



# The Field Press



A Publication of the Colorado Natural Areas Program

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*Parachute penstemon habitat on the Roan Plateau—a room with a view.*



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**Colorado Natural Areas** preserve some of the finest examples of Colorado's original and unique landscapes for the benefit of present and future generations. Sites qualify as Colorado Natural Areas when they contain at least one unique or high quality feature of statewide significance:

- **Native plant communities**
- **Geologic formations and processes**
- **Paleontological localities**
- **Habitat for rare plants and animals**

## Our “Energetic” Endeavor

Whether working within the ‘new’ or ‘old’ energy economy, recent efforts by the Colorado Natural Areas Program (CNAP) have brought conservation priorities to the forefront as energy development continues to expand. CNAP is in a unique position as a state agency to span the gap between energy industries and conservation groups. Recently, CNAP has celebrated significant conservation success that includes responsible energy development while leaving room for the protection of Colorado’s most significant natural features.

CNAP is mandated to monitor and protect Colorado’s most significant natural features, and we are the only state program responsible for rare plant conservation. Some natural areas have such rare species or imperiled landscapes that they should not be exposed to energy development. We still believe this to be true. However, certain species and landscapes that are found in prime energy development areas may still prosper if appropriate development guidelines are followed and impacts are mitigated or avoided.

For example, consider our recent work with the rare Parachute penstemon wildflower, known from only five populations in the world. The plants are restricted to steep slopes on the edge of the Roan Plateau in Colorado. Three of its five populations are found on land owned by Oxy, a petroleum company that intended to drill for natural gas directly next to the rare plants.

See **Energy** on page 3.





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*Who would have guessed  
there was a road here?*

*Geneva Basin Iron Fen*

## Partnerships Pay Off

*From the Program Manager—Rob Billerbeck*

The program is thriving this year! An amazing amount has happened including protection and research on Natural Areas and coordination with others on rare plant conservation issues. Our funding is still holding steady through this tough year because of the support from our leadership and the fact that our work has been beneficial to agencies and industry. We have been able to spend our money well with every dollar well matched by other entities, private and government. We would like to thank our partners so much for making this possible and working together toward conservation goals in the state of Colorado.

Some of the ground-breaking research we are supporting is covered in this issue, including the alkaloid studies that the Denver Botanic Gardens has performed. What a great way to demonstrate that the preservation of rare species may be important for economic and health reasons as well as ecological reasons. The rare plant research being performed on the West Slope in coordination with the BLM, USFWS, Utah State University and contractors will help provide solid information on best management practices for rare plants and their pollinators. We are also collaborating with other agencies on climate change research to assess what new challenges the Natural Areas and our rare species may face in the coming years.

One of the most exciting projects this year was the huge restoration project at Geneva Basin. Brian Kurzel worked with Clear Creek County, the USFS, a local Jeep club, and Wildland Restoration Volunteers (WRV) on a project to close and restore several unauthorized roads at the Geneva Basin Iron Fen Natural Area. This area has very unique and special wetlands that are an unusual orange color (from the iron) where you can watch pine cones that fall into the wetland turn into rock. The Mile-Hi Jeep Club supported the placement of very sturdy gates at the boundaries and helped educate their members about the value of this area. Then, Wildland Restoration Volunteers came in and did amazing restoration work that involved 90 volunteers and a very skilled backhoe driver who re-graded roads, moved rocks, planted native seeds and made the roads disappear. Thank you so much to all the Wildland Restoration Volunteers, Buddy the backhoe driver, and the Jeep Club for making this great project happen.

I'd like to make all our Friends aware of some changes to our Friends group structure. State Parks has now formed a new 501(c)3 Friends group that will act as an umbrella for the Natural Areas Friends group. Being under the aegis of this group would allow us to continue to collect tax-deductible donations and membership fees to provide funding at critical moments to protect our Natural Areas. We are very pleased with this move and will keep you apprised via email and newsletters as to further developments.

I'd like to end on the note of hope. The collaboration between diverse groups this year which included government agencies, academics, volunteers, oil companies, and motorized clubs have helped care for Colorado's most special places and truly leaves me feeling very encouraged. By working together, we can protect Colorado's best areas for our grandchildren to enjoy! 🌱

## Go Paperless!

If you would like to receive the Colorado Natural Areas Program newsletter by e-mail only, please e-mail us at [brian.kurzel@state.co.us](mailto:brian.kurzel@state.co.us). In the subject or body of the e-mail please state: "Newsletter via e-mail only"

If you want to continue receiving the paper newsletters, there is no need to contact us.

## Energy

from page 1

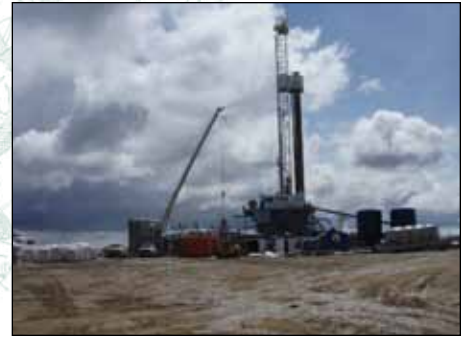
In most situations, this scenario would send chills down the spine of any good conservationist. However, CNAP's ability to strike a cooperative agreement with Oxy allowed for a conservation voice to sit at the table and speak for the rare plants. With CNAP's guidance, Oxy proceeded with responsible natural gas drilling that incorporated extensive Best Management Practices (BMPs) that either avoided or mitigated most impacts.

By providing some solutions that incorporated both conservation and development objectives, CNAP was able to strike a balance where an energy company could voluntarily be a good steward to a species whose survival was literally in their hands.

The truth is that rare plants are relatively easy to protect. They are found on a small number of acres and they generally don't move around much. As long as direct impacts are avoided, habitats are not fragmented and indirect impacts to the plants and their pollinators are reduced, there may be some room for limited development near rare plant habitats. The greatest trick may be getting energy companies to pay attention to rare plants and to be aware of the simple steps needed to meet conservation goals. In an effort to address this fundamental issue, CNAP collaborated with partners from the Rare Plant Conservation Initiative to develop rare plant BMPs for oil and gas development and to work directly with the industry to implement these practices. Along with our work on the ground with Oxy, CNAP presented these BMPs to a broader audience at an oil and gas symposium in Rifle last fall. And to assure that the most effective and defensible BMPs are available, CNAP is also partnering to fund research regarding the needs of both rare plants and their pollinators in areas of dense energy development. By leading the charge to inform responsible oil and gas development, we hope to minimize impacts to our irreplaceable natural values even as more drilling is inevitable.

With the 'New Energy Economy' also ramping up, renewable energy projects may also serve as a threat to rare and sensitive features, and these threats must be addressed. In recent years, CNAP has collaborated with the State Land Board to provide BMPs to reduce impacts of wind development on rare plants on the Eastern Slope. As with the work with oil and gas development, CNAP's implementation of rare plant BMPs for wind energy has been used to inform guidelines being developed by a statewide coalition addressing potential impacts of renewable energy.

The inevitable need for energy definitely comes with some pressing problems that are not easily solved. Hopefully, by forming cooperative relationships with energy companies, researching potential impacts and implementing Best Management Practices, CNAP can help 'energize' conservation in the face of increasing energy needs. 🌱



*Drilling rig in the Piceance Basin.*



*Monitoring on Oxy land to protect rare plants.*



*Wind farm at Chalk Bluffs Natural Area*



*Mapping rare plants near oil and gas development*

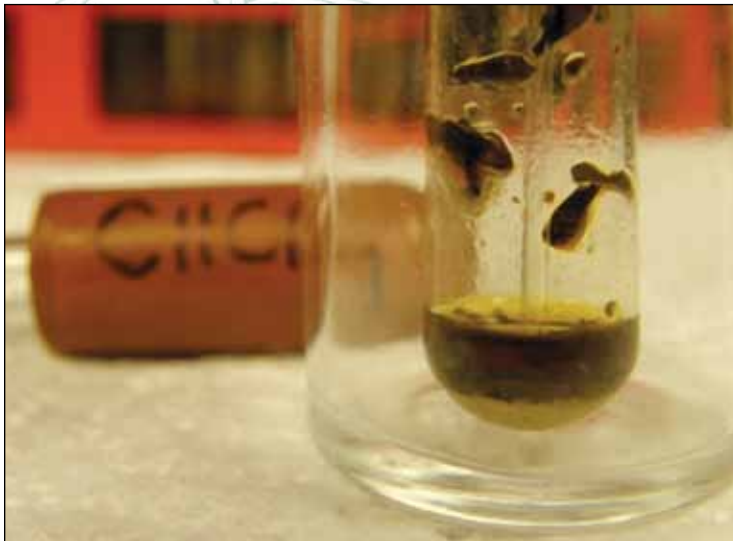


*Some restrictions near rare plant habitat on Oxy land.*

# The Search For Alkaloids in Colorado Rare Plants

Donald L. Hazlett & Brian Kurzel

**C**olorado's best natural features are inherently worth protecting. While many take this statement at face value, some need a bit more convincing. For CNAP to have a comprehensive conservation strategy, it doesn't hurt to have more of a "utilitarian" argument for the protection of rare and sensitive species. To address this need, CNAP has recently begun to fund research to determine if any of our rare plants in Colorado contain alkaloid biochemicals.



© Don Hazlett

Testing for alkaloids in rare plants.

Alkaloids are plant biochemicals that are potentially useful in medicine and/or industry (i.e. natural pesticides). Many of our most potent plant medicines are alkaloids. Among these (note the -ine ending) are caffeine, nicotine, codine, quinine, morphine, reserpine, ephedrine, etc. Since only 10–15% of a random set of vascular plants contain alkaloids, to identify a plant as alkaloid-rich tells us that this plant has a much greater chance of containing a biochemical that is useful to society. As stewards of rare plant populations, we learn from alkaloid screening tests which of our rare plants in Colorado, if any, contain these potentially useful biochemicals. This information, in turn, can provide more of an argument for the importance of these plants' conservation.

The ongoing research project, performed through a research grant awarded to the Denver Botanic Gardens, targets the 120 Colorado for screening. With a few exceptions, alkaloid tests

can be performed on old plant material and do not require the collection of new plants. Less than one-half gram of plant tissue is extracted in a 2-step process, condensed, subjected to thin-layer chromatography and visualized with a colored reagent. These accurate and sensitive screening tests are done by Dr. Donald Hazlett (ethnobotanist) with continual mentoring by Dr. Frank Stermitz (CSU chemist). Material has been generously provided from the 5 regional herbaria.



© Don Hazlett

Results from positive alkaloid tests

For the 95 Colorado rare plants that have so far been tested, 9 of these have been positive (about 10%). Five positive results were in plant genera that are typically characterized by alkaloids: *Anticlea vaginata*, *Delphinium alpestre*, *D. ramosum*, *Lupinus crassus* and *Thalictrum heliophilum*. These were not very surprising. However, 3 alkaloid-positive results were in genera not previously reported to contain alkaloids: *Cymopterus macdougalii*, *Herrickia horrida*, and *Penstemon crandallii* subsp. *procumbens*. Also of great interest is a positive result for *Lepidium crenatum*. Alkaloids in *Lepidium* species are few, but do occur. For example, *Lepidium meyenii* (maca, Peru ginseng) is an alkaloid-rich, cultivated medicinal plant from South America. The finding of alkaloids in a rare Colorado *Lepidium* creates the possibility of producing our very own rare *Lepidium* as Colorado ginseng!



© Bill Jennings

A rare plant with alkaloids, *Lupinus crassus*.

Researchers will continue to analyze Colorado rare plants for alkaloids, as well as to better identify the types of alkaloids present in Colorado rare plants. We've already shown that there is potential for these plant alkaloids to serve as the next material for a variety of human uses, including medicines or energy supplements. As long as any discoveries are thoughtfully managed to assure that the conservation of these rare species is the highest priority, this project will hopefully provide additional support for the a piece of Colorado natural heritage that needs all the help it can get. 🌱

# Mount Goliath Natural Area

*This article and photos are taken from Colorado State Parks & Natural Areas, Frank Weston's book which is the first-ever printed guide to our state's Natural Areas as well as the most spectacular State Parks.*

“**S**tanding adjacent to 14,264-foot Mount Evans west of Denver, Goliath Peak is home to one of Colorado's premier stands of bristlecone pines. From this lofty summit, one can look east out across the Great Plains almost to Kansas or the snow-capped mountains to the west. It's mind-boggling to consider that the oldest bristlecone pine in Colorado was a sapling when Rome fell in 476 A.D. Most of the trees currently growing on Mount Goliath were here when Columbus set sail from Spain.

How does anything live that long? For starters, bristlecones benefit from living where almost nothing else can. They experience little in terms of competition for space, food, or water. They require a large space for their root systems that keeps the trees widely spaced, eliminating threats from fire. In addition, bristlecones possess the ability to go almost dormant in periods of prolonged drought. They also use a harsh strategy to survive their brutal climate. When a major root dies, the sector of the trunk above that root also succumbs, along with any branches served by that sector. In time, the affected sector's bark falls off, leaving bare trunk wood. Some gnarled old bristlecones have only a thin strip of living bark, which sustains a single living branch and its needles.

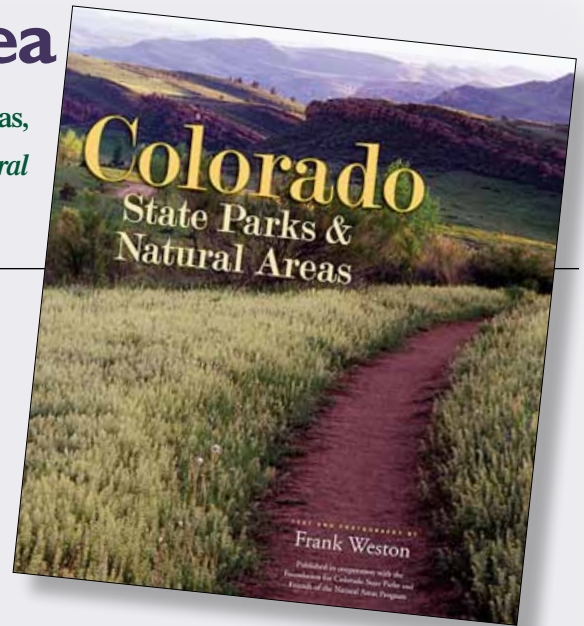
This dense, highly resinous wood is a formidable barrier to invasion by insects and bacteria. The resinous wood and the cool, dry alpine climate keep rot-causing fungi at bay, so that dead bristlecones sometimes stand for several hundred years before toppling. The bristlecone's resinous wood weathers into beautiful shades of rusty orange and yellow.

A greater understanding of the tenacious bristlecone pine can be attained by taking one of the interpretive hikes offered by the USDA Forest Service or the Denver Botanic Gardens. Both are provided free of charge, but reservations are required for the Denver Botanic Gardens hikes.”

— taken from pages 80–83 in *Colorado State Parks & Natural Areas*

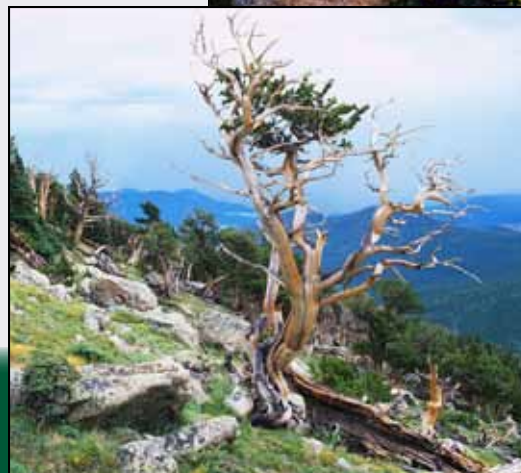
Additional information on facilities, restrictions and contacts are available in the publication. 🌲

**DIRECTIONS:** From Denver, drive west on I-70 to Idaho Springs. Exit left (south) onto CO 103 and continue for 13 miles. Turn right at CO 5. Pay at the fee station and then continue on CO 5 for 3 miles.



To purchase, visit:

[www.parks.state.co.us/parksstore](http://www.parks.state.co.us/parksstore)



## The Value of Volunteers

2009 was an astounding year for CNAP volunteer contributions. Consider this: volunteers increased their Natural Area visits by 10%; they increased their hours of service by 25%; they built new fences, closed miles of roads and counted thousands of rare plants. All of this work occurred through three major volunteer efforts:

- **Rare Plant Monitoring Stewards** collected quantitative data on the most threatened rare plants in Colorado. **Mark Sheehan, Mel Preusser and Larry Allison** mapped rare plants near Gunnison and located a couple new occurrences!
- **Wildlands Restoration Volunteers** collaborated with CNAP, Clear Creek County and other partners to close, obliterate and restore roads at Geneva Basin Iron Fen. Almost 2,000 hours of volunteer time were provided!
- **Volunteer Stewards** provided stewardship for 66 Natural Areas. Some highlights included **Chris Lea** leading a Native Plant Society field study at Antero-Salt Creek and **Steve Wenger** notifying us of motorcycle tracks in sensitive BLM areas.

In 2009, volunteers contributed over \$90,000 worth of value to the Natural Areas of Colorado. That's like adding two full-time employees to help protect the best features in the state! The breakdown of volunteer value in 2009 looked like this (based on \$20.82 per hour):

- **Rare Plant Monitoring Stewards**  
\$15,000
- **Wildland Restoration Volunteers**  
\$40,000
- **Volunteer Stewards**  
\$37,500



Volunteer Steward Chris Lee observes rare *Primula* at Antero/Salt Creek.

A breakdown of Volunteer Steward value provided to our various land managing partners includes:

### Bureau of Land Management

	<b>Total \$18,104</b>
Grand Junction Field Office	\$9,307
Gunnison Field Office	\$1,000
Little Snake	\$1,385
Royal Gorge Field Office	\$562
SLV	\$1,228
Uncompaghre Field Office	\$500
White River Field Office	\$4,122

### United States Forest Service

	<b>Total \$4,801</b>
Gunnison National Forest	\$1,083
Pike National Forest	\$3,227
San Juan National Forest	\$500

### Rocky Mountain National Park

**\$2,748**

### State Land Board

**\$6,475**

### Other

	<b>Total \$5,456</b>
Division of Wildlife	\$500
Nature Conservancy	\$1,541
Counties	\$2,457
City	\$167
State Parks	\$791

*Remember: If you donate 48 or more hours to the Colorado Natural Areas Program and State Parks, you receive a year-long Parks Pass, good at all 42 of the State Parks!*

## Welcome to New Stewards

THE FOLLOWING **11 STEWARDS** HAVE RECENTLY SIGNED UP to help be part of the effort to monitor and protect the best places in Colorado! Welcome to: **Brad Klafehn** for Dome Rock, **Lori and Roger Nagel** for Gunnison Gravels, **Bruce Snyder** for Tamarack Ranch, **Mo Ewing** for Lookout Mountain and Yanks Gulch, **Bill Liggett** for Rabbit Valley, **Nan Daniels** and **Curt Cole** for Saddle Mountain, **Linda Smith** for Shell Rock, and Bonny Prairie, **Ron Albrecht** for Zapata Falls, and **Jerry Edwards** for Garden Park.

WE WOULD ALSO LIKE TO THANK the following **13 people** who have joined our crew of Rare Plant Monitoring Stewards, working with CNAP and Denver Botanic Gardens to monitor and protect some of the rarest plants in Colorado: **Larry Allison, Lauren Collins, Nan Daniels, Mo Ewing, Denise Larson, Stephanie Owens, Mel Preusser, Jackie Raehl, Dan and Nina Rifkin, Kathy and Mark Sheehan, and Linda Smith.** 🌿

## Meet Our Volunteers

### MARY MOURAR

CNAP Volunteer Steward since 2001

- Fourmile Creek Natural Area in Park County
- Hurricane Canyon Natural Area in El Paso County



*“My favorite part of volunteering is exploring the Fourmile Creek fen, which may be why I’ve been a steward there since 2001. I actually love wading through the wetlands and each visit I see something new.”*

Mary sees her work with CNAP, as well as volunteering with Division of Wildlife and Colorado Mountain Club, as her “third career”. The foundation for her first endeavor was earned as a BS in Biology from Colorado College. Mary worked with the National Park Service as an Interpretive Ranger, “giving nature walks, evening programs, cave tours, etc. in incredibly beautiful spots around the Western U.S.” Her Master’s in Library Science from UCLA was the basis for career number two, a librarian in science and medical libraries. Mary began her third career, her work with CNAP, because, “it was a perfect opportunity to combine my interest in nature and learning more about Colorado without too much of a time demand.”

“I think CNAP staff and volunteer stewards are the eyes and ears on the ground to protect rare and endangered species and unique locations that are part of what makes Colorado special. We support the chronically understaffed Federal and state land management agencies by watching for potential threats, offering suggestions to improve situations, and increasing the knowledge about the natural areas.”

#### What advice would she give a new Volunteer Steward?

“Keep your eyes open to the big and small that makes your natural area special. And remember to turn in your field forms!” 🌿

## CNAP and Volunteers Earn National Recognition

Who says good works go unnoticed? In 2009, CNAP staff and volunteers involved in monitoring and protecting rare plants in the Piceance Basin of northwest Colorado received a **Landscape Stewardship Award from the Public Lands Foundation**. This nationwide group advocates for sustainable management of public lands around the country. The recognition is given to entities that work to advance and sustain community-based stewardship on landscapes that include public lands managed by the BLM. CNAP and our volunteers were one of only six recipients of this recognition in the nation!

The work that was recognized included several hundreds of hours of rare plant monitoring and work on a fence-building project to close a road that traveled through endangered plant habitat. Whether huddling to count rare plants or chipping bedrock to sink fence posts, CNAP staff and volunteers went above and beyond to help the BLM accomplish some great work. A big thanks to the committed folks that helped to protect these irreplaceable landscapes. 🌿



*BLM staff, Public Land Foundation reps and CNAP staff and Volunteers*



*Maggie Marston of the BLM and volunteer David Beaujon (top and right) build fencing at Duck Creek.*





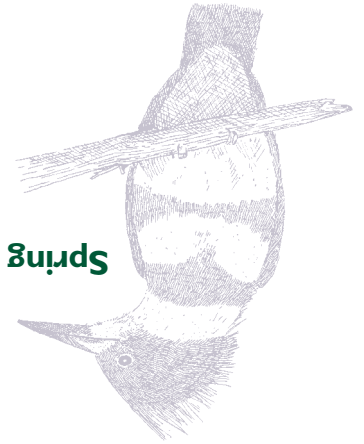
## Become a Volunteer Steward and help protect Colorado's best natural features!

**Opportunity:** CNAP is currently looking for volunteers to monitor some of the most spectacular and sensitive areas in the state! The Natural Areas Program needs volunteers to get out and visit these sites regularly to ensure these sites are being preserved for future generations. **If you are interested in any of these opportunities, please contact Brian Kurzel at 303-866-3203 x 4301 or [brian.kurzel@state.co.us](mailto:brian.kurzel@state.co.us).**

SITE NAME	COUNTY	OWNER	ACRES	HIKING	ATTRIBUTES	
Black's Gulch	Rio Blanco	BLM	800	Easy	A vertebrate fossil locality of Lysite (middle early Eocene) age in the Wasatch Formation.	General
Castlewood Canyon	Douglas	Parks/SLB	1990	Moderate	Supports one of the best remnants of northern Black Forest plant communities. Several plant species of special concern are within the park boundaries. An unusual dryland heron rookery and a vulture roosting site are among the zoologic features of the park.	Botany; Weeds
Cross Mountain Canyon	Moffat	BLM	2160	Moderate	A classic example of a superimposed river gorge with vertical cliffs over 200 feet high. Rare plants, four listed fish and diverse bird species.	General
Deer Gulch	Rio Blanco	BLM	1809	Difficult	Two plant species endemic to Green River shales; Good quality remnants of Great Basin grassland, mixed mountain shrubland and lower montane Douglas-fir forest communities	General; Hiking
Mount Goliath	Clear Creek	USFS	160	Difficult	Virgin stands of bristlecone pine interspersed with Engelmann spruce forest and alpine grasslands.	General
North Park Phacelia	Jackson	BLM	310	Moderate	Federally-listed plant; examples of a sagebrush community in good condition.	Botany
Redcloud Peak	Hinsdale	BLM	5974	Very Difficult	Habitat for rare butterfly	General; Hiking
San Miguel River at Tabeguache	Montrose	TNC	259	Easy	Highly scenic free-flowing portion of the river, sandbars support high-quality Fremont cottonwood riparian forest.	General
Wheeler Geologic	Hinsdale	USFS	640	Difficult	A mass of pinnacles and domes, some over several hundred feet tall. The geologic features occur within virgin forests of spruce & subalpine fir.	General; Hiking

BLM = Bureau of Land Management; DOW = Division of Wildlife; DPOR = Department of Reclamation SLB = State Land Board; TNC = The Nature Conservancy; USFS = U.S. Forest Service

Spring News!



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