PICEANCE BASIN
Conservation Action Plan
2011 Update

Dudley Bluffs bladderpod
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Piceance twinpod
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Plants of Focus

Dudley Bluffs Bladderpod (*Physaria congesta*)
Piceance Twinpod (*Physaria obcordata*)

Sponsored by the
Colorado Rare Plant Conservation Initiative

Workshop Dates: July 18, 2008 and June 29, 2010
Report Date: August 25, 2011

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Panjabi, S. and B. Neely. 2010. Piceance Basin Conservation Action Plan 2011 Update. Prepared by The Nature Conservancy and the Colorado Natural Heritage Program. Unpublished report prepared for the National Fish and Wildlife Foundation.

I. Introduction

A preliminary Conservation Action Plan was developed in July of 2008 (Panjabi et al. 2008; available on-line at http://www.cnhp.colostate.edu/teams/botany.asp#initiative) and focused on the conservation of two globally imperiled plant species, Piceance twinpod (*Physaria obcordata*) and Dudley Bluffs bladderpod (*Physaria congesta*). Participants of a 2010 follow-up workshop held in June 2010 reviewed all available information on these two target species, updated species occurrence information, and developed a vision and long-term ecological goals. Participants discussed the need to include additional species, ecosystems, landscape context, and geology to add value in this specific effort. The participants then updated information from the 2008 plan (Panjabi et al. 2008) on viability, threats, and strategies. This report serves as a comprehensive update to the 2008 plan. The primary audience is intended to be the workshop participants and other stakeholders interested in helping to implement the strategies and conserve the imperiled plant species and their habitats in the Piceance Basin.

II. Vision and Goals for the Piceance Basin

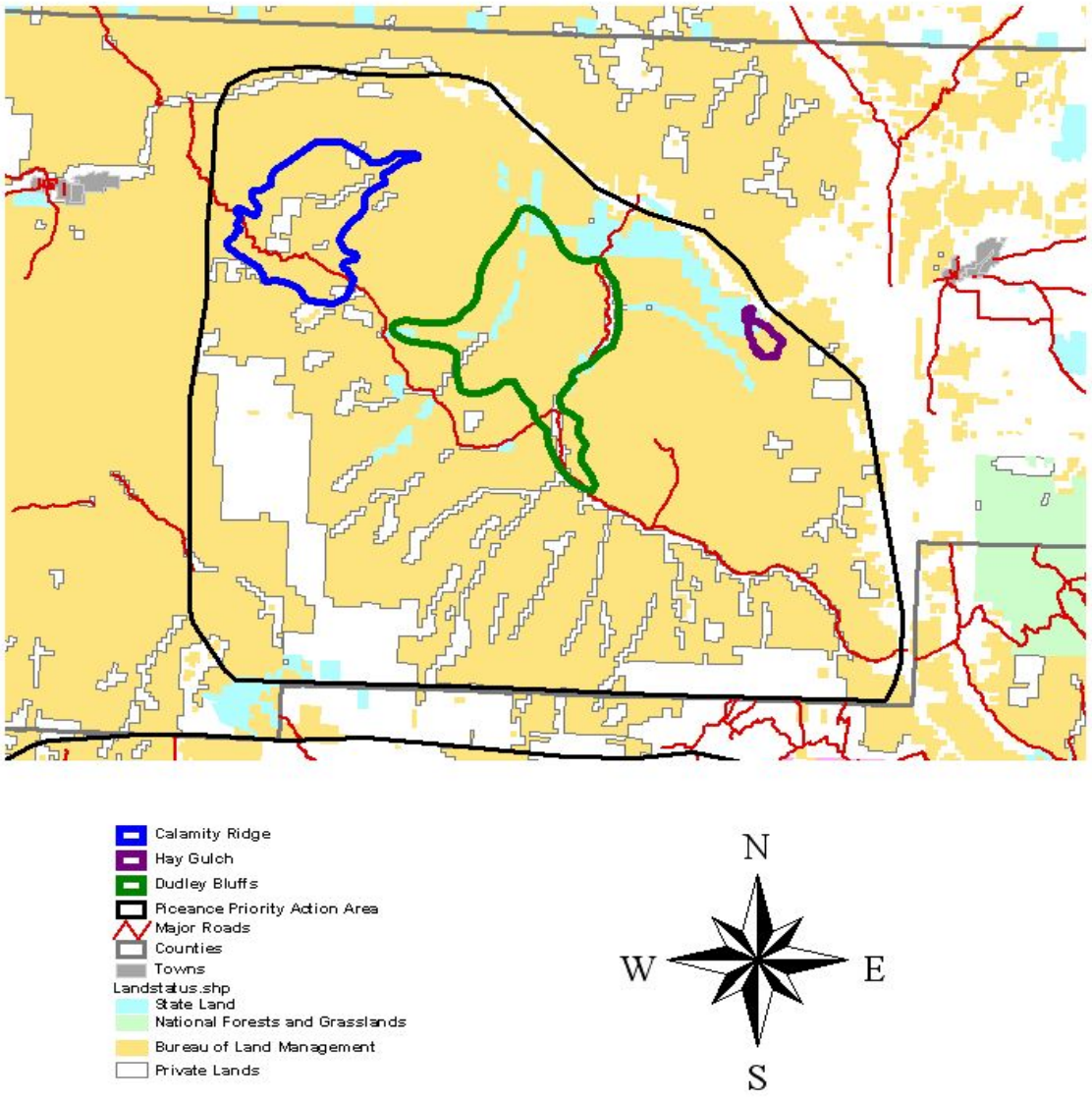
Vision

1. Populations of the imperiled plants Dudley Bluffs bladderpod and Piceance twinpod (and other imperiled plants) and their habitats thrive within functioning ecosystems.
2. A coalition of partners is working together to ensure their long-term survival and stewardship.

Long-term Ecological Goals

1. Conserve all viable and restorable occurrences of the Dudley Bluffs bladderpod (7 occurrences) and Piceance twinpod (10 occurrences)
2. Conserve at least 2,000 acres of habitat for both imperiled plants
3. Maintain/restore a mosaic of high quality plant communities (within a minimum buffer area of 600 meters surrounding the occurrences).

III. Map of the Piceance Priority Action Area



IV. Piceance Basin Priority Action Area and Associated Rare Plants

This document focuses on rare plants within the Piceance 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 Rio Blanco County, the Piceance Action Area includes all known occurrences of Dudley Bluffs bladderpod (*Physaria congesta=Lesquerella congesta;* G1, listed as threatened by the U.S. Fish and Wildlife Service) and Piceance twinpod (*Physaria obcordata;* G1G2, listed threatened) (Table 2). This Area occurs within the vicinity of the Upper Colorado River Corridor Priority Landscape identified by the Upper White River Basin Priority Landscape by the Colorado Conservation Partnership.

Table 2. Plants of Focus in the Piceance 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					
Dudley Bluffs bladderpod	*Physaria congesta (=Lesquerella congesta)*	Seven in the world, all in Rio Blanco County, Colorado	G1	Listed Threatened on the ESA	http://www.cnhp.colostate.edu/rareplants/PDBRA1N1T0.html
Piceance twinpod	*Physaria obcordata*	Ten in the world, all in Rio Blanco County, Colorado	G1G2	Listed Threatened on the ESA	http://www.cnhp.colostate.edu/rareplants/PDBRA220H0.html
Other important rare plants – focus of future efforts					
Piceance bladderpod	*Lesquerella parviflora*	Colorado endemic: Rio Blanco, Garfield, and Mesa cos.	G2	none	
Sun-loving meadowrue	*Thalictrum heliophilum*	Colorado endemic: Rio Blanco, Garfield, Mesa cos.	G2	USFS sensitive	
Narrow-stem gilia	*Gilia stenothrysa*	Utah and Colorado: Mesa and Rio Blanco cos.	G3	BLM sensitive	
Rollins' cat's-eye	*Oreocarya rollinsii*		G3	BLM sensitive	
Many-stem stickleaf	*Nuttallia multicaulis*		G3	none	Not included in Guide
Utah gentian	*Gentianella tortuosa*		G3	BLM sensitive	
Fremont's beardtongue	*Penstemon fremontii* var. *glabrescens*		G3G4T2	none	Not included in Guide

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

Dudley Bluffs bladderpod is a very small plant in the Mustard family (Brassicaceae). The plants are perennial, have star-shaped hairs, and bright yellow flowers that bloom early in the spring (April-May). Piceance twinpod is more robust, and is also a yellow flowered perennial in the Mustard family. The Piceance twinpod is similarly limited in its distribution and rarity. Both of these species grow on barren white shale outcrops of the Green River and Uintah Formations of Rio Blanco, Colorado, and nowhere else in the world.

The habitat of these two imperiled species is threatened by oil and gas development, oil shale and nahcolite mining, road construction and maintenance, weed infestations, ORV use, wind energy development, overgrazing, and trampling by wild horses.

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.

V. About the Workshop

Purpose: The objective of the 2008 workshop was to identify strategies for conserving the Dudley Bluffs bladderpod and Piceance twinpod based on an assessment of the viability and threats to their occurrences. The objectives of the 2010 workshop were to review progress, update viability, conservation issues, and conservation strategies.

Origin: The Rare Plant Conservation Initiative (RPCI) 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. RPCI 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, RPCI partners identified seven priority action areas around the state: Adobe Hills, Arkansas Valley Barrens, Middle Park, North Park, Pagosa Springs, Piceance Basin, and Roan Cliffs. For each of these areas, RPCI led a workshop during the summer of 2008 with local partners to identify priority conservation strategies.

Workshop date: The initial workshop was held on July 18, 2008, and the follow-up workshop was held June 29th-30th, 2010.

Workshop Participants (2010 participants are marked with an *):

Name	Affiliation
Attended	
Susan Panjabi (co-facilitator)*	Colorado Natural Heritage Program
Betsy Neely (co-facilitator)*	The Nature Conservancy
Sara Clark*	Utah State University
Lisa Foy*	Hayden Wing Consultants
Gina Glenne*	U.S. Fish and Wildlife Service
Ken Holsinger	Bureau of Land Management
Brianna Potts*	Bureau of Land Management

Name	Affiliation
James Roberts*	Bureau of Land Management
Rusty Roberts	Private consultant formerly with the BLM
Peggy Lyon	Colorado Natural Heritage Program
Janis Huggins	Colorado Natural Heritage Program
Jill Schulte*	Bureau of Land Management
Jennifer Wilkening	Colorado Natural Areas Program
Unable to Attend	
Brian Kurzel	Colorado Natural Areas Program
Susan Dorsey	Yampa Valley Land Trust
Ellen Mayo	US Fish and Wildlife
Erin Robertson	Center for Native Ecosystems
Paige Lewis	The Nature Conservancy
Carol Dawson	Bureau of Land Management
Denise Culver	Colorado Natural Heritage Program
Other Contacts	
Geoff Blakeslee	The Nature Conservancy
Vince Tedpidino	Utah State University
John Broderick	CDPW NW Senior Terrestrial Biologist
Mike Klish	Westwater Engineering
Tom Knowles	CDOW District Wildlife Manager in Meeker

VI. Workshop Results

A. Conservation Targets

Using 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 Piceance Basin Priority Action Area the targets are specific locations of the threatened plants, identified more specifically based on land ownership.

At the 2008 Piceance Basin workshop, we organized the occurrences of Dudley Bluffs bladderpod and Piceance twinpod into seven targets based on landownership within three "Potential Conservation Areas" (PCAs) as identified by the Natural Heritage Program (Table 3). A PCA represents CNHP biologists' best estimate of the primary area required to support the long-term survival of species or communities of interest or concern. Distinguishing between different landowners enabled us to effectively evaluate threats and identify meaningful strategies later in the workshop. The 2010 implementation meeting participants added four targets (Lower Greasewood BLM, Lower Greasewood private, Cathedral Bluffs BLM and Cathedral Bluffs private) for a total of eleven targets listed in **Table 3** below.

At the 2010 meeting, new occurrence information was reported and summarized from Hayden-Wing Associates, CNHP, CNAP, USFWS, BLM, Bio-Logic and Denver Botanic Gardens. Many researchers had the opportunity to make observations; results are integrated in CNHP database at CSU (CNHP 2011).

Table 3. A total of eleven conservation targets for the Piceance Priority Action Area are based on landownership and presence of Dudley Bluffs bladderpod, Piceance twinpod and other rare plant species. For example, there are three targets identified for the imperiled species at the Dudley Bluffs site: Dudley Bluffs BLM, Dudley Bluffs CDOW, and Dudley Bluffs private.

Target area (each area is a "Potential Conservation Area" (PCA) as identified by CNHP; Biodiversity significance rank follows the PCA name)	**Associated landownership**	**Targets and other significant species and plant communities present in area, followed by highest occurrence rank*** (some areas support more than one occurrence of listed element)
Dudley Bluffs-B1**	▪ BLM ▪ CDOW ▪ Private	▪ Dudley Bluffs bladderpod-A-only known occurrences ▪ Piceance twinpod-A-best known occurrences ▪ Piceance bladderpod-B ▪ Fremont beardtongue-E ▪ Many-stem stickleaf-B ▪ Rollins' cat's eye-E ▪ Western slope grassland-B ▪ Cold desert shrubland-B
Calamity Ridge-B2	▪ BLM ▪ Private	▪ Piceance twinpod-B ▪ Many stem stick leaf-B ▪ Piceance bladderpod-H ▪ Western slope grassland-C ▪ Mesic western slope PJ-A
Hay Gulch-B2	▪ BLM ▪ CDOW-Piceance State Wildlife Area	▪ Piceance twinpod-B ▪ Western slope grassland-B
Lower Greasewood-B3	▪ BLM ▪ Private (gap map shows only BLM)	▪ Fremont's beardtongue-H ▪ Narrow-stem gilia-A
Cathedral Bluffs-B2	▪ BLM ▪ Private	▪ Piceance bladderpod-A ▪ Sun-loving meadowrue-B ▪ Utah gentian AC ▪ Many stem stickleaf-C

* CNHP assigns a rank to each occurrence using the following codes: A = Very good; B = good; C = fair; D = poor; E=extant/viability unknown; H = possibly extirpated/ possibly extinct; X presumed extirpated/presumed extinct
**B1= Area of Outstanding Biodiversity Significance; B2=Area of Very High Biodiversity Significance; B3=Area of High Biodiversity Significance.

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?*

Table 4 shows the viability for each occurrence as previously identified by the Colorado Natural Heritage Program (CNHP). We do not show viability by *land ownership* because CNHP identifies viability by *occurrence*. Any one occurrence can occur on multiple land ownerships.

Table 4. Viability of all of the Known Occurrences of the two Threatened Plants, organized by area.

Target Area	Viability Rank*	Occurrence ID # (CNHP)
Dudley Bluffs bladderpod		
Dudley Bluffs	A	1
Dudley Bluffs	A	3
Dudley Bluffs	A	5
Dudley Bluffs	A	6
Dudley Bluffs	B	7
Dudley Bluffs	B	14
Dudley Bluffs	A	16
Piceance twinpod		
Dudley Bluffs	AB	5
Dudley Bluffs	C	6
Dudley Bluffs	A	7
Dudley Bluffs	B	8
Dudley Bluffs	C	9
Dudley Bluffs	C	11
Calamity Ridge	B	1
Calamity Ridge	A	3
Hay Gulch	B	14
Not yet assigned	E	13

* CNHP assigns a rank to each occurrence using the following codes: A = Very good; B = good; C = fair; D = poor; E=extant/viability unknown; H = possibly extirpated/ possibly extinct; X presumed extirpated/presumed extinct

The overall viability rankings of A-C for each occurrence were based on a systematic assessment of the components of viability, or indicators and associated indicator ratings as shown in table 5 below. These components of viability are “rolled up” into the overall viability rank.

Table 5. Basis for viability ratings.

		Indicator rating criteria			
Key Attribute	Indicator	**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 **Dudley Bluffs bladderpod**	# individuals	<50	50-1,000	1,000-10,000	>10,000
Population size & dynamics for **Piceance twinpod**	# individuals	<20	20-1,000	1,000-5,000	>5,000

C. New Research Updates (2010)

1. Recovery planning: the USFWS prepared a recovery plan for these species (one plan for both species, currently being reviewed by the USFWS regional office). It is important that this conservation plan does not duplicate USFWS efforts.

   Citation: U.S. Fish and Wildlife Service. 2011. Draft Revised Recovery Plan for *Physaria congesta* (Dudley Bluffs bladderpod) & *Physaria obcordata* (Dudley Bluffs twinpod). U.S. Fish and Wildlife Service, Grand Junction, Colorado.

2. Pollination study: the USFWS and CNAP are funding Sarah Clark's research project (at Utah State University, Logan, Utah) on the two mustard species.

   Clark, Sarah. 2011. The Importance of Pollinators to Rare Plants in the Piceance Basin. The Field Press: A Publication of the Colorado Natural Areas Program Volume 12 (1). Pg 4.

Tepedino, Vince. 2009. The Pollination Biology of a Piceance Basin Endemic: *Physaria obcordata* (Cruciferae). An unpublished report prepared for the Colorado Natural Areas Program, Denver, Colorado, by adjunct professor, Utah State University, Logan, Utah.

3. Dust study: BIO-Logic is conducting research looking at the effects of dispersed development to the two plant species and their plant communities.

4. Genetic study: the Denver Botanic Gardens has collected genetic samples from all occurrences of the two mustard species. These data will be used to look at the genetics of both species, to assess if any populations are suffering from small population sizes, and to assess if dispersed development could be influencing the genetic make-up of either species.

5. Soil suitability study: ExxonMobil is working with Hayden-Wing to study the soil chemistry in occupied and unoccupied habitat in the Dudley Bluffs Area of Critical and Environmental Concern.

6. Fragmentation analyses: the USFWS, BLM, CNHP, and others are working on local and region-wide fragmentation studies. These analyses would be useful for tracking the rate of fragmentation and for tracking cumulative effects to the species.

7. Habitat modeling: the USFWS is working with the Colorado Natural Heritage Program (CNHP) on further habitat modeling for *Physaria congesta* and *P. obcordata.*

D. Conservation Issues

In addition to those discussed in the 2008 Conservation Action Plan (Panjabi et al. 2008), participants of the 2010 workshop considered the potential impacts to the target species from: climate change, cumulative effects, fragmentation, livestock use (horses, cattle, fencing), dust and chemicals used on roads to suppress dust. A full threats assessment is presented in **Table 6** below.

Table 6. Summary of the conservation issues for Dudley Bluffs bladderpod and Piceance twinpod.

Area	Ownership or Mgmt	Natural gas extraction and coal bed methane	Evaporative ponds	Utility, pipeline, and gas plant construction	Mining (oil shale and nahcolite)	Invasives and control of invasives	Road construction	Road widening	Road maintenance, including dust suppression with chemicals	Trail or ditch maintenance	Habitat degradation from grazing and trampling	Use by wild horses (trampling and grazing/ browsing)	Wild fire	Climate change	Wind energy development	Off road vehicle use
Calamity Ridge	Private-energy cos. and private land owners	H		H	L	L	H	H	M		L	L	L	L-M?	L	L
Calamity Ridge	BLM	H		H	L	L	H	H	M		L	L	L	L-M?	L	L
Cathedral Bluffs	BLM			M	L				L					L-M?	L	
Cathedral Bluffs	Private			M	L				L					L-M?	L	
Dudley Bluffs	BLM including ACEC	H		H	L	L	H	H	M		L	L	L	L-M?		L
Dudley Bluffs	CDOW	H	L	H	L	L	H	H	M		L	L	L	L-M?		L

Area	Ownership or Mgmt	Natural gas extraction and coal bed methane	Evaporative ponds	Utility, pipeline, and gas plant construction	Mining (oil shale and nahcolite)	Invasives and control of invasives	Road construction	Road widening	Road maintenance, including dust suppression with chemicals	Trail or ditch maintenance	Habitat degradation from grazing and trampling	Use by wild horses (trampling and grazing/ browsing)	Wild fire	Climate change	Wind energy development	Off road vehicle use
Dudley Bluffs	Private-energy cos.	H	L	H	L	L	H	H	H		M	L	L	L-M?		L
Hay Gulch	BLM	M		H		H	H	H	M		L		L	L-M?		
Hay Gulch	CDOW	M		H		H	H	H	M		L		L	L-M?		
Lower Greasewood	BLM	M				L			L		L	L		L-M?		
Lower Greasewood	Private	M				L			L		L	L		L-M?		

E. Strategies

Based on an understanding of viability and threats, participants identified preliminary strategies (a) across all targets for Dudley Bluffs bladderpod and Piceance twinpod and (b) for specific target occurrences (see Table 7). Regarding the latter, participants identified at least one strategy for all occurrences and generally focused on strategies needed to mitigate key threats. After brainstorming strategies, participants prioritized them as high, medium, or low based on their anticipated effectiveness and level of threat. 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. In 2010, participants revisited the strategies and added a column to indicate the specific conservation issue the strategy was intended to address. It is important to emphasize that the target species are federally listed under the Endangered Species Act. Therefore, working with the USFWS, BLM, and CDOW on public land protection is an important component of the long term conservation of these species.

RPCI is also committed to pursuing specific conservation actions for private lands, including identifying willing land owners and private parcels suitable for conservation of the Dudley Bluffs bladderpod and Piceance twinpod, and working with oil and gas companies to implement Best Management Practices (Elliot et al. 2008).

Table 7. Preliminary Conservation Strategies for the Piceance twinpod and Dudley Bluffs bladderpod.

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
Energy development, associated roads and infrastructure	Dudley Bluffs	BLM	Continue monitoring occurrences of Dudley Bluffs bladderpod and Piceance twinpod to detect changes in population size or condition.	High	High	BLM and CNAP	See Elzinga et al. (1998) for guidance on monitoring designs.
Invasive plants	Hay Gulch	All	Control weeds in cooperation with BLM, CDOW, and Right of Way owners (O&G companies and Rio Blanco County).	High	High	BLM with CDOW, CNAP, Rio Blanco County, and private (oil and gas companies)	BLM is working with oil and gas companies and County to make sure they are managing weeds, etc.
Pipeline, roads and invasives	Hay Gulch and Dudley Bluffs	CDOW	Improve management of CDOW land (apply BMPs; botanist from CNAP or CNHP to assist with management).	High	High	CNAP-ask Brian about 2010 status	Tom Knowles-DWM in Meeker; pipeline location analysis

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
All	All	All	Secure funding from USFWS, CNAP, and others for implementing priority actions in this plan.	NA	High	RPCI	2010: funding secured for habitat modeling, genetics study, pollination study, dust study, soil suitability study funded by Exxon, NFWF, and others; potential funds available for, augmenting soil study and fragmentation study.
OHV use, oil gas development issues	All	BLM	Build and install informational signs and kiosks at the ACECs and Natural Areas that support the rare plants.	NA	High	BLM and CNAP	Happening now in some places
Energy development, associated roads and infrastructure	All	BLM and private	Use USFWS/BLM recommendations for Avoiding Adverse Effects on T and E plants (2010) and Best Management Practices developed by the CRPCI (Elliot et al. 2009).	NA	High	Jill will send; RPCI work with Gina to make sure efforts coordinate	See updated survey protocols and new BLM recommendations (get from Gina); ongoing research will inform these recommendations.

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
Energy development, associated roads and infrastructure	All	BLM and private	Work with oil and gas companies to protect plants and other natural resources. Funds available from Encana.	NA	High	TNC, Yampa Valley Land Trust	Use a landscape level approach including other sites such as Duck Creek and Cathedral Bluffs; mitigation sites; Ryan Gulch plants are on private land owned by Encana.
Energy development, associated roads and infrastructure	All	All	Identify intact areas to focus conservation efforts--conduct an anthropogenic fragmentation analysis--comprehensive effects analysis (e.g., not just oil and gas development).		High		
All	All	All	Identify intact areas to focus conservation efforts--model disturbances and effects on natural resources and rare species. And model the habitat for the imperiled species using new data available on geology, soils, etc.		High	USFWS, BLM, CNHP	Efforts began in 2011 to develop refined habitat model; fragmentation study planned for completion by 2015.
All	All	All	Identify suite of areas for conservation--research genetic diversity across all occurrence and within occurrences		High		

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
Energy development, associated roads and infrastructure	All	All	Use a site-specific approach and existing infrastructure to reduce further impacts and reduce existing impacts with mitigation measures.		High		
Energy development, associated roads and infrastructure	All	BLM and private	Recognize companies (e.g., Shell) for positive actions.	NA	High	RPCI, USFWS, and CONPS	Exxon is paying for soil suitability research
Energy development, associated roads and infrastructure	All	BLM, CDOW, and private	Expand monitoring efforts to include how the plants respond to layers of dust deposited as a result of the resource extraction activities.	NA	High		2010 is phase one, it is not a true dust study, rather it is looking at effects of dispersed development on the plants and plant community, and also on the pollinators (Sara's piece). Sara is comparing dirt and paved roads.
All	All	All	Implement USFWS Recovery Plans and Conservation Action Plan (Panjabi et al. 2008).				

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
All	All	All	See BLM Resource Management Plan and consider adding more management information about the rare species in an appendix or other areas in future revisions or as an amendment.				Next RMP revision is scheduled for 2013; all occupied T and E habitat is already stipulated as No Surface Occupancy for post 1997 leases.
OHV use	Dudley Bluffs	BLM	Build fencing to close road to avoid impact from vehicles	done		CNAP	Duck Creek
All	All	All	Conduct surveys targeting the imperiled species using potential habitat models with known negative search data.	High		USFWS, CNHP	Hay Gulch, and private lands in the vicinity of the confluence of Ryan and Piceance creeks are especially high priorities.
All	Calamity Ridge	private	Work with private landowners to identify specific protection strategies.	High			*Lesquerella parviflora* (G2) is known on private lands at Spring Creek; see other private lands with the listed species.
All	Cathedral Bluffs	private	Work with private landowners to determine specific protection strategies-share inventory results.	High			
Invasive plants	Hay Gulch	All	Avoid spread of weeds by following BMPs, washing vehicles, and avoiding spread of roots.	High		CDOW	

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
All	Dudley Bluffs, Calamity Ridge	BLM	Promote the expansion/modification of existing ACECs and the establishment of new ACECs as part of the White River RMP revision.	Low		BLM	2013
Energy development, associated roads and infrastructure	Dudley Bluffs	private	Recognize Shell at annual CONPS meeting for protecting plants in Duck Creek.	Medium		Brian	
All	All	All	Learn more about the pollinators important to the rare plants and how to protect them from dust, etc.	NA		RPCI	work with Vince Tepedino
Road widening	All	All	Contact Rio Blanco County planners regarding road widening locations to help assure there is not a conflict with rare plant habitat.	NA			County road work that is conducted with federal funds would be responsible for the plants under the ESA. County WAS pre-consulting with USFWS about expansion of Co. Rd. 5, mostly toward bottomlands

Conservation Issue	Site	Owner/ manager	Strategy	Priority w/in the site	Priority across sites	Lead	Notes
Invasive plants	All	All	Weed monitoring. Monitor rare plant locations to detect new weeds or increases in existing infestations.	NA			BLM and CNAP volunteers are monitoring weeds at some locations already.
Energy development, associated roads and infrastructure	All	BLM, CDOW, and private	Assure on-the-ground presence of qualified Botanist during projects, fencing, etc.	NA		BLM, CDOW, RPCI	
All	All	BLM, CDOW, and private	Consider negotiating land trades that would encourage protection of the rare plants.	NA			work load is prohibitive

VII. Next Steps

1. Identify a lead for the Piceance Basin Priority Action Area, possibly though the Colorado Native Plant Society.
2. Use results of parcel analysis to help secure conservation measures on private lands.
3. Stay up to date with oil and gas development and all associated changes to the ecosystem.
4. Distribute BMPs to energy companies and consultants.
5. Provide input and comments for the Resource Management Plan revisions that will begin in 2013.
6. Incorporate results of research into future updates of this conservation action plan.

VIII. References

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Attachment 1. Additional key species and plant communities in the Piceance area.

Although the focus of the workshop was on the globally imperiled plants, other key species and plant communities are known from the Piceance 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 Piceance area. These and other biodiversity values should be considered with more detailed planning efforts for this area.

Major group	Scientific name	Common name	Global rank	State rank	Federal status
Birds	*Amphispiza belli*	Sage Sparrow	G5	S3B	USFS
Birds	*Centrocercus urophasianus*	Sage Grouse	G4	S4	BLM/USFS
Natural Communities	*Acer negundo - Populus angustifolia / Cornus sericea* Forest	Narrowleaf Cottonwood Riparian Forests	G2	S2	
Natural Communities	*Acer negundo / Prunus virginiana* Forest	Montane Riparian Deciduous Forest	G3	S2	
Natural Communities	*Alnus incana - Salix (monticola, lucida, ligulifolia)* Shrubland	Thinleaf Alder-Mixed Willow Species	G3	S3	
Natural Communities	*Amelanchier utahensis / Carex geyeri* Shrubland	Mixed Mountain Shrublands	G2G3	S2S3	
Natural Communities	*Artemisia tridentata ssp. tridentata / Leymus cinereus* Shrubland	Sagebrush Bottomland Shrublands	G2	S1	
Natural Communities	*Artemisia tridentata ssp. wyomingensis / Pseudoroegneria spicata* Shrub Herbaceous Vegetation	Xeric Sagebrush Shrublands	G4	S3?	
Natural Communities	*Atriplex confertifolia / Achnatherum hymenoides* Shrubland	Cold Desert Shrublands	G3	S2	
Natural Communities	*Atriplex confertifolia / Leymus salinus* Shrubland	Cold Desert Shrublands	G3G5	S3	
Natural Communities	*Atriplex confertifolia / Pseudoroegneria spicata* Shrubland	Cold Desert Shrublands	G3	S2S3	
Natural Communities	*Betula occidentalis / Maianthemum stellatum* Shrubland	Foothills Riparian Shrubland	G4?	S2	

Major group	Scientific name	Common name	Global rank	State rank	Federal status
Natural Communities	*Carex nebrascensis* Herbaceous Vegetation	Wet Meadows	G4	S3	
Natural Communities	*Catabrosa aquatica - Mimulus* ssp. Spring Wetland	Spring Wetland	GU	S3	
Natural Communities	*Cornus sericea* Shrubland	Foothills Riparian Shrubland	G4Q	S3	
Natural Communities	*Distichlis spicata* Herbaceous Vegetation	Salt Meadows	G5	S3	
Natural Communities	*Eleocharis palustris* Herbaceous Vegetation	Emergent Wetland	G5	S4	
Natural Communities	*Juniperus osteosperma / Leymus salinus* spp. *salinus* Wooded Herbaceous Vegetation	Mesic Western Slope Pinyon-Juniper Woodlands	G3	S3	
Natural Communities	*Leymus cinereus* Herbaceous Vegetation	Western Slope Grasslands	G2G3Q	S1S2	
Natural Communities	*Populus angustifolia / Betula occidentalis* Woodland	Montane Riparian Forest	G3	S3	
Natural Communities	*Populus angustifolia / Rhus trilobata* Woodland	Narrowleaf Cottonwood/Skunkbrush	G3	S3	
Natural Communities	*Pseudoroegneria spicata - Achnatherum hymenoides* Herbaceous Vegetation	Western Slope Grasslands	G3G4	SU	
Natural Communities	*Pseudoroegneria spicata* Herbaceous Vegetation	Western Slope Grasslands	G2	S2?	
Natural Communities	*Pseudotsuga menziesii / Acer glabrum* Forest	Lower Montane Forests	G4?	S1	
Natural Communities	*Pseudotsuga menziesii / Betula occidentalis* Woodland	Montane Riparian Forest	G3?	S3	
Natural Communities	*Pseudotsuga menziesii / Symphoricarpos oreophilus* Forest	Western Slope Douglas Fir Forests	G5	S4	
Natural Communities	*Quercus gambelii - Cercocarpus montanus / (Carex geyeri)* Shrubland	Mixed Mountain Shrublands	G3	S3	

Major group	Scientific name	Common name	Global rank	State rank	Federal status
Natural Communities	*Salix bebbiana* Shrubland	Montane Willow Carrs	G3?	S2	
Natural Communities	*Salix exigua* / Barren Shrubland	Coyote Willow/Bare Ground	G5	S5	
Natural Communities	*Schoenoplectus pungens* Herbaceous Vegetation	Bulrush	G3G4	S3	
Natural Communities	*Typha (latifolia, angustifolia)* Western Herbaceous Vegetation	Narrow-leaf Cattail Marsh	G5	S4	
Natural Communities	*Typha domingensis* Western Herbaceous Vegetation	Western Slope Marsh	G5?	S1	
Reptiles	*Coluber constrictor mormon*	Western Yellowbelly Racer	G5T5	S3	
Vascular Plants	*Argillochloa dasyclada*	Utah fescue	G3	S3	
Vascular Plants	*Astragalus detritalis*	debris milkvetch	G3	S2	BLM
Vascular Plants	*Ceanothus martinii*	Utah mountain lilac	G4	S1	
Vascular Plants	*Gentianella tortuosa*	Utah gentian	G3?	S1	BLM
Vascular Plants	*Gilia stenothyrsa*	narrow-stem gilia	G3	S1	BLM
Vascular Plants	*Lesquerella parviflora*	Piceance bladderpod	G2	S2	BLM
Vascular Plants	*Monardella odoratissima*	mountain wild mint	G4G5	S2	
Vascular Plants	*Nuttallia multicaulis*	many-stem stickleaf	G3	S3	
Vascular Plants	*Oreocarya rollinsii*	Rollins' cat's-eye	G3	S2	BLM
Vascular Plants	*Oxytropis besseyi* var. *obnapiformis*	Bessey locoweed	G5T2	S2	
Vascular Plants	*Penstemon fremontii* var. *glabrescens*	Fremont's beardtongue	G3G4T2	S2	
Vascular Plants	*Sullivantia hapemanii* var. *purpusii*	Hanging Garden sullivantia	G3T3	S3	
Vascular Plants	*Thalictrum heliophilum*	sun-loving meadowrue	G2	S2	USFS

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
- Southern Rockies Ecosystem Project: http://www.restoretherockies.org/reports.html