

# Level 4 Potential Conservation Area (PCA) Report

Name Rare Plants of the Chalk Barrens

Site Code S.USCOHP8\*3283

## IDENTIFIERS

Site ID 482 Site Class PCA  
 Site Alias Beaver Creek  
 Site Alias Brush Hollow  
 Site Alias Portland  
 Site Alias Pueblo State Wildlife Area  
 Site Alias Pumpkin Hollow

## Network of Conservation Areas (NCA)

<u>NCA Site ID</u>	<u>NCA Site Code</u>	<u>NCA Site Name</u>
2466	S.USCOHP*27035	Arkansas Valley Barrens

## LOCATORS

Nation United States Latitude 382334N  
 State Colorado Longitude 1050119W

## Quad Code Quad Name

38104-C7	Swallows
38104-C6	Northwest Pueblo
38104-C8	Hobson
38104-D8	Pierce Gulch
38104-D7	Stone City
38104-D6	Steele Hollow
38105-D1	Florence
38105-C1	Florence SE
38104-E6	Buttes
38104-B6	Southwest Pueblo
38104-B7	Beulah NE
38104-E7	Timber Mountain

## County

Pueblo (CO)  
 El Paso (CO)  
 Fremont (CO)

## Watershed Code Watershed Name

11020002	Upper Arkansas
11020003	Fountain

## SITE DESCRIPTION

Minimum Elevation	4,800.00 Feet	1,463.00 Meters
Maximum Elevation	5,600.00 Feet	1,706.88 Meters

## Site Description

The site is characterized by barrens and breaks of Late Cretaceous shales, limestones, and chalks that formed in the ancient alluvial terraces of the Arkansas River and its tributaries. The modern river course has cut a deep canyon through the sedimentary bedrock that drops off in steep slopes adjacent to the river. Late Cretaceous sedimentary layers are a composite of Carlile shale, Greenhorn limestone, and Graneros shale as well as extensive swaths of Niobrara Formation. The barrens habitat that hosts the rare plants typically has low vegetative cover (10-20%). The surface of the shale barrens generally consists of small, platy rock fragments over a shallow, fine-textured soil matrix. Soils are calcareous and moderately to strongly alkaline. The shale breaks support a mosaic of plant communities with the unifying feature of a sparse herbaceous layer characterized by low cushion plants like woollycup buckwheat (*Eriogonum lachnogynum*), nailworts (*Paryonychia jamesii*, *P. sessilifolia*), stemless four-nerve daisy (*Tetraneris acaulis*), bladderpods (*Lesquerella* spp.), and Arkansas River fever few (*Parthenium tetraneris*). The breaks vegetation mosaic includes pinon - juniper woodlands (*Pinus edulis* and *Juniperus monosperma*) and shrublands with Bigelow sagebrush (*Artemisia bigelovii*) and/or James' frankenia (*Frankenia jamesii*) as well as herbaceous-dominated patches. The landscape surrounding the barrens is a mix of pinon - juniper savanna interspersed with grasslands. The site contains extensive old growth stands of juniper and pinon - juniper savannas with New

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Mexico feathergrass (*Hesperostipa neomexicana*), side oats grama (*Bouteloua curtipendula*), and ring muhly (*Muhlenbergia torreyi*). Grasslands are dominated by galleta grass (*Pleuraphis jamesii*) and blue grama (*Bouteloua gracilis*). Scattered shrubs include cholla cactus (*Cylindropuntia imbricata*), fourwing saltbush (*Atriplex canescens*), and winterfat (*Krascheninnikovia lanata*). The portions of the site north of Highway 50 are generally less dissected by development and roads than the portions along the Arkansas River. North of Highway 50, especially in the Beaver Creek area, taller grasses, including New Mexico feathergrass, occur. The Arkansas River runs through the site, and supports riparian vegetation dominated by cottonwood (*Populus deltoides*) degraded with invasive non-native plants including tamarisk (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*).

## Key Environmental Factors

Outcrops and barrens of Late Cretaceous sedimentary bedrock embedded in a landscape mosaic of grasslands, dwarf shrublands, and pinon - juniper woodlands and savannas.

## Climate Description

No Data

## Land Use History

No Data

## Cultural Features

No Data

## SITE DESIGN

Site Map P - Partial

Mapped Date 12/10/2007

Designer Neid, S.L.

## Boundary Justification

The boundary encompasses the concentration of element occurrences plus unsurveyed, apparently suitable habitat in the vicinity of the occurrences. Basinwide vegetation data (CDOW 2001) for the Arkansas River were used in conjunction with the element occurrence data to design the site boundary. Most of the element occurrences fall within the "Sparse Pinon Juniper/Shrub/Rock Mix" basinwide vegetation mapping unit. Kelso and others (2003) noted that the Middle Chalk and Upper Chalk units of the Smoky Hills Member of the Niobrara Formation are the most botanically important barrens of the area. Fine-scale geologic data delineating members of formations was not available when designing the site boundary. In general, site boundaries are drawn to represent our best estimate of the primary area needed for the survival of the occurrences. This area is sufficiently large to protect intact (or at least allow simulation of) most of the natural ecological processes necessary for survival of the species, including fire, herbivory, and hydrology. The boundaries also include the mosaic of local community types on which the species' may rely.

Primary Area 87,807.73 Acres

35,534.67 Hectares

## SITE SIGNIFICANCE

Biodiversity Significance Rank B1: Outstanding Biodiversity Significance

## Biodiversity Significance Comments

This site is a botanical hotspot and contains excellent (A-ranked) and good (B-ranked) occurrences of four globally imperiled (G2/S2) plant species: round-leaf four-o'clock (*Oxybaphus rotundifolius*), golden blazing star (*Nuttallia chrysantha*), Pueblo goldenweed (*Oonopsis puebloensis*), and Fendler's townsend-daisy (*Townsendia fendleri*). The site also contains excellent (A-ranked) and good (B-ranked) occurrences of the globally vulnerable (G3/S3) Barneby's fever-few (*Bolophyta tetraneuris*), Rocky Mountain bladderpod (*Lesquerella calcicola*), Arkansas Valley evening primrose (*Oenothera harringtonii*), and dwarf milkweed (*Asclepias uncialis* spp. *uncialis*), and excellent (A-ranked) occurrences of frankenia / Indian ricegrass (*Frankenia jamesii* / *Achnatherum hymenoides*) communities (GU) and the common one-seeded juniper / New Mexico feathergrass (*Juniperus monosperma* / *Hesperostipa neomexicana*) woodlands. High concentrations of rare plants merit an outstanding biodiversity significance rank.

Other Values Rank No Data

## Other Values Comments

Nice views of the Wet Mountains, Pikes Peak and the expansive plains are afforded from the site.

## LAND MANAGEMENT ISSUES

## Land Use Comments

Portions of the site are currently grazed; portions undergo light recreational use; portions undergo military maneuvers.

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## Natural Hazard Comments

No Data

## Exotics Comments

Exotic plants, including *Bromus tectorum*, *Verbascum thapsus*, and *Salsola* sp., are abundant in some areas adjacent to the occurrences, especially along roadsides. *Salsola* tumbleweeds are also beginning to choke a majority of the steep-sided gullies adjacent to rare plant occurrences. However, in general, exotic species have not spread to the shale barrens.

## Offsite

In close proximity to Pueblo, Pueblo West, and Pueblo Reservoir.

## Information Needs

Need current land management and future plans for site, especially privately owned portions. Further inventory for these species is needed; some areas have not yet been accessible for survey.

### ASSOCIATED ELEMENTS OF BIODIVERSITY

<u>Element</u>			<u>Global</u>	<u>State</u>	<u>Driving</u>
<u>State ID</u>	<u>State Scientific Name</u>	<u>State Common Name</u>	<u>Rank</u>	<u>Rank</u>	<u>Site Rank</u>
23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	No
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	Yes
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
19348	<i>Nuttallia chrysantha</i>	golden blazing star	G2	S2	No
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
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23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	No
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	Yes
19476	<i>Oenothera harringtonii</i>	Arkansas Valley evening primrose	G3	S3	No
23798	<i>Asclepias uncialis</i> ssp. <i>uncialis</i>	dwarf milkweed	G3G4T2T3	S2	No
19251	<i>Oenopsis</i> sp. 1	Pueblo goldenweed	G2	S2	Yes
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
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20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
22673	<i>Hesperostipa neomexicana</i> Herbaceous Vegetation	Great Plains Mixed Grass Prairie	G3	S3	No
19251	<i>Oenopsis</i> sp. 1	Pueblo goldenweed	G2	S2	Yes
23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	No
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
24880	<i>Frankenia jamesii</i> / <i>Achnatherum hymenoides</i> Shrubland	Foothills Shrubland	G2	S2	No
23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	Yes
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
19251	<i>Oenopsis</i> sp. 1	Pueblo goldenweed	G2	S2	Yes
24703	<i>Hesperostipa comata</i> Colorado Front Range Herbaceous Vegetation	Great Plains Mixed Grass Prairie	G1G2	S1S2	No
19251	<i>Oenopsis</i> sp. 1	Pueblo goldenweed	G2	S2	No
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
19348	<i>Nuttallia chrysantha</i>	golden blazing star	G2	S2	Yes
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24700	<i>Juniperus monosperma</i> / <i>Hesperostipa neomexicana</i> Woodland	Foothills Pinyon-Juniper Woodlands	G4	S3	No
23798	<i>Asclepias uncialis</i> ssp. <i>uncialis</i>	dwarf milkweed	G3G4T2T3	S2	No
19348	<i>Nuttallia chrysantha</i>	golden blazing star	G2	S2	Yes
20399	<i>Bolophyta tetraneuris</i>	Barneby's fever-few	G3	S3	No
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24800	<i>Artemisia bigelovii</i> / <i>Achnatherum hymenoides</i> Shrubland	Plains Escarpment Prairies (Limestone Breaks)	G3	S3	No
19251	<i>Oenopsis</i> sp. 1	Pueblo goldenweed	G2	S2	Yes
19348	<i>Nuttallia chrysantha</i>	golden blazing star	G2	S2	Yes
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19348	<i>Nuttallia chrysantha</i>	golden blazing star	G2	S2	No
21031	<i>Lesquerella calcicola</i>	Rocky Mountain bladderpod	G3	S3	No
23147	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	No
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23798	<i>Asclepias uncialis</i> ssp. <i>uncialis</i>	dwarf milkweed	G3G4T2T3	S2	No
17481	<i>Townsendia fendleri</i>	Fendler's townsend-daisy	G2	S2	Yes
19476	<i>Oenothera harringtonii</i>	Arkansas Valley evening primrose	G3	S3	No

## REFERENCES

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<u>Reference ID</u>	<u>Full Citation</u>
193570	Colorado Division of Wildlife. 2001-2003. Basinwide Vegetation Classification. Online at <a href="http://www.ndis.nrel.colostate.edu">http://www.ndis.nrel.colostate.edu</a> .
192561	Kelso, S., N. W. Bower, K. E. Heckman, P. M. Beardsley, D. G. Greve. 2003. Geobotany of the Niobrara Chalk Barrens in Colorado: A Study of Edaphic Endemism. Western North American Naturalist 63(3) 299-313.
194958	Neid, S.L. 2007. Final Report: Rare Plant Surveys on Fort Carson Military Reserve 2006-2007. Colorado Natural Heritage Program, Fort Collins, CO.
193568	Spackman Panjabi, S., J. Sovell, G. Doyle, D. Culver, L. Grunau. Final Report: Survey of Critical Biological Resources of Pueblo County, Colorado. Colorado Natural Heritage Program, Fort Collins, CO.
172228	Spackman, Susan and Sandra Floyd. 1996. Final Report: Conserving the Globally Imperiled Plants of the Middle Arkansas Valley, Colorado. Colorado Natural Heritage Program, Fort Collins, CO.
193569	The Nature Conservancy. 2001. Arkansas Valley Barrens Site Conservation Plan.

## ADDITIONAL TOPICS

### Additional Topics

Original site design by Spackman, S.C. 2003-01-24. Modifications by Doyle, G.A. 2005-12-09.

## VERSION

**Version Date** 12/09/2005  
**Version Author** Doyle, G.A.

## Disclaimer

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