
High Plains Environmental Center
Loveland, Colorado



Ecological Baseline
Data Report 2007

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Loveland, Colorado

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Executive Summary

The purpose of this baseline inventory study was to identify all vegetation, birds, mammals, insects, reptiles and amphibians, and aquatic macroinvertebrates that permanently exist or briefly occupy, the High Plains Environmental Center (HPEC) in Loveland, Colorado. The HPEC consist of 275 acres of open space which includes 2 reservoirs Equalizer Lake and Houts Reservoir (90 and 75 acres respectively). The remaining 110 acres stretch in a belt of various widths around the lakes. The neighboring properties currently include actively farmed alfalfa fields, abandoned dryland agricultural fields, residential development, a tree farm and a business park.

Early field work concentrated in each one of the six community types within the natural area. Field work obtained was largely quantitative. These communities include Weedy Disturbed, Wetland Palustrine Emergent Persistent, Wetland Palustrine Broadleaf Deciduous, Shrubland, Deciduous Forest, and Grassland. Midseason it was requested that the data be retrieved from each one of the eleven previously established zones. At the point of incorporation of the zone areas into the study, qualitative and incidental data collection was adopted.

The comprehensive species list shows 449 overall species of which 168 are plants, 12 are mammals, 121 are birds, 127 insects, 15 aquatic and 6 amphibian and reptiles.

Overview of Methodology

Field research techniques were based on the standard operating procedures described in the *Procedure Manual for Ecological Baseline Data Collection*, HPEC 2007. The following six life forms were inventoried: small, medium and large mammals, fisheries and other aquatic organisms, insects, birds, reptiles & amphibians, and vegetation. Data was collected throughout all four seasons where appropriate.

During the first six months of the year, field research concentrated in the six community types present at the High Plains Environmental Center's Natural Area. Midsummer the procedure changed to include data collection of life forms in all of the 11 zones, (map 1, page 6). This change of data collection was requested by the Land Steward Director of the HPEC. Because of time and budget limitations, small mammal and insect pitfall trapping remained in the previously described community types. Bird, vegetation, insect, reptile and amphibian data was gathered in zones 1 through 11. At the point of incorporation of the Zone areas into the study, qualitative and incidental data collection was adopted.

Small Mammals

Sherman live traps were used to identify the species of small mammals that occur within the boundaries of the project area. Twenty traps were set for two consecutive nights during three seasons in each of the six wildlife habitat types.

Medium & Large Mammals

Medium and large mammal species are determined to be present if an individual is observed, or if its sign is identified. Scat, droppings, tracks, dens, diggings or vocalizations are examples of sign of an animal's presence.

Birds

Vantage Counts

Seven vantage points were established around Houts Reservoir and Equalizer Lake to identify water fowl species. For passerines and other birds, incidental sightings in the appropriate zone area were recorded.

Birds

Secretive Marsh Bird Survey

Marsh birds such as Wilson's Snipe, Virginia Rail, American Bittern and Sora were located with recorded calls early in the mornings.

Insects

General observations were used to supplement the list of taxa compiled during the structured sampling efforts of sweep netting and pitfall trapping.

Reptiles and Amphibians

The community data for reptiles and terrestrial amphibians were collected in conjunction with the relative abundance surveys of large mammals and insect field work during the warmer months. The methods included identifying survey routes in all six community types, visiting all ponds and wetlands, conducting "chorus" surveys, and recording all opportunistic sightings.

Vegetation

Point-Intercept Transects and Belt Transects were used to collect quantitative community data. Qualitative surveys were established by compiling a comprehensive species list for each of the 11 zones.

Benthic Macroinvertebrates

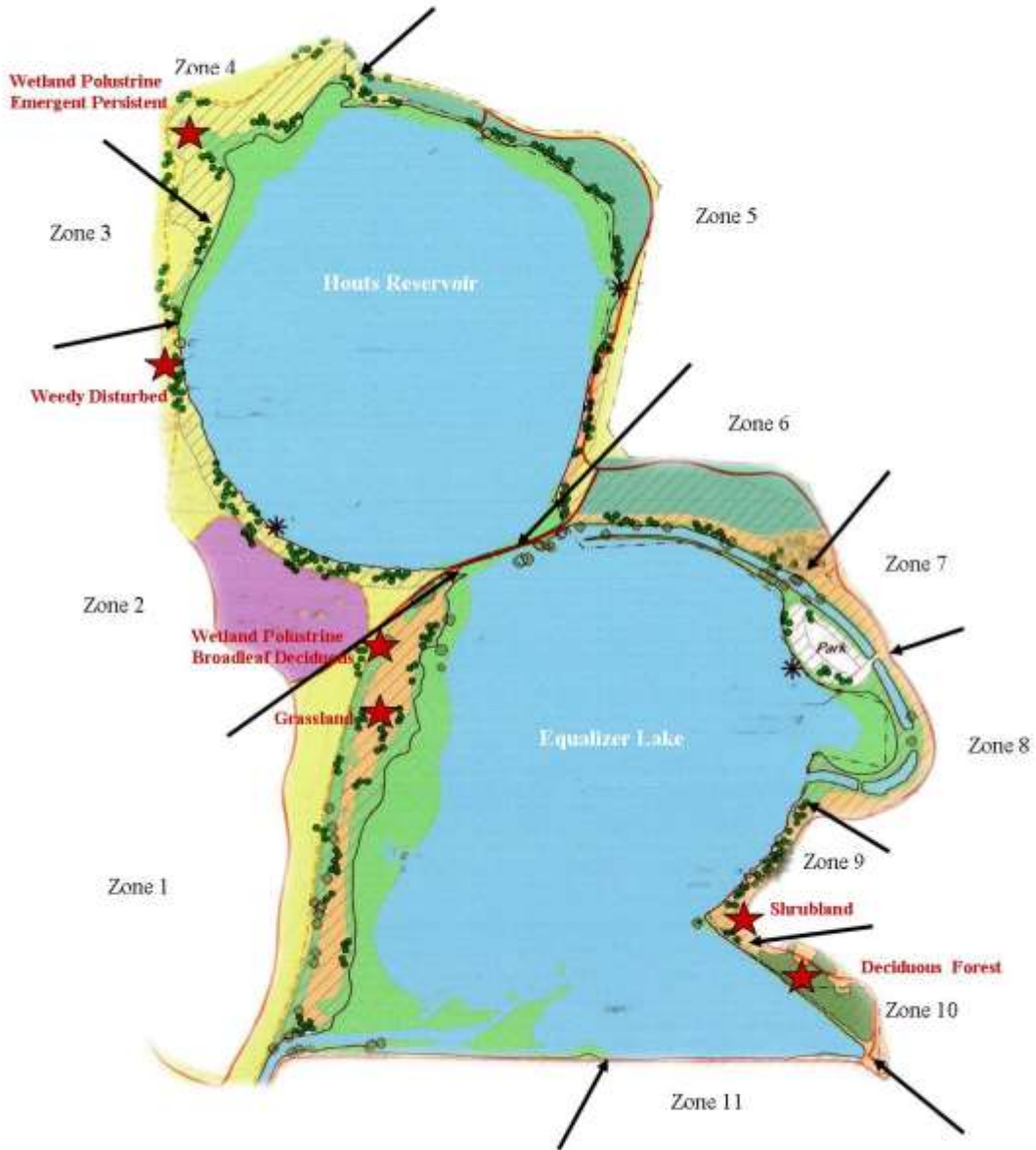
An Ekman bottom sampling dredge was used for sampling bottom-dwelling aquatic organisms in both Houts Reservoir and Equalizer Lake.

Fisheries

Previously collected data by the Colorado Division of Wildlife and Mountain View High School's Environmental Science class was included in this baseline report. This data was collected by electrofishing and seining.

Map 1: Community Types and Zones

Map of High Plains Environmental Center Natural Area
Loveland, Colorado



Descriptions of Zones

For the following 11 Zones, Table 1 on page 20 offers a detailed species list for each zone. Table 2 on page 30 provides the species richness index.

Zone 1

This area is located along the southwest, west, and northwest area of Equalizer Reservoir. This zone supports the most diverse habitat types and provides the highest wildlife habitat values within the HPEC Natural Area. Zone 1 is considerably larger than the other zones and much more varied in the community types that it offers wildlife. We suggest that if further inventories are conducted, that this zone be broken down into smaller sub-zones for ease of identification and data collection.

This zone consists of broadleaf wetlands, upland grasslands bordered by mature cottonwood trees on one side and cattail dominated wetlands along the other side. The Greeley Loveland Irrigation Canal enters the Natural Area in zone 1 creating small islands and peninsulas within the wetland area.



Picture taken from the west looking east where the canal enters the HPEC Natural Area

Overall, 253 species were recorded in this zone, the most diverse of all of the eleven zones. Of the 83 vegetation species, 36 are considered weedy. Five are tree species, six are shrubs, 42 are forbs, 29 are grasses and grass-like, one floating emergent, and two are vines. There were 11 recorded mammal, 90 bird, four amphibian and reptile, two aquatic and 63 insect species.



Beaver cutting along the northern end of this zone, at the south end of the landbridge.

Pictures taken near the center of Zone 1 looking towards the north with view of the historic barn



Winter



Summer



Fall

Zone 2

This zone lies adjacent to the southwest edge of Houts Reservoir. Most of this zone consists of disturbed and abandoned agricultural fields resulting in a high concentration of annual weeds



Picture taken from the southwest area of Houts Reservoir south of the pump house looking to the southeast with view of the historic barn

Zone 2 offers significantly less diversity with only a total of 117 species of which 35 are vegetative (13 weedy). Two tree species, 17 forbs, 15 grasses or grass-like, and one floating emergent. Eight mammal, 41 bird, two amphibian and reptile, one aquatic and 30 insect species were recorded.

Zone 3

This zone runs along the western edge of Houts Reservoir and is dominated by a disturbed/weedy habitat. It offers a narrow strip of cattails along the shoreline providing minimal cover for waterfowl.

This zone had the least amount of species diversity with a total of 96 species recorded. There are 24 vegetative species (14 weedy) two are trees, 13 forbs, and nine grasses or grass-like species. Seven mammal, 48 bird, one reptile, and 16 insect species were also recorded.



West shoreline of Houts Reservoir looking north along the trail

Zone 4

This zone continues along the northwestern edge of Houts Reservoir and includes a broad band of palustrine emergent wetlands. Although there is no mature tall woody vegetation within this zone, the wetlands offer a significant buffer for wildlife.

This zone had 139 species of which 41 are vegetative (19 weedy) including two tree, 19 forbs, and 20 grass or grass-like species. Seven mammal, 55 bird, one reptile, one aquatic and 34 insect species were recorded.



Northeast corner of Houts Reservoir looking to the west, southwest.

Zone 5

This zone is unusually large and stretches out along the northern and eastern edges of Houts Reservoir. To the north it is dominated by weedy species with a narrow band of cattails along the shoreline. Along the southern end of this zone a wetland mitigation project was begun in 2005 and improved in 2007. As in zone 1, it is recommended that zone 5 be broken down into 2-3 smaller sub-zones for future inventory work. As an example, the wetland mitigation site could be identified as zone 5.1.



View of wetland mitigation site along the south east corner of Houts Reservoir a few months after construction



Picture taken from the trail of the northeast area of the HPEC Natural Area looking south.

This zone supports 204 species of which 36 are vegetative (20 weedy) with two tree, 24 forbs, seven grass or grass-like, two floating emergent and one vine species. Five mammal, 48 bird, one reptile, one aquatic and 24 insect species were also recorded.

Zone 6

This area consists of mostly riparian areas including remnants of a historical irrigation canal. Pockets of wetlands and upland shrubs dominate this zone. A coyote den site is located within this zone, just south of RangeView III.

This zone supported 173 species of which 61 are vegetative(24 weedy) with five tree, four shrub, 32 forbs, 18 grass or grass-like, two floating emergent species. The remaining species are six mammal, 73 bird, four amphibian and reptile, one aquatic and 28 insect.



View of the landbridge between Houts Reservoir and Equalizer Lake. Looking west towards the historic barn.



Photo of abandoned irrigation canal along the northeast area of Equalizer Lake.

Zone 7

This area is along the north eastern side of Equalizer Lake and consists of both native upland shrub land and a landscaped park like setting including irrigated turf, flowers, picnic gazebo and a fishing dock.

159 species were recorded in this zone of which 77 were vegetative (29 weedy) including eight trees, seven shrubs, 411 forbs, 20 grass or grass-like and one floating emergent. The remaining were five mammal, 52 bird, four amphibian and reptile, one aquatic and 20 insect species.



Picture of Old Canal Park, east Equalizer Lake

Zone 8

This zone is made up of a portion of the eastern side of Equalizer Lake which includes a small bay with a broad cattail dominated wetland along its perimeter.



View from Old Canal Park looking into the bay of zone 8, with the Medical Center of the Rockies in the backdrop.



Looking north along the east edge of Equalizer Reservoir with view of Rangeview I, II, & III.

In zone 8 a total of 118 species were recorded of which 44 are vegetative (22 weedy) including two tree, three shrub, 28 forbs, 20 grass or grass-like, and one vine species. Six mammal, 40 bird, two amphibian and reptile, two aquatic and 18 insect species were also recorded.

Zone 9

Zone 9 stretches along the eastern edge of Equalizer Lake where the shoreline has suffered significant erosion resulting in recent shoreline stabilization projects. No wetlands have established in this area, which is dominated by weedy grasses, some native forbs and shrubs.



Looking south southwest over zone 9, showing small section of permitted fishing area

The total number of species recorded in this zone was 150 of which 70 are vegetative (28 weedy) including three tree, six shrub, 39 forbs, 21 grass or grass-like and one succulent species. Seven mammal, 50 bird, one reptile, one aquatic and 18 insect species were also recorded.

The following pictures show the seasonal variation within a habitat.

For example: the lack of cover during the winter months provide raptors with exceptional perch sites which are valuable for hunting success. During the spring and summer, cover is vitally important to the breeding success of most species. Fall offers food supply in the form of nectar and seeds to many birds and mammals.

View of Cottonwood Tree in southern part of zone 9, looking towards the west. This mature cottonwood tree offers substantial importance to wildlife throughout the seasons and great care should be practiced to protect it.



Winter



Summer



Fall

Zone 10

This zone is dominated by a dense stand of young cottonwoods along Equalizer's south eastern corner. The actual shoreline has suffered erosion from the westerly winds where no wetlands have established.



Looking towards the west from the southeast corner of HPEC property.



Picture of trail meandering through the cottonwood grove in zone 10

The total number of species recorded for this zone was 154 of which 51 were vegetative (25 weedy) including six tree, two shrub, 26 forbs, 16 grass or grass-like and one floating emergent species. Nine mammals, 64 birds, two reptiles and amphibians, one aquatic, and 27 insect species were also recorded.

Zone 11

This zone stretches across the dam on the southern end of Equalizer Reservoir. It consists of rip rap along the water's edge and weedy annuals on the other side.



Equalizer Dam looking west along the rip rap and Eagle Ridge Apartments.

Zone 11 offered 134 species of which 47 were vegetative (25 weedy) including two tree, two shrub, 26 forbs, 16 grass or grass-like and one floating emergent species.

Seven mammal, 55 bird, three amphibian
And reptile, 2 aquatic and 21 insect
species were also seen and recorded.



This mink was seen in zones 1 and 11.

Photo courtesy of Bob Atchley

Table 1: High Plains Environmental Center Species by Zone

<i>Vegetation Species</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
Trees											
Hackberry	X			X		X	X				
Russian-olive	X					X	X	X	X	X	X
Green ash										X	
Red cedar										X	
Honey locust							X				
Apple							X				
Narrowleaf cottonwood	X					X	X				
Plains Cottonwood	X	X	X		X	X	X		X	X	X
Tamarisk			X	X	X						
Chinese elm	X								X	X	
Purple-leaved plum							X				
Peach-leaved willow		X				X	X	X		X	
Shrubs											
Fringed sage							X		X		
Rubber rabbitbrush	X					X	X	X	X	X	X
Winterfat									X		
Broom snakeweed									X		
Red twig Dogwood	X						X				X
Burning bush							X				
Blue juniper							X				
Green juniper							X				
Nine bark							X				
Sand cherry	X										
Chokecherry	X					X					
Skunkbrush						X					
Golden currant	X							X	X		
Coyote willow	X				X	X		X	X	X	
Forbs											
Western yarrow							X		X		
Western ragweed									X		
Wild tarragon						X	X				
Redroot pigweed			X		X						
Swamp milkweed						X					
Showy milkweed	X	X	X	X	X	X	X	X	X	X	X
Asparagus							X		X		
Ground-plum	X								X		
Musk thistle	X		X				X	X	X	X	
Indian paintbrush									X		
Ridgeseed spurge								X	X		X
Goosefoot	X	X		X	X	X	X	X	X	X	X
Blue mustard	X										X
Western water hemlock						X					
Bastard toadflax										X	

Vegetation con't	1	2	3	4	5	6	7	8	9	10	11
Canada thistle	X	X		X	X	X	X	X	X		X
Wavy-leaf thistle							X				
Bindweed	X			X	X	X	X	X	X	X	X
Yellow creopsis							X				
Pink iceplant							X				
Pinnate tansymustard						X	X			X	
Horseweed	X	X		X	X			X	X		X
Purple prairie clover									X		
Pinnate tansymustard	X								X		
Wild licorice										X	
Flixweed	X	X	X	X	X	X	X	X	X	X	X
Horsetail	X	X					X		X		X
Red coneflower							X				
White coneflower							X				
Purple coneflower							X				
Redstem filaree	X										X
Toothed spurge											X
California poppy	X										
Toothed spurge	X										
Velvety gaura	X		X			X	X	X	X		
Curlycup gumweed						X			X		
Annual sunflower	X	X		X	X	X	X	X	X	X	X
Orange day-lily							X				
Hairy goldaster	X										
Yellow water-flag	X					X				X	X
Northern willow-herb			X	X							
Povertyweed	X					X	X		X	X	
Kochia	X	X	X	X	X	X	X	X	X	X	X
Blue lettuce							X		X		
Prickly lettuce	X	X		X	X	X	X	X	X	X	X
Sand lily									X		
Skeleton weed							X				
Water horehound						X					
White horehound								X			
False solomon's seal	X					X	X	X			
Common mallow	X				X						
Alfalfa	X									X	
White prairie aster					X	X				X	
White sweet clover	X	X			X	X	X		X	X	X
Yellow sweet clover		X				X					
Catnip		X				X		X	X		
Field mint						X	X	X			
Marshelder			X	X	X						
Yellow stemless evening-primrose							X				
Yellow evening-primrose	X						X	X	X	X	X
Buckley's beardtongue									X		
Silky crazyweed							X				
Pale smartweed		X	X	X	X	X					X

Vegetation con't	1	2	3	4	5	6	7	8	9	10	11
Black-eyed Susan							X				
Erect knotweed								X			
Virginia groundcherry	X							X	X	X	
Prostrate knotweed	X				X				X	X	X
Sulfur cinquefoil											X
Slimflower scurfpea									X		
Prairie Coneflower									X		
Wild buckwheat	X										
Curly dock	X	X	X	X	X	X	x	X	X	X	X
Russian thistle	X				X	X	X		X		
Annual sowthistle			X	X		X	X	X			
Hedge-nettle						X		X			
Stinging nettle								X			
Sand spurrey				X							
Puncture vine				X	X		X			X	X
Tumble mustard	X			X	X				X		
Canada goldenrod										X	
Buffalobur					X				X		
Scarlet globemallow									X	X	
Cut-leaf nightshade	X										
Canada goldenrod	X										
Dandelion	X					X		X			
Field pennycress	X										
False salsify	X		X		X	X	X	X	X	X	X
Narrow-leaved cattail	X										
Broad-leaved cattail	X	X	X	X	X	X	X	X		X	X
Blue vervain						X		X	X		
Great mullein		X		X			X	X			X
American vetch	X						X				
Cocklebur	X	X					X			X	X
Grasses & Grass-like Plants											
Intermediate wheatgrass	X	X	X	X		X	X	X	X		X
Tall wheatgrass								X	X		X
Quackgrass	X		X	X		X	X	X	X	X	X
Western wheatgrass	X	X	X	X	X	X	X	X	X	X	X
Slender wheatgrass	X	X							X	X	X
Crested wheatgrass		X		X		X	X		X		X
Wheatgrass	X								X		
Bread wheatgrass						X					
Thick-spike wheatgrass		X		X		X	X		X		
Redtop bent	X										
Blue grama	X								X		
Smooth brome	X	X		X		X	X	X	X	X	X
Japanese brome	X	X	X	X		X	X	X	X	X	X
Cheatgrass	X	X	X	X		X	X	X	X	X	X
Orchard sedge		X									
Emory sedge	X							X			
Hairy sedge	X					X	X	X	X	X	
Nebraska sedge				X							

Vegetation con't	1	2	3	4	5	6	7	8	9	10	11
Sun sedge	X										
Orchardgrass							X				
Inland saltgrass	X	X		X	X	X	X	X	X	X	X
Spikerush	X			X							X
Stinkgrass				X						X	
Canada wildrye	X	X					X	X	X		X
Meadow fescue	X	X		X			X	X			
Foxtail barley	X	X	X	X			X	X	X	X	
Baltic rush	X						X	X	X		
Prairie junegrass									X	X	
Indian ricegrass									X		
Soft rush								X			
Scratchgrass	X			X	X	X	X				
Witchgrass	X					X	X	X	X		
Fall panicum	X										
Reed canarygrass	X	X		X	X	X	X	X		X	X
Barnyardgrass					X	X					
Rabbitfoot-grass				X							
Kentucky bluegrass	X					X	X	X	X	X	X
Three-square	X		X	X	X	X	X	X			
Green needlegrass							X			X	
Great bulrush	X		X	X	X	X				X	
Alkali bulrush			X	X							
Yellow foxtail	X							X		X	X
Sand dropseed	X										X
Bread wheatgrass	X	X									
<i>Floating Emergents</i>											
Duckweed	X				X	X					X
Pondweed		X			X	X	X			X	
<i>Vines</i>											
Mock cucumber	X										
Virginia creeper	X				X			X			
<i>Suculents</i>											
Prickly pear cactus									X		
Mammals											
Coyote	X	X	X	X	X	X	X	X	X	X	X
Red Fox	X	X	X	X	X	X	X	X	X	X	X
Striped Skunk	X	X	X	X	X	X	X	X	X		
Raccoon	X	X	X	X	X	X	X	X	X	X	X
Mink	X									X	X
Beaver	X	X									
Muskrat	X	X	X	X		X		X		X	X
Cottontail Rabbit	X	X	X	X	X	X	X		X	X	X
Fox Squirrel	X									X	X
Prairie Dogs									X	X	
Deer Mouse	X	X	X	X				X	X	X	
Prairie Voles	X										

Birds	1	2	3	4	5	6	7	8	9	10	11
Canada Geese	X	X	X	X	X	X	X	X	X	X	X
Wood Duck	X					X					X
Gadwall	X		X	X	X	X			X	X	X
Green-winged Teal	X		X	X	X	X			X	X	X
Red head	X			X		X	X		X		
Lesser Scaup	X										
American Widgeon	X		X	X	X		X			X	X
Mallard	X	X	X	X	X	X	X	X	X	X	X
Bufflehead			X	X	X	X	X		X		
Common Goldeneye			X	X	X	X	X				
Blue-winged Teal	X	X	X	X	X	X	X		X	X	X
Cinnamon Teal									X		
Northern Shoveler	X		X		X					X	X
Northern Pintail	X										X
Hooded Merganser	X										
Common Merganser	X		X	X	X	X	X		X		
Ruddy Duck	X			X	X	X	X		X		
Pied-billed Grebe	X	X	X	X	X	X	X	X		X	X
Eared Grebe		X									
Western Grebe	X	X	X	X	X	X	X	X	X	X	X
Clark's Grebe	X	X	X	X	X	X	X	X	X	X	X
American white Pelican	X	X	X	X	X	X	X		X		
Double-crested Cormorant	X	X	X	X	X	X	X		X	X	
American Bittern	X										
Great blue Heron	X	X	X	X	X	X	X	X	X	X	X
Black crowned night Heron	X					X				X	X
White-faced ibis	X										
Turkey Vulture	X				X			X			X
Osprey	X					X	X		X	X	X
Bald Eagle	X					X	X		X	X	X
Northern Harrier	X	X	X	X	X	X					
Red-tailed Hawk	X	X	X	X	X	X			X	X	X
Swainson's Hawk	X	X									
Rough-legged Hawk	X									X	
American Kestrel	X	X		X		X	X		X	X	X
Prairie Falcon						X			X		
Ring-necked Pheasant			X	X							
Virginia Rail	X		X								
Sora	X										
American Coot	X	X	X	X	X	X	X	X	X	X	X
Killdeer	X	X	X	X	X	X	X	X	X	X	X
Spotted Sandpiper		X			X	X					X
Solitary Sandpiper											X
Long-billed Curlew					X						
Black-necked Stilt	X		X	X						X	
American Avocet	X		X	X		X			X	X	X
Wilson's Snipe	X			X							
Lesser Yellowlegs	X		X	X		X			X	X	X

Birds con't	1	2	3	4	5	6	7	8	9	10	11
Long-billed Dowitcher	X										
Marbled Godwit	X		X	X		X				X	X
Ring-billed Gull	X	X	X	X	X	X	X	X	X	X	X
Herring Gull	X	X	X	X	X	X	X	X	X	X	X
California Gull	X	X	X	X	X	X			X	X	X
Black Tern			X	X	X	X					
Great black backed Gull			X	X							
Rock Dove	X	X				X	X	X	X	X	X
Mourning Dove	X	X	X	X	X	X	X	X	X	X	X
Western screech owl	X										
Barn Owl	X					X					
Great horned Owl	X							X		X	X
Common Nighthawk	X	X	X	X	X	X	X	X	X	X	X
Broad-tailed Hummingbird	X										
Belted Kingfisher	X	X				X			X	X	X
Downy Woodpecker	X					X					
Hairy Woodpecker										X	
Northern Flicker	X				X	X		X	X	X	X
Western Wood-Pewee	X					X	X			X	X
Say's Phoebe	X				X					X	X
Willow's Flycatcher										X	
Western Kingbird	X	X	X	X	X	X	X	X	X	X	X
Eastern Kingbird	X	X				X				X	X
Northern Shrike	X	X	X	X		X	X				
Loggerhead Shrike	X	X	X	X		X	X				
Horned Lark				X	X	X					
Blue Jay	X									X	X
Black-billed Magpie	X					X			X	X	
American Crow	X					X			X	X	X
Northern rough winged Swallow	X	X	X	X	X	X	X	X	X	X	X
Bank Swallow	X	X	X	X	X	X	X	X	X	X	X
Cliff Swallow	X	X	X	X	X	X	X	X	X	X	X
Barn Swallow	X	X	X	X	X	X	X	X	X	X	X
Black-capped Chickadee	X					X				X	
White-breasted nuthatch										X	
House Wren	X					X					
Marsh Wren	X			X		X					
Rock Wren											X
Mountain blue Bird	X										
American Robin	X	X	X	X	X	X	X	X	X	X	X
European Starling	X		X			X	X	X	X	X	X
Yellow Warbler	X					X		X	X	X	
Wilson's Warbler									X	X	
Yellow-rumped warbler	X									X	
Common Yellowthroat	X			X	X	X	X	X		X	
Dark eyed Junco							X	X		X	
American tree Sparrow	X					X	X	X	X		
Vesper Sparrow	X			X	X						

Birds con't	1	2	3	4	5	6	7	8	9	10	11
Lark Bunting				X			X				
Chipping Sparrow						X	X	X	X		
Lark Sparrow											
Swamp Sparrow								X			
Song Sparrow		X				X	X	X			
White crowned Sparrow						X	X	X	X		
Field Sparrow	X										
Blue Grosbeak	X										
Red-winged black Bird	X	X	X	X		X	X	X	X	X	X
Western Meadowlark	X	X	X	X	X	X	X	X	X	X	X
Yellow-headed Blackbird	X	X	X	X	X	X	X	X			
Brewer's Blackbird	X	X	X	X	X	X	X	X		X	
Common Grackle	X	X	X	X	X	X	X	X	X	X	X
Brown-headed Cowbird	X	X			X	X	X	X		X	X
Bullock's Oriole	X						X			X	
House Finch	X			X	X	X	X	X		X	X
American Goldfinch	X	X	X	X	X	X	X	X	X	X	X
House Sparrow	X					X	X	X		X	X
Amphibian and Reptiles	1	2	3	4	5	6	7	8	9	10	11
Bullfrog	X	X	X	X		X	X	X		X	X
Bullsnake	X					X	X	X	X		X
Yellow-bellied Racer	X						X				
Western plains Garter Snake	X					X	X			X	
Tiger Salamander		X									
Woodhouse Toad					X	X					X
Insects	1	2	3	4	5	6	7	8	9	10	11
Leafhopper	X	X								X	
Roly- poly	X			X	X	X		X		X	X
Boxelder bug		X				X					
Blue Darner	X	X		X	X	X		X			
Carion beetle larvae	X										
Pea aphid	X										
Painted lady	X			X		X	X		X		X
Green midge	X										
Bumble bee	X										
Flame Skimmer	X		X	X	X		X		X	X	X
White tailed dragonfly	X	X									
Aphid	X										
Goldenrod crab spider	X										
Water strider	X				X		X	X			
Sonoran bumble bee	X										
Millipede	X										
Red harvester ant	X										
Honey Bee	X	X		X		X	X		X		
Variegated fritillary	X										
Grass plant bug	X										
Mosquito	X	X	X	X	X	X	X			X	X

Insects con't	1	2	3	4	5	6	7	8	9	10	11
False chinch bug	X										
Chironomus midge	X			X							
Palestriped flea beetle	X										
European earwig	X		X	X		X					X
Tri-colored bumble bee	X	X	X	X							
Jumping spider	X										
Convergent lady beetle	X	X		X				X			
Green bird grasshopper	X							X		X	
Long-jawed orbweaver	X										
Deer fly	X										
Gypsy moth	X										
Burrowing wolf spider	X	X		X	X	X			X	X	
Swallowtail Butterfly	X										
Field cricket	X			X		X			X		X
Monarch Butterfly	X	X	X	X	X		X		X	X	
White Checker Butterfly	X										
Gnaphosid spider										X	
Carpenter ant										X	
Water springtail										X	
Yellow Sulphur Butterfly	X										
Cabbage Butterfly	X	X		X		X	X	X	X	X	X
Dainty sulphur Butterfly											X
Swallowtail Butterfly	X	X				X			X		
Carolina Locust	X	X		X	X	X		X		X	X
Variiegated fritillary	X			X					X		
Firefly	X										
Two Striped Grasshopper	X	X		X	X	X	X	X		X	
Milkweed Leaf Beetle	X	X	X		X	X	X	X			X
Two spotted lady Beetle	X										X
Paper Wasp	X						X	X	X		X
Western harvester ant	X										
Pavement Ant	X					X					
Orange sulphur butterfly	X	X	X		X	X					
No see ums	X	X			X		X				X
Variiegated Meadowhawk	X	X	X	X	X	X	X	X		X	X
House Fly	X	X	X								
Widow skimmer											X
Twelve Spotted Skimmer	X			X	X	X		X		X	X
Blue fronted dancer dams.	X									X	
Bald faced hornet											X
Pallid winged grasshopper	X										
Rainbow bluett	X	X	X	X	X	X	X	X	X	X	X
Clear-winged grasshopper											X
Differential Grasshopper	X		X		X					X	
Yellow Jacket	X	X									
Soldier Beetle	X				X	x					
Squash bee	X										
Spider Wasp	X										
Zebra jumping spider	X					X					

Insects con't	1	2	3	4	5	6	7	8	9	10	11
Tiger Beetle	X					X					
Crab spider		X									
Grasphosid spider		X									
Sac spider		X								X	X
Green bottle fly		X				X					
Seven spotted lady beetle		X									
Blue dasher		X	X								
Inclined dart		X	X		X						
Black-tailed bee fly		X	X	X		X	X				
Familiar bluet			X		X				X		
Tetragnathid spider			X								
Gall wasp				X							
Green lacewing				X							
Brown lacewing				X							
Giant wolf spider				X		X					
Daddy longlegs				X							
Cloudless sulphur butterfly				X							
Flower fly				X							
Ruby meadowhawk				X							
Blue fronted dancer dams.										X	
Spotted cucumber beetle				X							
Sowbug				X				X		X	
Stone centipede				X							
Tarantula hawk				X					X		
Eastern carpenter bee				X	X						
Funnel web spider					X			X			
Steel-blue cricket hunter					X						
Dungfly					X						
Blue mud dauber					X						
Two-lined leather wing						X					
Rambur's forktail						X	X				
Elm leaf beetle							X				
Burrowing mayfly							X				
Sulphur winged grasshopper									X		
Painted damsel							X				
Mayfly							X				
Braconid wasp						X					
Oil Beetle								X			
Silky ant								X	X		
Micromoth								X			
Army cutworm										X	
Field ant										X	
Western tiger swallowtail										X	
Giant grassland cicada										X	X
Yellow jacket										X	
Roly poly hunter										X	
Philodromid crab spider								X			
Bold jumping spider								X			
Common boatman								X			

Insects con't	1	2	3	4	5	6	7	8	9	10	11
Common whitetail								X			
Ground beetle									X		
Alfalfa looper									X		
Black saddlebags								X			
Crambid moth									X		
True weevil							X				
European mantid								X			
Aquatic species	1	2	3	4	5	6	7	8	9	10	11
Crayfish	X	X		X	X	X	X	X	X	X	X
Bloodworm								X			
Aquatic snail	X										

Table 2: Species Richness by Zone

<i>Number of Species in Zone.</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
Vegetation	83	35	24	41	36	61	77	44	70	51	47
Bird	90	41	48	55	48	73	52	40	50	64	55
Mammal	11	8	7	7	5	6	5	6	7	9	7
Insect	63	30	16	34	24	28	20	24	18	27	21
Reptile & Amphibian	4	2	1	1	1	4	4	2	1	2	3
Aquatic (does not include fish)	2	1	0	1	1	1	1	2	1	1	1
Total Species	253	117	96	139	204	173	159	118	147	154	134

Review of Data Collected

The High Plains Environmental Center provided long-term or short-term habitat to 121 bird species during 2007. Forty-nine species were waterfowl (ducks, geese, gulls, terns, shorebirds), 16 were raptors (birds of prey such as eagles, hawks and owls) and 43 were passerines (song/perching birds).

Overall, there were only two species of special concern status found: the Bald Eagle and the Long-billed Curlew.

Comparing the data from 2007 with previous year's data in regards to birds at the HPEC, there seems to be a slight trend of a reduction in numbers of both waterfowl species and individual numbers, but a slight increase in passerines species. This trend could be explained because of simple natural cycles and weather patterns, or possibly because of a shift in available habitat caused by the maturing of both development and landscaping within the Centerra area.

Appendix A shows a list of species organized by their respective zone.

Appendix B shows a comprehensive list of birds sighted at the HPEC organized in the American Ornithologist's Union (AOU). This table identifies breeding birds, migrating birds, and their abundance as well as the time of year they are likely to be seen at the HPEC.

Appendix C shows by month the types of birds and their abundance. This table serves useful in the event of planning a bird walk during certain seasons and identifies what species are likely to occur.

Appendix D is the Breeding Bird Matrix identifying the courtship, nesting and fledging schedule of birds breeding at the HPEC.

Appendix E is the comprehensive species list for the HPEC.

In General, small mammal field work yielded low numbers and low diversity, with the highest density in zone 1. The average trapping result was four small mammals per 400 square feet for each of three seasonal trapping efforts in zone 1. Zone 10 yielded the least number of small mammals with only one deer mouse caught during all three seasons. A possible explanation for such a low small mammal population in this zone is the high predation rate by ants. Intensive and repetitive herbicide application in all of the zones, might account for the low small mammal numbers at the HPEC.

Appendix F shows small mammal data.

Along with the expected mammal species such raccoons, striped skunks, fox squirrels, eastern cottontail rabbits, coyotes, red fox and black-tailed prairie dogs, two surprising mammal species were documented, the mink in zones 1 and 11 and a beaver which showed activity in zone 1 and 2 towards the fall of 2007.

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