

Rare Plant Conservation Planning Workshop Results

ARKANSAS VALLEY BARRENS



Golden blazing star © S. Spackman, CNHP 1999



Round-leaf four-o'clock © S. Spackman, CNHP 1999



Pueblo goldenweed © S. Spackman, CNHP 1999

Plants of Focus

Golden blazing star (*Nuttallia chrysantha*)

Pueblo goldenweed (*Oonopsis puebloensis*)

Round-leaf four-o'clock (*Oxybaphus rotundifolius*)

Sponsored by the
Colorado Rare Plant Conservation Initiative

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Kram, M., S. Panjabi, B. Neely, and S. Kettler. 2008. Rare Plant Conservation Planning Workshop: Arkansas Valley Barrens Priority Action Area. Prepared by The Nature Conservancy and the Colorado Natural Heritage Program. Unpublished report prepared for the National Fish and Wildlife Foundation.

I. Summary

This document identifies conservation strategies for round-leaf four-o'clock, golden blazing star, and Pueblo goldenweed, based on an assessment of the plants' viability and threats by participants of a June 2008 workshop. The primary audience is intended to be the workshop participants and other stakeholders interested in helping to implement the strategies.

The Arkansas Valley Barrens Priority Action Area as identified by the Colorado Rare Plant Conservation Initiative (RPCI) includes nearly all of the known occurrences of round-leaf four-o'clock, golden blazing star, and Pueblo goldenweed. A Priority Action Area is an area needing immediate conservation action to prevent the need for listing, extinction, or further losses of imperiled plant species. Selection was based on the level of imperilment of rare plant species, quality of the occurrences, urgency of the management and protection actions, and other opportunities such as funding and land ownership patterns. These areas are based on the Potential Conservation Areas identified by the Colorado Natural Heritage Program, at Colorado State University, with input by the RPCI and the Rare Plant Technical Committee (RPTC).

Located in Pueblo, Fremont, El Paso and Custer counties, the Arkansas Valley Barrens Priority Action Area includes nearly all known occurrences of round-leaf four-o'clock (*Oxybaphus rotundifolius*= *Mirabilis rotundifolia* , G2, known from only 30 locations in the world) golden blazing star (*Nuttallia chrysantha* = *Mentzelia chrysantha*, G2, known from only 24 locations in the world), and Pueblo goldenweed (*Oonopsis puebloensis*, G2, known from only 18 locations in the world).

Although many of the known occurrences of the three plants appear to be in good to very good condition, the habitat of these imperiled species is threatened by residential development, motorized recreation, mining, and road construction and maintenance. In addition, if Pueblo Reservoir were to undergo future expansion, potential habitat and existing plants would be destroyed.

Protection of habitat on private lands from permanent conversion (e.g., residential development) and extreme surface disturbance (e.g., limestone mining) will be an effective conservation strategy to ensure that populations of these species remain viable throughout the Priority Action Area. If land protection through conservation easement, purchase/transfer of development rights, or other incentives could be used to support local landowners in their efforts to maintain the existing landscape, the rare plants would benefit.

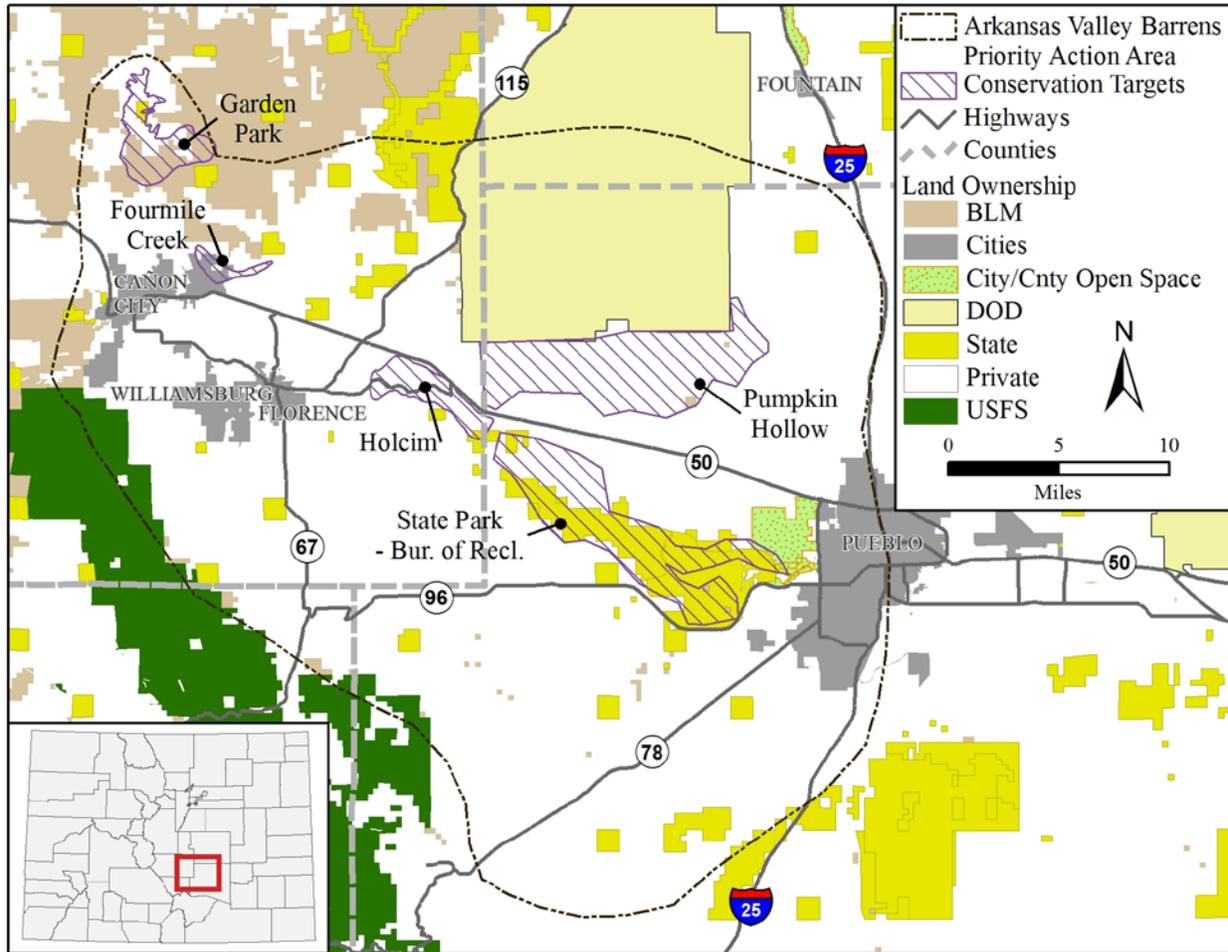
On public lands, appropriate maintenance of transportation right-of-ways and management of recreation would be important contributions to the protection of these plants. The Colorado Department of Transportation (CDOT) is aware of the significance of state highway right-of-ways to these plants, and plans are underway to employ best management practices along state and federal highways in the area. Similar efforts by the County to govern maintenance of local roads would be useful. In addition, careful planning to avoid excessive impacts from hiking, ORV use, fishing and hunting access, and camping at the Pueblo State Wildlife Area and Pueblo State Recreation Area would benefit the rare plants.

Participants of the June 2008 workshop identified and prioritized a variety of specific strategies to protect the highest quality occurrences of the imperiled plants within target areas; the high priority strategies are listed in the following pages. See Table 5 for a full list of strategies. Workshop participants plan to meet every 6-12 months to assess progress toward the implementation of these strategies.

High priority strategies for conserving Arkansas Valley Barrens rare plants

Target		Strategy	Priority	Lead	Notes
Target Areas	Owner/manager				
Strategies across all target areas					
All	All	Develop materials to show status and trends of populations and share with major landowners, land trusts, counties, cities etc.	High	S.Neid w/assistance from S.Kettler	Include a more comprehensive list of species than only these occurrences. See packet from Colorado Natural Areas Program (B.Kurzel)
All	Private	Pursue conservation easements and other land protection tools, working with local land trusts	High	S.Kettler	This strategy was proposed by authors during the production of this report.
Strategies for specific target areas					
Garden Park	BLM	Inform BLM travel management plan	High	CNHP	Only a strategy if the travel management plan is not already completed.
Garden Park	Private	Protect plants (Blazing Star #10) on private parcels adjacent to BLM through conservation easements or other protection tools.	High	S.Spaulding	
Holcim	All	Ensure that surface disturbance will avoid key occurrences/areas through planning and/or conservation easements by (1) obtaining permission to conduct inventories (2) conducting inventories and (3) Discussing win-win situations for plants and mining	High	TNC w/assistance from S.Spaulding	S.Panjabi spoke with Holcim in 1995 about the plants and TNC toured the site with Holcim in the 1990s. Consider sr. mgmt and natural resource specialists.

II. Map



III. Arkansas Valley Barrens Priority Action Area and Associated Rare Plants

This document focuses on rare plants within the Arkansas Valley Barrens Priority Action Area as identified by the Colorado Rare Plant Conservation Initiative (RPCI). To date, RPCI has identified seven such areas across Colorado. A Priority Action Area is an area needing immediate conservation action to prevent the need for listing, extinction, or further losses of imperiled plant species. Selection was based on the level of imperilment of rare plant species, quality of the occurrences, urgency of the management and protection actions, and other opportunities such as funding and land ownership patterns. These areas are based on the Potential Conservation Areas identified by the Colorado Natural Heritage Program, at Colorado State University, with input by the RPCI and the Rare Plant Technical Committee (RPTC).

Located in primarily in Pueblo and Fremont counties and including small portions of Custer and El Paso counties, the Arkansas Valley Barrens Action Area includes nearly all known occurrences of round-leaf four-o'clock (*Oxybaphus rotundifolius*, G2) golden blazing star (*Nuttallia chrysantha*, G2), and Pueblo goldenweed (*Oonopsis puebloensis*, G2) (Table 1). The

area also supports numerous other important rare plants that are beyond the scope of this workshop (Table 1) as well as other important species and plant communities (Attachment 1). This area occurs at the southwest edge of the Peak to Prairie Priority Landscape identified by the Colorado Conservation Partnership (<http://www.keepitcolorado.org/>).

Table 1. Globally imperiled plants known from the Arkansas Valley Barrens (AVB) Priority Action Area.

Common name	Scientific name	Known occurrences	Global rank*	Status	CNHP Rare Plant Field Guide Link
Focus of the workshop and this document					
Golden blazing star	<i>Nuttallia chrysantha</i>	24 in the world, 22 of which are in the AVB area.	G2	Forest Service/ Bureau of Land Mgmt. Sensitive	http://www.cnhp.colostate.edu/rareplants/PDL/OA03080.html
Pueblo goldenweed	<i>Oenopsis puebloensis</i>	18 in the world, all of which are in the AVB area.	G2	[none]	http://www.cnhp.colostate.edu/rareplants/PDA/STDQ050.html
Round-leaf four-o'clock	<i>Oxybaphus rotundifolius</i>	30 in the world, 28 of which are in the AVB area.	G2	[none]	http://www.cnhp.colostate.edu/rareplants/PDN/YC0A140.html
Other important rare plants – focus of future efforts					
Arkansas Valley evening primrose	<i>Oenothera harringtonii</i>	38 in the world, 16 of which are in the AVB area	G2G3	[none]	http://www.cnhp.colostate.edu/rareplants/PDO/NA0C1U0.html
Brandegee wild buckwheat	<i>Eriogonum brandegeei</i>	6 in the world, 2 of which are in the AVB area.	G1G2	BLM	http://www.cnhp.colostate.edu/rareplants/PDP/GN080U0.html
Barneby's fever-few	<i>Bolophyta tetraeuris</i>	26 in the world, 24 of which are in the AVB area.	G3	[none]	http://www.cnhp.colostate.edu/rareplants/PDA/ST6V090.html
Dwarf milkweed	<i>Asclepias uncialis</i>	22 in Colorado, 5 of which are in the AVB area	G3G4 T2T3 (treated as G2)	Forest Service/ Bureau of Land Mgmt. Sensitive	http://www.cnhp.colostate.edu/rareplants/PDA/SC02220.html
Fendler's townsend-daisy	<i>Townsendia fendleri</i>	5 in the Colorado, 1 of which are in the AVB area.	G2	[none]	Not included in guide
Rocky Mountain bladderpod	<i>Lesquerella calcicola</i>	23 in the world, 14 of which are in the AVB area.	G2	[none]	Not included in guide

*G1 = critically imperiled. G2 = imperiled. G3=vulnerable. For more detail on global ranks please visit the Colorado Natural Heritage Program's website at <http://www.cnhp.colostate.edu/heritage.html>.

Round-leaf four-o'clock, known only from Las Animas, Fremont, and Pueblo counties in southeastern Colorado, is a showy member of the Nyctaginaceae (Four-O'Clock) family. Plants stand about 2-3 dm tall and support bright magenta flowers with petals that are about 1 cm long, and have five exerted stamens. The flowers of round-leaf four-o'clock open before dawn, and generally close by mid-morning. This species is found on barren chalk outcrops of the Smoky Hill Member of the Niobrara Formation in sparse shrublands or woodlands.

Golden blazing star is a yellow-flowered member of the Loasaceae (Stickleaf) family. The plants stand about 20-75 cm tall and support bright yellow flowers with 10 petals, 15-20 mm long. The flowers of golden blazing star open at about 6 pm and remain open until about 9 pm. Golden blazing star is found on barren slopes in soils derived from limestone, shale, or clay within a limited distribution in Fremont and Pueblo counties, Colorado.

Pueblo goldenweed is a yellow-flowered member of the Asteraceae (Sunflower) family. The plants stand about 15-30 cm tall and support an inflorescence of bright yellow ray and disk flowers. Pueblo goldenweed is found in barren shale outcrops in sparse shrublands or pinyon-juniper woodlands, in soils derived from the Smoky Hill Member of the Niobrara Formation. This species was discovered in 1982, and is still awaiting formal publication. Pueblo goldenweed is only known from a limited distribution in Fremont and Pueblo counties, Colorado.

The habitat of these three imperiled species is threatened by residential development, motorized recreation, mining, and road construction and maintenance.

Although the focus of the workshop was on the globally imperiled plants, Attachment 1 describes other significant species and plant communities in this area. A full suite of biodiversity values should be considered during more expansive conservation planning efforts for this area.

IV. About the Workshop

Purpose: To identify strategies for conserving the round-leaf four-o'clock, golden blazing star, and Pueblo goldenweed, based on an assessment of the viability and threats to their occurrences.

Origin: The Rare Plant Conservation Initiative (RCPI) is a diverse partnership of public and private organizations dedicated to conserving Colorado's natural heritage by improving the protection and stewardship of the state's most important plants. RCPI is developing a strategy for the conservation of Colorado's most imperiled plant species. As part of this effort, the group is working with partners to identify statewide and site-specific strategies in areas with (a) the most imperiled species, and (b) a reasonable likelihood of conservation success. For site-specific strategies, RCPI partners identified five priority action areas around the state: Arkansas Valley Barrens, Middle Park, North Park, Pagosa Springs, and the Piceance Basin. For each of these areas, RCPI led a workshop during the summer of 2008 with local partners to identify priority conservation strategies.

Workshop date: June 12, 2008

Participants:

Participant	Affiliation
Attended	
Susan Panjabi (co-facilitator)	Colorado Natural Heritage Program
Stephanie Neid	Colorado Natural Heritage Program
Mo Ewing	Colorado Open Lands
Sigrid Meiris	Palmer Land Trust
Steve Spaulding	Palmer Land Trust
Megan Kram (co-facilitator)	The Nature Conservancy
Betsy Neely	The Nature Conservancy
Steve Kettler (RPCI lead for the Arkansas Valley Barrens)	U.S. Fish & Wildlife Service
Unable to attend	
Eric Brekke	Bureau of Land Management
Tass Kelso	Colorado College
Brian Kurzel	Colorado Natural Areas Program
Juniper Katz	Colorado Open Lands
Frogard Ryan	The Nature Conservancy

V. Workshop Results

A. Conservation Targets

Using the The Nature Conservancy’s (TNC) site conservation planning workshop methodology, “conservation targets” are a limited suite of species, communities, and/or ecological systems, or specific locations of these elements of biodiversity (e.g., occurrences, sub-occurrences, or other areas) that are the basis for setting goals, identifying conservation strategies, and measuring conservation effectiveness.

At the Arkansas Valley Barrens Priority Action Area our targets are specific locations of the imperiled plants, identified more specifically based on land ownership. We organized the highest quality known occurrences (ranked A or B by the Colorado Natural Heritage Program) of round-leaf four-o'clock, golden blazing star, and Pueblo goldenweed into six target areas (see Map and Table 2).

Table 2. Total of six target areas based on the highest quality known occurrences of round-leaf four-o'clock, golden blazing star, and Pueblo goldenweed.

Target area (see map for specific locations)	Landownership
BLM/Garden Park	▪ BLM, town of Black Hawk, and private
Fort Carson	▪ Department of Defense
Four Mile	▪ Private
Holcim	▪ Private—Holcim Cement Company
Lake Pueblo State Park and Pueblo State Wildlife Area	▪ Bureau of Reclamation, State of Colorado
Pumpkin Hollow	▪ Private

B. Viability

“Viability” per TNC terminology is the “health” or “functionality” of the conservation targets. During the Workshop we attempted to answer two key questions through the viability assessment: *How do we define ‘health’ (viability) for each of our targets?* and *What is the current status of each of our targets?*

There are four possible viability ranks: A = very good; B = good; C = fair and D = poor. The Arkansas Valley Barrens Priority Action Area has so many A- and B-ranked occurrences that we only focused on these occurrences during the workshop. In other words, we assessed threats and identified strategies only for those target areas containing A- and B-ranked occurrences.

Table 2 shows overall viability of rare plants across target areas. All areas are ranked as “good” or “very good” overall, primarily because we only assessed A- and B-ranked occurrences of the plants with the areas. That being said, it is still useful to recognize that Pumpkin Hollow and the State Park/Bureau of Reclamation areas are the highest ranked target areas across the Arkansas Valley Barrens.

Table 3. Overall viability of rare plants across Target Areas.

Target area name	Target species known from area	Overall viability of target plants at area	Other globally rare plants at target area
Lake Pueblo State Park and Pueblo State Wildlife Area	golden blazing star, Pueblo goldenweed, round-leaf four-o'clock	A = Very Good	dwarf milkweed, Barneby's feverfew, Rocky Mountain bladderpod, Arkansas Valley evening primrose
Pumpkin Hollow	golden blazing star, Pueblo goldenweed, round-leaf four-o'clock	A = Very Good	Barneby's feverfew, Arkansas Valley evening primrose
BLM/Garden Park	golden blazing star	B = Good	Brandegee wild buckwheat, dwarf milkweed
Fort Carson	golden blazing star, Pueblo goldenweed, round-leaf four-o'clock	B = Good	dwarf milkweed, Barneby's feverfew, Arkansas Valley evening primrose
Four Mile	round-leaf four-o'clock, Pueblo goldenweed	B = Good	dwarf milkweed, Barneby's feverfew, Rocky Mountain bladderpod
Holcim	golden blazing star, Pueblo goldenweed, round-leaf four-o'clock	B = Good	Barneby's feverfew, Rocky Mountain bladderpod, Arkansas Valley evening primrose

The overall viability rankings of A-D for each plant occurrence were based on a systematic assessment of the components of viability, or indicators and associated indicator ratings as shown in the table below. These components of viability are “rolled up” into the overall viability rank (Table 4).

Table 4. Basis for viability ratings, AVB rare plants.

Key Attribute	Indicator	Indicator rating criteria			
		D - Poor	C - Fair	B – Good	A - Very Good
Intactness of occurrence and surrounding area	% fragmentation	Highly fragmented	Moderately fragmented	Limited fragmentation	Unfragmented
Population structure & recruitment	Evidence of reproduction	Little or no evidence of successful repro. (few seedlings and/or no flowering or fruiting)	Less productive, but still viable with evidence of flowering and/or fruiting and mixed age classes	Good likelihood of long-term viability as evidenced by flowering, fruiting, and mixed age classes.	Excellent viability as evidenced by high % flowering and fruiting, and mixed age classes
Species composition / dominance	Percent ground cover of invasive species	>50% cover	11-50% cover	1-10% cover	<1% cover
Population size & dynamics for the Golden blazing star	# individuals	<10	10-99	100-500	500+
Population size & dynamics for the Pueblo goldenweed	# individuals	<20	20-99	100-500	500+
Population size & dynamics for the round-leaf four-o'clock	# individuals	<25	25-99	100-500	500+

C. Threats

With the viability analysis complete, participants then identified the primary threats to each target area. They identified and ranked threats based on their expertise, local knowledge, and sense of the key issues facing each target (Table 5). Identifying and ranking threats is an important input, along with understanding viability, to ultimately identifying efficient and effective strategies.

Although the occurrences we considered appear to be in good to very good condition, the habitat of these imperiled species is threatened by motorized recreation, residential development, mining, and road construction and maintenance.

Table 5. Primary threats to each target area. Red = high threat, orange = medium threat; yellow = low threat. Please note that during the workshop the group did not identify housing and urban area construction as a threat to any of the areas. However, upon completing this analysis the authors felt that housing development should be listed as at least a medium threat to all areas that contain private lands that are not included in a conservation easement.

Target Area	Foot traffic or training	Motorized rec. or training	Altered fire regime	Housing and urban areas - construction	Housing and urban areas - maint.	Road const.	Road Maintenance	Utility const.	Utility maint.	Excessive grazing	Invasive non-natives	Mining/quarrying	Notes
Garden Park/BLM		Med		Med						Low		Low	Mining: Dinosaur fossil site.
Fort Carson		Med	Low			Low	Med	Low					Motorized training: impacts unknown. Altered fire regime: may not be a threat. Road maint.: spraying may be an issue.
Four Mile	Med			High	Med			Med	Med		Med		Betsy, Megan, and Susan drove by this target area following the workshop and observed new housing development in close proximity to the its boundary.
Holcim							Med			Med	Low	High	Excessive grazing: Horses are more the issue than cattle. Invasives may or may not be an issue.
Pumkin Hollow											Low		Threats mostly abated due to conservation easements.
State Park - BoR	Med			Med		Med	Med						Steph and Susan identified the threats following the meeting since we ran out of time during the workshop. Plants at this target area are also threatened by potential expansion of Pueblo reservoir.

D. Strategies

Based on an understanding of viability and threats, participants identified strategies (a) across all target areas for the three globally imperiled plants and (b) for specific target areas. After brainstorming strategies, participants prioritized them as high, medium, or low based on their anticipated effectiveness. See p. 3 for high priority strategies and Table 6 for all strategies. Specific to private land protection efforts, the RPCI is also evaluating opportunities to work with willing private landowners and local land trusts to conserve these species and their habitats using voluntary tools such as conservation easements. An overarching goal is to avoid the need for listing the species on the Endangered Species List.

Table 6 focuses on future strategies, which should be considered in the context of conservation activities that have already been completed:

- Private lands activities: Land trusts active in the AVB area have been brought into the process and informed of the conservation priorities on private lands. We have identified 11 private lands sites important for rare plant conservation and of these, most are being followed up on by land trusts. Follow-up ranges widely from initial contacts with private land owners to gauge conservation interest, to more detailed discussion and negotiations on conservation easements and funding options.
- Working with Ft. Carson: Natural Resources and Fish & Wildlife Service staff at Ft. Carson have been provided a summary of the status, distribution, and conservation issues related to the rare plants and the GIS locations. They provided feedback on the current and future plans for military training and potential impacts. They intend to use the GIS information provided as one of the layers that they overlay with training plans to avoid and minimize impacts to the rare plants and other natural resources.

Table 6. Prioritized list of strategies for conserving the rare plants within target areas in the Arkansas Valley Barrens.

Target Area	Owner / Manager	Strategy	Priority	Lead	Notes
Strategies across all Target Areas					
All	All	Develop materials to show status and trends of populations and share with major landowners, land trusts, counties, cities etc.	High	S.Neid w/assistance from S.Kettler	Include a more comprehensive list of species than only these occurrences. See packet from Colorado Natural Areas Program (B.Kurzel)
All	All	Conduct inventories	Med	CNHP	
All	All	Develop and share BMP with stakeholders (CDOT, counties, etc.)	Med	RPCI w/ assistance from CNHP and S.Kettler	Report authors felt that this may be a higher priority.
All	All	Monitor plants to assess status and trends.	Med	CNHP	Report authors felt that this may be a higher priority than medium .
All	All	Continue to ensure that CDOT, County, and Holcim are aware of issues with	Low		Already talking with CDOT. Figure out who maintains which roads. Give CDOT

Target Area	Owner / Manager	Strategy	Priority	Lead	Notes
		maintenance and spraying thru use of placards or other means			and/or County detailed maps and BMPs
All	Private	Pursue conservation easements and other land protection tools, working with local land trusts	High	S.Kettler	This strategy was proposed by authors during the production of this report.
All	Private	Encourage the development of city and county open space programs and transfer of development rights (TDR) programs.	Med	S.Spaulding	
Strategies for specific Target Areas					
Ft. Carson	All	Work with DoD to conserve plants on private lands (e.g. conservation easements)	Med	S.Kettler	Include laundry list of species rather than "our targets"
Ft. Carson	DoD	Work with DoD to ensure that activities (i.e., mechanized training, spraying) do not impact the rare plants (e.g., special botanical areas).	Med	S.Kettler	Nat. Res. Folks are aware of the plants, and will incorporate into their guidance for training and management plans.
Garden Park	BLM	Inform BLM travel management plan	High	CNHP	Only a strategy if the travel management plan is not already completed.
Garden Park	Private	Protect plants (Blazing Star #10) on private parcels adjacent to BLM through conservation easements or other protection tools.	High	S.Spaulding	
Holcim	All	Ensure that surface disturbance will avoid key occurrences/areas through planning and/or conservation easements by (1) obtaining permission to conduct inventories (2) conducting inventories and (3) Discussing win-win situations for plants and mining	High	TNC w/assistance from S.Spaulding	S.Panjabi spoke with Holcim in 1995 about the plants and TNC toured the site with Holcim in the 1990s. Consider sr. mgmt and natural resource specialists.
Holcim	All	Incorporate rare plant considerations into reclamation plans	Low		
Holcim	All	Investigate potential need for excessive grazing strategy	Low		

VI. Next Steps

Ongoing - The leads for all high- and medium-ranked strategies (Table 6) are responsible for ensuring their implementation.

Ongoing - The group proposed to meet annually to gauge progress toward implementing strategies. This meeting will be coordinated by Steve Kettler, USFWS, and the RPCI lead for the Arkansas Valley Barrens Priority Action Area. Preferably this meeting would occur in the summer so a field visit to the plants is also possible.

Winter 2009 - TNC/RPCI will organize a conference call in the winter as a check in.

Attachment 1. Additional key species and plant communities in the Arkansas Valley Barrens area

Although the focus of the workshop was on the globally imperiled plants, other key species and plant communities are known from the Arkansas Valley area as shown in the table below (Colorado Natural Heritage Program 2008, <http://www.cnhp.colostate.edu/>). Specifically, the table identifies rare species and rare and/or high quality examples of plant communities in the Arkansas Valley area. These and other biodiversity values should be considered for more detailed planning efforts for this area.

Major group	Scientific name	Common name	Global rank	State rank	
Birds	<i>Buteo regalis</i>	Ferruginous Hawk	G4	S3B,S4N	
	<i>Charadrius montanus</i>	Mountain Plover	G2	S2B	
	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S1B,S3N	
	<i>Strix occidentalis lucida</i>	Mexican Spotted Owl	G3T3	S1B,SUN	
Fish	<i>Etheostoma cragini</i>	Arkansas Darter Southern Redbelly	G3G4	S2	
	<i>Phoxinus erythrogaster</i>	Dace	G5	S1	
Insects	<i>Euphilotes rita coloradensis</i>	Colorado Blue	G3G4T2T3	S2	
Mammals		Common Hog-nosed Skunk			
	<i>Conepatus leuconotus</i>	Black-tailed Prairie Dog	G4	S1	
	<i>Cynomys ludovicianus</i>	Dog	G4	S3	
Reptiles		Triploid Colorado Checkered Whiptail			
	<i>Aspidoscelis neotesselata</i>	Corn Snake	G2G3	S2	
	<i>Elaphe guttata</i>		G5	S3	
Natural Communities	<i>Artemisia bigelovii</i> / <i>Achnatherum hymenoides</i>	Plains Escarpment Prairies (Limestone Shrubland Breaks)	G3Q	S3Q	
	<i>Carex nebrascensis</i>	Herbaceous Vegetation Wet Meadows	G4	S3	
	<i>Frankenia jamesii</i> / <i>Achnatherum hymenoides</i>	Shrubland Foothills Shrubland	GU	SU	
	<i>Hesperostipa comata</i>	Colorado Front Range Herbaceous Vegetation	Great Plains Mixed Grass Prairie	G1G2	S1S2
	<i>Hesperostipa neomexicana</i>	Herbaceous Vegetation	Great Plains Mixed Grass Prairie	G3	S3
	<i>Populus angustifolia</i> - <i>Juniperus scopulorum</i>	Woodland Montane Riparian Forest	G2G3	S2S3	
	<i>Populus angustifolia</i> / <i>Alnus</i> <i>incana</i>	Woodland Montane Riparian Forest	G3	S3	
	<i>Populus angustifolia</i> / <i>Betula occidentalis</i>	Woodland Montane Riparian Forest	G3	S2	

Major group	Scientific name	Common name	Global rank	State rank
	<i>Populus tremuloides</i> / <i>Alnus incana</i> Forest	Montane Riparian Forests	G3	S3
	<i>Pseudotsuga menziesii</i> / <i>Betula occidentalis</i> Woodland	Montane Riparian Forest	G3?	S3
	<i>Sarcobatus vermiculatus</i> / <i>Distichlis spicata</i> Shrubland	Saline Bottomland Shrublands	G4	S2
	<i>Schoenoplectus acutus</i> - <i>Typha latifolia</i> - (<i>Schoenoplectus tabernaemontani</i>) Sandhills Herbaceous Vegetation	Great Plains Marsh	G4	S2S3
Vascular Plants	<i>Aquilegia chrysantha</i> var. <i>rydbergii</i>	golden columbine	G4T1Q	S1
	<i>Pellaea wrightiana</i>	Wright's cliff-brake	G5	S2
	<i>Penstemon degeneri</i>	Degener beardtongue	G2	S2
	<i>Sarcostemma crispum</i>	twinevine	G4G5	S1

For more information about these and other biodiversity values, see reports including but not limited to the following:

- Colorado Wildlife Action Plan
<http://wildlife.state.co.us/WildlifeSpecies/ColoradoWildlifeActionPlan/>
- The Nature Conservancy Ecoregional Assessments.
<http://conserveonline.org/workspaces/cbdgateway/era/reports/index.html> The Central Shortgrass Prairie Ecoregional Assessment describes the ecological significance of the 518,000 acre Arkansas Valley Conservation Area (Appendix O: page 24).
- Southern Rockies Ecosystem Project: <http://www.restoretherockies.org/reports.html>.