

The Wilderness Society • High Country Conservation Advocates • Great Old Broads for Wilderness • West Slope Conservation Center • Colorado Mountain Club • Western Colorado Congress • Sheep Mountain Alliance • Conservation Colorado • Ridgway Ouray Community Council • Western Environmental Law Center • Defenders of Wildlife • Rocky Mountain Wild

Forest Planning Team  
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December 8, 2017

Dear GMUG Planning Team,

Please accept these comments from The Wilderness Society, High Country Conservation Advocates, Great Old Broads for Wilderness, West Slope Conservation Center, Colorado Mountain Club, Western Colorado Congress, Sheep Mountain Alliance, Conservation Colorado, Ridgway Ouray Community Council, Western Environmental Law Center, Defenders of Wildlife, and Rocky Mountain Wild on the Draft Assessment Report for the Grand Mesa-Uncompahgre-Gunnison (GMUG) National Forest (NF). These comments address the designated areas and infrastructure chapters, and build upon the information we submitted in our January 17, 2017 comment letter for consideration and incorporation in the assessment phase of the plan revision.

I. Infrastructure

Overall, the infrastructure chapter addresses the relevant issues. We offer the following comments specific to roads and trails.

**1. Chapter 1, Introduction**

Key Issues, Page 1. The report states that the key issues related to infrastructure within the plan area are “prioritizing maintenance needs for forest facilities and roads in light of significant deferred maintenance and limited funding, infrastructure resiliency to extreme weather events...” While we agree that the GMUG will need to develop a strategy for prioritizing maintenance, the key issue is chronic underfunding and system decay. Prioritizing maintenance is a strategy for addressing this key issue. We therefore recommend rewording this sentence to say:

“Key issues related to infrastructure with the plan area are chronic underfunding leading to under-maintained infrastructure, infrastructure resiliency to extreme weather events,...” We would also recommend adding a sentence that says, “under-maintained infrastructure leads to decay and loss of roads and damage to adjacent resources.”

**2. Chapter 2, Conditions and Trends**

Fiscal information. The draft report states that the GMUG NF spends about one million dollars annually on road maintenance and has a \$49 million maintenance backlog (page 5). The report should explain the significance of these numbers. How much does the GMUG NF need to maintain its roads to standard? What is the consequence of the annual and long-term shortfall on road system condition and utility, and

adjacent resources? How many roads are operating below their assigned road objective level because of the fiscal shortfalls? This information is necessary to guide future road system direction and management in the context of other forest funding priorities and develop a need for change statement. See pages 40-41 of our January 17, 2017 letter.

Resiliency to new storm patterns. We thank you for identifying this as a key issue. If studies, reports, or other information exists that sheds light on the current capacity of the GMUG road system to withstand anticipated future storm patters, please include it in the assessment report. Having this information will help guide infrastructure management and priorities over the next 20 years. If information does not exist, the assessment report should identify this as an information gap.

Road use. It would be helpful to provide information on the use of Forest Service roads. Specifically, it would be useful to know the purpose (e.g., recreation, commercial transport, timber operations) for vehicle miles traveled for each maintenance level. This information is important for establishing road management direction and priorities over the next 20 years.

Roads in Colorado Roadless Areas. It would be helpful if the assessment report provided information on the number and type of roads currently located in upper and lower tier Roadless Areas. This information is necessary to guide road management direction and priorities over the life of the plan, as well as guide ecosystem restoration direction and priorities.

### **3. Chapter 3, Sustainability**

Watershed health and roads. The assessment report provides information on the number of stream crossings in the plan area and the percent of road miles within 100 and 300 feet of a stream, and states that this infrastructure is particularly vulnerable to more extreme storm events anticipated under future climate scenarios (draft Infrastructure report at 10-11). The report should also cite existing Forest Service Watershed Condition Framework data, as suggested in our January 17, 2017 report at page 46. The Watershed Condition Framework characterizes the health of forest watersheds into three Classes -- Class 1: Properly Functioning, Class 2: Functioning at Risk, or Class 3: Impaired, based on a set of twelve condition indicators. Indicator #6 is the condition of forest roads and trails and provides an important measure of the effects of the transportation system on the ecological integrity of aquatic systems. The indicator is based on four roads- and trails-related attributes: open road density; road maintenance; proximity to water; and mass wasting. The map attached as Figure 1 depicts those conditions on the GMUG National Forest.<sup>1</sup> The map shows that just over half (51%) of the forest's watersheds are in fair condition/functioning at risk as a result of transportation infrastructure. Only about 43% of watersheds are functioning properly, while about 6% of watersheds are in poor condition as a result of roads and trails.

While road density information is incorporated into the Watershed Condition Framework indicator #6, understanding the spatial distribution of road density in and of itself is important. It is an important indicator of watershed and wildlife habitat condition.<sup>2</sup> The assessment report should describe road densities throughout the forest and identify where they exceed accepted ecological thresholds. This information is necessary to guide road management direction and priorities over the life of the plan. See

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<sup>1</sup> The relevant data can be found at [http://www.fs.fed.us/publications/watershed/excel\\_WCC\\_attribute\\_info.xlsx](http://www.fs.fed.us/publications/watershed/excel_WCC_attribute_info.xlsx).

<sup>2</sup> See GMUG National Forest, *Final Travel Analysis Report*, at 5-6 (September 30, 2015 ("GMUG TAP")). See our January 17, 2017 letter at 46.

the discussion on ecological thresholds for road density on pages 7-9 of Appendix 4 of our January 17, 2017 letter.

Cross-reference to Other Chapters. Other chapters discuss the impact of roads on resources. It would be helpful to reference specific sections from other chapters that shed light on the sustainability of the road system. For example,

- Draft Assessment on Aquatics and Riparian Ecosystems. Pages 15-17 describe the impact of roads and trails on watershed condition, and show that most watersheds within aquatic ecosystems are functioning at risk from roads and trails, stating, “Of the anthropogenic stressors [to aquatic ecosystems] evaluated individually, roads and trails have the greatest impact by far.” Page 23 provides a concise summary of the impact of roads and trails on aquatic systems.
- Draft assessment on Terrestrial Ecosystems. Pages 14-15 describe the relative impact of roads and trails on terrestrial ecosystems.

#### **4. Chapter 4, Current Forest Plan and its Issues in the Broader Landscape**

The chapter identifies two needs for change related to the current road system (page 15):

- Consider updating management objectives related to annual minimum targets for construction/reconstruction. The revised forest plan needs to reflect current agency policy related to the Travel Management Rule (36 CFR 212) to maintain a minimum road system.
- Consider plan direction relative to locating, relocating or prioritizing the reinforcement of existing infrastructure vulnerable because of climate change. Is existing 100-year floodplain sufficient?

These are important and we thank you for identifying them. Given the clear direction in the Travel Management Rule to identify the necessary minimum road system needed and unneeded roads for decommissioning or conversion<sup>3</sup>, we recommend that you make the first bullet more explicit about this responsibility by modifying it as follows:

- Consider updating ~~management objectives~~ **plan components** related to annual minimum targets for construction/reconstruction/**decommissioning**. The revised forest plan needs to reflect current agency policy related to the Travel Management Rule (36 CFR 212) to **identify and** maintain a minimum road system.

And add this additional item:

- There is a need to identify and decommission (or convert to trails) unneeded roads. Roads should be prioritized using ecological and fiscal criteria.

## II. Designations

### **Chapter 1, Introduction**

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<sup>3</sup> 36 C.F.R. § 212.5(b)(1) and (2)

Key Issues. This section summarizes the key issues for existing designated areas but does not discuss key issues related to the “potential need and opportunity for additional designated areas.” Since evaluating “potential need and opportunity for additional designated areas” is a requirement of the planning rule<sup>4</sup>, it would make sense to raise relevant key issues relevant to that exploration. We therefore recommend that you add to this section the following language that reflects the public input detailed in pages 2-3:

Places with special values, purposes, or resources that are currently undesignated. Areas with wilderness characteristics and ecological importance may benefit from future designation. Existing Research Natural Areas may be insufficient to meet the purpose of the RNA system and may require supplementation. Places with unique resources or purpose that are not currently recognized may benefit from recognition and specific management direction to sustain the unique resources and values. Legislative and community driven land protection proposals to designate additional places in the GMUG exist.

Summary of Public Input. Overall, the summary seems comprehensive. The eighth bullet says:

“Consider expanding current designated areas or recommending new designated areas. Specific comments included: Identifying a specific area of research associated with the Rocky Mountain Biological Laboratory;”

We would ask that you modify this bullet to reflect the fact that we identified a number of places deserving designation in our January 17, 2017 letter. We recommend incorporating the following modified paragraph into the final report:

“Consider expanding current designated areas or recommending new designated areas. Specific comments included: Identifying a specific area of research associated with the Rocky Mountain Biological Laboratory; areas included in the San Juan Wilderness Legislation; areas identified by the GMUG in the draft 2007 land and resource management plan; and other areas identified in citizens proposals submitted for consideration during the previous plan revision process.”

## **Chapter 2. Conditions and Trends.**

Adjacent designated areas. This section should include a description of adjacent areas managed by other entities (e.g., BLM, Rio Grande National Forest, White River National Forest) that are designated or proposed for designation. This information is necessary to inform opportunities to improve landscape-scale connectivity and conservation. Figure 2, which we provided in our January 17, 2017 letter, is a map depicting the location of Colorado Roadless Areas (CRA) on the GMUG NF in relationship to CRAs on the adjacent/proximal national forests, adjacent/proximal BLM lands with wilderness characteristics, and designated and recommended wilderness areas.<sup>5</sup>

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<sup>4</sup> 36 C.F.R. § 219.6(b)

<sup>5</sup> Forest Service directives require inclusion in the wilderness inventory of unroaded acres that are contiguous to another forest’s or agency’s roadless or wilderness-quality lands. FSH 1909.12, ch. 70, § 71.21(2) (wilderness inventory to include areas of less than 5,000 acres that are “contiguous to an existing wilderness, primitive areas, administratively recommended wilderness, or wilderness inventories of other Federal ownership”). This holds true for roadless areas that straddle the GMUG boundary to BLM roadless lands, as well as to lands administered by another forest. For instance, the roadless lands administered by the GMUG and San Juan National Forests for the

Climate Change. The assessment should identify conditions and trends related to climate change.

Land Status Changes. Changes in on-the-ground conditions and land status (e.g., the acquisition of 37,000 acres of inholdings) since 1983 have resulted in a substantially different land base in specific locations such as along Hwy 550 (e.g., the Bear Creek area and Hayden Mountain Area). The assessment report should note this and that these changes potentially open up new opportunities to designate tracts with special values.

### **Chapter 3. Sustainability.**

In addition to the brief discussion of economic and social impacts of wilderness and other natural areas, we recommend that you provide information on the benefits of protected areas and roadless areas related to water quality and quantity, nature-based recreation, and species protection. We recommend inclusion of the following language:

*The best available scientific information documents the numerous ecological benefits and services provided by roadless and other undeveloped natural areas. These areas play a key role in conserving biodiversity (Loucks et al. 2003). They enhance the representation of different ecosystems, thereby preserving refugia for species (Dietz et al. 2015). They facilitate connectivity (Belote et al. 2016; Loucks et al. 2003). They provide high-quality or undisturbed water, soil, and air resources (Anderson et al. 2012; DellaSala et al. 2011). And they serve as ecological baselines to facilitate better understanding of our impacts to other landscapes and as reference areas for ecological restoration (Arcese and Sinclair 1997). Land management plans are required to provide for these and other ecological services. 36 C.F.R. §§ 219.8-219.9. In addition, undeveloped natural areas provide important social services, including unsurpassed recreational and scenic opportunities, and places to connect with nature and spirit.*

Information from this subsection should be cross-referenced and incorporated into the assessment of potential need and opportunity for additional designated areas and other relevant assessment report chapters (e.g., recreation, ecosystem services, ecological integrity).

**Chapter 5. Potential Need and Opportunity.** We thank you for providing a good overview of potential need and opportunity for additional designated areas. We offer the following comments on the section for your consideration.

Potential Research Natural Areas. The draft report explains that in 1993, the GMUG with the assistance of the Colorado Natural Heritage Program identified 12 high quality areas of cover types or plant associations, including those with especially unique or under-represented types with minimal conflicts with existing uses. In 2003, the GMUG then reviewed the 12 areas according to criteria in FSM 4063 and remapped them to remove portions that did not meet the criteria. In 2006, as part of a prior revision attempt, the GMUG carried forward only three of the 12 for consideration in the proposed plan. While this summary is helpful, we would benefit from additional information. Specifically, the draft report needs to explain if the inventory of potential research natural areas that is now decades old is outdated or still viable and why, especially now that climate change is a consideration; 2) and why only three of

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Columbine Lake/Lookout Peak area are less than 5,000 acres respectively. The entire area, however, exceeds 5,000 acres in size.

the 12 inventoried areas were carried forward into the proposed plan. The final report should also provide information on the nine areas that were not carried forward.

Representation of ecosystems in designated areas. Thank you for including a discussion of representation of ecosystems in protected areas. Conservation biologists have reached the conclusion that maintaining biodiversity is more likely when a certain minimum percentage of all naturally occurring ecosystems are rigorously protected. Dietz et al (2015) adopted the IUCN figure of 20% as a reasonable protection threshold.

The discussion on page 43 of the draft designations chapter states that 81% of alpine ecosystems are in designated areas and most ecosystems have about half of their area in designated areas (page 43). It refers to an analysis presented in the draft terrestrial ecosystems chapter that defined designated areas as wilderness areas, legislated areas, special interest area, research natural areas, and roadless areas. This analysis provides insight into the representation of ecosystems *that would occur* if the administratively designated areas (e.g., roadless areas) were rigorously protected – for instance, as wilderness. Colorado Roadless Areas do not enjoy permanent protection, and allow some intrusive management activities.

We recommend that the GMUG complement the representation analysis in the terrestrial ecosystem chapter with a second representation analysis that shows the current representation of ecosystems in permanently protected designations (e.g., wilderness and Congressionally designated areas like Roubideau). Together, the two analyses would nicely illustrate the gap between the current representation of ecosystems in protected areas and the potential representation of ecosystems if roadless areas were permanently protected. See Appendix 1 of our January 17, 2017 that provides this second analysis at both the forest and federal scales.

Known important roles for designated areas such as providing habitat or connectivity for species at risk. Designated areas have historically been viewed through a recreation lens. However, they can play a crucial role in maintaining biodiversity and connectivity, and protecting habitat of at-risk species, as discussed above in this letter and in our January 17, 2017 submission (pages 16-18). Scientists have understood that identifying and protecting species-rich, biodiversity hotspots, wildlife movement corridors, and other important habitat areas for years is essential for systematic species conservation planning, especially in the face of climate change (*see for guidance*: Margules and Pressey 2000; Loucks et al. 2003; Shriner et al. 2006; Noon et al. 2009; Carroll et al. 2010; Theobald et al. 2012; Dickson et al. 2014; Comer et al. 2015).

While we are pleased that the draft report acknowledges this concept and that more information is needed on this topic, we think that some information currently exists that should be incorporated into the final assessment report. This information will inform the identification of additional designated areas that would enhance biodiversity and protect key species strongholds (i.e., important habitat areas for federally protected species and Species of Conservation Concern that should be managed primarily for conservation because of the essential role these places play in contributing to at-risk species recovery and viability). The assessment should provide sufficient information to help illuminate the types of designations most appropriate to maintain or restore the ecological conditions in important places for species at risk. Below are a few examples of information sources that should be incorporated into the revised assessment.

- *The 2006 GMUG Comprehensive Assessment*. We were surprised to find that the GMUG’s 2006 Comprehensive Assessment Chapter 4 “Areas of Species Biodiversity Significance--Plants & Natural Communities of Concern,”<sup>6</sup> and also “Appendix A—Plant and Natural Communities at the Subregional Scale”<sup>7</sup> did not seem to provide a significant data source for the designations assessment. The documents provide inventories and maps of Colorado Natural Heritage Program (CNHP) Potential Conservation Areas (PCAs) on the forests as well as Conservation Sites identified by The Nature Conservancy.
- *Gunnison Basin, Gunnison sage-grouse habitat designations*. The GMUG, including parts of the Gunnison Basin, contain designated critical habitat<sup>8</sup> for the Gunnison sage-grouse, which is listed as threatened under the U.S. Endangered Species Act (ESA). Though the critical habitat designation provides some level of habitat protection via ESA Section 7(a)(2) consultation during project development. However, the GMUG should assess the opportunity to provide affirmative protective management prescriptions in a special Gunnison sage-grouse management area to help fulfill the planning rule’s requirement to contribute to the recovery of threatened and endangered species under 219.9(b)(1). The GMUG should also consider potential sage-grouse habitat restoration and recovery areas for inclusion in such a management area. The Gunnison Basin is also an Audubon Important Bird Area.<sup>9</sup>
- *Colorado Natural Heritage Program (CNHP) Potential Conservation Areas (PCA)*. CNHP PCAs<sup>10</sup> should be assessed as opportunities for special interest area designation or other management designations that ensure the protection of the species and natural communities that are found on these areas. There are 39 PCAs overlapping the forests with “very high biodiversity significance” and two of “outstanding biodiversity significance.” PCAs serve as a good starting point for evaluating opportunities to protect at risk species habitat, particularly rare and otherwise imperiled plants.
- *Colorado Parks and Wildlife (CPW) – Species Activity Data*. CPW’s Species Activity Data<sup>11</sup> GIS database includes species data for conservation planning such as bighorn sheep, elk, and mule deer migration corridors; Canada lynx potential habitat; nesting areas for at-risk birds; and distributions of several at-risk species. These datasets can help identify areas of importance for the GMUG to consider as designated areas.

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<sup>6</sup> GMUG 2006 Comprehensive Assessments.

<https://www.fs.usda.gov/detail/gmug/landmanagement/planning/?cid=fseprd502008>.

<sup>7</sup> [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd502045.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd502045.pdf).

<sup>8</sup> 79 Federal Register 69312. Final Rule. Designation of Critical Habitat for the Gunnison sage-grouse.

<https://www.gpo.gov/fdsys/pkg/FR-2014-11-20/pdf/2014-27113.pdf>.

<sup>9</sup> Audubon Society. Gunnison Basin Important Bird Area. <http://www.audubon.org/important-bird-areas/gunnison-basin>.

<sup>10</sup> Colorado Natural Heritage Program Potential Conservation Areas, Reports:

[http://www.cnhp.colostate.edu/download/gis/pca\\_reports.asp](http://www.cnhp.colostate.edu/download/gis/pca_reports.asp) and GIS data:

<http://www.cnhp.colostate.edu/download/gis.asp>.

<sup>11</sup> Colorado Parks and Wildlife – Species Activity Data:

<http://www.arcgis.com/home/group.html?id=0e6f9051b06146018038e9a929ab4910#overview>.

- *Colorado Parks and Wildlife, Canada Lynx Information.*<sup>12</sup> CPW has records, including movements information, from its Canada lynx reintroduction program.

## **Chapter 6. Potential Need for Plan Changes.**

Given the discussion of the potential need and opportunity for additional designated areas in this chapter of the assessment report and the planning rule's clear direction in §219.7(c)(2)(v) – (vii), we were surprised that this section does not include a need for change related to potential additional designations. To remedy this omission, we recommend the inclusion of the following need for change:

*There is a need to consider additional areas for designation including areas suitable for inclusion in the National Wilderness Preservation System, eligible wild and scenic rivers, and other places with special character or purpose to protect and connect highly deserving areas and resources, meet ecological needs for species, and enhance sustainable recreation opportunities.*

Thank you very much for considering these comments.

Sincerely,

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<sup>12</sup> Colorado Parks and Wildlife – Lynx Reintroduction Program: <http://cpw.state.co.us/learn/Pages/SOC-LynxResearch.aspx>.



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## Literature Cited

Anderson, H.M., C. Gaolach, J. Thomson, and G. Aplet. 2012. Watershed Health in Wilderness, Roadless, and Roaded Areas of the National Forest System. Wilderness Society Report. Available at <http://wilderness.org/resource/watershed-health-wilderness-roadless-and-roaded-areas-national-forest-system>.

Arcese P. and A.R.E. Sinclair. 1997. The Role of Protected Areas as Ecological Baselines. *The Journal of Wildlife Management*, 61(3): 587-602. Available at [http://www.jstor.org/stable/3802167?seq=8&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003242731#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/3802167?seq=8&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003242731#page_scan_tab_contents).

Belote, R. T., M. S. Dietz, B. H. McRae, D. M. Theobald, M. L. McClure, G. H. Irwin, P. S. McKinley, J. A. Gage, and G. H. Aplet. 2016. Identifying Corridors among Large Protected Areas in the United States. *PLoS ONE* 11:e0154223. Available at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154223>.

Carroll, C., J.R. Dunk, and A. Moilanen. 2010. Optimizing resiliency of reserve networks to climate change: multispecies conservation planning in the Pacific Northwest, USA, *Global Change Biology*. 16(3): 891-904. Available at <https://naldc.nal.usda.gov/download/40326/PDF>

Comer, P.J., R.L. Pressey, M.L. Hunter, C.A. Schloss, S.C. Buttrick, N.E. Heller, J.M. Tirpak, D.P. Faith, M.S. Cross and M.L. Shaffer. 2015. Incorporating geodiversity into conservation decisions. *Conservation biology*, 29(3): 692-701. Available at <https://pubag.nal.usda.gov/pubag/downloadPDF.xhtml?id=9199&content=PDF>

DellaSala, D., J. Karr, and D. Olson. 2011. Roadless areas and clean water. *Journal of Soil and Water Conservation*, 66(3): 78A-84A. Available at <http://www.jswconline.org/content/66/3/78A.full.pdf+html>.

Dickson, B.G., L.J. Zachmann, and C.M. Albano. 2014. Systematic identification of potential conservation priority areas on roadless Bureau of Land Management lands in the western United States. *Biological Conservation*, 178: 117-127. Available at <https://nau.pure.elsevier.com/en/publications/systematic-identification-of-potential-conservation-priority-area>.

Dietz, M.S., R.T. Belote, G.H. Aplet, & J.L. Aycrigg. 2015. The world's largest wilderness protection network after 50 years: An assessment of ecosystem representation in the U.S. National Wilderness Preservation System. *Biological Conservation*, 184: 431-438. Available at <http://www.sciencedirect.com/science/article/pii/S0006320715000944>

Loucks, C., N. Brown, A. Loucks, and K. Cesareo. 2003. USDA Forest Service Roadless areas: Potential Biodiversity Conservation Reserves. *Conservation Ecology* 7(2): 5. Available at <http://www.ecologyandsociety.org/vol7/iss2/art5/>.

Margules, C.R. and R.L. Pressey 2000. Systematic conservation planning. *Nature*, 405(6783): 243-253. Available at <http://www.montana.edu/hansenlab/documents/labreadings2011/margules00.pdf>

Mawdsley, J., R. O'Malley, and D.S. Ojima. 2009. A Review of Climate-Change Adaptation Strategies for Wildlife Management and Biodiversity Conservation. *Conservation Biology*, 23(5): 1080-1089. Available at <http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2009.01264.x/abstract>.

Noon, B.R., K.S. McKelvey, and B.G. Dickson. 2009. Multispecies conservation planning on US federal lands. *Models for Planning Wildlife Conservation in Large Landscapes*. Elsevier. pp. 51-83. Available at: <https://nau.pure.elsevier.com/en/publications/multispecies-conservation-planning-on-us-federal-lands>.

Shriner, S.A., K.R. Wilson, and C.H. Flather. 2006. Reserve networks based on richness hotspots and representation vary with scale. *Ecological Applications*, 16(5): 1660-1673. Available at <https://pubag.nal.usda.gov/pubag/downloadPDF.xhtml?id=9199&content=PDF>

Theobald, D.M., S.E. Reed, K. Fields, and M. Soule. 2012. Connecting natural landscapes using a landscape permeability model to prioritize conservation activities in the United States. *Conservation Letters*, 5(2): 123-133. Available at <http://onlinelibrary.wiley.com/doi/10.1111/j.1755-263X.2011.00218.x/full>

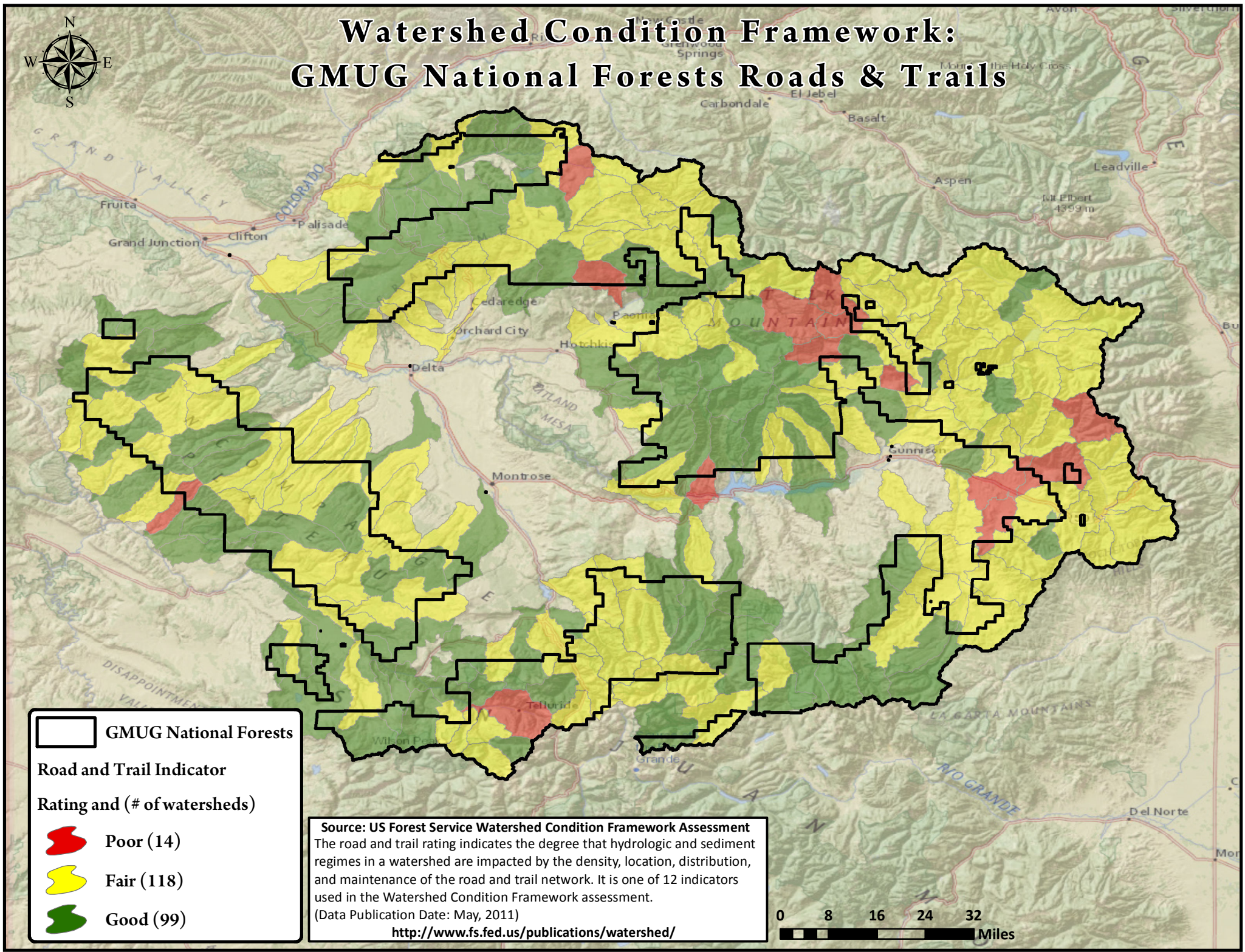
## Attachments


Figure 1: Watershed Condition Framework conditions related to roads and trails indicator.

Figure 2: Regional map showing GMUG roadless areas in relationship to roadless areas on the adjacent/proximal national forests, adjacent/proximal BLM lands with wilderness characteristics, and designated and recommended wilderness areas.






# Watershed Condition Framework: GMUG National Forests Roads & Trails



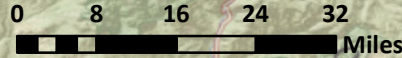
 GMUG National Forests

Road and Trail Indicator

Rating and (# of watersheds)

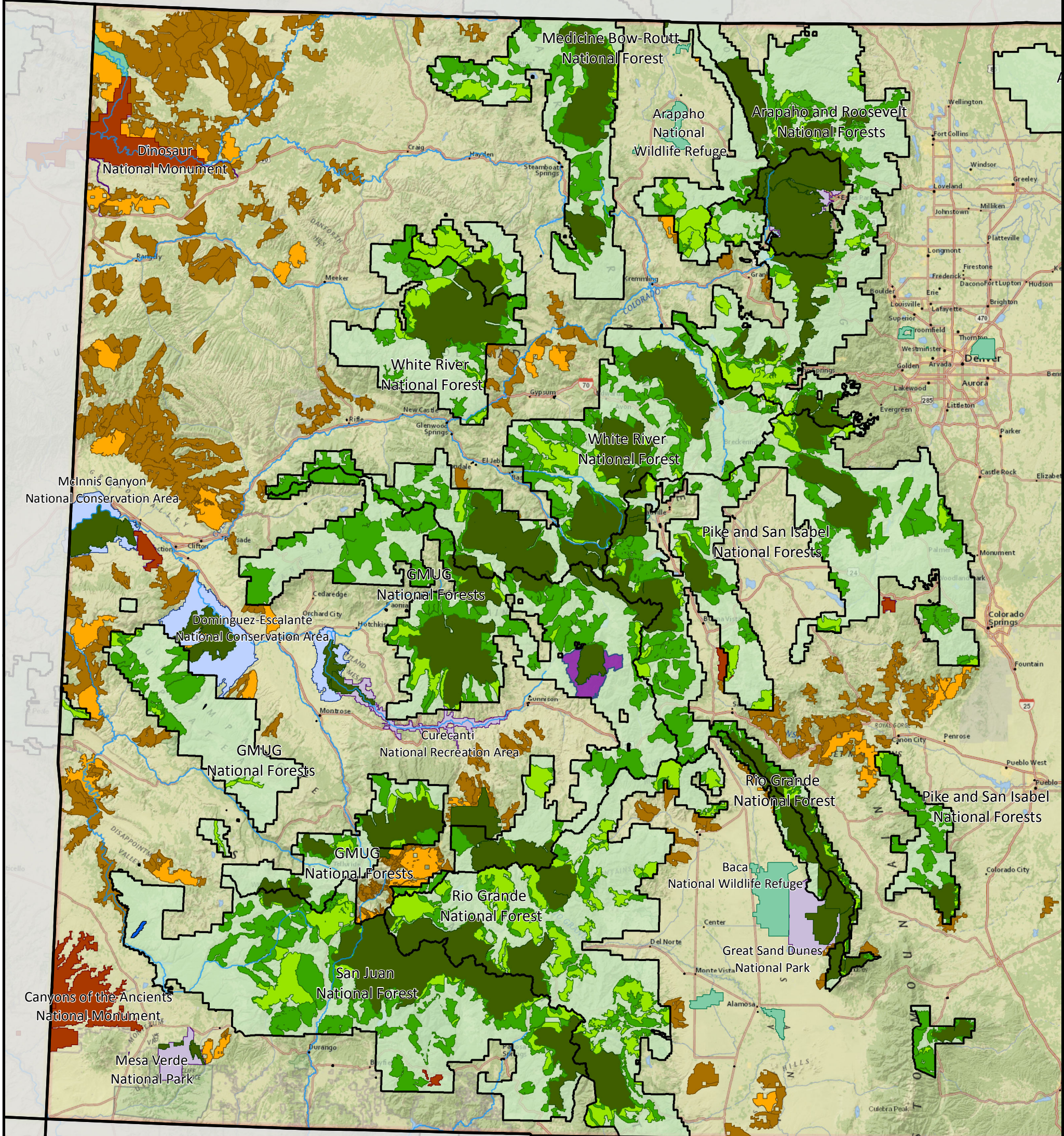
-  Poor (14)
-  Fair (118)
-  Good (99)













**Source: US Forest Service Watershed Condition Framework Assessment**  
 The road and trail rating indicates the degree that hydrologic and sediment regimes in a watershed are impacted by the density, location, distribution, and maintenance of the road and trail network. It is one of 12 indicators used in the Watershed Condition Framework assessment.  
 (Data Publication Date: May, 2011)  
<http://www.fs.fed.us/publications/watershed/>





# Designated and Inventoried Conservation Lands in Colorado



 Colorado Roadless Areas, Upper Tier	 BLM Wilderness Study Areas (WSAs)
 Colorado Roadless Areas	 Recreation Management Area (RMAs)
 Designated Wilderness	 Research Natural Areas
 National Wildlife Refuge (USFWS)	 National Park Service Lands
 National Monuments	 BLM National Conservation Areas (NCAs)
 BLM and citizen-inventoried lands with wilderness characteristics	 National Forests

