a private client in identifying, assessing, prioritizing and designing advance mitigation sites for PMJM habitat in the North Fork and main stem of the Cache la Poudre River.
- **TriView Metropolitan District ESA and CWA Permit Resolution, Monument, CO** - Mr. Gurnée is representing the TriView Metropolitan District (TriView) and Phoenix Bell as the lead consultant to resolve outstanding compliance issues related to a joint ESA, Section 7 Consultation and CWA, Section 404 Permit. Grant is leading negotiations amongst the various landowners, TriView and the Town in an effort to resolve compliance issues related to PMJM and wetland habitat, such that development may proceed in this core area of the town. Upon resolution and agreement of the stakeholders, he will lead the negotiations with the FWS and Corps to formally amend the Biological Opinion and 404 Permit. Once the approvals are amended, Grant will lead the planning, design and implementation of PMJM and wetland habitat to meet mitigation requirements under the ESA and CWA.
- **Bernardi Residential Property, Eldorado Canyon, Boulder, CO** – ecos consulted with the Corps and FWS to document and fulfill regulatory requirements for a residential home construction project in PMJM, wetland and riparian habitat. Mr. Gurnée coordinated with the FWS and Corps and obtained approvals under ESA, Section 7 and CWA, Section 404. He prepared all consultation documents, including the Biological Assessment, mitigation plan, and construction documents and specifications. Grant is leading the on-site layout of plant communities and construction supervision, aimed at restoring wetland and riparian habitat occupied by the PMJM.
- **Northgate Boulevard Realignment, Colorado Springs, CO** – Mr. Gurnée performed the habitat assessment and mapping; and coordinated and prepared ESA, Section 7 and CWA, Section 404 consultation documents as required by the FWS and Corps, including mitigation construction documents, specifications, on-site layout of plant communities and construction supervision aimed at restoring wetland and riparian habitat occupied by Preble's meadow jumping mouse.
- **Jefferson County Highways and Transportation Department Gunbarrel Bridge Replacement, Oxyoke, CO** - ecos staff consulted with the Corps, FWS, CDOT, and the FHWA to document regulatory requirements for a bridge replacement project in PMJM, wetland and riparian habitat. He and his Team produced a CDOT Wetland Finding Report, Biological

Assessment, acquired a Section 404 Permit and Biological Opinion (Section 7 of the ESA), and then implemented habitat mitigation improvements at the site.

- **Northgate Project, Colorado Springs, CO** - As project manager, Mr. Gurnée led the team in the assessment, permitting and regulatory negotiation (Section 404 of the CWA and Section 7 of the ESA) for the project which included the planning, design and construction supervision of a precedent setting, "joint" mitigation plan for 60 acres of wetland, riparian and PMJM habitat.

Ecological Master Planning

- **Sundance Trail Guest Ranch, Larimer County,** CO – ecos is currently assisting a local guest ranch in the assessment of natural resources and site features, and the development of site plans to balance natural habitat and aesthetic values with the expansion of guest facilities and services.
- **Sand Creek Channel Improvements Stability Analysis at Indigo Ranch, Colorado Springs, CO** - ecos was retained to perform an analysis of channel stability under proposed development conditions for a 1.17-mile reach of Sand Creek. Ecos utilized existing vegetation composition data, density and height within the Project reach as a basis; and compared the 10-year and 100-year storm event modelling data (specifically flow velocity, flow depth and shear stress) to reference literature to provide a professional opinion regarding the future stability of the channel under developed conditions. The analysis of channel stability for the proposed Project assumes a bioengineering and biotechnical approach that preserves and enhances the existing vegetation, as well as substrate cohesion and stability, within the channel and its streambanks. The Stability Analysis will likely serve as a benchmark study for the City of Colorado Springs to use to preserve other naturally stable channels.
- **Uncompahgre River Corridor Master Plan, Montrose, CO** – Grant and his Team assessed the character, condition and quality of aquatic, wetland and riparian habitat along a 10-mile rural and urban corridor of the Uncompahgre River through the City of Montrose. Habitats were then rated, ranked, prioritized and master planned for their preservation potential and integration in to the parks, recreation and trail system. The master plans form the foundation for the City to focus environmental stewardship, tourism and generate riverfront economic development with a focus on the river – the major asset of the Community.
- **Brush Creek Stewardship and Enhancement Plan, Saratoga, WY** – Mr. Gurnée managed the assessment of a 12,000-acre, private ranch near Saratoga, Wyoming and the preparation of the Ranch Stewardship Plan (Plan). The Plan includes land and resource stewardship goals, objectives, and implementation action items; including ranch-wide master planning of the trail and recreational systems, design of the Brush Creek riparian corridor trail, and restoration/fisheries habitat enhancement of Brush Creek. Trail and recreation planning and design focused on universal access, habitat sensitivity, environmental education, and wildlife observation opportunities and unique landscape experiences.

Environmental Assessment and Impact Studies

- **NEPA EA for Eagle County Airport Runway Expansion, Eagle County, CO** - Grant was project manager and senior ecologist for an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) for a proposed 1000-foot runway expansion and ILS installation at the Eagle County Airport, west of Vail, Colorado. Critical issues addressed included noise, ecological, and public opinion considerations. Grant conducted the work under FAA guidance requirements for EAs.
- **NEPA EA for the Avon Interstate 70 Interchange** - Mr. Gurnée was project manager and senior ecologist for this NEPA EA. He performed environmental assessment and data compilation work for construction of a new CDOT interchange and associated development on Interstate 70. This included evaluating T&E Species; a wetlands inventory; a cultural/archeological resources survey; noise and air pollution modeling and studies; and reviewing soils, meteorology, geologic hazards, and other impacts.
- **Raritan River Wetland Inundation Impact Study, N.J.** - Grant's work on the preparation and processing of the first Individual Permit under the New Jersey Freshwater Wetlands Protection Act of 1987 included a precedent setting wetland inundation study. This study shaped the N.J. Department of Environmental Protection's policy regarding the need to assess hydrologic impacts during wetland permit reviews.

Construction Oversight and Plant Installation

- **2013 Flood and 2014 Runoff Events, Damage Restoration, Cache la Poudre River, CO** - ecos performed the construction oversight of 3 flood and runoff damage restoration projects along the Cache la Poudre River.

- **Lions Park CWA and ESA Mitigation Site** - ecos performed the construction oversight for an advance river and wetland mitigation site at Lions Park in LaPorte, Colorado.
- **TZ Ranch, Elk Hollow Creek Fishery Habitat Enhancement Plan, Saratoga, WY** - ecos performed the construction oversight for the Elk Hollow Creek Project.
- **Brush Creek Ranch Fishery Enhancement Plans, Saratoga, WY** – Mr. Gurnée assisted in the construction oversight for a 3-mile reach of Brush Creek to improve fisheries and outdoor recreation experiences for guests of the Ranch.
- **C Lazy U Ranch, Willow Creek Fishery Enhancement Plan, Granby, CO** - Grant assisted in the construction oversight for this fishery habitat, channel stabilization and streambank restoration project.
- **Standley Lake Protection Project, Westminster, CO** – Mr. Gurnée performed construction oversight of a 12-acre created emergent wetland that he and his Team designed to fulfill CWA mitigation requirements and bring closure to the City's drinking water protection project.
- **Caribou Peat Bog Restoration, Nederland, CO** – Grant prepared native plant community design, planting cost estimate, and on-the-ground oversight of volunteers to restore a high altitude peat bog disturbed by an illegal four-wheel drive "mudfest".
- **Department of Energy Wetland Mitigation Bank, Westminster, CO** – Mr. Gurnée provided construction supervision of the grading and planting of a 12-acre wetland mitigation bank that he and his Team designed for the Department of Energy.
- **ARCO Lower Area One and Butte Reduction Works, Butte, MT** – Grant performed construction observation and supervision of temporary labor crews to plant a passive treatment wetland designed to absorb heavy metals from groundwater.

Natural Treatment System Design

- **Natural Treatment Wetlands, Butte, MT** - Mr. Gurnée and his Team performed the assessment and design of the ARCO Lower Area One and Butte Reduction Works passive treatment wetlands. These natural treatment systems were situated within two units of a reclaimed superfund site to treat heavy metals in surface and groundwater.
- **Natural Treatment Wetlands, Avondale, AZ** – Grant and his Team performed the assessment and design of a constructed wetland system to treat surface water and inject/recharge the municipal well system for the City of Avondale, AZ. This system successfully alleviated a well moratorium necessitated by a contaminated groundwater aquifer.

PUBLICATIONS:

Giordanengo, John H., Randy Mandel, William Spitz, Matthew Bossler, Michael Blazewicz, Steven Yochum, Katie Yagt, William LaBarre, Grant Gurnée, Robert Humphries and Kelly Uhing. 2016. Living Streambanks, A Manual of Bioengineering Treatments for Colorado Streams. Submitted to the State of Colorado, Colorado Water Conservation Board Denver, Colorado. Submitted by AloTerra Restoration Services, LLC, and Golder Associates, Inc.

Gurnée, Grant E. 1998. Wetland Revegetation Techniques chapter in Native Plant Revegetation Guide for Colorado, Caring for the Land Series, Volume III; a joint publication of the Colorado Natural Areas Program, Colorado State Parks, and Colorado Department of Natural Resources. Denver, Colorado.

Gurnée, Grant E. 1995. Optimizing Water Reclamation, Remediation and Reuse with Constructed Wetlands. Environmental Concern Wetland Journal, Summer 1995 Issue. Environmental Concern, Inc. St. Michaels, Maryland.

PRESENTATIONS:

Gurnée, Grant E., 2016. Clean Water Act, Section 404 Permits for Flood Recovery Projects. Presented at the Colorado Stream Restoration Network (CSRN) conference in Longmont, CO on March 23, 2016.

Gurnée, Grant E., 2016. Endangered Species Act Consultation for Flood Recovery Projects. Presented at the Colorado Stream Restoration Network (CSRN) conference in Longmont, CO on March 23, 2016.

Gurnée, Grant E., 2010. Stream Corridor/Bioengineering Round Table. Presented at the Colorado Riparian Association (CRA) Sustaining Colorado Watersheds Conference on October 5 - 7, 2010 in Vail, Colorado.

Gurnée, Grant E. and Greg A. Fenchel, 2009. Stream Corridor/Bioengineering Workshop. Presented at the Colorado Riparian Association (CRA) Sustaining Colorado Watersheds Conference, October 7 - 9, 2009 in Vail, Colorado.

Gurnée, Grant E. and Scott J. Franklin, 2008. Section 404 Individual Permits: Negotiating the Application and Follow-up Process. Presented at the CLE International, Colorado Wetlands Conference, May 8 – 9, 2008 in Denver, Colorado.

Gurnée, Grant E. and Julie, E. Ash, P.E., 2007. Edwards Eagle River Restoration Project. Presented at the Colorado Riparian Association (CRA) Sustaining Colorado Watersheds Conference, October 5 - 7, 2009 in Breckinridge, Colorado.

Gurnée, Grant E. 2000. Natural Treatment Alternatives for Surface Discharges, Surface Runoff, and Mined Land Reclamation. Presented at the International Mining Technology Seminar, September 13 – 15, 2000 in Belo Horizonte, Minas Gerais, Brazil.

Gurnée, Grant E. 1999. Wetland Mitigation: Considering Mitigation Requirements in the Project Planning Process. Presented at the Continuing Legal Education (CLE) Wetlands & Mitigation Banking Conference, October 21 & 22, 1999 in Denver, Colorado.

Hoag, Chris, Hollis Allen, Craig Fisheneck and Grant Gurnée. Bioengineering Workshop sponsored by the U.S. Army Corps of Engineers Waterways Experiment Station and the U.S. Department of Agriculture – Aberdeen Plant Materials Center. Presented September 1998 in Carson City, Nevada.

Hoag, Chris and Grant Gurnée. 1998 Glancy Riparian Demonstration Project. Assistant instructor for a hands-on bioengineering workshop on the Carson River. September 1998 near Dayton, Nevada.

Gurnée, Grant E. 1998. Stream and Wetland Restoration Successes and Failures: The Good, the Bad, and the Ugly. Presented at the Colorado Riparian Association (CRA) Restoring the Greenline Conference. October 16, 1998. Salida, Colorado.

Gurnée, Grant E. 1998. Save Our Streams, Wetland Conservation and Sustainability Workshop. Lead Instructor of wetland assessment and restoration course presented with the Izaak Walton League. April 21 & 22, 1998. Boulder, Colorado.

Windell, Jay, and Grant Gurnée. 1998. Creation of a Stream, Riparian and Wetland Ecosystem: Tributary to the Roaring Fork River, Basalt, Colorado. Presented at the American Society of Civil Engineers, Wetlands Engineering & River Restoration Conference, March 23 – 27, 1998 in Denver, Colorado.

Gurnée, Grant E. 1998 A Case Study: Department of Energy's Wetland Mitigation Bank at Standley Lake. Presented at the Continuing Legal Education (CLE) International, Colorado Wetlands Conference, January 27 – 29, 1998 in Denver, Colorado.

Gurnée, Grant E. 1997. Wetland Mitigation: Design and Implementation via the Design/Build/Grow Process. Presented at the International Erosion Control Association, Erosion & Sediment Control Workshop, November 19, 1997 in Northglenn, Colorado.

Gurnée, Grant E. 1997. Wetland Mitigation: Design and Implementation via the Design/Build/Grow Process. Presented at the International Erosion Control Association, Erosion & Sediment Control Workshop. November 19, 1997. Northglenn, Colorado.

Gurnée, Grant E. and Gary Bentrup. 1996. Wetland and Riparian Protection Strategies. Presented at the Sierra Club, Regional Growth Strategies Conference, "New Perspectives and Strategies to Preserve Mountain Communities." February 16 – 17, 1996. Glenwood Springs, Colorado.

Gurnée, Grant E. 1994. How to Recognize and Deal with Wetland Regulation Issues. Presented at the Continuing Legal Education (CLE) International, 3rd Annual Western Agricultural and Rural Law Roundup. June 23-25, 1994. Fort Collins, Colorado.

AWARDS:

- Colorado Landscape Contractors Award, Sand Creek Enhancement Project – 2000

PROFESSIONAL ASSOCIATIONS:

- Association of State Wetland Managers (ASWM)
- Society of Wetland Scientists (SWS)
- Environmental Concern (EC)

ecos ecosystem services LLC

RESUME – Sub Consultant

Julia Auckland

Wildlife Biologist
Plant Ecologist
Wetland Ecologist

AREAS OF EXPERTISE:

- Field Ornithology
- Butterfly Surveys
- Threatened and Endangered Species
- Habitat mapping and Wetland Delineation
- Noxious Weed surveys wetlands
- Environmental Permitting and Consultation

EDUCATION:

- Bachelor of Science, Fisheries and Wildlife Science, North Carolina State University
- Master of Science, Ecology and Evolutionary Biology, Iowa State University

CONTINUING EDUCATION:

- 38 Hour U.S. Army Corps Wetland Delineation Training
- FACWet – Functional Assessment of Colorado Wetlands, CDOT
- Stormwater Management and Erosion Control, CETC #150
- ACEC Future Leaders Supervisory Skills Workshop

PROTECTED SPECIES SURVEYS:

- Ute-ladies' tresses orchid and Colorado butterfly plant
- Southwestern willow flycatcher
- Preble's meadow jumping mouse
- Nesting raptors including burrowing owls

EXPERIENCE SUMMARY:

Julia Auckland is a wildlife biologist and environmental consultant who has worked on, and managed, projects throughout the United States for over 15 years. She is a valued subcontractor for ecos and has been since 2013. She has worked as a sole proprietor since 2012. Her areas of expertise include field ornithology, butterfly surveys, threatened and endangered species, habitat mapping, noxious weed surveys, wetlands, and permitting. She has worked on a wide variety of infrastructure and development projects. Ms. Auckland customizes each project approach based on the client's goals, resource constraints, regulations, budget, and schedule.

Raptor & Nesting Bird Surveys:

Ms. Auckland has completed pre-construction surveys for nesting birds (raptors, burrowing owls and/or songbirds) on three pipelines, ten transportation projects, and almost 100 oil and gas drilling sites. Her avian experience also includes bald eagle nest monitoring, multi-species surveys, long-term population monitoring, trapping, banding, and behavioral studies in 12 states, Mexico, and Australia for university research projects, endangered species management on military bases, agricultural operations, and environmental impact studies.

Threatened and Endangered Species Surveys:

Ms. Auckland has substantial experience surveying for threatened and endangered species. She has completed multiple Preble's mouse habitat assessments and surveys for Ute ladies'-tresses orchid and Colorado butterfly plant.

Wetlands Delineation and Permitting:
Ms. Auckland has been completing wetlands delineations, permitting, and mitigation since 1993. She has completed more than 50 wetlands projects including delineations, permitting, mitigation monitoring, and mitigation design.

Noxious Weed Surveys:
Ms. Auckland has completed noxious weed surveys on projects ranging from small transportation improvements to a 1,000+ acre wind farm. She has also completed noxious weed management plans for multiple sites in Colorado.

NEPA:
Ms. Auckland has been the environmental manager on more than 40 transportation projects requiring National Environmental Policy Act (NEPA) compliance (Categorical Exclusion, EA, EIS, and PEL). She has been the technical lead for sections on wetlands, wildlife, vegetation, water quality, and air quality. She has managed staff and sub-consultants in the areas of hazardous materials, archaeology, paleontology, history, Section 4(f), stormwater management, socioeconomics, and land use.

RELEVANT PROJECT EXPERIENCE:

Wetlands

Environmental Permitting for Transportation Projects: Environmental compliance project manager on more than 40 Colorado transportation projects requiring wetlands delineations and permitting. Completed the majority of the wetland delineations for these projects. Wrote or reviewed all of the delineation reports and permit applications. Prepared on-site mitigation plans and monitored wetland mitigation sites.

Metro Wastewater Reclamation District: Wetland delineation and biological constraints assessment for an effluent pump back force-main (11 miles) and interceptor (6.8 miles) to serve the Northern Treatment Plant. Adams County, Colorado

Xcel Energy: Project manager for an environmental constraints analysis of two 2,500+ parcels. Mapped habitat types and completed a wetland delineation in conformance with Army Corps of Engineers requirements. Assessed each site for the potential occurrence of species listed as endangered, threatened, candidate, and/or rare by the USFWS and the Colorado Division of Wildlife. Prepared summary reports. Brush and Las Animas, CO.

Mc Gonigle Canyon: Coordination and monitoring of a 29-acre wetland restoration project including grading, erosion control, gabion construction, native plant salvage, non-native plant removal, irrigation installation, and planting, San Diego County, CA.

Threatened and Endangered Species

Denver Water: Monitored riparian habitat restoration completed as mitigation for impacts to Preble's meadow jumping mouse habitat (Zapus hudsonius preblei), Littleton, CO.

Colorado Springs Utilities Preble's Mouse Surveys: Conducted surveys for Preble's mouse habitat for a sewer line rehabilitation project in Colorado Springs along Sand Creek. Survey area included over 30 stream crossings, Colorado Springs, CO.

US Army Corps of Engineers: Surveyed Chatfield State Park for the federally threatened Ute ladies'-tresses orchid (Spiranthes diluvialis), Littleton, CO.

Clark County Butterfly Surveys: Contracted with Clark County to complete multiple surveys over two summers for the Mt. Charleston blue and the Spring Mountains acastus checkerspot as required by the USFWS and USFS, Mt Charleston, NV.

Whooping Crane Surveys for the Platte River Endangered Species Partnership: Assistant project manager and field crew coordinator for fall Whooping Crane migration surveys. Coordinated a 10-person field crew to fly survey routes over an eighty-mile section of the central Platte River in Nebraska for 30 consecutive days. Conducted aerial whooping crane surveys and surveyed river cross-sections (topography, water depth, substrate, and vegetation).

Additional Avian and Wildlife Experience

Buckley Air Force Base: Conducted a survey of prairie dogs and burrowing owls at Buckley Air Force Base. Assisted with mapping approximately 600 acres of prairie dogs at the 3,500-acre base. Prairie dog population estimates and burrowing owl

nest mapping was also performed. Helped established permanent and temporary transects, sampled for various vegetation and wildlife, identified species of concern, and monitored site conditions. Summarized findings in a report to help guide in future development plans at the base. Aurora, CO.

Preconstruction Bird Surveys (2005 – present): Completed multiple surveys for nesting songbirds, nesting raptors and burrowing owls. Projects have primarily been for residential development, transportation projects, pipeline work, and oil & gas.

Nesting Bird Monitoring on CDOT Region 6 Bridges: Worked with CDOT Region 6 environmental staff to develop standard protocols for bridge construction project that would prevent violations of the Migratory Bird Treaty Act. Twice a week, bridges scheduled for construction during the nesting season were surveyed for nests so that nests could be removed prior to egg-laying. Evaluated the cost and effectiveness of different nest exclusion and removal methods. Prepared a detailed summary report. Denver, CO.

Biodiversity Surveys of the Greater Yellowstone Ecosystem for Iowa State University (1998-2001): Two years as the project manager and one year as the assistant project manager for a study of the efficacy of using satellite imagery to predict biodiversity in the Greater Yellowstone Ecosystem. Managed a complex research project in a remote area that required moving between a northern and southern study area every two weeks. Conducted point counts for birds and surveyed butterflies for three field seasons. Hired trained, and supervised field assistants for two field seasons. Coordinated with botany and GIS field crews. Designed and implemented a mark-recapture study of *Parnassius clodius* butterflies to estimate populations, mobility, and survival rates.

Red-cockaded woodpecker research, monitoring, and management (1991-1996): Worked on multiple red-cockaded woodpeckers (RCW) (federally endangered species) projects over six years beginning as a university field research assistant and culminating as the project manager on the 250,000 acre Eglin Air Force Base in Florida.