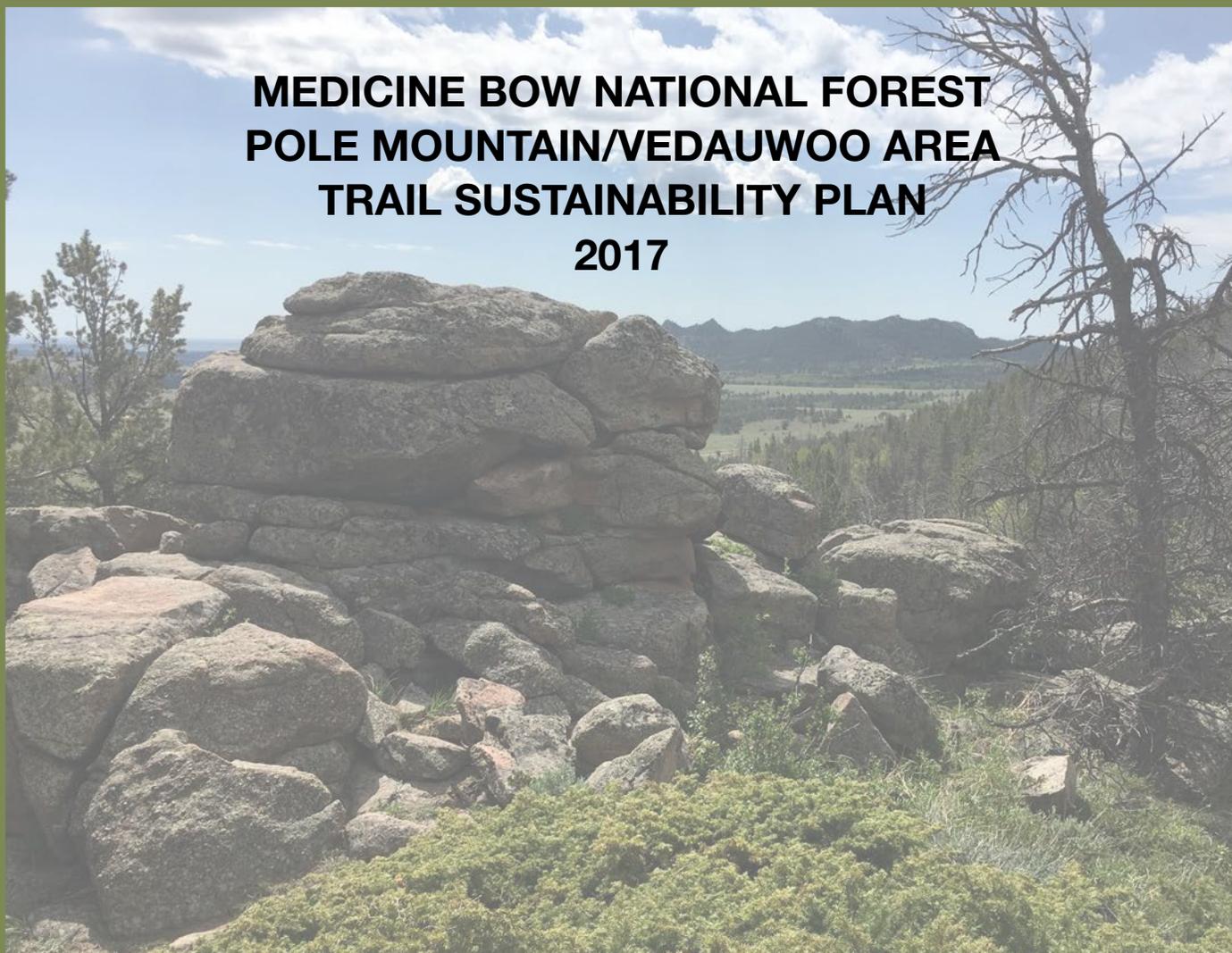


# MEDICINE BOW NATIONAL FOREST POLE MOUNTAIN/VEDAUWOO AREA TRAIL SUSTAINABILITY PLAN 2017



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## FOREST PLAN DIRECTION

The Pole Mountain area is located north of Interstate 80 between Laramie and Cheyenne in Albany County, Wyo. Approximately 55,000 acres in size, Pole Mountain is a popular area for recreation and the uniqueness of its terrain. Large rock outcrops, rolling hills, short grass prairie, and many different types of trees inhabit this area on the Medicine Bow National Forest. The Pole Mountain area is managed by the Laramie Ranger District.

In the Laramie, Cheyenne, and Fort Collins area, the Pole Mountain unit is some of the closest and most accessible National Forest System lands. Pole Mountain sees heavy year-round usage from visitors who want to explore public lands. Popular uses include, but are not limited to, mountain biking, livestock grazing, hiking, off-highway vehicle travel, horseback riding, communication sites, climbing, camping, military training, hunting/fishing, and winter sports.

The area is broadly managed for year-round, backcountry recreation, with numerous developed recreation areas at nodes of public interaction (i.e. trailheads, camping and picnic areas, etc.). In accordance with the most recent Land and Resource Management Plan for the Medicine Bow National Forest Record Of Decision (2005), Alternative D was selected as the primary management direction for the Forest, providing a mix of multiple-use activities with a primary emphasis on enhancing non-motorized recreation opportunities while maintaining active forest vegetation management (non-motorized uses play a larger role than in Alternative A). The Decision was made based on a number of established criteria, including:

1. Ensuring the long-term health of the land, including maintaining and enhancing the viability of native plant and animal species and contributing to the recovery of threatened and endangered species.
2. Implementing a balanced variety of natural resource programs featuring a sustainable output of multiple uses.
3. Continuing the emphasis on providing high-quality nationally significant recreation opportunities while protecting the environment.
4. Contributing to the economic vitality of neighboring communities by implementing a variety of natural resource programs that provide a sustainable output of multiple uses.

The Forest Plan also directs the development of a master trail management plan (Chapter 3, page 27, included in Appendix B) for the Pole Mountain Area.

## TRAIL SYSTEM VISION

### CREATE RECREATION EXPERIENCES THAT:

- Provide high-quality recreational trail amenities,
- Sustain significant visitation, and a positive interpretation of land and resource management activities, and
- Successfully market a four-season opportunity for outdoor recreation.

### PROVIDE A DIVERSITY AND PROGRESSION OF TRAIL EXPERIENCES TO:

- Offer a broad range of high quality trails that appeal to the wide demographic of skills present in the region,
- Enhance routing options on narrow singletrack and improved trail system connectivity of these routes, and
- Better disperse recreational use throughout the trail system.

### CONSTRUCT DURABLE TRAILS THAT:

- Ensure the quality of the developed trail product is consistent over the long term,
- Operate efficiently and optimize the annual capital/labor needed to effectively address degradation issues brought on by high levels of trail use, climatic events, and other activities, and
- Reduce trail damage incurred by early and late season use and following significant climatic events.

### ENGAGE THE PUBLIC AND STEWARDS THROUGH:

- Clear and consistent navigation and easy-to-understand information on the recreation options provided, and
- Building collaborative stewardship relationships based on mutual understanding of scheduled improvements, responsibilities, and quality of ongoing trail redevelopment/maintenance.

## TRAIL SYSTEM VISION

### PROPOSED ACTION: POLE MOUNTAIN/VEDAUWOO TRAIL SUSTAINABILITY PLAN

**Environmental Benefits:** Concentration of recreation facilities in a sustainable, manageable manner that disperses recreational use. The relocation and redevelopment of trails with narrow corridors, rolling grade, and gentle gradients, along with restoration of closed trails, will mitigate the existing impacts being realized by an unsustainable trail system where erosion and natural resource impacts cannot be reduced.

**Environmental Costs:** An increase of approximately 8.25 acres of disturbed area, with the addition of 17 miles of trail at full conceptual build out of the expanded trail systems, while reducing the potential negative impacts currently realized due to multiple trail segments located in seasonally wet areas and in erosive alignments.

**Environmental Risks:** A very small risk of displacement of some wildlife. However, relocating trails out of seasonally wet locations in favor of sidehill locations higher (and drier) in the watershed may facilitate browsing by moose and other wildlife in these wet aspen groves.

**Compliance:** The additional developments would comply with the Forest Plan.

**Reduction of Identified Needs:** Improvements to the quality and connectivity of singletrack routes, especially on Pole Mountain, would reduce the publicly identified need for additional trails, which has historically been expressed through the unauthorized creation of non-system routes throughout this area.

**Environmental Impact Avoidance, Mitigation, and Restoration:** The primary purpose of the trail sustainability plan is to mitigate existing impacts to the area's natural resources by the recreational trail facilities. Conceptual trail relocations will be assessed by resource staff and altered as necessary to avoid additional impacts and closed routes will be decommissioned, stabilized, and restored to a natural forest condition.

**Implementation Costs:** Costs for the redevelopment and ongoing maintenance are anticipated to be primarily born by the public, through volunteer trail building and maintenance, grant/funding development

**Enforceability:** The specific locations of trails will be approved by USFS following resource clearances and the low-impact redevelopment and ongoing maintenance of the trail facilities would be framed by a Memorandum Of Understanding and/or Challenge Cost Share agreements with local support groups.

## TRAIL ASSESSMENT

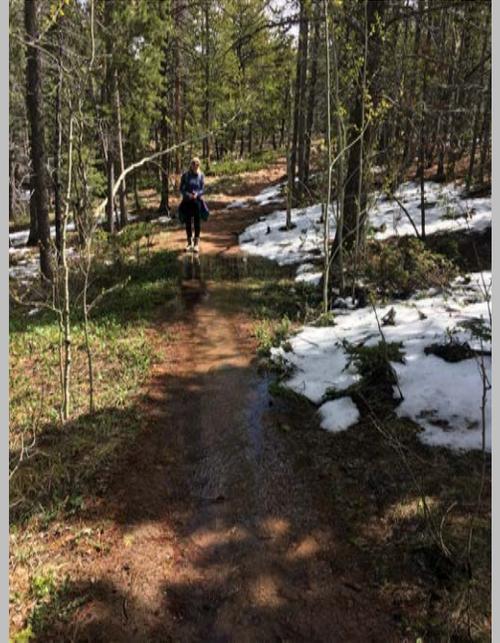
The Pole Mountain/Vedauwoo Trail Sustainability Plan was initiated with a Recreational Trails Program Grant made to Wyoming Pathways. The grant was intended to begin the process of improving the system trails managed by the Medicine Bow National Forest near popular trailheads between the Laramie and Cheyenne communities. Funding allowed for:

- Professional assessment of trail conditions,
- Prioritization of maintenance and redevelopment activities,
- Wyoming Conservation Corps-led (WCC) maintenance with professional oversight and quality control management, and
- Development of a long-term plan to improve the manageability of the trail facilities.

Kay-Linn Enterprises (Kay-Linn) staff initiated the project with Wyoming Pathways leadership, local trail advocates, and US Forest Service staff in late May, 2017. The group hiked a significant portion of the trail system, identified known issues, discussed past trail maintenance activities and the best projects to utilize WCC resources. Kay-Linn staff then continued the initial assessment process, hiking the remainder of the system trails, refining the prioritization and defining the maintenance work to be undertaken by WCC.

Following the WCC-led maintenance, Kay-Linn began the process of trail relocation planning. Where trails did not have the potential for successful maintenance that would provide for long-term manageability, corridors for sustainable trail relocation were delineated with field flagging, and GPS tracks for future natural and cultural resource inspection by USFS staff.

This document provides recommendations for improved sustainability and manageability of the Pole Mountain/Vedauwoo trail system.



## PHYSICAL SUSTAINABILITY

The physical sustainability of a trail is a function of its durability under climatic and use regimes. The most important determinants of a trail's durability are landscape position and trail alignment/gradient. Trails located on a fall line or in flat areas tend to become problematic over time because water cannot be effectively managed off the trail. Trails in these landscape positions typically increase in width or braid and suffer from erosion (fall line trail alignment) or excessive muddiness (flat trail alignment). Sidehill/contour trail alignments and moderate trail grades offer much better options for water and trail user management.

### FALL-ALIGNED TRAILS

Many segments of the trails throughout the Pole Mountain system are located with a fall line alignment. In upper watershed locations where landscape gradients are low (0-10%) and the fall aligned segments do not continue for hundreds of linear feet, the existing rock substrate and minimal water management can sustain these trails over time, especially for high quality Winter season use.

However, when the topography is steeper than 10%, these fall line trail segments begin to erode. The steeper gradients accelerate water during runoff events (rainfall or snowmelt) and increase its erosive potential. Ruts or rills begin to develop within the trail that channelize water, increasing the volume of runoff and furthering the erosive potential. This situation is exacerbated by recreational use, as boots, tires, and hooves maintain the condition of unconsolidated soils due to the steeper angle that recreational forces are applied to the trail tread. Unfortunately, water management in these situations is not possible because of the fall line location of the trail. In many locations, the small rills have become larger, deeper ruts, and finally the entire width of the trail becomes an actively eroding slope, exposing large roots and rocks. At the bottom of these slopes the deposition of the eroded sand and gravel results in further unconsolidated trail tread that holds water and has a tendency to remain muddy and/or wet long after the rest of the trail has dried. In both the erosion and deposition areas, trail users attempt to avoid the segments that are challenging to negotiate, further widening the trail or forming braided routes. In



## PHYSICAL SUSTAINABILITY

many instances, these badly aligned trail segments have become six or more feet wide, where adjacent contour aligned trail segments seeing the same use volumes and type retain a width of two feet.

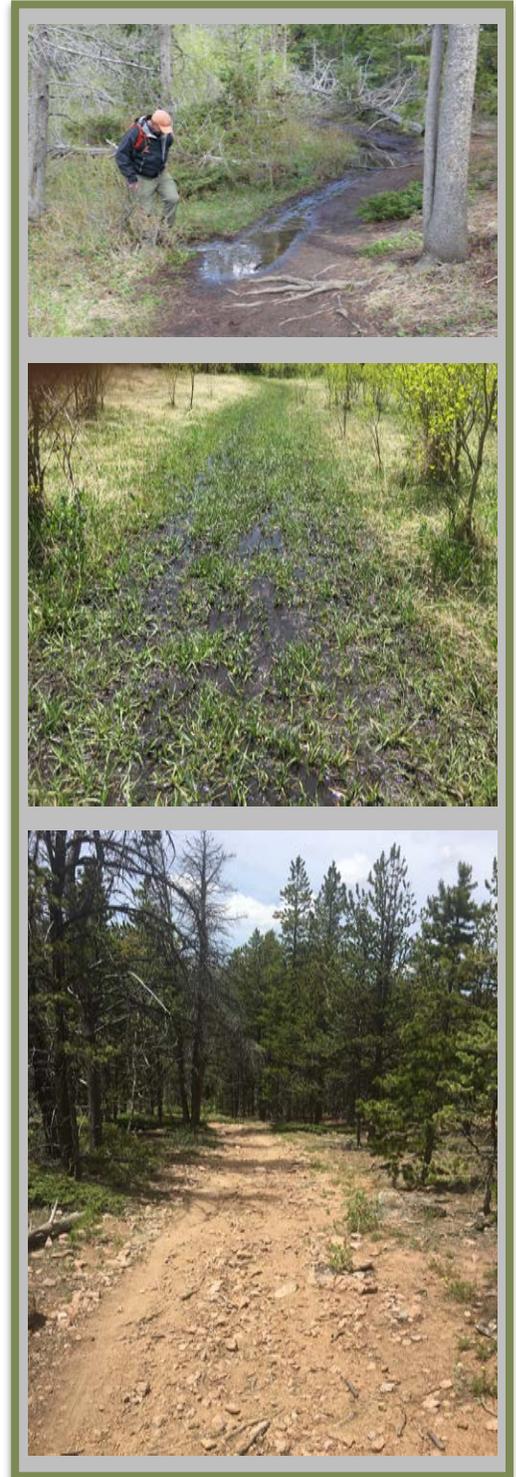
Because effective water management is not possible on longer fall-aligned trail segments, these areas must be relocated to contour-aligned locations where natural watershed hydrology can be maintained and the volume and velocity of water on the trail can be minimized.

### **DRAINAGE-ALIGNED TRAILS**

A number of trails within the Pole Mountain system are located on the bottom of wetland meadow drainages. The original convenience of these locations allowed trails to be developed without significant tree removal or trail excavation. Most of these meadows have gentle gradients (0-10%) that, with snow cover, provide high quality Winter season use.

However, during Summer use, these trails become compacted. When the trail attains an elevation below that of the surrounding meadow, surface and groundwater are directed to the trail and a virtual gutter is created. Not only does this situation alter the natural hydrology and potentially the vegetation quality and diversity within the area, it also results in a wet or muddy trail condition that persists long after surface water disappears in the meadows. Consequently trail users either avoid the wet condition, compacting new trail tread and trampling additional vegetation adjacent to the existing trail or they avoid these trails until ground water tables have dropped significantly and the trail finally dries. Trail users have reported that these meadow-located trails often don't reach this dry condition until August, resulting in a heavily curtailed Summer use season.

Further, the meadow locations are the prime feeding areas for moose. The presence of humans in the meadows has the potential to reduce moose utility of these areas. With many trail segments routed through meadows continuously for hundreds of linear feet, this situation may break up moose movement patterns, cause



## PHYSICAL SUSTAINABILITY

higher levels of stress due to human presence, or create unnecessary human-moose interactions.

Similar to the fall-aligned trail segments, improved water management of the drainage-aligned trails is not possible. These trails need relocation out of their wetland location, onto nearby hillsides where the trails will not impact the hydrology and wildlife.

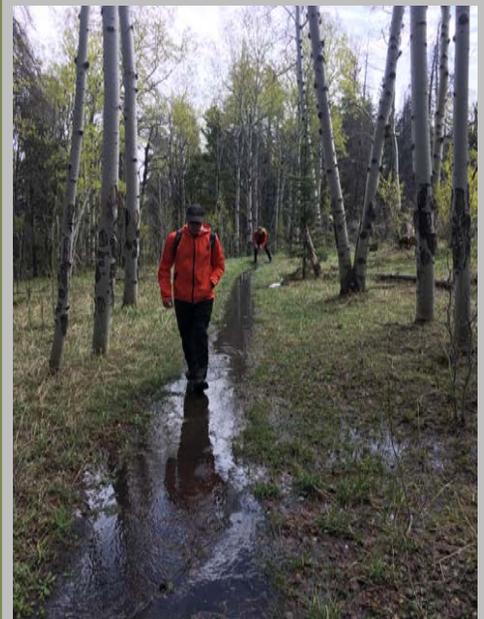
### WATER MANAGEMENT

Where the Pole Mountain/Vedauwoo trails are not experiencing acute sustainability challenges of fall line or drainage alignments, there are still issues with:

- trail gradients that exceed a maximum sustainable grade for the predominant decomposing granite soil type, and
- lack of trail outslope or grade reversals to manage water off of the trail tread.

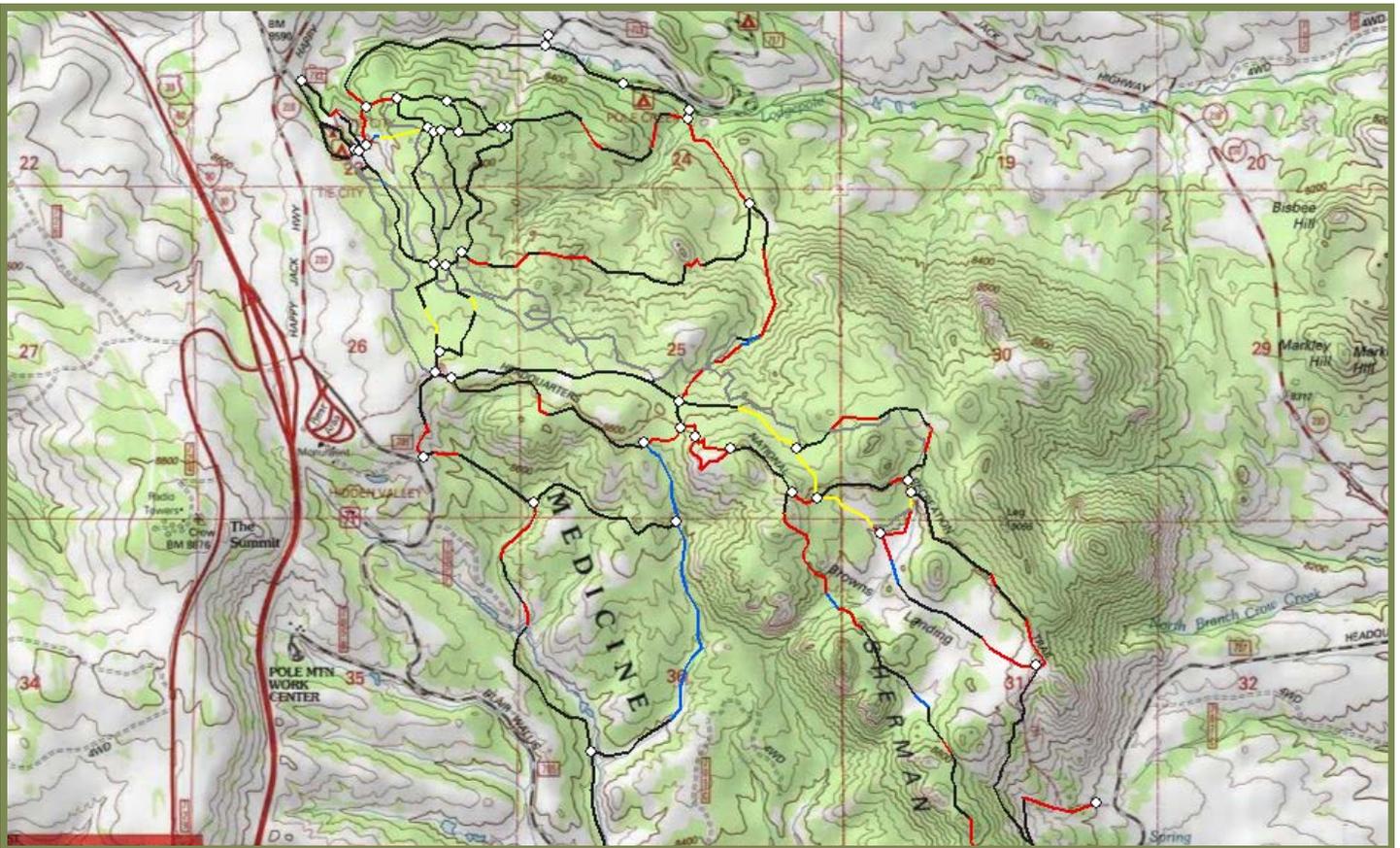
Fortunately, these issues can largely be handled through maintenance treatments on the existing trail tread. Improved water management is necessary throughout the entire trail system. As the majority of the trail system is somewhat cupped, water management maintenance should focus on the installation of broad-based, self-cleaning rolling grade dips and knicks. Reestablishing an outsloped trail tread through a debarming treatment on miles of trail would require far more effort and result in a wider trail tread that is generally not desired by trail users. Installing water bars is not as effective as grade dips/knicks and require consistent cleaning and inspection.

Shorter, steep segments of trail (greater than 10% grades) that are eroding or smaller seasonally wet areas will require rock armoring treatment to remain stable over time. Water should be managed directly above the rock armor treatment.



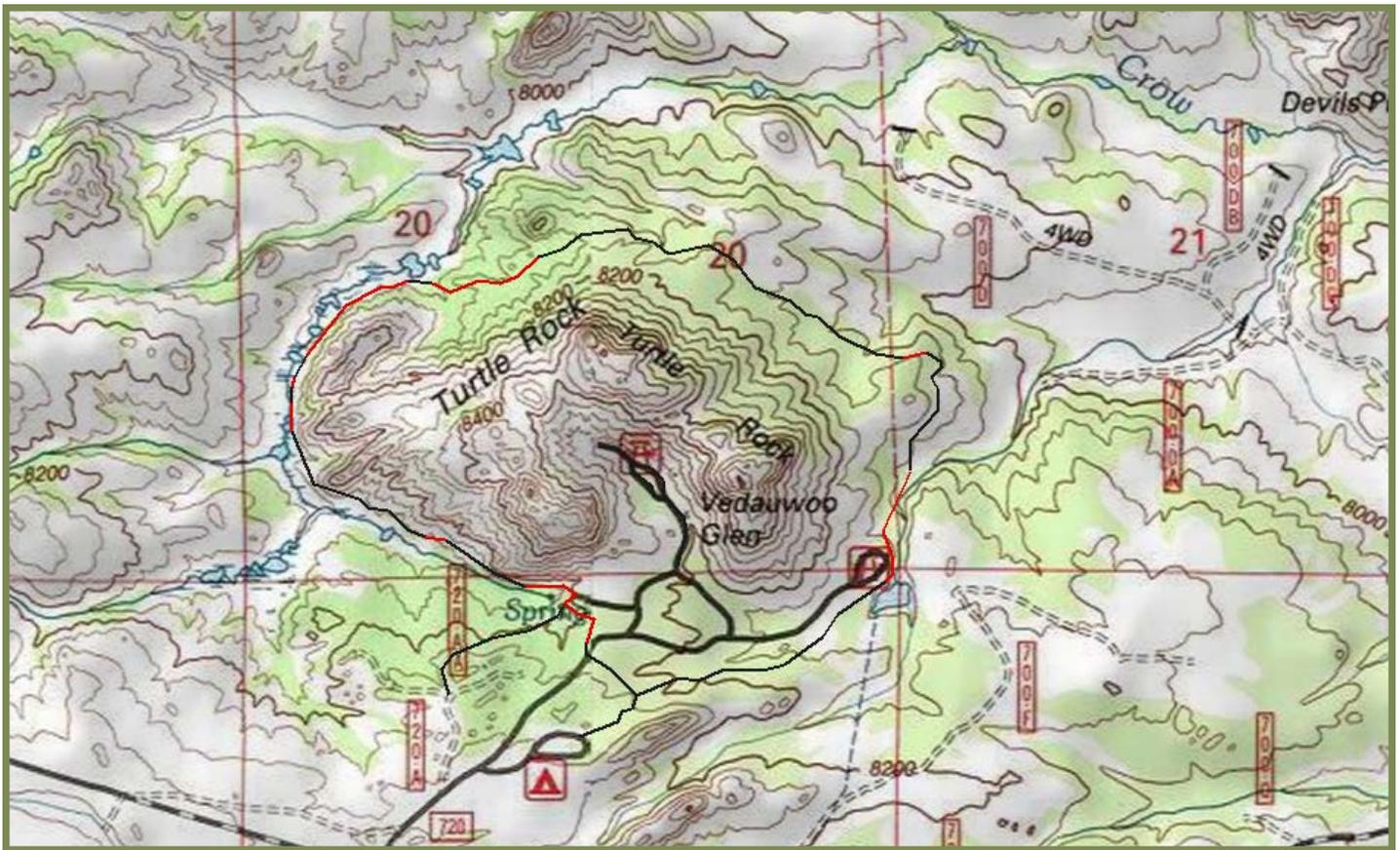
## PHYSICAL SUSTAINABILITY

The maps below reflect major sustainability issues throughout the Pole Mountain trail system. Trail segments in red are generally fall-aligned and eroding and trail segments in blue are almost terminally wet throughout the summer use season. Both of these require relocation as maintenance is not possible. Trail segments in black all require improved water management and many small areas of rock armoring where the trail is steeper than 10% and beginning to erode. Trail segments in yellow are wide ski trails experiencing erosion.



## PHYSICAL SUSTAINABILITY

The maps below reflect major sustainability issues throughout the Turtle Rock trail. Trail segments in red are generally fall-aligned and eroding. Relocation is often not possible on this trail, and instead will require aggressive water management and the development of rock steps. Trail segments in black require improved water management and many small areas of rock armoring where the trail is steeper than 10% and beginning to erode.



## SOCIAL SUSTAINABILITY

Social sustainability reflects how visitors interact with the trail system and landscape, from access and navigation to the quality of the recreation experience and regulatory compliance.

### ACCESS

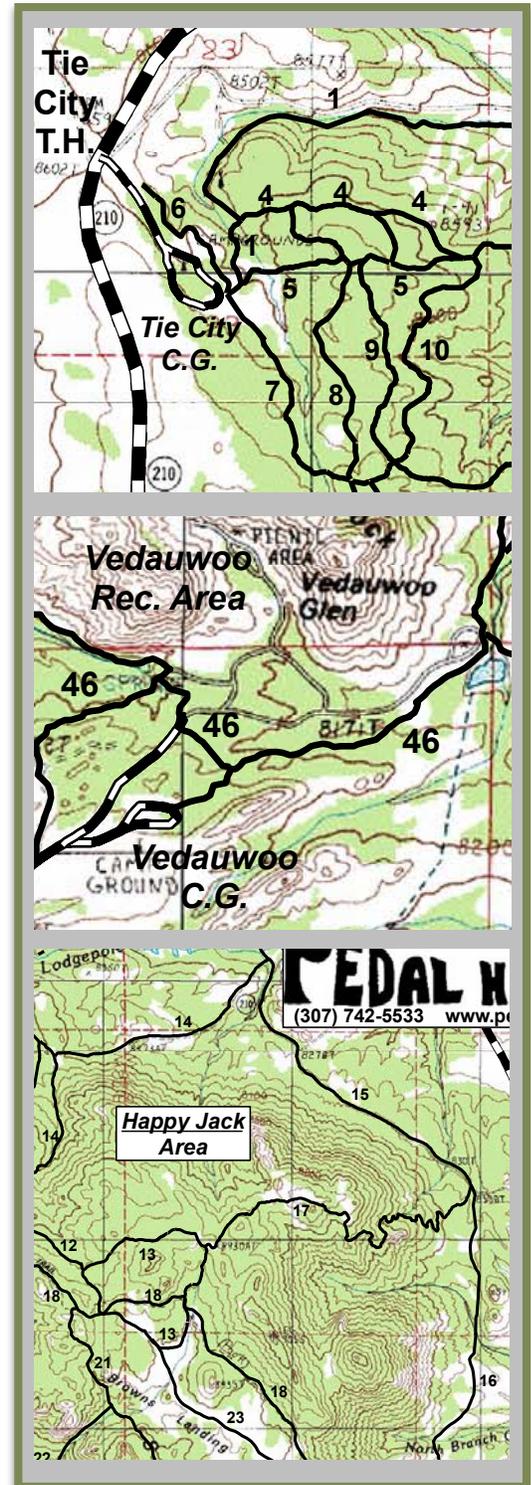
The Pole Mountain/Vedauwoo trail system was developed with Winter use in mind. As such, the core of the trail system is a dense network of mostly wide corridor ski routes accessed from the Tie City Trailhead on Happy Jack Road. Additional trailheads are located further east on Happy Jack Road (Happy Jack Trailhead), on Blair-Wallis Road (Lincoln Monument Trailhead), and on Headquarters Road (Headquarters Trailhead), where singletrack trails connect to the parking areas.

The Turtle Rock Trail in the Vedauwoo Recreation Area is accessed by eastern and western trailheads, as well as a small pullout on the campground road. The trail is informally accessed on spurs from picnic and camp sites.

All of the trailheads require use fees for the trail system. Kiosks are present at the trailheads, which have regulatory and fee information posted, but trail maps are not present. This situation often results in navigation confusion on the part of trail users and a sense that use regulation is held in higher regard than providing a quality recreational trail experience.

### NAVIGATION

Most official system trails are signed and named at junctions with carsonite posts. Challenging nomenclature exists throughout the system, including Summit Loop and Summit Trail, multiple Blackjack Loops, and Upper and Lower UW Trail and Upper UW Loop. Additional non-system trails are present in the Pole Mountain area and are denoted in commercially available trail maps, including Haunted Forest (from Aspen Trail east to Happy Jack Road), Cardiac Bypass, Old Happy Jack Road, Escape, Death Crotch, and Hooch Trails. Similarly, in the Vedauwoo Recreation Area, numerous unsigned, non-system routes connect to the Turtle Rock Trail, including Valley Massif Cut Off, Damn



## SOCIAL SUSTAINABILITY

to the Turtle Rock Trail, including Valley Massif Cut Off, Damn Trail, and Beaver Pond Trail.

The combination of a multiple junctions and parallel routes in the ski trails near the Tie City Trailhead, confusing nomenclature, a lack of trailhead-based maps, and the presence of unrecognized trails create navigation challenges in the Pole Mountain/Vedauwoo area. Navigation challenges exist along the Turtle Rock Trail due to the multiple informal access points near the picnic and camp sites.

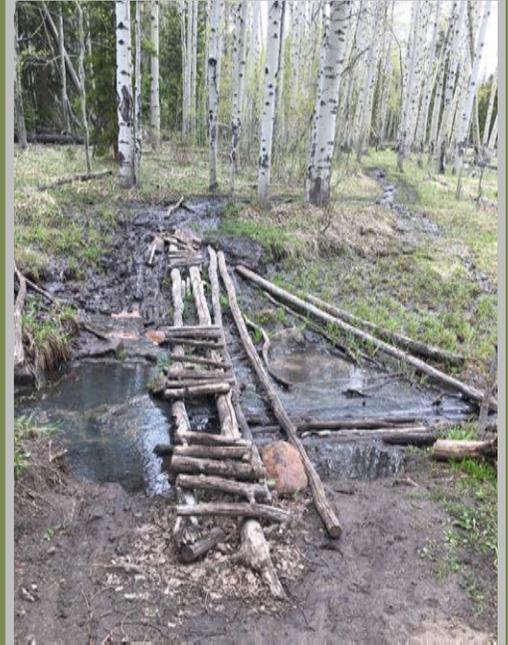
### RECREATIONAL EXPERIENCE

Two trail types are present in the Pole Mountain/Vedauwoo trail systems- narrow (18-36" wide) singletrack and wide (15+ feet) ski trail. Loops of short and moderate distance are present, allowing for a diversity of route choices. High quality vistas are present throughout the trail system and the area retains a relatively backcountry feel, even with Interstate 80 often visible and audible from the trails.

Family-friendly experiences are possible out of the Tie City Trailhead, but are hindered by a very steep, loose, eroding segment of the Campground By-Pass Trail. Larger summer season loops desired by avid trail users are complicated by drainage-aligned trail locations and a lack of some key trail connections on system trails. Turtle Rock Trail, the most visited trail in the Forest, has eroded into an experience that is somewhat challenging to negotiate due to large (and growing) rock steps and loose conditions in many locations. This reduces the trail's accessibility to what is often a more casual and less prepared demographic of visitors that frequent the area's picnic and camp sites.

### REGULATORY COMPLIANCE

Trails are generally free of litter. Many of the connectivity issues have been somewhat resolved through social trail development, but navigation challenges created by this situation reserves that larger connectivity primarily to visitors very familiar with the landscape. The proliferation of non-system routes and shoddy structures reflect a desire for additional trail opportunities and mileage.



## MANAGERIAL SUSTAINABILITY

Managerial sustainability revolves around the capacity of land managers and stewards to develop the knowledge and capital resources necessary to meet the ongoing maintenance needs of the trail system.

### FOREST CAPACITY

Evidence of recent or effective trail maintenance is sparse. Water bars are present on some trails, but have not been maintained and are largely non-functional. Prior to water bar placement, soil-catching check dams were installed on some trails. Like the water bars, they have built up sediment to the top of the structure, allowing water to cascade and cause more erosion. This unconsolidated trail tread often results in trail users widening or braiding the trail.

Bridges on the trail system are reaching the end of their functional lifespan, with deck boards falling apart or rotting under deposited sediment. A few trail relocations were attempted in the past, but generally the resulting trail was too steep and is now eroding and in need of a second relocation.

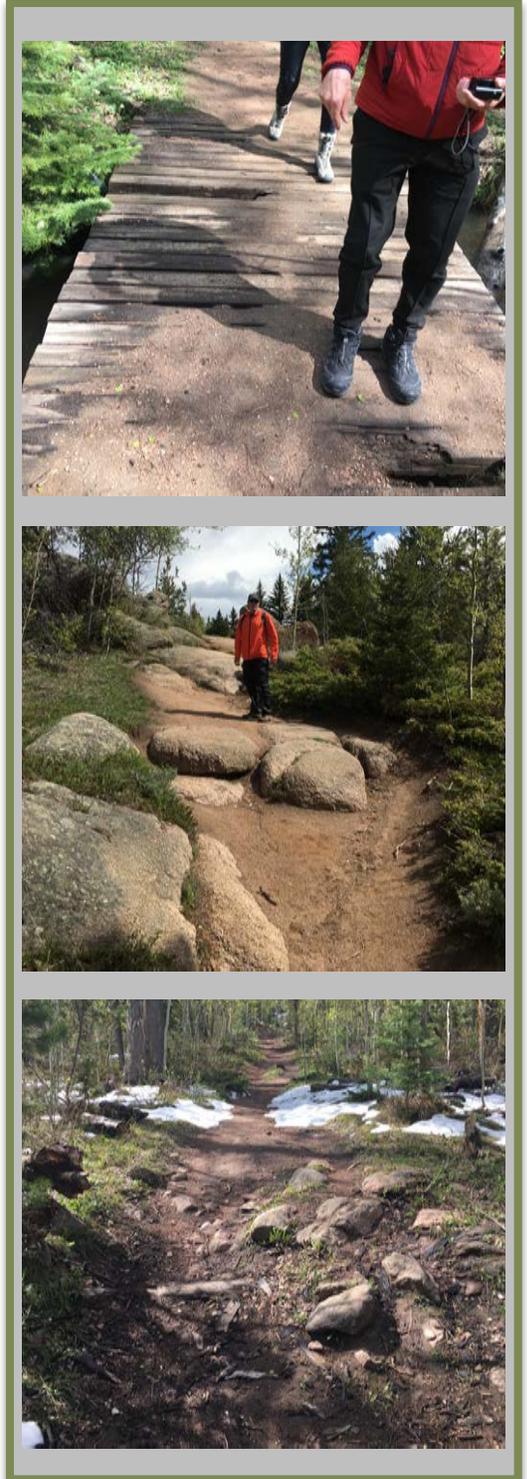
### VOLUNTEER CAPACITY

The public has historically been active in the Pole Mountain/Vedauwoo area. However, much of the efforts have been devoted to routing (rather than constructing) new trails. The trail corridors are very well maintained, given the number of tree falls in the previously pine beetle infested forest. That stated, it is not clear how many or if any of the volunteers running chainsaws on the Forest are certified to do so.

Volunteers from the Laramie area organized a professionally-led trail development and maintenance best practices seminar in Summer, 2017 and are beginning to undertake trail maintenance and relocation activities. Further growing this volunteer base and skills will be fundamental to the ongoing redevelopment and maintenance of the trail system.

### FUNDING

The grant supporting the development of this sustainability plan also provided for significant Wyoming Conservation Corps (WCC) assistance in Summer, 2017. With the WCC based in Laramie, this labor component should be a consistent presence on the Forest trails in implementing this sustainability plan. The Forest could annually allocate funds from fee collection to engage WCC crews to undertake trail relocations and maintenance.



## PHASE 1- MITIGATIVE ACTIONS

The Trail Sustainability Plan was initiated in Summer, 2017 under a Wyoming Recreational Trails Program Grant. Kay-Linn worked with Forest staff and local advocates to identify priority needs. With little effective water management maintenance on the Pole Mountain/Vedauwoo trail system in place, the development of rolling grade dips and knicks throughout the trail system was developed as the highest priority action that could be immediately approved and implemented. Kay-Linn flagged the locations of more than 200 water management structures on Turtle Rock, Headquarters, Pole Creek, Aspen, Middle Aspen, Alder, Crow Creek, Haunted Forest, and Blackjack Trails, trained WCC crews on proper construction techniques, and provided a quality control inspection of the water management work. This action will help:

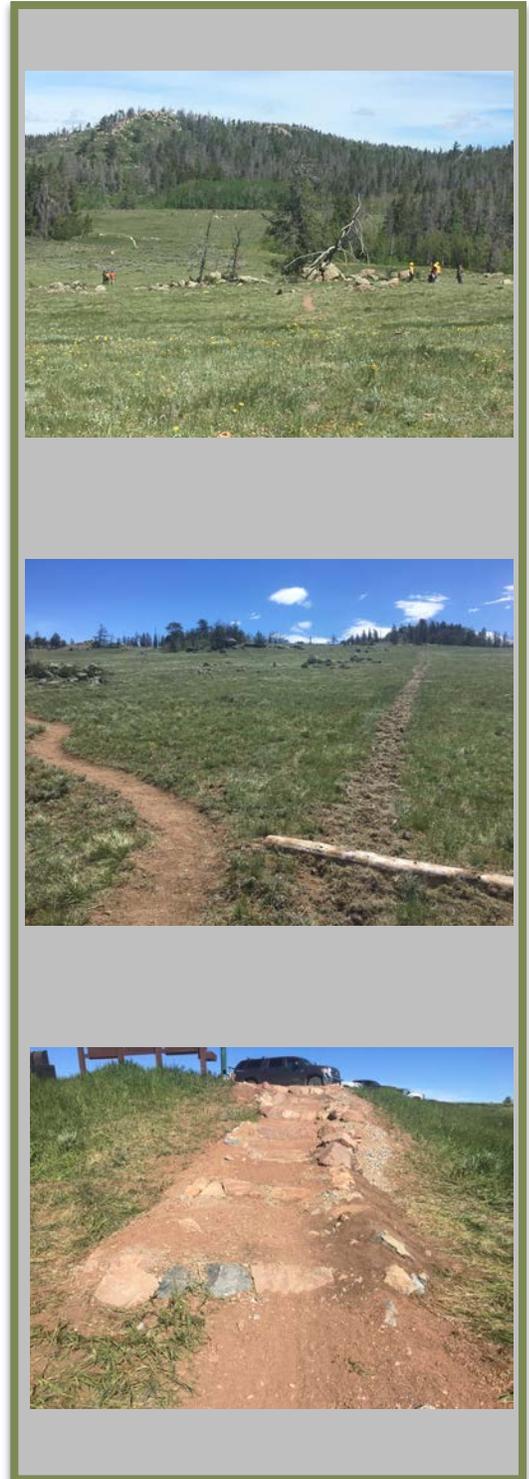
- arrest erosion,
- dry trails more quickly after rain events or snowmelt, and
- maintain a solid trail tread.

The WCC and local volunteer crews subsequently addressed a number of short trail relocations to remove fall line trail segments and/or enhance the trail's ability to shed water. This work included:

- the contour trail relocation and trail restoration of the upper portion of Brown's Landing Trail,
- relocating a segment of Crow Creek Trail from a wet meadow location to the adjacent hillside and restoring the meadow
- multiple small relocations and rock armoring treatments on Aspen and Haunted Forest Trails,
- numerous rock step improvements on Headquarters Overlook Trail, and
- reconstruction of the trail entrance at the Tie City TH.

Additional small trail relocations were approved by the Forest for future construction, including the relocations of:

- the Camground By-Pass Trail off the steep, eroding fall line alignment to provide a consistent, family-friendly trail experience, and
- Relocation of a fall-aligned and eroding segment of the Headquarters Trail near the eastern relocated junction with Brown's Landing Trail.



## PHASE 2- CORRECTIVE ACTIONS

Numerous segments of fall- or meadow- aligned trails cannot be sustained through typical water management techniques, as described in the Physical Sustainability Assessment. As such, no work was completed in Phase 1 on these trails. These trail segments all require relocation to a rolling contour, sidehill alignment.

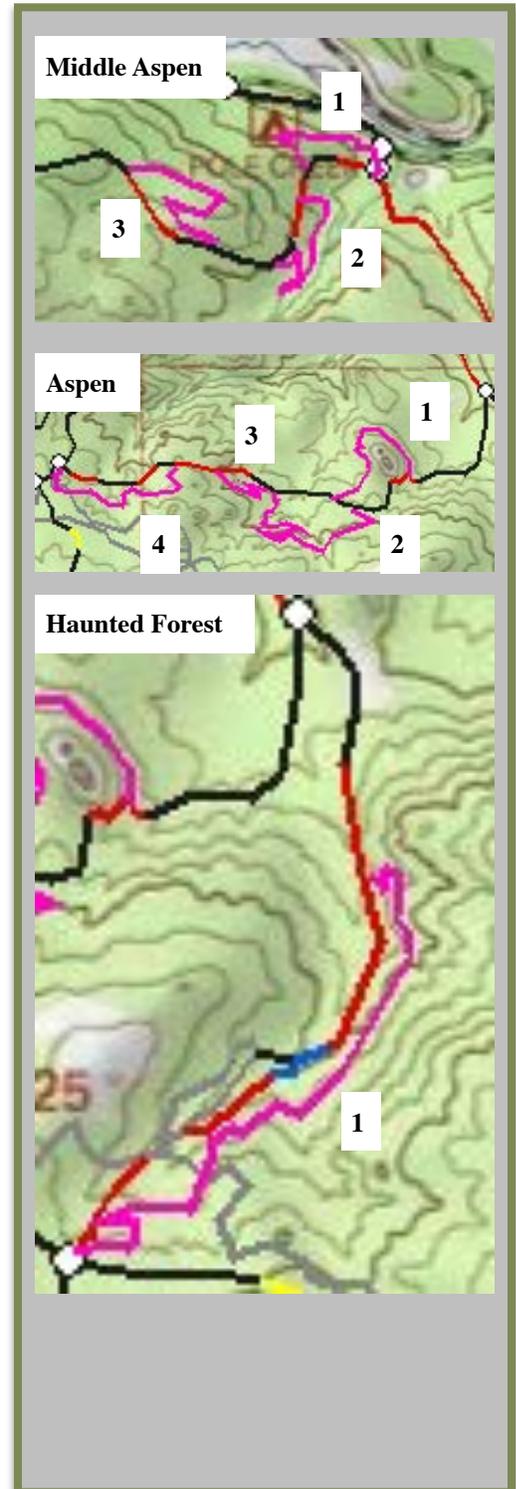
### RELOCATION ALIGNMENT

The initial corridors for these realigned routes were flagged in the forest (fluorescent pink, orange, and red flagging with polka dots) for future resource clearance work. The corridors were developed with minimal gradients (approximately 5%) to allow for construction of a rolling grade trail that incorporates small reversals in grade, from ascending to descending, and a sinuous, from left to right, form. When the grade reversals and sinuosity are developed in the final trail alignment, running trail grades will vary from 0 to 10%. Coupled with a constructed tread that is slightly outsloped, natural watershed hydrology will be retained, sedimentation into wetland or water resources will be eliminated, trail widths will remain narrow and consistent, and long-term maintenance needs will be greatly reduced. From an experiential standpoint, these realigned trails will dry faster than the surrounding landscape, extending low impact use of the trails earlier and later in the non-Winter season.

### PRIORITY TRAIL CORRIDOR REALIGNMENTS

The first phase of corrective actions totals approximately 29,050 linear feet/5.5 miles of relocated trail to alter the current resource-damaging alignments, including:

- 3 segments of Middle Aspen Trail totaling 4,750 linear feet,
- 4 segments of Aspen Trail totaling 8,450 linear feet
- 1 segment of Haunted Forest Trail of 3,700 linear feet

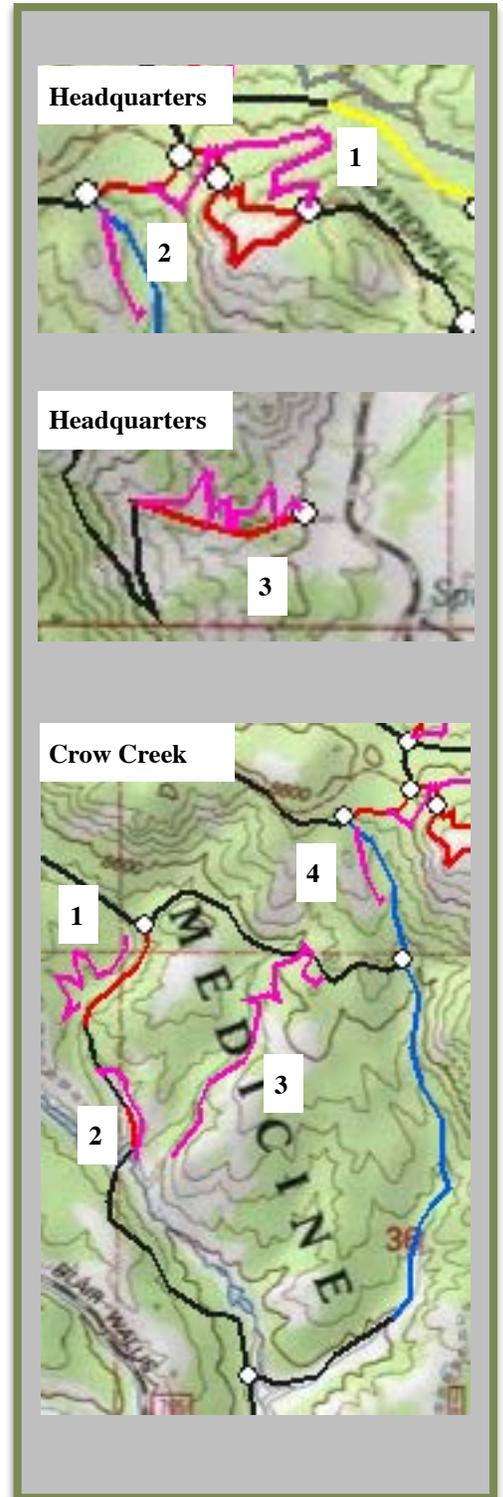


## PHASE 2- CORRECTIVE ACTIONS

- 3 segments of the Headquarters Trail, totaling 4,225 linear feet
- 4 segments of the Crow Creek Trail, totaling 7,925 linear feet
- 2 segments of Turtle Rock Trail, totaling 1,900 linear feet

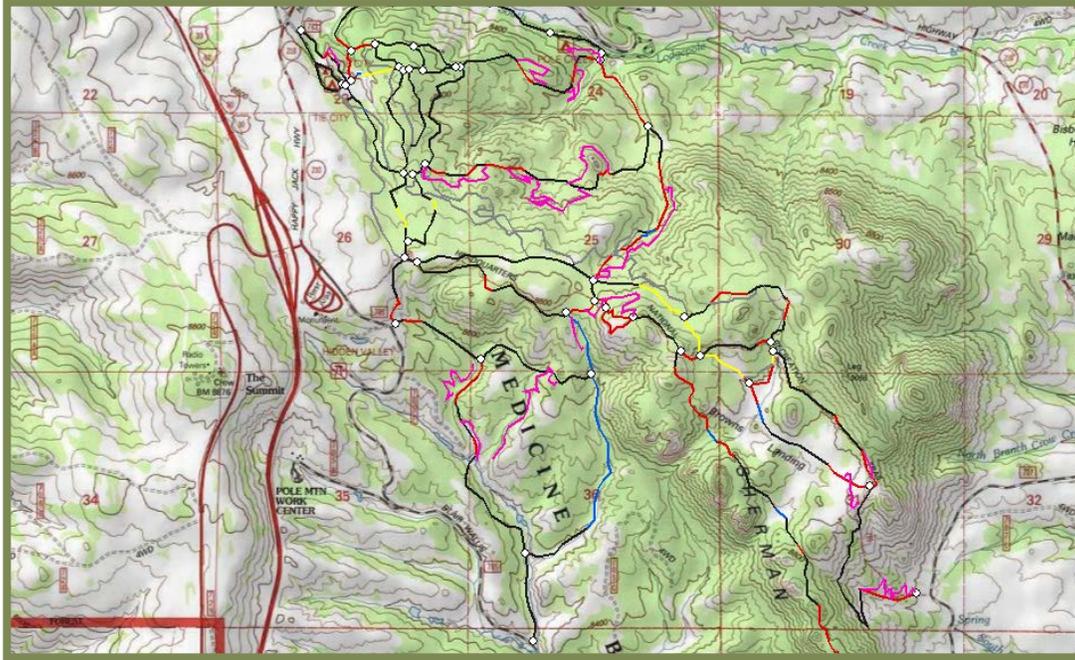
### HEAVY MAINTENANCE

On the Turtle Rock Trail, a lack of effective water management led to erosion that has left many locations in need of rock step construction, reconstruction of retaining walls, and aggressive water management on steep trail segments. In total, 90 check steps, 17 fully cribbed steps, 40 linear feet of 36" high retaining wall, 80 linear feet of 4'-wide puncheon, and 20 rolling grade dips have been sited around the trail loop. Completing this work will improve accessibility to the trail for less athletic visitors.

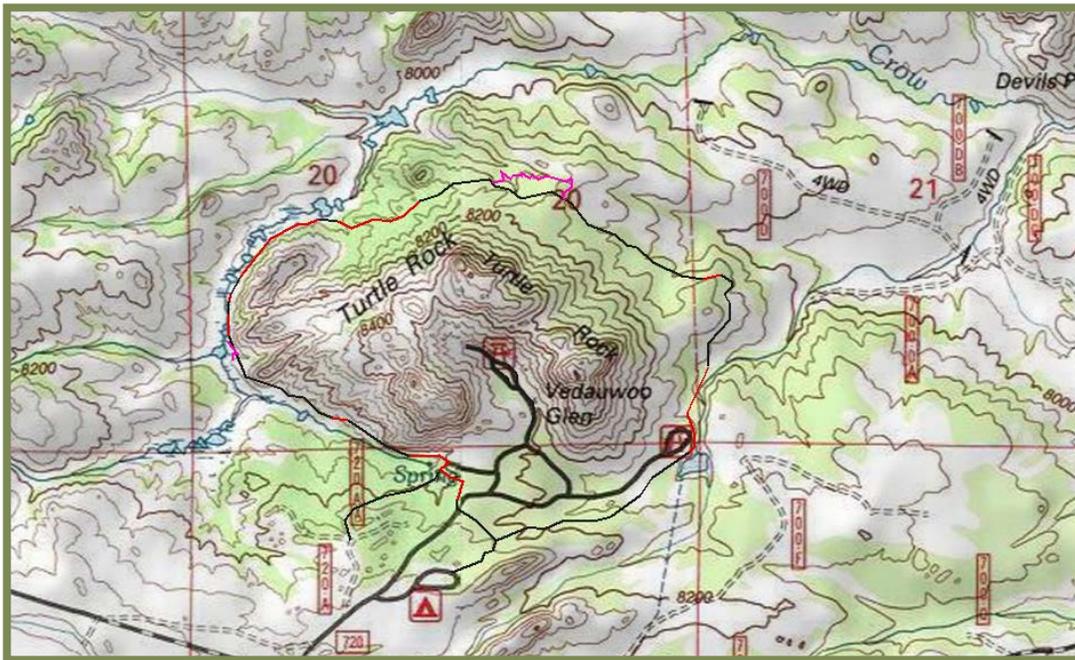


## PHASE 2- CORRECTIVE ACTIONS

### OVERALL RELOCATION NEEDS- POLE MOUNTAIN TRAILS (PINK SEGMENTS)



### OVERALL RELOCATION NEEDS- VEDAUWOO RECREATION AREA/TURTLE ROCK TRAIL



## PHASE 2- CORRECTIVE ACTIONS

### PROJECT PRIORITIZATION

The various relocation and heavy maintenance needs have been prioritized in the table below. High priority projects relate to trail segments that are currently causing natural resource damage and are rapidly degrading. Medium priority projects relate to challenged trail segments where water cannot be effectively managed off the trail and erosion/deposition and natural resource damage is occurring, but the degradation is occurring at a slower rate. Low priority projects need to be attended to at some point in the future, but the level of natural resource damage and degradation is not expected to increase dramatically in the next few years.

### CONSTRUCTION IMPLEMENTATION STYLES

There are a variety of construction implementation styles that are recommended in the following table for the redevelopment of sustainable trails in this area. Given the history of maintenance on these trails, the assumption has been made that trail relocation and heavy maintenance is not going to be undertaken by Forest personnel. More likely, the corrective actions outlined above will be implemented by a combination of professional contractors, WCC and/or other service Corps, and volunteers.

Professional trail contractors typically utilize small mechanized machinery (i.e. mini excavators, skid steers, and specialty dozers) to construct large amounts of trail in challenging conditions where hand tool-based construction would be nearly impossible. Professionally constructed trails are completed most efficiently where machine access and/or trailheads are nearby. When access is not as convenient and project work is challenging, WCC crews that are well-trained, in good physical condition and work full days can often be a better construction option. Projects that are relatively small and access is convenient are great projects for volunteers to undertake, as the total manpower capacity is often smaller than a WCC crew. In some situations a hybrid construction model, with professional contractors providing the challenging trail tread construction and volunteers/WCC undertaking clean up work behind the machines, is the most time and cost efficient implementation method. Hybrid construction is more challenging to organize and control quality, but can provide considerable savings when well-managed.

### COST ESTIMATION

The cost estimation presented below is made for planning purposes. The figures are based on:

- Similar recent trail construction projects throughout the region,
- 2018 cost estimates for WCC engagement, and
- Project management expense of organizing and providing quality control of the work.

In total, the Corrective Actions phase outlined above reflects an approximately \$100k capital project with volunteer assistance of at least 1,100 hours, valued at \$26,550 (utilizing Independent Sector's 2016 valuation of \$24.14/hour). If volunteers provided labor in a hybrid construction situation, the volunteer inputs would need to increase by approximately 650 hours.

## PHASE 2- CORRECTIVE ACTIONS

### PROJECT PRIORITIZATION, CONSTRUCTION TECHNIQUE, AND ESTIMATED COSTS

TRAIL SEGMENT	PRIORITY LEVEL	CONSTRUCTION TECHNIQUE	EST. LENGTH	ESTIMATED UNIT PRICE	ESTIMATE SUBTOTAL
Middle Aspen 1	High	Volunteer	1,600	\$0.50	\$800.00
Middle Aspen 2	Medium	Contractor	1,600	\$5.75	\$9,200.00
Middle Aspen 3	High	Hybrid	1,600	\$3.75	\$6,000.00
Aspen 1	High	Contractor	2,100	\$6.25	\$13,125.00
Aspen 2	High	Contractor	3,175	\$5.75	\$18,256.25
Aspen 3	High	Hybrid	1,050	\$3.75	\$3,937.50
Aspen 4	Medium	Volunteer	2,100	\$0.50	\$1,050.00
Haunted Forest	High	Volunteer	3,700	\$0.50	\$1,850.00
HQ 1/Cardiac	Low	WCC	2,650	\$2.25	\$5,962.50
Headquarters 2	Medium	Volunteer	550	\$0.50	\$275.00
Headquarters 3	Medium	Volunteer	2,650	\$0.50	\$1,325.00
Crow Creek 1	Medium	WCC	2,100	\$2.25	\$4,725.00
Crow Creek 2	Medium	Volunteer	1,050	\$0.50	\$525.00
Crow Creek 3	Medium	Hybrid	3,700	\$3.75	\$13,875.00
Crow Creek 4	Medium	WCC	1,050	\$2.25	\$2,362.50
Turtle Rock 1	Medium	WCC	335	\$2.25	\$753.75
Turtle Rock 2	Medium	WCC	1,565	\$2.25	\$3,521.25
Turtle Rock Maint.	High	WCC	NA	NA	\$12,000.00
<b>Est. Total</b>					<b>\$99,543.75</b>

## PHASE 3- EXPERIENTIAL IMPROVEMENT

### MAP DEVELOPMENT

As the Corrective Actions are being implemented, new trail maps will need to be developed that accurately portray the redeveloping system. The maps should provide information on trail difficulty and length, similar to the State-produced maps for the Curt Gowdy and Glendo State Park trail systems. A note at each trailhead kiosk adjacent to a large format trail system map should be included stating brochure maps are available at the Lincoln Monument Visitor Center, as well as Cheyenne and Laramie outdoor recreation outlets. GPS alignments of the redeveloped trails should be developed and uploaded to commonly utilized on-line trail data repositories.

### NAVIGATION AND CONNECTIVITY

The presence of numerous unsigned, non-system trails throughout the Pole Mountain/Vedauwoo area creates navigational confusion. Segments of these trails are eroding and/or causing resource damage. As non-system trails, formal maintenance is not possible. To provide a more manageable, navigable trail system, these routes should either be added to the system or closed and restored to natural topography and hydrology.

Some of the official system trails, including portions of Summit Trail and Loop, Brown's Landing, Crow Creek and Double Black Diamond, have significant erosion and resource damage conditions that have not been addressed as part of the Corrective Actions in this plan. As groomed ski routes (Summit and Brown's Landing), the existing alignments will not likely be altered appreciably. Recontouring the existing trails, improving water management, and encouraging revegetation will decrease grooming challenges. However, with continued summer use, the current issues will redevelop due to the fall line nature of these routes. It is recommended that these trails be closed to summer use, with connectivity restored with new, sidehill-located rolling contour trails.

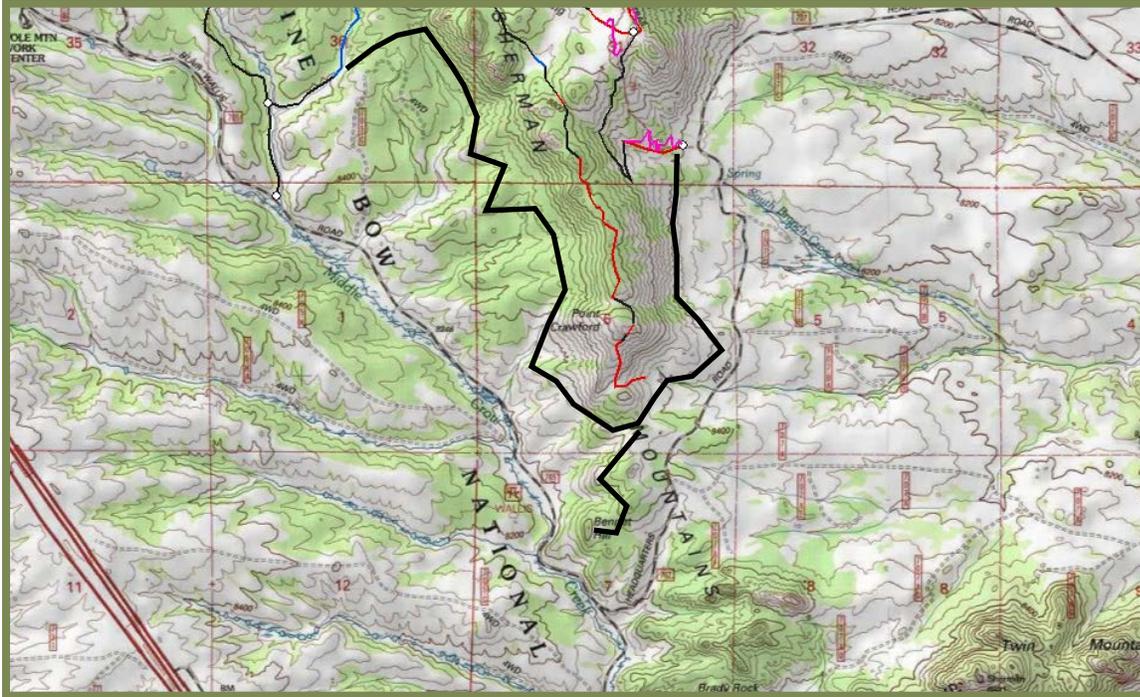
Finally, the trail system on the eastern side of the Pole Mountain area is lacking in quality and connectivity. Old road beds and jeep tracks do not make for high quality recreation and have significant water management challenges. The Headquarters Trailhead is underutilized because of a lack of trail options and recreationists in this area are forced onto the forest roads. The terrain on this portion of the Forest is favorable to the development of trails parallel and uphill of the existing roadways, connecting the Happy Jack, Headquarters and Lincoln Monument Trailheads, and creating a much better connected, dispersed, and safer recreational experience.

### CHALLENGE

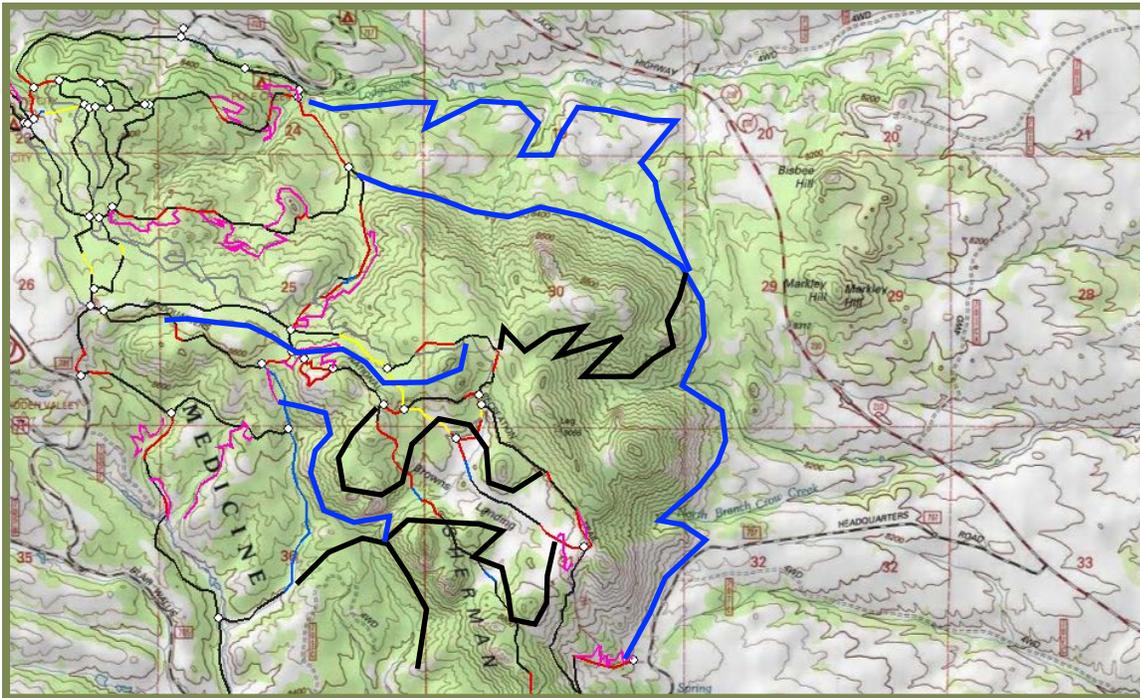
Challenging trail experiences, intended to be provided in a backcountry setting, are only present on the Pole Mountain/Vedauwoo trails due to erosion following improper design. Following Corrective Actions to address these sustainability and resource damage concerns, the only continuously difficult trail will be the Headquarters Overlook. Opportunities to balance the diversity of trail experiences offered is possible through creative relocations of portions of the Aspen, Middle Aspen, Crow Creek, Headquarters, Double Black Diamond trails, as well as the system addition (with sustainability improvements) of Death Crotch, Hooch, and connecting trails in the eastern and southern portion of the system, which will also help better disperse use.

## PHASE 3- EXPERIENTIAL IMPROVEMENT

### HEADQUARTERS TO LINCOLN MONUMENT TRAILHEAD CONNECTIVITY/CHALLENGE



### HAPPY JACK TO HEADQUARTERS TRAILHEAD CONNECTIVITY/CHALLENGE



## TRAIL MANAGEMENT OBJECTIVES

The following trail specifications are intended to guide new trail design, construction, and maintenance activities for the Pole Mountain/Vedauwoo trail system. Some alterations from the Forest Service Trail Manual have been selected due to soil and use conditions present in this area.

SPECIFICATION	LEAST DIFFICULT	MORE DIFFICULT	MOST DIFFICULT
<b>USFS Trail Class</b>	3	2	1
<b>Designed Use</b>	Cross Country Skiing	Mountain Bike	Mountain Bike
<b>Managed Uses</b>	Pedestrian, Bike, Horse, Snowshoe/Winter Bike	Pedestrian, Bike, Horse, Snowshoe/Winter Bike	Pedestrian, Snowshoe/Winter Bike
<b>Target Grade</b>	2-10%	5-10%	7-12%
<b>Short Pitch Maximum</b>	20%	15%, armored tread if greater 15%	20%, armored tread if greater than 15%
<b>Maximum Pitch Density</b>	5-15% of trail	5-10% of trail	5-15%
<b>Target Cross Slope</b>	0-5%	3-7%	3-7%
<b>Maximum Cross Slope</b>	15%	15%, primarily on rolling grade dip/knick drains	15%, primarily on rolling grade dip/knick drains
<b>Clearing Height</b>	8', or height of grooming equipment	12'	8'
<b>Clearing Width</b>	72" - 20'	48", some light vegetation may encroach	36", some light vegetation may encroach
<b>Shoulder Clearance</b>	0-12"	6-12"	0-12"
<b>Design Turn Radius</b>	15-20', or to accommodate grooming equipment	5-7'	3-10', insloped turns to reduce displacement
<b>Protrusions</b>	None	Less than 6", may be common and continuous	Less than 24", likely common and continuous
<b>Obstacles</b>	None	12"	24"

## TRAIL MANAGEMENT OBJECTIVES

TRAIL NAME	TRAIL CLASS	DESIGNED USE	DIFFICULTY
<b>Summit Trail*</b>	3	Cross Country Skiing	Least
<b>Alder Trail</b>	3	Cross Country Skiing	Least
<b>Ridge Trail</b>	3	Cross Country Skiing	Least
<b>Roller Coaster Trail</b>	3	Cross Country Skiing	More
<b>Lower UW Trail</b>	3	Cross Country Skiing	More
<b>Upper UW Trail</b>	3	Cross Country Skiing	More
<b>Meadow</b>	3	Cross Country Skiing	More
<b>Summit Loop*</b>	3	Cross Country Skiing	More
<b>Brown's Landing Trail*</b>	3	Cross Country Skiing	More
<b>Crow Creek Loop*</b>	3	Cross Country Skiing	More
<b>Campground By-Pass</b>	2	Mountain Biking	More
<b>Pole Creek Trail</b>	2	Mountain Biking	More
<b>Middle Aspen Trail</b>	2	Mountain Biking	More
<b>Aspen Trail</b>	2	Mountain Biking	More
<b>Haunted Forest</b>	2	Mountain Biking	More
<b>Headquarters Trail</b>	2	Mountain Biking	More
<b>Headquarters Overlook</b>	1	Mountain Biking	Most

\* Trails that require a parallel/nearby alternative summer route for sustainability reasons. Summer equivalents would be managed as Trail Class 1 or 2, More or Most Difficult, depending on terrain.

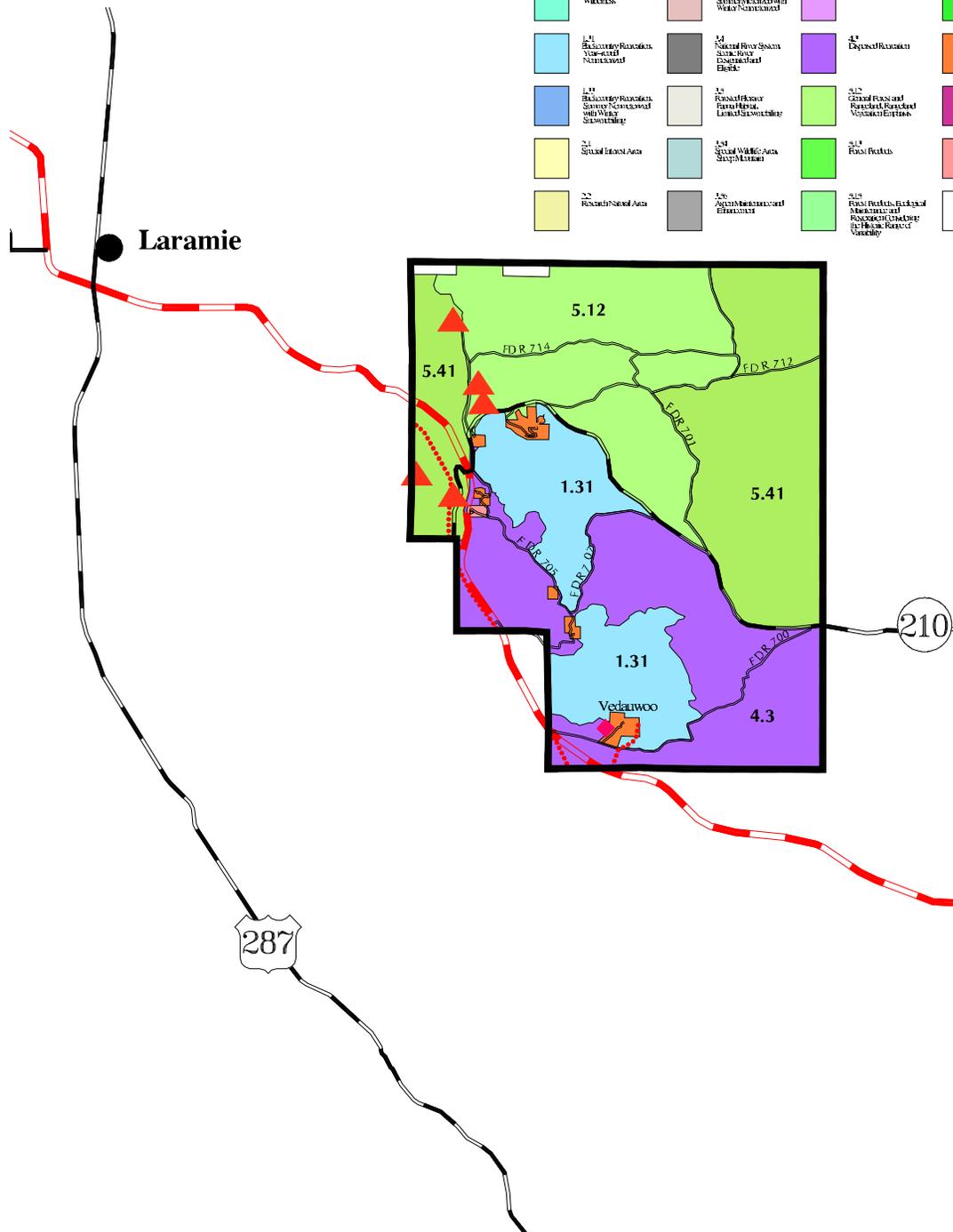
# APPENDIX A

## MANAGEMENT AREA INFORMATION

# MANAGEMENT AREA INFORMATION

## Management Area Key

1.1 Wilderness Sub-Plan	3.1 Backcountry Roadway System Management	3.6 Critical Curvature/ER Water Range	3.41 Extramile Water Range	3.5 National River System Wild River Subplan and Backcountry Wilderness
1.2 Riparian/Other Wilderness	3.22 Backcountry Roadway System Management Wild Sub-Plan	4.2 Study	3.42 Riparian Study Area	3.22 Research/Study Area Wilderness
1.1 Backcountry Roadway System Management	3.4 National River System Sub-Plan Designated Electric	4.3 Designated Recreation	3.21 Ecological Recreation	3.5 Utility Corridor
1.11 Backcountry Roadway System Management with Water Sustainability	3.5 Forest Plan or Forest Management Plan/Forest Land Use/Designation	3.12 Critical Forest and Forested/Recreated/Recreated Vegetation Ecosystem	3.22 Riparian Forest, Ecological/Forest	3.4 Electric Site
2.1 Special Interest Area	3.43 Special Wildlife Area Sub-Plan	3.13 Forest Products	3.6 Administrative Site	National Forest Subplan and/or Backcountry Area 7.1 Research/Study Areas. Administrative boundaries. Research/Study Areas. National Forest administrative boundary. Administrative boundary. Administrative boundary. National Forest Subplan.
2.2 Research/Study Area	3.6 Aquatic Management Element	3.14 Forest Products, Ecological Management and Research/Study Area to Forest Research Variability	Land Not Covered by this Plan	



# MANAGEMENT AREA INFORMATION

## MANAGEMENT AREA PRESCRIPTIONS

### 1.31 Backcountry Recreation, Year-round Nonmotorized

**Theme** – Backcountry, nonmotorized recreation areas are managed to provide recreation opportunities in a natural-appearing landscape.

**Setting** - These areas, usually 2,500 acres or larger, are generally unroaded or may have some evidence of past roads. They are natural or natural appearing with little or no evidence of recent human-caused disturbance. They are important for providing nonmotorized recreation near the primitive end of the recreation opportunity spectrum.

**Desired Condition** – A variety of uncrowded, all year, nonmotorized recreation opportunities are provided in a natural or natural-appearing setting. Improvements such as trailheads, travelways, signs, bridges, fences, or shelters that enhance the recreation opportunities may be present. Travelways provide challenging hiking, horseback riding, or mountain biking opportunities. The potential to view wildlife is high.

Late successional structure stands may be present offering a variety of wildlife species associated with these habitats. Rangeland vegetation will occur in a mix of seral stages but will predominantly be in mid seral to late seral stages of development. Domestic livestock will be encountered in this area during the summer. Some signs of management practices, such as salting areas, fences, and water developments, may be present. Existing old roadbeds may be evident, but rehabilitation efforts will change their appearance. These roadbeds may be utilized as part of the trail system. There will usually be less than 15 encounters with other parties per day. These areas may offer unique hunting opportunities away from sight and sound of motorized vehicles.

#### Standards and Guidelines

##### General

- Standards
1. Allow uses and activities only if they do not degrade the semi-primitive character of the area.
  2. Reclaim disturbed lands to a condition suitable for the purposes for which the area was identified.

##### Fire and Fuels

- Guidelines
1. When possible, where fire suppression is necessary, use techniques, which minimize soil and vegetation disturbance.
  2. Use perimeter control or prescription control as the wildland fire management strategy.

##### Infrastructure

- Standards
1. Motorized travel is prohibited except when authorized by special use permit or for administrative or emergency purposes.

## MANAGEMENT AREA INFORMATION

### MANAGEMENT AREA PRESCRIPTIONS

- 2. Prohibit new system road construction or road reconstruction unless necessary to honor valid existing rights.
- Guidelines 1. Allow use of motorized equipment, such as chainsaws and trail equipment, for maintenance, construction, and other management activities.
- 2. Restrict construction of facilities and structures that are not subordinate to the landscape.
- 3. Road construction is restricted to temporary road development for geophysical seismic projects. All temporary roads will be immediately reclaimed after use.

#### Minerals

- Standards 1. Allow oil and gas leasing; however, no ground-disturbing activities are permitted.
- 2. Prohibit removal of mineral materials.

#### Rangelands

- Guideline 1. Allow livestock facilities that do not detract from the semi-primitive character of the area.

#### Recreation

- Guidelines 1. Manage for a year-round ROS class of Semi-Primitive Nonmotorized as mapped.
- 2. Limit recreation developments to travelways, sanitation facilities; horse holding and handling facilities, directional and resource signing, and primitive shelters.
- 3. Do not allow dispersed campsite condition to exceed Cole's Class 3. Close and re-vegetate Cole class 4 and 5.
- 4. Make all resource management activities compatible with recreation opportunities. Reduce impacts to other resources.
- 5. In order to maintain the semi-primitive quality of the area, discourage concentrated public use.

#### Scenery

- Guideline 1. Meet the scenic integrity objective of High.

#### Special Uses

- Standards 1. Prohibit new utility corridors.

## MANAGEMENT AREA INFORMATION

### MANAGEMENT AREA PRESCRIPTIONS

2. Prohibit new special-use facilities.
- Guideline 1. Discourage competitive contests and group events.

#### Transportation

- Standard 1. Prohibit motorized uses.
- Guidelines 1. After appropriate analysis and as funding allows, take the following actions, where needed:
- Minimize trail impacts to scenic resources,
  - Eliminate duplicate routes,
  - Remove trails from maps where repeated travel over the same route is to be discouraged.
2. Provide only the minimum signing necessary to indicate directional information at trail junctions or to protect resources.
  3. Existing unneeded roads should be decommissioned or converted to trails.

#### Vegetation

- Standard 1. Use only vegetation management practices necessary to meet specific resource objectives other than wood production. Timber harvest is not scheduled and does not contribute to the allowable sale quantity.
- Guidelines 1. Reclaim disturbed lands to a condition suitable for the purposes for which the area was identified.
2. Allow the cutting or removal of trees under circumstances such as; to reduce fuel load and fire risk, especially adjacent to private land; to curtail imminent threat of insect attack; enhancing a scenic view from a prominent overlook, to maintain wildlife habitat diversity or maintenance of existing facilities.

## MANAGEMENT AREA INFORMATION

### MANAGEMENT AREA PRESCRIPTIONS

#### Category 8

Ecological conditions are likely to be permanently altered by human activities beyond the level needed to maintain ecological processes and landscapes with a natural appearance. These areas are generally small in scale. Ecological values are protected where they affect the health and welfare of human occupancy. Areas such as mines and other concentrated uses are included in this category. Human activities generally provide jobs and income, either directly or indirectly. Motorized transportation is common.

##### 8.21 Developed Recreation

**Theme** – These areas contain developed recreation sites that provide an array of recreational opportunities and experiences in a forested environment. These areas also include the surrounding terrain, resulting in an attractive setting for the developments. Areas are managed to provide a variety of recreation opportunities in highly developed multiple-site, recreation complexes.

**Setting** – This Management Area provides intensive recreational use. Modifying the area often enhances recreational activities. The sounds of people using the area are evident, and interaction between visitors is sometimes high.

**Desired Condition** - Vegetation will be managed for recreation and aesthetics. In particular, management of forest vegetation should provide for resistance to windthrow, fire, and insects and disease. Although these areas will be intensively managed, they will blend and harmonize with the surrounding environment. Rangeland vegetation will occur in a mix of seral stages but will predominantly be in mid seral to late seral stages of development. Livestock will not usually be present within developed recreation sites, but may be visible nearby.

Opportunities to view wildlife will be encouraged but may be limited to those species that are common and/or accustomed to the presence of people. Habitat for sensitive species may be enhanced where opportunities exist, but the focus will be on protection and maintenance.

These areas will be characterized by easy access and will be capable of sustaining a relatively high number of recreationists. Opportunities for solitude will be limited due to frequent contact with other users. Picnic tables, fire grates, toilet buildings, and camping sites will be visible. Access to and parking for sites, natural attractions, water features, or areas that provide desired recreation opportunities would be provided. Directional and regulatory signs will be widely used to identify activities and requirements for use of the area. Roads and recreation sites may be paved. Facilities will meet the intent of Forest Service Outdoor Recreation Accessibility Guidelines and the associated standards for accessibility.

## MANAGEMENT AREA INFORMATION

### MANAGEMENT AREA PRESCRIPTIONS

#### Standards and Guidelines

##### Fire and Fuels

- Guideline 1. Use direct control as the wildland fire management strategy.

##### Infrastructure

- Guideline 1. Only allow operation of licensed vehicles in developed campgrounds.

##### Integrated Pest Management

- Standard 1. Focus pest management activities and methods on enhancing or protecting site vegetation and facilities.

##### Minerals

- Standards 1. Withdraw areas from entry for locatable minerals.  
2. Allow oil and gas leasing; however, no ground-disturbing activities are permitted.  
3. Prohibit removal of mineral materials.

##### Recreation

- Guidelines 1. Manage for an ROS class of Roaded Natural or Rural in summer. Manage for an ROS class of Rural, Roaded Natural, Semi-Primitive Motorized, or Semi-Primitive Non-Motorized in winter, as mapped.  
2. Construct, reconstruct, and maintain developed sites in accordance with the Recreation Opportunity Spectrum (ROS) classification established for the immediate area.  
3. Locate, develop, and manage recreation sites to protect natural resources.  
4. Discourage dispersed camping within ¼-mile of developed campgrounds.  
5. Use fencing to exclude grazing from developed recreation sites.

##### Scenery

- Guideline 1. Meet the scenic integrity objective of Low.

## MANAGEMENT AREA INFORMATION

### MANAGEMENT AREA PRESCRIPTIONS

#### Vegetation

- Standard 1. Use only those vegetation management practices necessary to meet specific resource objectives other than wood production. Timber harvest is not scheduled and does not contribute to the allowable sale quantity.

#### Wildlife

- Guidelines 1. Encourage habitat improvement projects, which will increase opportunities for viewing wildlife, habitat management, and fishing.
2. Provide opportunities to educate visitors and interpret wildlife habitat, cultural resources, and biotic communities.

# APPENDIX B

## GEOGRAPHIC AREA INFORMATION

## GEOGRAPHIC AREA INFORMATION

### GEOGRAPHIC AREAS

#### **Pole Mountain Geographic Area**

This geographic area is an isolated parcel of NFS land located approximately 20 miles southeast of Laramie on the Laramie District. Pole Mountain encompasses roughly 55,584 acres of broad rolling hills, which are dissected by drainages running in an east-west direction. The area includes 369 acres of private land, no state land, and 55,215 acres of National Forest land. Grasses and shrubs are the dominant vegetation (61%). Lodgepole and ponderosa pine make up 11% and 16% of the vegetation, respectively; there is also aspen (7%), and minor amounts of limber pine. Willow, aspen, sedges, and rushes dominate riparian vegetation. Within the forested area, 12% is considered late successional.

Major drainages include Lodgepole and Crow Creeks. Widespread beaver dams create abundant pools in all drainages. Beaver ponds at the lower elevations are heavily fished in the spring and summer, as they are the first to thaw on the District. Water quality is generally good. Middle Crow Creek is augmented with water from the Douglas Creek drainage (Snowy Range) and provides municipal water supply for the City of Cheyenne.

Current elk and antelope populations are above herd unit objectives, while the mule deer population is at the herd unit objective. Eastern and western boundaries of the area are considered mule deer winter range and the western and northern boundaries are elk winter range, including crucial winter range. The southwest boundary area is antelope crucial winter range. There are also elk calving areas within this area. Cliff and rock formations provide excellent habitat for raptors, including prairie falcons. Preble's meadow jumping mice have been trapped in eastern watersheds of the Pole Mountain area including branches of Lodgepole Creek and Crow Creek.

This area is of great importance to both local and out-of-state recreationists. Its proximity to Laramie, Cheyenne, and Interstate 80 makes it a convenient, popular recreation destination. There are five developed campgrounds, three developed picnic grounds, and one major visitor center. There are also numerous dispersed campsites located along or near the end of the many two-track roads that cover virtually the entire area. Technical rock climbing is very popular in the Vedauwoo and Blair areas and is known regionally as one of the best places to climb. Fishing is a common activity in the many streams and beaver ponds that cover the area. Big game hunting is also popular.

Summer trail use is also very popular for mountain bikers, hikers and, to a lesser degree, equestrians. The elevation and climate allow this area to open much sooner than areas on the main part of the Forest, so it is common to see people using the trails for summer recreation as early as April. Cross-country skiing is very popular at Tie City and Happy Jack with a series of trails that are groomed and maintained by local volunteers known as the Medicine Bow Nordic Association.

# GEOGRAPHIC AREA INFORMATION

## GEOGRAPHIC AREAS

There is widespread evidence of historic use in the area. The majority of the hundreds of cultural sites fall into seven historic themes: American Indian, fur trapping and early exploration, logging, mining, historic sites, grazing and ranching, and military facilities. Outstanding sites include American Indian sites, the Lodgepole Trail, and various military facilities.

Unique areas and features include the following:

- ◆ Open shortgrass prairie with large rock outcrops.
- ◆ Headquarters Trail.
- ◆ Middle Crow Creek provides municipal water supply for the City of Cheyenne.

**Management Area Prescription Allocation** – The management area prescriptions applied to the Pole Mountain Geographic Area are listed in the following table.

Table 3-11. Pole Mountain management area prescriptions.

#	MA Prescription	Acres	Percent of Total Area
1.31	Backcountry Recreation, Year-round Nonmotorized	8,981	16
4.3	Dispersed Recreation	14,637	27
5.12	General Forest and Rangelands, Rangeland Vegetation Emphasis	14,120	26
5.41	Deer and Elk Winter Range	16,661	30
8.21	Developed Recreation	747	1
8.6	Administrative Sites	69	<1
	Nonfederal land	369	1
	Total	55,584	100

Source: GIS (ARC/Info), allocation and geographic area layers

### Geographic Area Desired Condition

Grasses and shrubs will continue to be the dominant cover type, with lodgepole and ponderosa pine intermixed. Rangeland vegetation is in good condition with a mix of seral stages present.

Dispersed motorized recreation opportunities will dominate this area, with backcountry nonmotorized opportunities occurring on 16% of the area. The area will continue to be an important and highly used recreational area on the Forest. Fewer low standard roads will be present.

Current developed recreation facilities will be maintained and improved.

The Middle Crow Creek watershed will continue to be managed under multiple-use prescriptions that protect or improve the quality of municipal water for the City of Cheyenne.

# GEOGRAPHIC AREA INFORMATION

## GEOGRAPHIC AREAS

### Geographic Area Objectives, Strategies, Standards, and Guidelines

#### Objectives:

1. Complete a master trail management plan for the Pole Mountain area within the next five years.
2. Reduce unauthorized off route use within the Pole Mountain Geographic Area.
3. Ensure multiple use management of the Middle Crow Creek watershed is compatible with protection of domestic water supply needs.

#### Strategies:

1. Work with partners (Corp of Engineers, State, EPA etc.) to dispose of military ordnance that pose safety risks to the public.
2. Construct and/or improve trailheads to access the Headquarters National Recreation Trail.

#### Guideline:

1. Adhere to agreements in the Memorandum of Agreement between the Forest Service and Natural Resources Conservation Service for the Hydrometeorological Data Collection Sites shown in the table below:

Table 3-12. Hydrometeorological data collection sites.

Site Name	Station #	Elevation	Township	Range	Section
Pole Mountain	05H01	8395	15N	72W	23
Crow Creek	N/A*	8280	14N	71W	5

\* Site number not available at this time