

CHAPTER 3

ERIE'S NATURAL ENVIRONMENT

“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.



The Erie planning area includes stunning views of the Front Range mountains with open fields in the foreground. The mountains catch the eye and the openness of the grassland habitat allows the view.

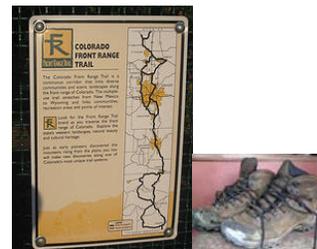
Longs Peak on an October day in the Erie planning area (Site 97)



The mountains in this grand view spawn the creeks, formed by water erosion over millennia, that flow into the planning area bringing snowmelt to the more arid flatland. Boulder Creek, Coal Creek, and the historic grasslands are the major defining elements in Erie's landscape. Starting in the mid-1800s, enterprising farmers dug agricultural ditches to route creek water to their crops. These ditches resemble small creeks crisscrossing open fields and spreading precious water on the landscape. Other natural resources associated with the creeks' floodplains, including gravel for many uses and soils for planting, have been extensively developed. This human use has also defined the landscape: now reclaimed gravel ponds line the broad floodplains of the creeks and little native vegetation remains in pastures and fields where planted crops have replaced native grassland.

Recreation is another human use of the landscape, and one that is growing. Our task, as responsible stewards and recreationists, is to understand the land and protect the areas that are special, enhancing them when we can.

Recreation is an important human use of the landscape, and one that is replacing mining and agriculture in places. In years past, people thought that this activity did not impact natural areas. However, we now understand that this is not the case. For example, trails in areas with topographic relief are vulnerable to erosion and loss of vegetation. Birds avoid areas near trails for nesting, and mammals seek isolated areas away from human use for birthing.



An important aspect of natural habitat, and one that was considered in the context of the Erie planning area, is connectivity. Is the habitat fragmented and severed such that plant communities cannot expand and animals are limited in where they can go? For example, small mammals avoid crossing roads because of the sudden loss of vegetative cover. Roads effectively fragment habitat. Connectivity or linked areas, on the other hand, occur along linear features such as creeks and many ditches. Their diverse plant community includes trees and shrubs that provide a corridor for movement by such animals as white-tailed deer, raccoons, and red foxes. This important feature functions on a landscape scale rather than on the scale of the individual natural area. This issue is important to keep in mind during the planning process.

The Floodplain

A floodplain is a low area of land adjacent to a stream or other water course that is subject to flooding and holds the overflow of water during a flood. Often it is visible on the landscape as a change in topography above which flood waters do not reach or by the presence of trees and shrubs within the lower floodplain area. Although the floodplain may appear to be a distinct habitat type, this zone of interaction between water and land is actually a mosaic of several, or all the habitat types found in Erie (Figure 2).

A floodplain has a source of permanent water. By virtue of association with the dynamic of water movement, floodplains provide a diversity of soils and relative water availability that allows corresponding diversity of plant communities. In semiarid regions such as the Colorado Front Range, floodplains stand out in contrast with their surroundings. Floodplain vegetation typically comprises three vertical layers of vegetation structure: groundcover (grasses and herbaceous plants called forbs), shrubs, and trees. In addition, the different representative habitat types – agricultural, aquatic, grassland, wetland, woodland, and other – are arranged horizontally in a pattern determined by flood levels and soil deposition. The close proximity of habitat types and combination of water, food sources, and cover options ensure that floodplains are one of the areas most used by wildlife. Of course, the presence of water, shade, and wildlife are attractive to people, and thus these areas are also favored locations for trails and passive recreation.

*The major function and benefit of a **natural floodplain** is that its wide surface area absorbs storm water. Above all its other features and benefits, it is this safety net aspect that is the primary reason for preservation.*

A unique floodplain characteristic is the continual dynamic interaction of water energy, nutrients, vegetation, soil, and topography. For example, rising waters carry and deposit nutrients and sediment, which are necessary components of the reproductive life cycles of plants such as plains cottonwoods. Cottonwood seedlings require newly created banks of sediment on which to germinate and establish. Water sustains plants, whose roots hold

soil in banks and prevent erosion and whose leaves of which moderate water temperatures by providing shade for aquatic organisms. Flood water inundations lead to changes in microtopography on the land, which favor different plants and create a mixture of habitat types. A floodplain's health is linked to the surrounding landscape. It can recover and regenerate from human and natural disturbance as long as its large size is maintained and the negative influences (such as hard surfaces) from the surrounding landscape do not become too great. Hard surfaces such as roads, driveways, parking lots, houses, and sidewalks create areas where rainwater cannot be absorbed into the earth. This surface water accumulates and enters creeks in larger volumes than if it was being absorbed all along. The large volumes of water cause erosion. Furthermore, this runoff water is not available to recharge the groundwater as it would in a more natural environment.

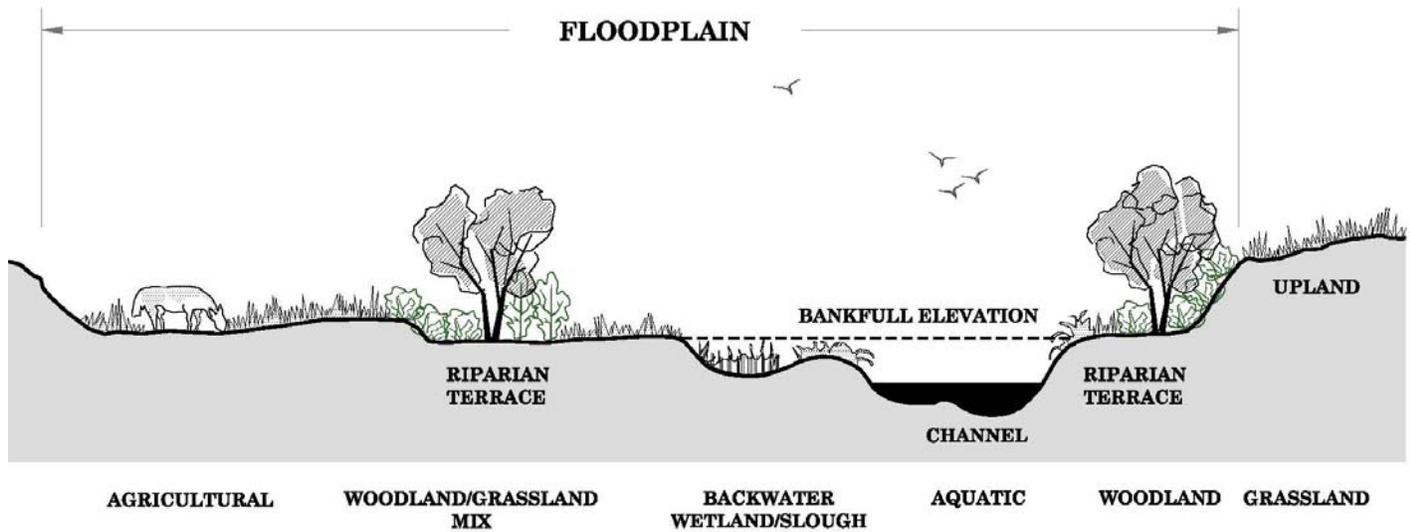


Figure 2. Floodplain Ecology

FLOODPLAIN: The relatively flat area adjacent to a stream that is subject to inundation and that absorbs storm water; an area rich in diversity, productivity, and interaction between water, soil, plants, and wildlife. The outer limit is defined naturally by geology and topography but can be modified with walls, embankments, etc.

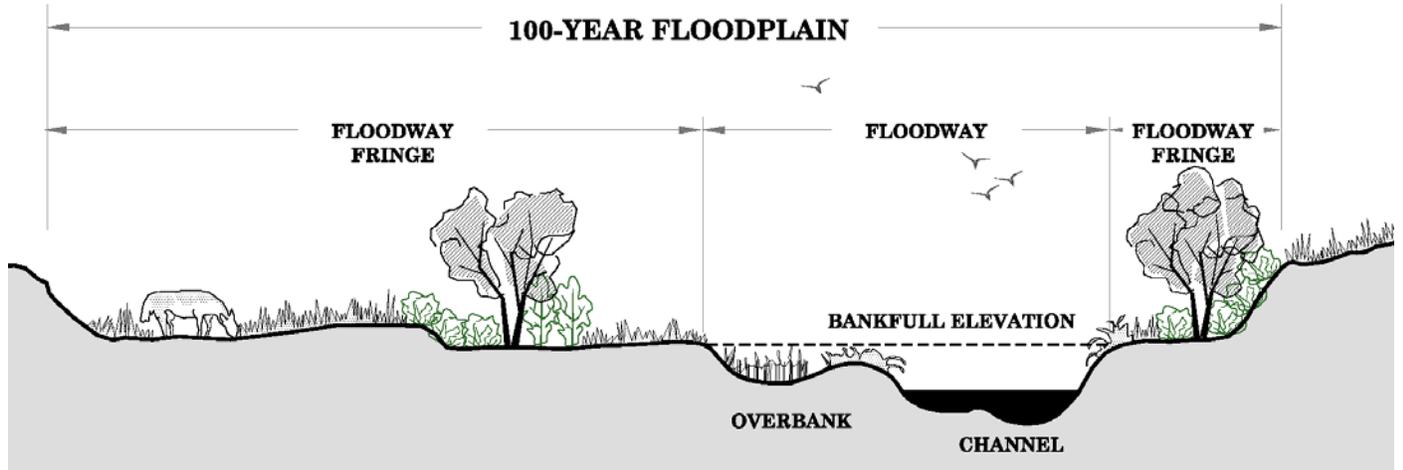


Figure 3. Floodplain Regulation

FLOODWAY: The channel and adjacent overbank areas that carry most of the flood water downstream. This is usually the area of highest water velocity during a flood.

FLOODWAY FRINGE: The area outside of the floodway, but still within the 100-year floodplain.

100-YEAR FLOODPLAIN: the area adjacent to the channel that has a 1% chance of being flooded in any given year.

The Landscape Context

Landscape ecology provides a big picture view of ecological relationships and can be applied to both natural and urbanized areas of all sizes. The principles of landscape ecology also provide a foundation for addressing wildlife conservation or natural area conservation issues at the rural-urban interface. Terms used to describe landscape ecology are defined below.

Patches

Patches are plant and animal communities that are surrounded by areas with differing community structures. An example of a patch in Erie is Wise Woods (Site 40), which is an area of planted large, mature trees surrounded by agricultural lands.

Wise Woods is a patch of woodland
in a matrix of agricultural fields
(Site 40).



Corridors

Corridors are linear elements through which wildlife, water, energy, nutrients, and humans move. Coal Creek, irrigation ditches, and Highway 52 are examples of corridors. Interconnected corridors are called networks. A network in a rural area might consist of intermittent stream drainages, irrigation ditches, fencerows, and wind breaks.

Corridors such as this curved
ditch provide important habitat
for wildlife movement (Site 71).



Matrix

The background within which patches and corridors exist is called the matrix. Prior to settlement, the landscape matrix of the Erie area was short-grass prairie. Over the past 100 or more years the matrix has become

agricultural fields. Currently, the matrix in many parts of Erie is residential development.

Agricultural fields serve as one of the major landscape matrices in the Erie planning area (Site 24).



*The term **community** can refer to plants, animals, or people. A community is a group of organisms found living together in a particular environment. This can refer to a plant community comprising the species of plants that occur together (as in the plant alliances described in Chapter 2), or a group of people living in a subdivision.*

The study of patches and their connections provides a perspective of how landscapes change with human intervention. It also creates a model for optimizing the arrangement of natural area parcels. In natural landscapes, patches tend to be large, irregularly shaped, and few in number. Urbanization progressively subdivides an area into smaller patches. Edges become straight, large patches are eliminated, and smaller, rectangular-shaped patches result. Corridors and networks increase with human disturbance, yet barriers to movement also increase and tend to disrupt or destroy the connective functions of the corridor system.

When natural habitat is converted to agriculture or residential use, native plant communities are lost or simplified and wildlife species with narrow habitat tolerances are displaced. In Erie, this means the loss of thirteen-lined ground squirrels and lark buntings (the state bird) that require expanses of native short-grass prairie. Bird species that can survive in the small habitat patches resulting from residential development are typically introduced species such as house sparrows and European starlings, or common generalist species such as American robins and house finches. If a conservation goal is to attract and retain native and less common species, then one must reserve larger patches of representative native vegetation types. For some species, such as warblers and other songbirds that are riparian specialists, providing diverse vegetation structure in these large-

scale reserves and in smaller planted areas throughout the residential community is best.

An example of this large-patch-size principle that is evident in Erie can be seen by comparing the diversity of waterfowl species in a large body of water such as Panama Reservoir versus smaller lakes. Panama Reservoir is host to a much larger diversity of waterfowl species – including uncommon ones such as white pelicans and green-winged teal – while small ponds support fewer species and more likely common ones such as Canada geese and mallard ducks.



Panama Reservoir
(Site 2)

The application of landscape ecology illustrates how to integrate natural and human systems and suggests landscape patterns that are more compatible with natural processes and conservation objectives. The guidelines that emerge represent four general ecological principles: size, connectivity, adjacency, and diversity.

Size

Consolidate natural areas in large enough parcels to be effective habitat areas. Minimize detached outliers of inaccessible open space, except where used as buffers around sensitive areas or animal movement corridors. Keep large patches as intact as possible; for example, avoid fragmenting them with facilities such as trails or buildings that can be located elsewhere.

Connectivity

Conserve a network of corridors that connect patches, and minimize barriers to movement within the corridors. In Erie, many natural areas are linked together by the existing network of irrigation ditches. Bridges allow for a continuous stream bank, whereas culverts full of water have no bank and can block connectivity.

Diversity

Maximize the heterogeneity of patches by promoting variety in patch shape and also by providing variety in vegetation species, age, size, and structure. Note that variation in vegetation structure – the “architecture” of a single plant or group of plants – is as important as plant species diversity. Apply this guideline to patches of all scales. For example, a clump of multi-stemmed trees with a shrub understory is more structurally diverse than a single-stem tree in a mown bluegrass lawn.

Large natural areas are essential. However, in a natural areas system, smaller patches with heterogeneous native vegetation, along with corridor networks, are equally valuable elements that bring songbirds and other wildlife from the larger natural areas into the community for people to enjoy.

Adjacency

Wildlife species from insects and reptiles to birds and mammals are adapted to a variety of habitat types for breeding, hiding, foraging, nesting, denning, and hibernating. Many species use more than one habitat type and

thus adjacencies are extremely important. For example, a ferruginous hawk might perch in a cottonwood as it searches for black-tailed prairie dogs or desert cottontails in the adjacent short-grass prairie. Woodhouse's toads breed in marshes, rain pools, ponds, lakes, and reservoirs, and forage in floodplains and irrigated agricultural lands where soils are deep and crumble easily. A maternity colony of little brown bats may spend the day in an attic or outbuilding, and immediately fly to water at dusk for a drink of water before their evening foraging on moths that are agricultural pests. These adjacencies (cottonwood tree and prairie dog colony; wetland and pasture; attic, pond, and mixed area) are what make these areas of particular value to wildlife. Adjacent human land uses such as cultivated fields, cattle pastures, subdivisions, or urban and industrial areas can influence the wildlife species choosing to inhabit the area, sometimes with a detrimental effect.

These dead cottonwoods in the middle of an open field provide an important perch site for raptors such as red-tailed and ferruginous hawks hunting for prairie dogs in the fields below.

These adjacencies (trees or snags in or adjacent to an open field) are important wildlife habitat components (Site 92).



The ability of each parcel to contribute to the whole system should also be considered. For example, although a potential natural area may have a low overall wildlife habitat quality rating, its value could actually be in the contribution it could make to the natural areas system, such as closing a gap in an existing corridor; adding to the size of a habitat patch; providing open (grassland) habitat near a creek corridor; or, with enhancement, providing an unusual type of habitat structure that is not well-represented in the area.

Habitat Types

Different plant and animal species require different habitat types. Warblers and woodpeckers nest in woodlands, and western meadowlarks and killdeer nest in grasslands. Red foxes like edges between habitats, and pocket mice only occur in grasslands.

It is easy to identify habitat types based on the dominant vegetation. If the dominant vegetation is grasses in an open area, the habitat type is grassland. Alternatively, if cattails and willows near a ditch are common,

then the habitat type is wetlands. The type of habitat indicates what wildlife species are likely to occur there. Each habitat type comprises a variety of plant communities, also called alliances, as described in Chapter 2.

Six major habitat types were found in the Erie planning area, as listed in Chapter 2 and described in more detail below.

Agricultural

Agricultural habitat is characterized by open fields with flat or gently rolling topography. This habitat might be a cropland of vegetables or small grains, a field of alfalfa, or irrigated pastureland. If there are trees or shrubs in the area, they are usually scattered at the periphery or planted in rows between fields to act as a wind break. The dominant soils are deep, well-drained soils that once supported native short grasses such as blue grama with root depths of 60 inches or more. After converting grassland to agricultural land, blowing soil and water erosion become hazards that can lead to a loss of topsoil and, in turn, reduce crop yields over time. Common agricultural communities include corn, alfalfa hay, and western wheatgrass.

Agricultural habitats are important to wildlife for what they lack – houses and human activity. They provide open vistas for species that do not tolerate disturbance well, such as nesting bald eagles and ferruginous hawks. Songbird species such as western meadowlarks, horned larks, and killdeer will nest on the ground in agricultural habitats. Woodhouse's toads use agricultural lands to forage for sowbugs, centipedes, grasshoppers, and other insects. Ring-necked pheasants are distinctive, large introduced game birds. They thrive in agricultural areas, especially small farms where shelter belts are allowed to develop.

Aquatic

Aquatic habitats are characterized by open water. They can be natural or human-made. Aquatic habitats include a water channel such as a creek, ditch, or tributary, or a pond or lake. Coal Creek is a perennial stream (year-round flow). Other drainages in the area may be seasonally dry. The dominant soils found in Erie's bottomlands are deep, poorly drained soils with a seasonally high water table 2 to 4 feet below the soil surface. Duckweed is a common aquatic plant. Eurasian milfoil is an introduced noxious aquatic plant that is, unfortunately, making a presence in the area.

Open water is a necessity for many wildlife species as a source of drinking water, as well as for breeding and foraging. Chorus frogs, tiger salamanders, and Woodhouse's toads require shallow waters with a slow (or no) current to lay their eggs. Mallards and Canada geese, as well as less common species such as gadwalls, American coots, American widgeons, northern pintails, white pelicans, and double-breasted cormorants forage almost entirely in aquatic habitat. Spectacular diversity and numbers of these waterfowl species can be seen during migration on open bodies of water, especially in fall. Erie's numerous reclaimed gravel ponds provide a very important stopover for these species.

Bats require drinking water on a nightly basis. In fact, when they exit the roost at dusk, their first stop is to get a drink. When an isolated bat is

found in an unusual place (e.g., sidewalk or heating vent), it is typically dehydrated. Big brown bats and little brown bats are the two most common bat species in the Erie area. They often make use of human dwellings, such as attics and outbuildings, for their summertime roosts.

The banks of creeks, ponds, and reservoirs are an important component of the aquatic environment. Some banks slope gradually toward the channel, allowing for establishment of natural vegetation. This provides shade for aquatic invertebrates and the fish that feed on them, and cover for terrestrial wildlife. Others are lined with rip-rap or concrete, a condition less suited to vegetation establishment and wildlife use. Or, due to processes such as erosion resulting from grazing and water flows, the banks can be too steep for vegetation to establish or wildlife to navigate.

Grassland

Grasslands are flat or gently rolling plains dominated by grasses with a wide variety of forbs and some shrubs. Grasslands occur in upland areas where soils were well drained and often sandy at the surface, and comprised native short-grass species such as buffalo grass. Most grasslands in the planning area are now converted grasslands that include grama grasses, introduced annual grasses, and smooth brome. In lowlands, such as alluvial floodplains where soils are deep and sometimes poorly drained, native western wheatgrass and bluegrasses begin to dominate. Lowland communities can include weedy mesic grasses and forbs, as well as weeds associated with ditches.

Historically, short- and mixed-grass prairie were the dominant habitats on Colorado's eastern plains, including the Town of Erie planning area. Today, land use activities such as agriculture, construction, habitat fragmentation, grazing, and gravel mining have changed the composition of Erie's grasslands, lowering the diversity of native species and introducing weeds. These changes impact the native flora and fauna.

Grasslands represent Erie's natural heritage, and many species of wildlife have evolved adaptations to this habitat type. Given that grasslands can be hot and dry in the summer, many species are nocturnal and/or use underground burrows during the hottest time of day. Prairie dogs are a typical grassland species. Their importance lies in the predators they attract, and the shelter their burrows provide for other species. Raptors, including red-tailed hawks, ferruginous hawks, and bald eagles feed on prairie dogs, as do coyotes and bullsnakes. Burrowing owls use abandoned or peripheral burrows for nesting and to stay cool. Tiger salamanders also use prairie dog burrows to conserve moisture.

Some of the typical grassland species, including thirteen-lined ground squirrels, swift foxes, and pronghorn antelope, no longer occur in the Erie area. These species require extensive stands of native vegetation such as blue grama and buffalo grass.



Tiger salamanders can often be observed during soft rains in prairie dog burrows that are near bodies of water. The salamanders use the burrows and come up when it rains.

Other

This habitat type is used for areas where weeds have become dominant as a consequence of discontinued human activities such as farming and mining. It is further subdivided into agricultural weedy habitats and nonagricultural weedy habitats.

An agricultural weedy habitat is usually an inactive or retired crop field where weeds have taken over. A dominant species in the Erie area is escaped cultivated rye grass and kochia. Rye grass can be seen in monoculture stands in many different areas of Erie, but particularly just east of Coal Creek near the Town. Areas of noxious weeds such as Canada thistle, musk thistle, or diffuse knapweed can be found in patches within these habitats.

*The common definition of a **weed** is a plant growing where human interests do not desire it. However, in the context of 'naturalness', the presence of weeds is far more serious than a simple barrier to a desired aesthetic. As used in this inventory, the term weed refers to exotic (non-native) plant species that displace natural, native vegetation. **Noxious weeds** refer to legal designation by the State of Colorado for exotic plant species with growth habits that include aggressive population expansion and disbursement that cause significant negative ecological and/or economic impacts. Boulder County lists 13 noxious weeds that occur in the Erie area including Canada thistle, musk thistle, common teasel, and tamarisk.*



Escaped cultivated rye grass is a non-native grass that has taken over portions of the planning area. Here it is the dominant plant (Site 71).

A nonagricultural weedy habitat can occur in both uplands and lowland swales. Such areas are usually a result of past activities other than agriculture such as gravel mining, livestock grazing, and nearby or past development. Dominant species might include tumble mustard or goosefoot, kochia, field bindweed, goathead, and lambsquarters on an upland area, and reed canary grass or smooth brome in a swale.

Wildlife generally does not fare as well in these weedy habitat types as in native vegetation. Typically weeds are introduced species, whereas animals have adapted over evolutionary time to the native vegetation. The aggressive growth of weeds keeps many native plant species from establishing. Weedy vegetation is not as useful to wildlife for breeding, finding cover, and traveling. An exception to this is the introduced ring-necked pheasant; these birds are valued for their beauty and their meat. They use agricultural fields including weedy abandoned ones.

Ring-necked pheasants were introduced to Colorado in 1894, and do well in cultivated and weedy fields. They occur mostly in northeastern Colorado, but are in decline as small farms give way to industrial farming practices that don't leave shelter belts or field stubble.



The abandoned coal mines in the Erie area were not visited during the survey. However, they may provide roosting sites for bats. At other coal mines in the state, the rare Townsend's big-eared bat, several *Myotis* species, and big brown bats have been found. Roosting sites on the plains are limited for bats, so these mines may be of significance, especially with abundant water for drinking nearby.

Wetland

A wetland habitat is a lowland or area adjacent to a pond, such as a cattail marsh or a swale between two ridges where the water table is close to the surface and the surface soils are saturated for several months per year. Wetlands can also occur in floodplains where a nearby creek might be the water source. Wetland soils support grasses, sedges, and forbs adapted to emerge from semiwet (mesic) or wet (hydric) environments. Common wetland plant communities in Erie include wet meadows with Nebraska sedge, common three-square bulrush, Baltic rush, stands of other plants in standing water, and cattails. Wetlands are vital habitats that replenish groundwater. Because these habitats also make extremely productive croplands, the

majority of them have been drained leaving only a small percentage of natural wetlands still intact.

Many species of wildlife require wetlands for nesting, foraging, and breeding. Amphibians and reptiles in particular make use of these zones located between aquatic and woodland or grassland habitats. Amphibians such as tiger salamanders, chorus frogs, and introduced bullfrogs require wetland areas to breed. Red-winged blackbirds and the less common yellow-headed blackbird nest exclusively in cattails. Raccoons and skunks are species that forage in wetlands and have adapted well to human activity.

Raccoon and skunk tracks such as these are often observed in the mud next to wetland habitat (Site 85).



A University of Colorado student found that small breeding populations of red-winged blackbirds in urbanized areas were population sinks. They were less likely to successfully fledge young than in more rural, larger cattail stands.

Woodland

Woodland habitat is an expanse of trees growing in close proximity to one another and often includes a shrub layer and an herbaceous understory. For the purpose of this document, we include ditch woodlands, shrublands, shelter belts, and riparian forests in woodland habitat because they are not extensive enough in Erie's landscape to justify separating them into distinct habitats. The most common woodland type in Erie is riparian forest. Woodland soil characteristics impact the type and quality of trees produced. If a woodland has been trampled by cattle or if heavy equipment has been operated in an area, soil compaction can begin cutting off water and oxygen to tree roots. Indicators of soil compaction include dying leaves on mature trees, dying branches on younger trees, and reduced tree growth rates.

Ditch woodlands, shelter belts, and riparian forests often support native plants such as plains and narrowleaf cottonwoods, and non-natives such as Russian-olives, black locusts, crack willows, and tamarisk. Shrublands, too, will often have thickets of native coyote willows or peach-leaf willows mixed with non-natives such as shrub roses and privet.

Riparian woodlands lining creeks in Colorado are one of the most important wildlife habitats in the state. Their diverse structure (tall trees,

intermediate shrubs, and lower forbs and grasses) provide a plethora of hiding, nesting, and foraging places, as well as movement corridors for a diverse array of species. White-tailed deer forage on wild plum and seek cover and great blue herons forage and nest along Boulder and Coal creeks (Figure 4 and 5). Northern flickers build cavity nests in standing dead trees (snags), and songbirds such as warblers rely on healthy riparian forests and willow shrublands for stopover places where they can rest up and forage during migration or for nesting sites during spring and summer.

Ditches where the vegetation is allowed to develop mimic small streams in terms of ecological function. The woodlands associated with the unusual Wise Woods, in the midst of agricultural fields, are home to a nesting great-horned owl, a state-listed champion walnut tree, and at least one hoary bat.

NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

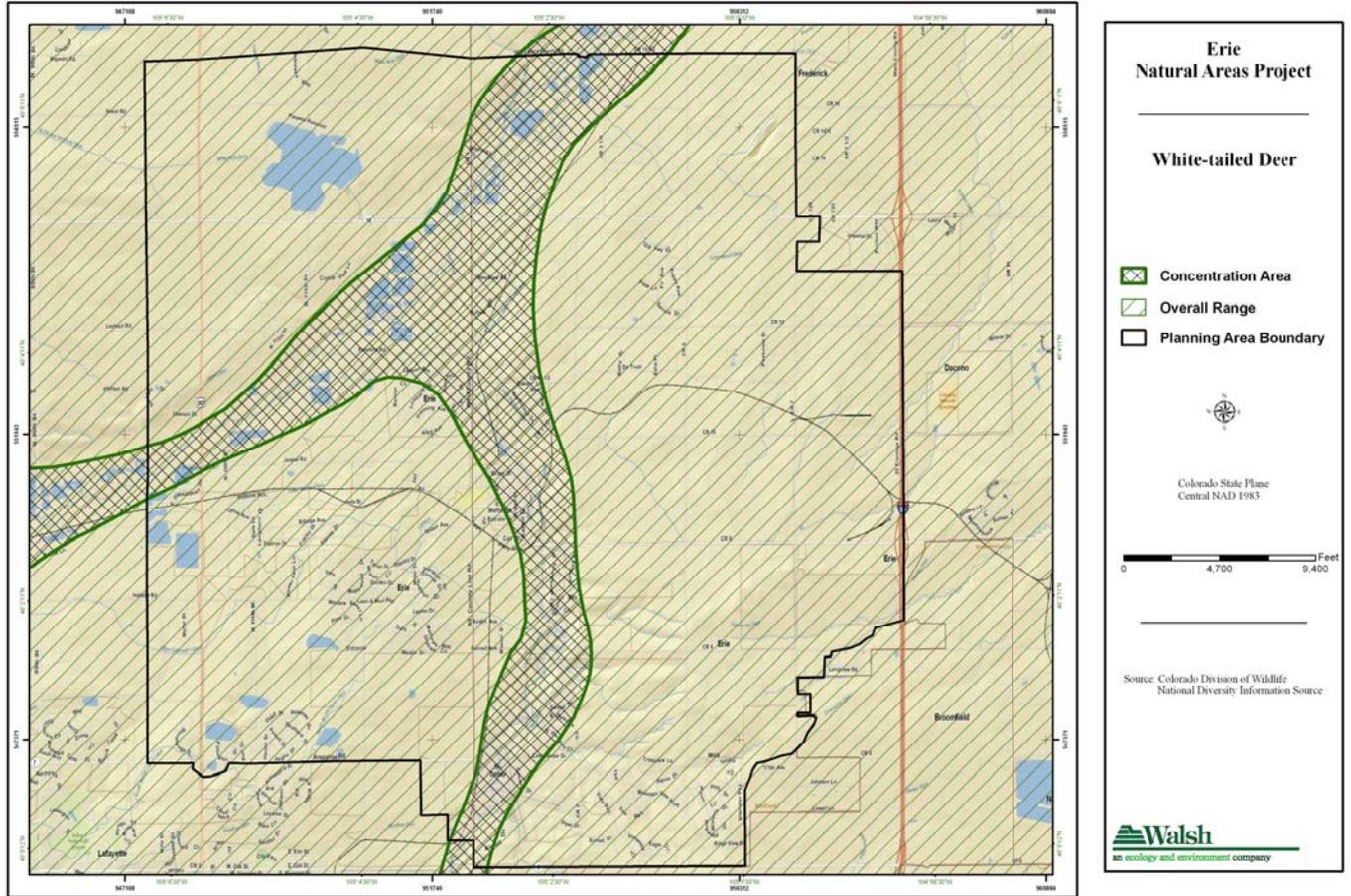


Figure 4. White-tailed Deer Range and Concentration Area in the Erie Planning Area.

NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

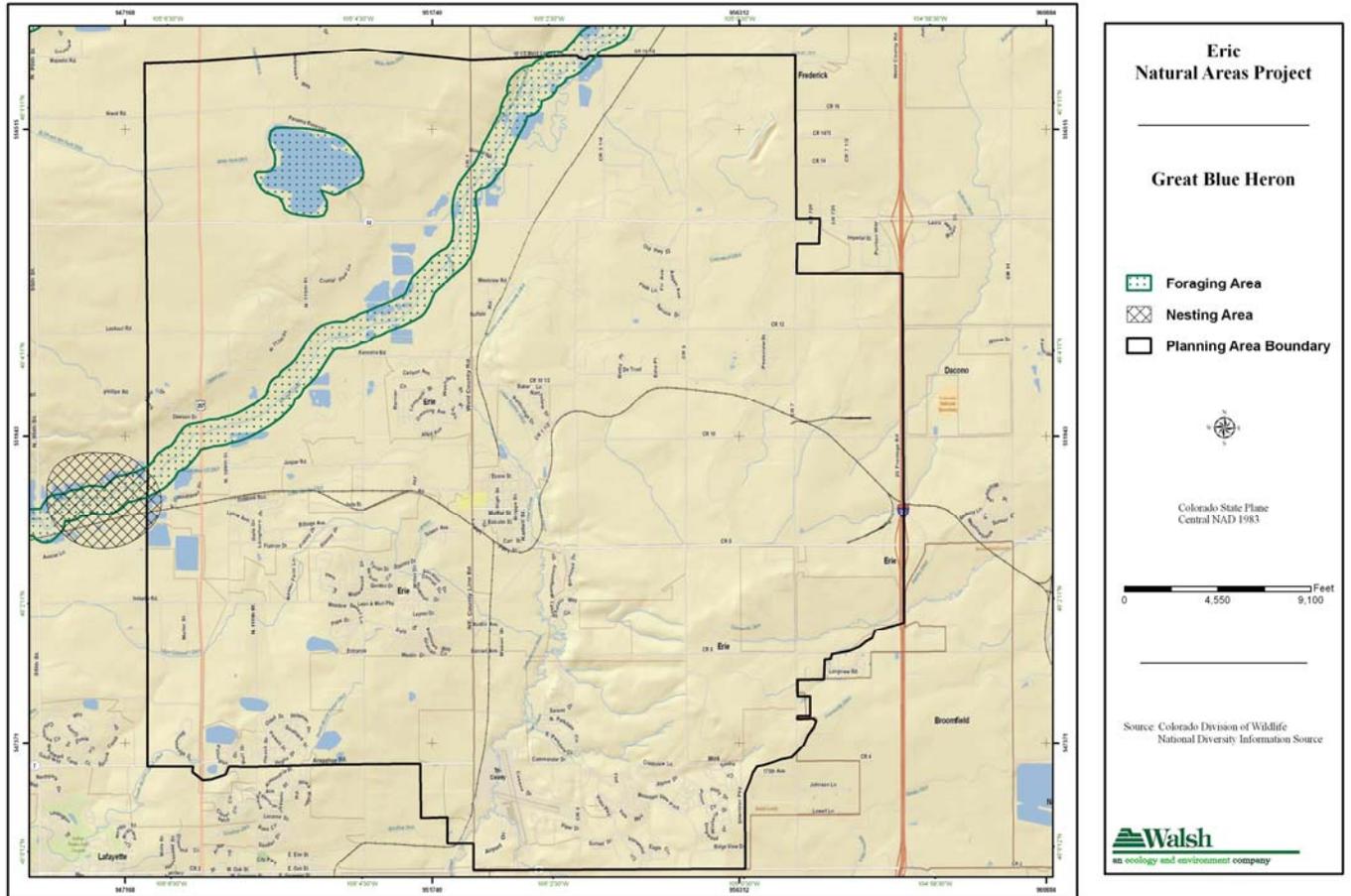


Figure 5. Great Blue Heron Foraging and Nesting Areas in the Erie Planning Area.

NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

Riparian woodlands
comprise roughly
3 percent of the land
mass in Colorado, but
are used by 80
percent of the wildlife
(Site 6).



Cottonwoods along
the creeks and
ditches are the
sentinels of the
plains, providing a
welcome visual
break and important
wildlife habitat (Site
27).



Hoary bats are
distinctive-looking
(hence the name) tree-
roosting bats that
migrate long distances.
This one was found
dead on the ground at
Wise Woods (Site 40).



*An **agricultural** habitat is an open field with flat or gently rolling topography. The habitat might be a cropland of vegetables or small grains, a fallow field of alfalfa, or irrigated pastureland.*





Aquatic habitats are characterized by open water. They can occur naturally or be human-made. Aquatic habitats include water channels such as creeks, ditches, or tributaries, or open bodies of water such as ponds or lakes.





Grasslands are flat or gently rolling plains dominated by grasses with a wide variety of forbs and some shrubs. They include natives such as grama grasses, buffalo grass, and western wheatgrass, as well as introduced crested wheat grass and smooth brome.



NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO



The **other** habitat type includes areas where weeds have become dominant as a consequence of discontinued human activities such as cultivation and mining. It is further subdivided into agricultural weedy habitats and nonagricultural weedy habitats.



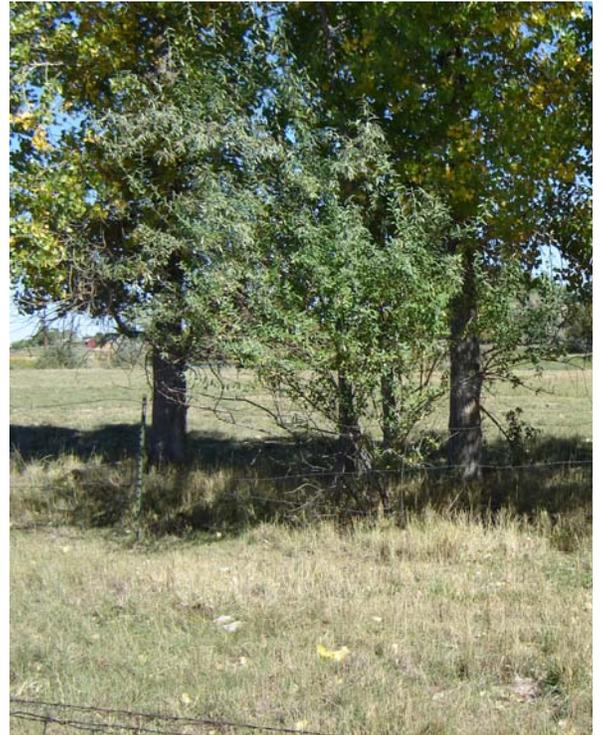


Wetlands are areas where the abundance of water influences soils and vegetation communities. Wetlands refer to the vegetation that grows in standing water, such as cattails and bulrushes.





A **woodland** habitat is an expanse of trees growing in close proximity to one another and often includes a shrub layer and an herbaceous understory of grasses and forbs. For the purpose of this document. Woodland also includes ditch woodlands, shrublands, shelter belts, and riparian forests.



Wildlife

Bison, pronghorns, swift foxes, long-tailed weasels, white-tailed jackrabbits, thirteen-lined ground squirrels, and various species of pocket mice roamed and foraged on the native grasslands. Lark buntings performed song flights over the landscape to attract females, and mountain plovers nested on the ground. Ferruginous hawks and eagles soared overhead preying on prairie dogs, cottontails, and jackrabbits. Some of these species no longer occur because of the loss of the native grassland. One that remains, although in small pockets rather than extensive towns, is the black-tailed prairie dog. Many of the species that associate with its colonies, such as tiger salamanders and western rattlesnakes, take refuge in its burrows. Some species, such as desert and eastern cottontails, black-tailed jackrabbits, and western meadowlarks, are quite capable of tolerating disturbance and thus are still present.

Riparian species have fared better than grassland species, and some of them, such as raccoons and red foxes, have expanded their ranges since human settlement. Other species are generalists and continue to occupy various habitat types. These include white-tailed deer, coyotes, deer mice, American robins, red-tailed hawks, black-billed magpies, and mallards.

For all wildlife, the key is to preserve habitat and leave some of it undisturbed. The focus should be on the riparian corridors and wide open expanses of converted grassland and agricultural habitat.



The State Grass of Colorado, **blue grama** is the defining short-grass prairie species.



Bull snakes can exceed 6 feet in length and are usually a yellow color with a black, brown, and red blotchy pattern. Bull snakes are nonvenomous and consume small mammals such as rats, rabbits, mice, and prairie dogs. They are common reptilian pets.



Thirteen-lined ground squirrels are small and easily distinguishable due to their characteristic pattern of spots embedded in stripes. They are an omnivorous species, and up to

50 percent of their diet consists of animal matter. They inhabit short-grass prairie.



Barn owls are a buff color on top, with very pale underparts. They have a heart-shaped face. Barn owls roost in dark openings in cliffs, trees, and buildings. For the most part, they feed on rodents.



Peeking early spring wildflowers are a subtle treat.

Vegetation and wildlife of the Erie planning area



Undisturbed short-grass prairie visually captures the natural expanse of the Front Range.

Species of Special Concern

A number of species that occur or may occur in the Erie planning area are listed as threatened, endangered, or of special concern by either the U.S. Fish and Wildlife Service or the Colorado Division of Wildlife. The best approach to protect these vulnerable species, listed in Table 2 and shown in the photographs below, is to protect habitat.

Table 2: Listed Wildlife Species in the Erie Planning Area			
Common Name	Scientific Name	Status	Likelihood
Amphibians			
Northern leopard frog	<i>Rana pipiens</i>	SC	Observed
Reptiles			
Common garter snake	<i>Thamnophis sirtalis</i>	SC	Likely
Birds			
Bald eagle	<i>Haliaeetus leucocephalus</i>	ST, recently delisted	Observed
Burrowing owl	<i>Athene cunicularia</i>	ST	Observed
Ferruginous hawk	<i>Buteo regalis</i>	SC	Likely
American peregrine falcon	<i>Falco peregrinus anatum</i>	SC	Observed
Mountain plover	<i>Charadrius montanus</i>	SC	Unlikely
Mammals			
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	FT, ST	Unlikely
Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	SC	Potential
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	SC	Observed
Swift fox	<i>Vulpes velox</i>	SC	Unlikely

Status: FT=federally threatened, ST=state threatened, SC=state species of concern.
Likelihood: Potential=has the potential to occur in the planning area; Likely=is likely present; Unlikely=is unlikely to occur; Observed=observed by Walsh staff, residents, the Colorado Division of Wildlife, the Colorado Natural Heritage Program staff, or Jones (1997).

The **Northern leopard frog** has been observed just west of the planning area along Boulder Creek. Leopard frogs occur in marshes, in shallow areas of ponds, along creeks, and along irrigation ditches. Active from March through October, they can be displaced by the introduced bullfrog.





Common garter snake (source: Colorado Herpetological Society). The common garter snake is not very common, and in Colorado occurs only along the South Platte River in northeastern Colorado. It inhabits pond and stream edges and is active from March through October. The plains garter snake is more common, but lacks the red coloration of the common garter snake.

Bald eagle (source: U.S. Fish and Wildlife Service). Due to successful recovery efforts, the bald eagle has recently been delisted from the endangered species list. It is still protected under the Bald and Golden Eagle Protection Act. A pair nests in the area around Panama Reservoir (see Map 2), where they hunt fish in the reservoir and steal prairie dogs, cottontails, and jackrabbits from other raptors. Bald eagles generally avoid human disturbance.



Burrowing owl (source: U.S. Fish and Wildlife Service). The burrowing owl nests primarily in black-tailed prairie dog colonies and occurs in a few locations in the Erie planning area. They feed on insects, small rodents, and occasional songbirds. They are a listed species due to the decline in prairie dog habitat. Summer monitoring is highly recommended.

Ferruginous hawk (source: Kansas State Government). The ferruginous hawk is a very large hawk with a 4.5-foot wing span. It occupies grassland habitat and nests in trees. Black-tailed prairie dogs are a common prey species. The open nature of many of the natural areas in the planning area and the presence of prairie dogs are the reason that these birds are still present. They are a declining species across the Front Range and efforts to protect grasslands and prairie dogs are encouraged. Winter monitoring is highly recommended.



Peregrine falcon (source: Texas Parks and Wildlife). The peregrine falcon prefers high ledges and rock faces and roams out onto the eastern grasslands to hunt. It has been observed hunting along Boulder Creek in the Erie planning area. These falcons avoid human disturbance; as such, they are infrequently observed.

Mountain plover (source: Utah Division of Wildlife). The mountain plover inhabits short-grass prairie. It is unlikely to be found in the Erie planning area due to habitat loss.





Townsend's big-eared bat (source: Utah Division of Wildlife). Townsend's big-eared bat is associated with woodlands, caves, and abandoned mines. This rare bat has been found in abandoned coal mines in Colorado. If it occurs in the planning area, it would most likely be in an uncollapsed mine with open shafts. The Bats/Inactive Mines Program will survey abandoned mines and, if the site is actively used by bats, can put bat gates over the openings. The gates allow bats to pass but keep humans safely out.

Preble's meadow jumping mouse (source: Mark Bakeman). Preble's meadow jumping mice are typically found in lush undergrowth along creeks and ditches that have good vegetative structure. They are unlikely to occur in the Erie planning area, as evidenced by unsuccessful trapping efforts (see map above). They hibernate from October through April, are good swimmers, and can travel distances of a mile.



NATURAL AREAS INVENTORY, TOWN OF ERIE, COLORADO

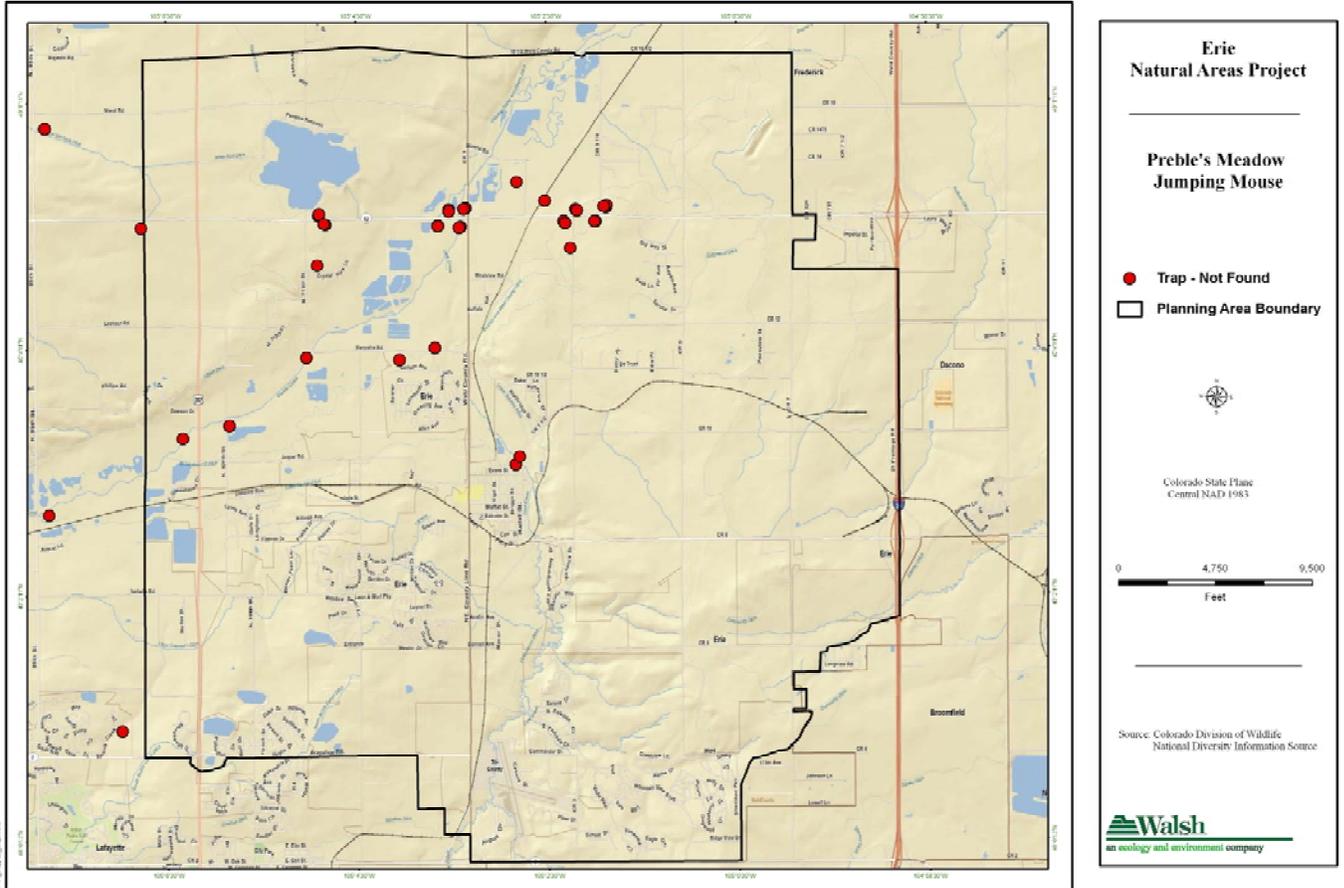


Figure 7. Locations of Trapping Efforts for Preble's Meadow Jumping Mouse.

Black-tailed prairie dog (source: Walsh Environmental). People are sometimes surprised to find the black-tailed prairie dog on this list. It is there because it has experienced a 90 percent decline in population numbers. Although a visible species that does occur in a number of the natural areas, it occupies a tiny fraction of its former range. They eat annual forbs and grasses and form colonies in grassland areas. The presence of prairie dogs is an indicator of high-quality habitat for wildlife because many other species inhabit their burrows (tiger salamanders and burrowing owls), prefer prairie-dog-occupied areas (cottontails and jackrabbits), and prey on them (bald eagles, ferruginous hawks, coyotes, and foxes).



Swift fox with an Ord's kangaroo rat (source unknown). The diminutive swift fox inhabits grassland areas of eastern Colorado. It is unlikely to occur within the planning area due to loss of native grasslands.