

## Appendix B: Design Criteria Common to All Alternatives

Resources and their corresponding design criteria are listed below. Effects analysis was conducted presuming the implementation of these design criteria.

### Botanical Resources Damage Protection

Design criteria must be developed for the following routes to avoid damage to R2 sensitive plant species, Forest plant species of local concern, M.A. 3.1 Botanical Areas, and riparian/wetland/fen areas.

**Table B-1. Routes requiring design criteria**

Species	Occurrence	Route Number	Alt B	Alt C	Alt D
<b>Routes to be designed, removed, or rerouted to avoid impacts to R2 sensitive species</b>					
<b>Bearlodge RD</b>					
<i>Botrychium campestre</i>	BOCA5-8	872.3		X	
<i>Botrychium lineare</i>	BOLI7-1	864.1 (outside Dugout Gulch Botanical Area)	X	X	
<i>Carex alopecoidea</i>	CAAL8-12	U71002	X		
	CAAL8-31	841.1L	X	X	
<i>Cypripedium parviflorum</i>	CYPA19-10	863.2C	X	X	
<i>Viburnum opulus var. americanum</i>	VIOPA2-2, VIOPA2-16	864.1 (in Dugout Gulch Botanical Area)	X	X	
	03DUG3A, 94S460B	U650017	X	X	
<b>Northern Hills RD</b>					
<i>Carex alopecoidea</i>	CAAL8-22	U710024		X	
<i>Cypripedium parviflorum</i>	950070B	U080045	X	X	X
<i>Platanthera orbiculata</i>	01G040	CZ0418, U010076	X	X	
	PLOR4-18	U010071	X	X	
<i>Sanguinaria canadensis</i>	SACA13-2	567.1F	X	X	X
	SACA13-2	172.1A	X	X	X
<i>Viburnum opulus var. americanum</i>	VIOPA2-4	U080156	X	X	
	980010	CZ4846	X	X	
<b>Mystic RD</b>					
<i>Cypripedium parviflorum</i>	CYPA19-2	CZ1790	X	X	X
<b>Routes requiring design criteria to avoid impacts to Black Hills NF plant SOLC</b>					
<b>Mystic RD</b>					
<i>Gentiana affinis</i>	07M008A	CZ4927		X	
<b>Hell Canyon RD</b>					
<i>Gentiana affinis</i>	GEAF-4	HC9	X	X	
	07B040A	CZ3526	X	X	
	07B042	HC1	X	X	
<b>Routes requiring design criteria to avoid impacts to M.A. 3.1 Botanical Areas</b>					
<b>Bearlodge RD</b>					
Dugout Gulch Botanical Area		864.1C	X	X	
		864.1	X	X	
		864.1A	X		
<b>Routes requiring design criteria to avoid impacts to fens</b>					
<b>Mystic RD</b>					
South Fork Castle Creek fen		385.1A	X	X	X
Newton Fork fen		304.1L	X	X	X

## Cultural Resources

Design Criteria for Cultural Resources are based on established cultural resource protection protocols, and guidance provided in the *USDA FS Policy for NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use* prepared by the FS in consultation with the Advisory Council on Historic Preservation. According to this policy, only certain travel management proposals are to be considered as undertakings with the potential to affect historic properties. Accordingly, only properties located in the area of potential effects for the following types of proposals require design criteria.

1. The construction of a new road or trail.
2. The authorization of motor vehicle use on a route currently closed to vehicles.
3. The formal recognition of a user-developed (unauthorized) route as a designated route open to motor vehicles.
4. Closing a route currently open to motorized use. (For this decision no proposed road closures would be implemented on the ground. Any road proposed for closure would not be designated as open to motorized travel on the map. There would be no ground disturbance and therefore no potential to effect historic properties. If physical closures such as gates or berms are proposed in the future, the districts would determine how the road would be closed and consultation would be handled with a separate 106 report.)
5. The area of potential effects not only includes the route corridor itself, but also the area adjacent to the route designated for motorized dispersed camping and motorized game retrieval.

Unless otherwise recommended by cultural resources specialists in consultation with affected State Historic Preservation Offices (SHPOs) and Tribes, the following Design Criteria apply to all sites within the area of potential effect as defined in items 1-5 above:

- Geotextile fabric and a layer of crushed rock will be applied to all routes described in items 1-4 above where there is the potential to disturb cultural properties.
- All cultural properties located on 10 percent slopes or less within designated dispersed motorized camping areas will be monitored annually for a period of 3 years after the decision is implemented.
- All cultural properties located on 30 percent slopes or less within designated motorized game retrieval areas will be monitored annually for a period of 3 years after the decision is implemented.
- Sites determined to be threatened or adversely impacted by dispersed motorized camping or dispersed motorized game retrieval may require additional site protection measures. These site protection measures may include modifying routes to avoid the resources, increasing monitoring or law enforcement, area closures, constructing barriers, concealing sites, various forms of surface hardening treatments, and interpreting resources.

Existing, formally established system (classified) roads and trails including up to a 300-foot game retrieval and dispersed camping corridor, already open to motor vehicle travel, generally need not be re-evaluated for purposes of this rule. Their designation on a MVUM would not generally be considered an undertaking for the purposes of NHPA and not subject to Section 106 review.

If, during the course of any ground disturbance related to this project, any bones, artifacts, foundations, or other indications of past human occupation of the area were discovered, work would stop and a Forest or District archaeologist would be contacted. The archaeologist would determine if additional consultation with the SHPO and applicable Native American Tribes would be required before work continued.

## Hydrology and Fisheries

### Road/Trail Drainage within the Water Influence Zone (WIZ)

- Provide adequate road and trail cross drainage to reduce erosion (Guideline 9202e) by installing waterbars/rolling dips within the WIZ using the following as a guide:

Spacing for Water Bars	
Road or Trail Grade (%)	Spacing Between Waterbars (Feet)
2	250
5	135
10	80
15	60
20	45
<i>Source: SD State University et al. (2003)</i>	

- One waterbar/rolling dip should be installed as close to the stream crossing as possible (on both sides) to redirect concentrated water off the trail and allow for filtration of concentrated water before entering the stream to disconnect the pollutant sources (sediment).
- The waterbars/rolling dips just before the stream crossing should be hardened with gravel to maintain function.
- If there is no opportunity to drain waterbars/rolling dips, small sediment basins should be used to maintain the above water bar/rolling dip spacing.

### Stream Crossings

- Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life (Standard 1203). (No native material crossings, gravel or large gravel rocks should be used because these do not protect the stream bottom and banks. They allow sediment to be generated during the crossing of each vehicle.)
  - Perennial stream crossings on the following routes should be armored or remediated as soon as practicable in this order of priority, if designated on the MVUM. Prioritization is based on level of use, degree of impact, and aquatic resource value.

Route	Stream Crossing	Alt B	Alt C	Alt D	District
CZ-4895	Rapid Creek		x		Mystic
CZ-3050	South Fork Castle Creek	x	x	x	Mystic
CZ-3462	Heely Creek	x	x	x	Mystic
CZ-3464	Heely Creek	x	x	x	Mystic
CZ-0886	Heely Creek	x	x		Mystic
MY84	Heely Creek	x	x	x	Mystic
U230014	Tributary – Ditch Creek	x	x	x	Mystic
CZ-4927	Castle Creek		x		Mystic
U120146	Gimlet Creek	x	x		Northern Hills
CZ-4846	Gimlet Creek	x	x		Northern Hills
MY3	Gimlet Creek	x	x	x	Northern Hills
MY66	Spring Creek	x			Mystic
MY50	Horse Creek	x			Mystic

- Design options for mitigation. (The goal is to protect the stream bottom and banks to prevent sediment from entering the stream or being mobilized when vehicles cross and to prevent widening of the stream.)

- Bridge
  - Cattle guard (bridge)
  - Arch/half round culvert (width is at least bankfull width)
  - Concrete rails/mats (buried so top of rails/mats is at the stream bed elevation)
  - Culvert (diameter or width is at least bankfull width and buried so stream substrate is in the bottom of the culvert)
  - Other material may be used as it becomes available as long as it meets the goal to prevent sediment and stream widening
- Generally, the road/trail grade to the crossing will be less than 5 percent.
  - Minimize fill in floodplains to facilitate crossings to allow flood flows to pass with minimal interruption.
  - Perennial stream crossings on the following routes should be monitored annually for the first 3 years if designated on the MVUM to determine if unacceptable resource damage is occurring to streambanks and riparian vegetation. If so, the streambanks should be mitigated at a designated crossing location per the options identified above.

Route	Stream Crossing	Alt B	Alt C	Alt D	District
CZ-4829	Elk Creek	x	x		Northern Hills
CZ-4859	Jim Creek	x	x		Northern Hills
CZ-4878	Prairie Creek		x		Mystic
CZ-4889	Tributary – Spring Crk		x		Mystic
CZ-4889	Victoria Creek	x	x	x	Mystic
CZ-4895	Prairie Creek		x		Mystic
CZ-4910	Estes Creek	x	x		Northern Hills
CZ-4927	Slate Creek		x		Mystic
CZ-4928	Newton Fork Creek		x		Mystic
U270093	Tepee Gulch	x	x		Mystic

### Closing Roads

- When possible and circumstances permit, road/stream crossings on perennial and intermittent streams on closed roads will have the crossing rehabilitated by restoring the natural shape (**including stream width**) to allow natural flows at all stages by pulling culverts and by removing any fill placed in the floodplain.

### Fish Spawning Protection

- The following design criteria should apply for instream construction activities to install, repair or remove road/trail crossings on perennial streams to meet the R2 Watershed Conservation Practices Management Measure 3; Design Criteria (c) to keep heavy equipment out of streams during fish spawning, incubation, and emergence periods.
  - In all South Dakota streams classified as cold water streams, when water flow is present, the discharge of dredged or fill material shall not take place between October 15 and April 1.
  - In Wyoming, the period and timing of in-water construction should be adjusted as necessary to avoid conflicts with brown or brook trout spawning from September 15 through November 30.

### Wet Areas/Wetland Areas

- Areas not connected to streams that are wet and have riparian/wetland vegetation will be avoided and runoff from the roads/trail will not be drained into these areas.
- Avoid creating elevated road/trails through wetlands which disrupt the flow of water through the wetland.

### Trailheads

- Do not locate or expand trailheads in the WIZ (a minimum 100 feet buffer from waterbodies).

### Game Retrieval and Road Egress

- Prohibit land vehicles from entering perennial streams where resource damage would occur except to cross at specified points (Guideline 9107).
- Vehicular traffic, except for snowmobiles, will be restricted to roads and trails in riparian areas (Guideline 9108).
- Walk-in fisheries are closed to motorized travel (Guideline 9109).

### Dispersed Camping

- Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain (Guideline 5301).

### Lands

Prior to implementing any of these alternatives, a study should be conducted to analyze the following effects of limiting access to public lands: (1) effects of reduced access to private land (across public land) and how this would increase the need for special use permits, (2) effects of reduced access to private land and its potential impact on adjoining property values by restricting development and possibly changing the use of adjoining private land from recreational to residential, and (3) effects of reduced access on small businesses such as campgrounds which rely on motorized access to public land as one of their forms of recreation.

An implementation schedule for any of these alternatives should be established, utilizing a phased-in approach. The implementation schedule should be initiated in one or two of the most problematic areas, allowing the Forest to assess the impacts to public and private programs and entities that may be affected. The assessments could then be utilized to plan further implementation of travel management alternatives.

Language in the Travel Management Plan should clearly identify the rights of access for all motorized activities including administrative use.

### Minerals

The Travel Management Plan should contain language that clearly states the rights of the public to access Forest lands for prospecting and mining. The Travel Management Plan should clearly inform FS decision makers that travel management regulations and the MVUM cannot unreasonably restrict the rights of prospectors and miners. The following statements must be included in the Travel Management Plan:

- Prospectors and miners have a statutory right, not mere privilege, under the mining laws to go upon and use the open public domain lands of the NFS for the purposes of mineral exploration, development and production. Exercise of that right may not be unreasonably restricted (*39 Federal Register*, 31317).

- The right of reasonable access for purposes of prospecting, locating, and mining is provided by statute. Such access must be in accordance with the rules and regulations of the FS. However, the rules and regulations may not be applied so as to prevent lawful mineral activities or to cause undue hardship on bona fide prospectors and miners (Forest Service Manual 2800, Section 2813.4)

**Range and Weeds**

- Any road closures that install impassable physical barriers, such as large rocks or earthen berms that could restrict administrative access, should be done on a site-specific basis with interdisciplinary input.
- Any new road or trail that crosses a fence would have gates or cattle guards installed (consider self-closing gates on trails).

**Wildlife**

- The Powerline Trailhead (Alternatives B, C, and D) would be closed seasonally or otherwise designed with barricades placed at the proposed trailhead or otherwise designed to continue to limit parking to one or two vehicles with trailers, before being added to the MVUM, to be consistent with Forest Plan Standard 3111.
- The following routes or a portion of these routes would be closed seasonally from April 1 to August 15 to protect nesting goshawks, for the alternatives indicated.

**Table B-2. Routes closed seasonally (April 1–August 15) to protect nesting goshawks**

Route Number	Alternative B	Alternative C	Alternative D
<b>Bearlodge RD</b>			
832.1		X	
830.3		X	
830.1B	X		
U680017	X		
U680015	X	X	
U680078		X	
863.3G		X	
U720011		X	
805.3O		X	
875.2B		X	
875.2A		X	
875.2F		X	
806.2A	X	X	
875.1C	X	X	
875.1A	X	X	
U710120	X	X	
875.2D		X	
875.2F		X	
806.2E	X	X	
806.2F		X	
806.2B		X	
806.2G		X	

Route Number	Alternative B	Alternative C	Alternative D
<b>Northern Hills RD</b>			
733.3E	X	X	
733.3D	X	X	
733.3A	X	X	
733.3C	X	X	
CZ-3569	X		
U120121	X	X	
U120124	X	X	
U120148	X	X	
U130161	X	X	
<b>Mystic RD</b>			
CZ-4887		X	
159.1B	X	X	X
159.1C	X	X	X
CZ-4878		X	
389.1K	X	X	
423	X	X	X
304.1H	X	X	X
304.1F	X	X	X