

CHAPTER 2

THE APPROACH

“A thing is right only when it tends to preserve the integrity, stability and beauty of the community; and the community includes the soil, water, fauna and flora, as well as the people.”
-Aldo Leopold, A Sand County Almanac, 1949.



This study served to delineate and field-survey 113 natural areas in the Erie planning area. Six large (2 feet x 3 feet) maps were generated of the 50-square-mile planning area based on rectified aerial photographs. Natural areas were delineated by drawing polygons around relatively undeveloped areas that visually appeared to have ecological significance, such as bodies of water, wetlands, creeks, draws, sections of ditches that had dense vegetation, unplowed fields and pastures, fields with prairie dog burrows, and areas with notable changes in vegetation. Property boundaries were inconsequential to this effort. Subsequently, additional natural areas suggested to us by Town of Erie staff, Claire Solohub of the Colorado Division of Wildlife, and residents of the planning area were included. The nine ditches that traverse the Erie planning area were all surveyed and rated. However, polygons were not drawn around them.

Parcel layers were superimposed on the delineated polygons. The names and addresses of all ownership parcels that 1) overlapped with the natural area polygons, and 2) were more than 20 acres in size, were highlighted. This resulted in 46 ownership parcels. Letters were sent to these landowners requesting access to the parcels. An additional five letters were subsequently sent out for some smaller parcels.

From September 24 through November 20, 2007, a team of two Walsh ecologists conducted field surveys of the delineated natural areas. A survey data form was developed to rate the natural areas on multiple ecological categories, described below. Data were entered onto an electronic tablet for direct download to a database, and comment notes were made on hard-copy data sheets. Visits at each site lasted 20 minutes to 1 hour or more, depending on the size and complexity of a site.

Survey Form

A number of criteria were developed to rate the surveyed natural areas. These include wetlands value, ecological condition, vegetation component, and potential value to wildlife. Most categories were assigned a rating of 1 to 5, with 1 indicating a low rating and 5 indicating the highest rating possible. Ratings for the extent of weed cover and ground disturbance were reversed such that a rating of 5 represented the least amount of weediness and ground disturbance. This allowed for a straightforward summing of ratings across all categories to develop a summary rating.

The following section presents the definitions of the terms and evaluation criteria used to rate each natural area. The survey was divided into the general categories of basics, wetlands, landscape context, vegetation, wildlife habitat, enhancement potential, and site comments, each of which is represented by several fields in the project database.

NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

Basics

Site #: Each natural area was identified with a site number that was assigned as the natural area polygons were drawn. It serves as an identifier for locating a site on the maps and linking all site data.

Site Name: Each natural area was named according to its natural attributes visible on an aerial photograph. These names were not affected by property ownership or property lines.

Acres: The size of each natural area (in acres) was determined by the ArcGIS Calculate Geometry program.

Map: Refers to the map sheet number. The sheets are alphanumerically labeled west to east and north to south and begin with Sheet A1 (far northwest quadrant) and end with Sheet C2 (far southeast quadrant).

Site Description: This field contains a description of the natural area.

Wetlands

Wetland Functionality: Wetland functionality was evaluated in terms of hydrology, presence and quality of wetland vegetation, and soils. Functionality was rated on a scale of 0 to 5, as follows:

0 = No open water

1 = Concrete or riprap-lined ditch or a ditch with no vegetation

2 = Small farm or detention pond with little to no vegetation, turbid, over-nutriented, and incapable of draining, filtering, or flushing except by intermittent flow; very degraded creek or ditch with little to no vegetation

3 = Small lake or pond that is somewhat vegetated and provides some residence time for water; ditch or canal that is well-vegetated, perhaps with some terracing but water moves through quickly; natural or intermittent swale, draw, or gully that is somewhat to well-vegetated with very permeable soils that can recharge groundwater regularly; natural perennial or intermittent stream that is somewhat vegetated, straight, and downcut, with water that moves through quickly, and it is not well connected with the floodplain

4 = Large pond or lake with somewhat vegetated or narrow wetland fringe; natural perennial stream that is sinuous, well-vegetated, and physically connected with the floodplain

5 = Large pond or lake with well-vegetated and broad wetland fringe; large well-vegetated wetland

TOWN OF ERIE NATURAL AREAS INVENTORY



Site #: 71
Tracked Field

Map: B2
 Acres 55

This site is a large field between the cemetery and Coal Creek.

Wetlands:

Wetland Functionality: 3 Wetland Value: 3

Landscape Context

Nearby Land Use: Habitat Types Present: 3

- | | |
|---------------------|-----------|
| Field without Crops | Grassland |
| Creek | Wetland |
| Ditch | Other |
| Natural Area | |
| Residential | |

Viewshed: From Site

Vegetation

Plant Communities: ADUD, CSL, RCSH, SDH

Vegetation Structure:	County-listed Noxious Weeds:	Noxious Weed Cover	5
Forbs	Musk Thistle	Ground Disturbance:	5
Grass	Canada Thistle	Plant Diversity:	3
		Grassland Value:	4

Wildlife Habitat

Prairie Dog Habitat: 0% Wildlife Species of Concern:
 Overall Wildlife Habitat Quality: 3

Primary Factors Present	Secondary Factors Present
Water or wetland is present	Site is larger than 3 acres Site is adjacent to another natural area One of the three vegetation structure types is in good condition

Wildlife Species Seen eastern cottontail, coyote

Enhancement Effort: Medium

Summary Rating: 22

Site Comments

This site is a large field below the cemetery and near Coal Creek. Ryegrass and cheat grass dominate. Cottonwood Extension Ditch runs along the bottom of the sloping field. Overall species diversity is low in this relatively homogenous site because it is dominated by escaped cultivated rye. However, a large number of natives such as salsify, sand sage, sand dropseed, buffalo grass, and sagewort are present. The presence of a good number of upland native species is noteworthy, and efforts should be made to protect them. This site is unique in this regard. The rolling topography presents a feature of interest. With Cottonwood Extension Ditch on the site and Coal Creek adjacent, this area has value to wildlife as an open but uncultivated field. Grass and forb seeds are plentiful for small mammals and seed eating birds. Meadowlarks surely nest here in spring. This site presents a unique opportunity for restoration or enhancement in upland habitat with the removal of non-natives and planting or seeding with natives. This site presents the best site in the planning area for native grassland restoration.

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Wetland Value (to wildlife): The wetland value to wildlife was evaluated for its ability to provide habitat to wildlife. This value takes into account water body size, water movement, and quality of surrounding vegetation. The value is rated on a scale of 1 to 5 as follows:

- 1 = No open water
- 2 = Poor-quality ditch, creek, or pond; vegetation virtually absent; small pond
- 3 = Some vegetation at the edge, even weedy; includes ephemeral pools; medium-sized pond
- 4 = More vegetation at the edge; larger pond
- 5 = Excellent wildlife habitat, sinuosity present in creek, vegetation well developed; large pond, reservoir, or creek

Landscape Context

Nearby Land Use: Multiple land use types were listed for each natural area. This category includes all land uses observed in the surrounding area, including agricultural lands (with crops), field (without crops), subdivision, farm, creek, ditch, natural area, residential, oil well, and gravel mining.

Habitat is the natural environment – including the physical and biotic environment – in which a species lives.

Habitat Types Present: This category lists the habitat types present on a site. This refers to the six habitat types determined to represent the range of habitat seen in the Erie planning area: agricultural, aquatic, grassland, wetland, woodland, and other. These habitat types are described in Chapter 2. The rating for this category is the sum of the number of different habitat types present.

Viewshed: Viewshed is a qualitative measure determined by viewing the natural environment visible to and from the site being assessed. If there is a good view from the site (most frequently a mountain view), then “From Site” was entered. If the site itself appeared to provide a pleasing view as viewed from the surrounding area, then “To Site” was entered. A blank entry indicated there was no notable view from or to the site.

Vegetation

Plant Communities: Plant communities are groups of plants that occur together. The plant community classification system used here, also called a system of plant alliances, is adopted from the U.S. National Vegetation Classification (Maybury 1999). Plant alliances for the Erie planning area are listed in Table 1 at the end of the chapter. For example, Creek Shelter

Belt/Riparian Forest (CSB) is a plant community comprising plains cottonwood, crack willow, coyote willow, and Russian-olive. Although a particular alliance usually contains 10 or more species, only 1 to 4 dominant species are listed. This classification system is being used throughout the United States, including Boulder County and City of Boulder. Exact and technical in nature, it will be very useful in the future to know the plant communities that populated each natural area in 2007.

Vegetation Structure: This category lists the various plant structure types present, and includes tree, shrub, forb (broad-leaved plant), grass or grass-like plant, and litter. The rating is the sum of the structure types present.

*You know it's a **tree** if you can walk under it and it's a **shrub** if you can't. **Forbs** are nonwoody flowering plants. **Grasses** are easy to recognize and have long blades.*

County-listed Noxious Weeds: This category refers to the 13 noxious species listed by Boulder County Parks and Open Space, and includes diffuse knapweed, spotted knapweed, Russian knapweed, leafy spurge, musk thistle, Canada thistle, Scotch thistle, bull thistle, dalmatian toadflax, yellow toadflax, houndstongue, common teasel, and tamarisk. This field lists all of these species that were found on the site.

Noxious Weed Cover: This category refers to the percentage of each site that is covered by county-listed noxious weeds. Ratings used to evaluate weed cover are as follows, with the highest rating applied to the lowest amount of weed cover:

*5 = 0-5 percent
4 = 6-10 percent
3 = 11-25 percent
2 = 26-50 percent
1 = 51-100 percent*

Ground Disturbance: The extent of ground disturbance is an estimated measure of bare ground. Factors taken into account include bare soil, roads (paved and unpaved), construction areas, and areas with vegetation removed. Ratings used to evaluate ground disturbance are as follows, with the highest rating applied to the lowest amount of ground disturbance:

*5 = 0-5 percent
4 = 6-10 percent
3 = 11-25 percent
2 = 26-50 percent
1 = 51-100 percent*

Plant Diversity: Plant diversity lists the number of different species on each site. This category was related to the number of plant communities (alliances) found on each site. It was given a rating of 1 to 5 as follows:

<i>1 = 1-10 species</i>
<i>2 = 11-30 species</i>
<i>3 = 31-50 species</i>
<i>4 = 51-70 species</i>
<i>5 = 71-100 species</i>

Grassland Value: The evaluation system generally favored sites with water, largely as a consequence of the two wetlands categories described above, which could contribute 10 points to the summary rating. As a consequence, open grassland sites were under-valued in the rating system. In an attempt to better reflect the value that grasslands impart to natural areas, this rating category was added. It assigned 2 points for the presence of grassland as a habitat type, 2 points for the observed presence of native grass species, and 2 points for the presence of prairie dog habitat.

Wildlife Habitat

Prairie Dog Habitat: For those sites with prairie dog habitat (burrows visible), an estimate was made of the percentage of the site containing black-tailed prairie dogs and/or their burrows.

Wildlife Species of Concern: This field addresses wildlife species of concern that could potentially use the site for migration, breeding, nesting, or movement. The list of species of special concern adopted here is the one that was developed by Boulder County Parks and Open Space.

Overall Wildlife Habitat Quality: This rating of wildlife habitat was obtained by evaluating a number of primary and secondary factors, listed in the table below. These factors were weighted depending on their importance to wildlife. Higher values indicate more significant habitat features, such as the presence of water or inclusion in a movement corridor. Occasionally, the wildlife rating from the table did not match the field team's perceived wildlife value of the site. In cases such as this, the ratings from the table were overridden and altered to agree with the field team's observations.

Wildlife Species Seen: This category lists wildlife species observed, identified by scat and/or tracks, or mentioned as present by resident(s).

NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

Primary Factors			Secondary Factors		
Factor	Yes	No	Factor	Yes	No
<i>Is water or wetland present on property (perennial or seasonal)?</i>			<i>Is the site larger than 3 acres?</i>		
<i>Are any state- or federally-listed species potentially present, other than prairie dogs?</i>			<i>Is the site adjacent to another natural area?</i>		
<i>Could or does the area serve as a migration or movement corridor?</i>			<i>Is one of the three habitat structure types represented in good condition?</i>		
<i>Does the area serve an irreplaceable source of food or cover, or as a site for reproduction for any desirable species of wildlife?</i>			<i>Does the site have three or more habitat types?</i>		
<i>Are prairie dogs present?</i>			<i>Is the site potentially part of a corridor habitat, or does it represent a poor component of such?</i>		
<i>3 or more primary Yes = 5</i>					
<i>2 or more primary Yes = 4</i>					
<i>1 primary or 2 or more secondary factors Yes = 3</i>					
<i>No primary and 1 or fewer secondary factors Yes = 2</i>					
<i>None of these = 1</i>					

Enhancement Effort

Natural areas were rated on the amount of effort that would be required to enhance the site. Enhancement effort was categorized as low, medium, or high.

Low enhancement effort typically refers to sites that require weed control. At some sites, a change in mowing regimen may be indicated. This could be cessation of mowing to allow vegetation to grow. However, sometimes mowing is used as a weed control effort, which also serves an important function.

Medium enhancement effort typically refers to sites that would be enhanced by seeding and/or tree removal. Seeding typically involves

broadcast or drill seeding over existing (typically sparse) vegetation. Tree removal, specifically of Russian-olive, Siberian elm, and tamarisk, and removal of trash, are also included. This category may include limited tree and shrub planting to increase habitat value and the installation of erosion control blankets or other hand placed bio-engineering materials that can be used to stabilize soils and/or prevent stream bank failure.

High enhancement effort refers to activities that require earth moving, structural changes, and subsequent revegetation efforts. It may include grading, slope reduction, grade control installation, and tilling, such as occur in creek restoration and prairie restoration projects. It also includes controlled burning, extensive seeding, and plantings of plugs or containerized plants. In some cases this may involve removal of riprap or concrete rubble and replacement with natural bank stabilization materials such as plantings and/or root wads.

Summary Rating

A summary rating was developed (see Chapter 4) that summed all the ratings categories. Because most sites had relatively little noxious weed or ground disturbance cover, these two categories had consistent ratings of 4 and 5 and added disproportionately to the summary rating. To compensate, their value was downweighted by dividing the original value by 4. Summary ratings were ranked as follows:

Low	10-17
Medium	18-22
High	23-31

Site Comments

This field includes a written description of the natural area and its special features. It is meant to give the reader a feel for the site. It addresses possible use by wildlife species, plant communities present, and enhancement potential.

Table 1: Plant Communities (Alliances) Present in the Erie Planning Area		
Alliance Acronym	Plant Alliance Common Name	Scientific Names
Agricultural		
ASBH	Cultivated alfalfa/smooth brome/cultivated hay	<i>Medicago sativa</i> / <i>Bromopsis inermis</i> / <i>Poa</i> spp., <i>Phleum</i> spp., <i>Dactylis glomerata</i>
CAH	Cultivated alfalfa hay	<i>Medicago sativa</i>
CC	Cultivated corn	<i>Zea mays</i>
ISAP	Introduced species agricultural pasture	<i>Triticum aestivum</i> , <i>Medicago sativa</i>

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Grasslands (Graminoids)		
BGH	Blue grama herbaceous	<i>Bouteloua gracilis</i>
CWH	Crested wheatgrass seminatural herbaceous	<i>Agropyron desertorum</i>
KBH	Kentucky bluegrass seminatural herbaceous	<i>Poa pratensis</i>
PPOF	Planted prairie old field	<i>Bouteloua gracilis</i> , <i>Dalea</i> spp., <i>Liatris punctata</i>
SBH	Smooth brome seminatural herbaceous	<i>Bromopsis inermis</i>
SBWU	Smooth brome/wheatgrass understory	<i>Bromopsis inermis</i> , <i>Agropyron desertorum</i> , <i>Pascopyrum smithii</i> , <i>Thinopyrum intermedium</i>
SDH	Sand dropseed herbaceous alliance	<i>Sporobolus cryptandrus</i>
WTFH	Western wheatgrass temporarily flooded herbaceous	<i>Pascopyrum smithii</i>
WWH	Western wheatgrass herbaceous	<i>Pascopyrum smithii</i>
Other/Nonagricultural Weedy		
ADUD	Annual dominated upland disturbance	<i>Alyssum</i> spp., <i>Anisantha tectorum</i> , <i>Bassia sieversiana</i> , <i>Breca arvensis</i> , <i>Convolvulus arvensis</i> , <i>Rumex crispus</i> , <i>Sisymbrium altissimum</i>
BTPH	Black-tailed prairie dog grassland complex	<i>Convolvulus arvensis</i> , <i>Gutierrezia sarothrae</i> , <i>Yucca glauca</i>
CSL	Chenopodium, Russian thistle, prickly lettuce	<i>Chenopodium</i> spp., <i>Salsola australis</i> , <i>Lactuca serriola</i>
GFWM	Grass-forb weedy mesic alliance	<i>Breca arvensis</i> , <i>Bromopsis inermis</i> , <i>Lactuca serriola</i> , <i>Helianthus annuus</i> , <i>Persecaria</i> spp., <i>Phalaroides arundinacea</i> , <i>Rumex crispus</i> , <i>Scirpus</i> spp., <i>Typha latifolia</i>

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LWDA	Lowland weedy ditch alliance	<i>Alyssum</i> spp., <i>Anisantha tectorum</i> , <i>Bassia sieversiana</i> , <i>Breaa arvensis</i> , <i>Carduus nutans</i> , <i>Dipsacus fullonum</i> , <i>Rumex crispus</i> , <i>Sisymbrium altissimum</i>
MF	Mown field	<i>Poa</i> spp.
Other/Agricultural Weedy		
CGH	Cultivated grass hay	<i>Dactylis glomerata</i> , <i>Phleum</i> spp., <i>Poa</i> spp., <i>Medicago sativa</i>
DCAP	Disturbed cultivated agricultural pasture	<i>Medicago sativa</i> , <i>Elymus</i> spp.
ECCS	Escaped cultivated crop species	<i>Elymus</i> spp., <i>Medicago sativa</i> , <i>Triticum aestivum</i>
Wetland		
CBSH	Cattail bulrush semipermanently flooded herbaceous	<i>Typha (angustifolia, latifolia)</i> , <i>Scirpus</i> spp.
CDMA	Carex dominated mesic	<i>Carex</i> spp.
CHSH	Cattail herbaceous semipermanently flooded	<i>Typha (angustifolia, latifolia)</i> , <i>Schoenoplectus</i> spp.
EW	Emergent wetland herbaceous vegetation	<i>Eleocharis palustris</i> , <i>Typha</i> spp., <i>Scirpus</i> spp.
NSH	Nebraska sedge seasonally flooded herbaceous	<i>Carex nebrascensis</i>
RCSH	Reed canarygrass seasonally flooded herbaceous	<i>Phalaroides arundinacea</i>
SFB	Seasonally flooded bank	<i>Typha</i> spp., <i>Phalaris</i> spp., <i>Bromopsis inermis</i>
WM	Wet meadows	<i>Carex nebrascensis</i>
Woodland (Trees and Shrubs)		
APS	American plum shrubland	<i>Prunus americana</i>
BETW	Box-elder temporarily flooded woodland	<i>Acer negundo</i>
CCS	Choke cherry shrubland	<i>Prunus virginiana</i>
CSB	Creek shelterbelt/riparian forest	<i>Populus deltoides</i> , <i>Salix fragilis</i> , <i>Salix exigua</i> , <i>Elaeagnus angustifolia</i>
CWS	Crack willow scattered	<i>Salix fragilis</i>

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CWTS	Coyote willow temporarily flooded shrubland	<i>Salix exigua</i>
GATF	Green ash/American elm temporarily flooded forest	<i>Fraxinus pennsylvanica/ Ulmus americana</i>
OR	Orchard	<i>Dactylis glomerata, Bouteloua dactyloides, Poa spp.</i>
PCSI	Plains cottonwoods scattered individuals w/mesic understory	<i>Populus deltoides</i>
PCSIX	Plains cottonwoods scattered individuals w/xeric understory	<i>Populus deltoides</i>
PWTW	Peach-leaf willow temporarily flooded	<i>Salix amygdaloides</i>
ROS	Russian-olive scattered	<i>Elaeagnus angustifolia</i>
ROW	Russian-olive seminatural woodland	<i>Elaeagnus angustifolia</i>
SB	Shelterbelt	<i>Elaeagnus angustifolia, Populus deltoides, Salix fragilis</i>
WRSH	Wood's rose shrub herbaceous	<i>Rosa woodsii</i>
WSTS	Western snowberry temporarily flooded shrubland	<i>Symphoricarpos occidentalis</i>