The Wilderness Society ● Defenders of Wildlife ● High Country Conservation Advocates ● Wilderness Workshop ● Rocky Mountain Wild ● Great Old Broads for Wilderness ● Western Colorado Congress ● Ridgway Ouray Community Council ● Sheep Mountain Alliance ● Quiet Use Coalition ● Conservation Colorado ● Rocky Smith

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The Wilderness Society, Defenders of Wildlife, High Country Conservation Advocates, Wilderness Workshop, Rocky Mountain Wild, Great Old Broads for Wilderness, Western Colorado Congress, Ridgway Ouray Community Council, Sheep Mountain Alliance, Quiet Use Coalition, Conservation Colorado and Rocky Smith are pleased to present the following comments for consideration and incorporation in the assessment phase of the Grand Mesa-Uncompahgre-Gunnison (GMUG) National Forest Land and Resource Management Plan revision.

The mission of The Wilderness Society (TWS) is to protect wilderness and inspire Americans to care for our wild places. The GMUG National Forest has long been a priority for TWS. Since its founding in 1935, TWS has worked closely with diverse interests who care about the future of our national forests. We provide scientific, legal, and policy guidance to land managers, communities, local conservation groups, and state and federal decision-makers aimed at ensuring the best management of our public lands. Our 700,000 members and supporters nationwide and, in particular, our more than 19,220 members and supporters in Colorado are deeply interested in forest planning as it pertains to the conservation, restoration, and protection of wildlands, wildlife, water, recreation, and the ability to enjoy public lands for inspiration and spiritual renewal.

Defenders of Wildlife (Defenders) is a national non-profit conservation organization founded in 1947 focused on conserving and restoring native species and the habitat upon which they depend. We submit the following on behalf of our 1,200,000 members and supporters nationwide, including more than 21,000 in Colorado.

High Country Conservation Advocates (HCCA) is located in Crested Butte, Colorado and has over 800 members. HCCA was founded in 1977 to protect the health and natural beauty of the land, rivers, and wildlife in and around Gunnison County now and for future generations. For 40 years HCCA has engaged on public lands issues. HCCA is a grassroots organization that collaborates with local stakeholders and policymakers, applies sound science, educates, and upholds the environmental laws affecting our community.

Wilderness Workshop is a place-based, grassroots non-profit public lands conservation organization working to protect the ecological integrity of the White River National Forest and adjacent public lands. WW was founded in 1967 and uses science, law, policy, public education and grassroots organizing to advance our Mission. Our 1000 members support our work to protect wildlife and wild places, for their sake and for our own.

Rocky Mountain Wild (RMW) is a non-profit environmental organization based in Denver, Colorado, that works to conserve and recover the native species and ecosystems of the Greater Southern Rockies using the best available science. RMW has a well-established history of participation in Forest Service planning and management activities. RMW works to save

endangered species and preserve landscapes and critical ecosystems. It achieves these goals by working with biologists and landowners, utilizing GIS technology to promote understanding of complex land-use issues, and monitoring government agencies whose actions affect endangered and threatened species. Its members and supporters include approximately 1200 outdoor enthusiasts, wildlife conservationists, scientists, and concerned citizens across the country. RMW's staff and members visit, recreate on, and use Forest Service lands impacted by this planning process.

Founded in 1989, Great Old Broads for Wilderness is a national grassroots organization, led by elders, that engages and inspires activism to preserve and protect wilderness and wild lands. Great Old Broads has 11 chapters (aka broadbands) in Colorado including Grand Junction and Ridgway. Members regularly hike and explore in the GMUG National Forest, and care deeply about its future.

Western Colorado Congress (WCC) is an alliance for community action empowering people to protect and enhance their quality of life in Western Colorado. We have been working for land conservation and the responsible use and development of our natural resources for 35 years. Our work is based in the local knowledge and experience of our members who live, work and play in western slope communities surrounded by public lands. WCC is here to empower their voices and concerns in regards to public land management.

The Ridgway Ouray Community Council (ROCC) is a nonprofit community organization of nearly 300 members whose mission is to build, nourish and protect the healthy spirit of our community. ROCC is dedicated to quality of life and environmental issues that will help safeguard and conserve the public lands in and around Ouray County. ROCC is a community group member of Western Colorado Congress.

Sheep Mountain Alliance (SMA) is a grassroots citizen organization dedicated to the conservation of the natural and human environment of Southwest Colorado and the Telluride region. SMA provides protection to and education about regional ecosystems, wildlife habitats, and watersheds, serving nearly 20,000 residents and visitors of the San Juan Mountains and the San Miguel and central Dolores River watersheds. Since its formation in 1988, Sheep Mountain Alliance has been the primary environmental voice for our region. Our community and 700+ members look to us to monitor, inform, and take action on urgent environmental issues from water quality to public lands protection that affect their lives and livelihoods.

The Quiet Use Coalition is a 20-year-old non-profit organization working to preserve and create quiet use areas on our public lands and waters, while protecting wildlife habitat and natural soundscapes. Our members are familiar with, and regularly enjoy and use, GMUG National Forest lands.

Conservation Colorado is a grassroots organization that educates and mobilizes people to protect Colorado's environment and quality of life. We focus on reducing dirty fossil fuels and increasing clean, renewable energy; solving the climate change crisis; preserving public lands,

clean air and water for everyone; and empowering citizens to engage in the democratic process. We collaborate on key environmental issues to find success at the state and federal levels.

Rocky Smith has been monitoring Colorado's national forests for 35 years. He participated in the development of the first management plan for the GMUG national forest, as well as a major amendment to it in 1990. He also reviews and provides input on various projects proposed for the GMUG. He hikes and backcountry skis on the GMUG when he can.

The 2012 National Forest System Land Management Planning Rule requires the Forest Service to provide opportunities for public participation in the development of the assessment, including the submission of existing information by the public.[1] The National FACA Committee for the implementation of the 2012 planning rule issued recommendations in late 2015 for improving the development of assessments and suggested that planning teams better address, incorporate, and respond to relevant information submitted by the public during the assessment phase.[2] This submission specifically addresses several of the topics the Forest Service is required to evaluate in a plan assessment:

(1) Distinctive role and contribution;

(2) Potential need and opportunity for additional designated areas;

(3) Transportation infrastructure; and

(4) Recreation.[3]

In addition to these topics, Defenders of Wildlife will in the coming days submit a complementary letter and supporting information addressing ecological integrity and wildlife.

While certainly not exhaustive, we believe the information contained in this letter and its appendices represents the best available scientific information, which the 2012 planning rule requires the agency to utilize.[4] We anticipate that the Forest Service will have significant

[1] 36 C.F.R. § 219.4(a) (generally requiring "opportunities to the public for participating in the assessment process"); *id.* § 219.6(a)(2) (agency must "[c]oordinate with or provide opportunities for . . . non-governmental parties[] and the public to provide existing information for the assessment").
[2] Planning Rule National Advisory Committee, *Recommendations on the Development of Assessments*, Recommendation # 4 (Dec. 1, 2015), *available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd489766.pdf.
[3] 36 C.F.R. § 219.6(b) enumerates fifteen categories for which "the responsible official shall identify and evaluate existing information relevant to the plan area." The categories most relevant to this submission include: "potential need and opportunity for additional designated areas," *id.* § 219.6(b)(15); "[i]nfrastructure, such as recreational facilities and transportation and utility corridors," *id.* § 219.6(b)(11); and "[r]ecreation settings, opportunities and access, and scenic character," *id.* § 219.6(b)(9).
[4] 36 C.F.R. § 219.3 (agency "shall use the best available scientific information to inform the planning process" and "shall document how [that] information was used to inform the assessment").

additional forest-specific information available and will also incorporate that information into the assessment.

The assessment is a very important part of the planning process because it determines the need for change in the plan and provides the information on which the revised plan components and other required content will be based. Thus it is very important to ensure adequate time for public review and comment. The Planning Directives provide the following direction for public participation in the development of the assessment:

> 1. The Interdisciplinary Team shall provide the following opportunities for public participation in the assessment:
>
> a. At the start of the assessment, inform the public about the scope and scale of the assessment and encourage participants to share their knowledge of existing forest conditions.
>
> b. During the development of the assessment, receive public input on specific elements of the assessment.
>
> c. Make the draft assessment report available for public review and feedback during a specified time period. Notification that the draft assessment report is available for review should state that the assessment report will continue to be available for public review throughout the planning process. …[5]

If a draft of the assessment is released all at once, it will likely be several hundred pages long. Please allow at least 60 days for public review and comment. An alternate way to ensure adequate public comment is to release the assessments of one to three of the 15 items required by 36 CFR 219.6(b) at a time, as the Rio Grande National Forest did, and allow 30 days or so for comment on each group of assessments.

We look forward to further discussing the information in this letter and working with you throughout the assessment and plan revision process. Please contact Vera Smith, Forest Planning and Policy Director for TWS at vera_smith@tws.org or 303-650-5942, or Matt Reed, Public Lands Director for HCCA at matt@hccacb.org or (303) 505-9917, with any questions.

[5] FSH 1909.12, section 42.11.

Table of Contents

I. Optimizing the Assessment

As a preliminary matter, we have some over-arching suggestions for optimizing the assessment to ensure it complies with the letter and intent of the 2012 planning rule and provides the information necessary for a successful plan revision. The assessment is designed to "rapidly evaluate existing information about relevant ecological, economic, and social conditions, trends, and sustainability and their relationship to the land management plan" and to provide the basis for the Forest Service's identification of the need to change existing plan direction.[6] To that end, the 2012 rule enumerates fifteen topics that the assessment must address.[7] For each of those topics, we suggest that the Forest Service develop a series of questions that the assessment will strive to answer.[8] We believe that question-and-answer approach will best assist the agency in evaluating the extent to which current plan direction satisfies the substantive requirements of the 2012 rule and other relevant law and policy. The National FACA Committee also suggested this approach as a good planning practice to enhance the utility, functionality, and applicability of assessment information.[9] This approach should also assist the agency in integrating its assessment across related topics. The following sections of this letter propose relevant questions for each of the topics addressed in detail.

After developing the questions, the Forest Service should identify existing studies, reports, proposals, and other information that may be relevant, determine which sources of information constitute the best available scientific information, and utilize that information to answer the questions. In doing so, the agency must "[d]ocument . . . how the best available scientific information was used to inform the assessment," including "[i]dentify[ing] what information was determined to be the best available scientific information, explain[ing] the basis for that determination, and explain[ing] how the information was applied to the issues considered."[10] In addition to recommending questions, this letter also strives to identify best available scientific information and apply it to answer the relevant questions.

II. Distinctive Role and Contribution

Under the 2012 planning rule, plans must "reflect[] the unit's expected distinctive roles and contributions to the local area, region, and Nation, and the roles for which the plan area is best suited, considering the Agency's mission, the unit's unique capabilities, and the resources and

[6] 36 C.F.R. § 219.5(a)(1) & (2)(i).
[7] 36 C.F.R. § 219.6(b).
[8] *See, e.g.*, Nantahala and Pisgah National Forests Assessment (Mar. 2014), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3793034.pdf (generally utilizing question and answer approach).
[9] Planning Rule National Advisory Committee, *Recommendations on the Development of Assessments*, Recommendation # 5.
[10] 36 C.F.R. §§ 219.3, 219.6(a)(3).

management of other lands in the vicinity."[11] The forest assessment is the logical place to identify the forest's current roles and contributions, based on existing information, to inform the plan revision process.[12] For example, the Flathead National Forest Assessment identified that forest's distinctive role as "the true heart of the Rocky Mountain ecosystem," providing large, interconnected blocks of wild habitat for carnivores and other wildlife species.[13] That assessment information then informed the draft plan, which identified the forest's nationally significant ecological role and contribution as "the heart of the Crown of the Continent Ecosystem, with a complex of wilderness and unroaded areas" that provide "one of the most intact assemblages of medium to large carnivores in the contiguous United States."[14] The GMUG National Forest is known locally, regionally, and nationally for its rugged and spectacular mountains, 14,000-foot peaks that attract mountaineers and sportsmen from around the world, and vast, accessible backcountry recreation opportunities. The GMUG bridges the Colorado Plateau and the Rocky Mountains, and, as the all-important fragile headwaters of the Gunnison River, provides snowmelt runoff to the arid and thirsty southwest United States. The spectacular natural features of the GMUG are nationally known: The Grand Mesa National Forest encompasses the largest flat-top mountain in the world, the Uncompahgre National Forest has some of the most renowned fall scenery in Colorado, and the Gunnison National Forest is home to seven designated wilderness areas that straddle the spine of the continent. Because the GMUG varies from 14,000-foot peaks to 5,800-foot canyon bottoms, it encompasses a diverse array of ecosystems and wildlife, from semi-desert shrub-lands to alpine meadows. In the face of climate change and increased human pressure, the GMUG provides a large, diverse, and healthy stronghold for wildlife, connecting ecologically varied habitats across the greater Southern Rockies.

As explained in more detail in the following sections, the GMUG's half million acres of existing wilderness, other vast roadless lands, and outstanding eligible wild and scenic rivers provide

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[11] 36 C.F.R. § 219.2(b)(1); *see also id.* § 219.7(f)(1)(ii) ("Every plan must . . . [d]escribe the plan area's distinctive roles and contributions within the broader landscape . . . .").

[12] Depending on the nature of those distinctive roles and contributions, this information would be consistent with any number of the required assessment topics, such as "[t]errestrial ecosystems, aquatic ecosystems, and watersheds," 36 C.F.R. § 219.6(b)(1), "[b]enefits people obtain from the NFS planning area," *id.* § 219.6(b)(7), "[m]ultiple uses and their contributions to local, regional, and national economies," *id.* § 219.6(b)(8), or "[e]xisting designated areas . . . and potential need and opportunity for additional designated areas," *id.* § 219.6(b)(15). For example, the final planning directives instruct that, in assessing the potential need and opportunity for additional designated areas, the forest should address "known important ecological roles such as providing habitat or connectivity for species at risk that could be supported by designation." Forest Service Handbook (FSH) 1909.12, ch. 10, § 14. And in assessing ecosystems' status and trends, the forest should consider "[h]ow the existing role or contributions of the plan area affects the key ecosystem characteristics or ecological functions (processes) relevant to the broader landscape." *Id.* § 12.14c.

[13] Flathead National Forest, Assessment, pt. 1, p. 3 (Apr. 2014), *available at* https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3796880.pdf.

[14] Flathead National Forest, Draft Revised Forest Plan, p. 10 (May 2016), *available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd502201.pdf. The distinctive roles and contributions section of the draft plan identifies numerous other ecological, social and economic, and cultural and historical resources that are unique attributes or benefits of local, regional, and/or national importance and contribute toward social, economic, and ecological sustainability. *Id.* pp. 9-13.

essential wildlife habitat and attracts hikers, hunters, anglers, skiers and others seeking an unspoiled backcountry recreation experience. The assessment should identify existing information relevant to the forest's distinctive backcountry recreation heritage, role, and contribution as an important ecological stronghold and source of drinking water.

III. Potential Need and Opportunity for Additional Designated Areas

The 2012 planning rule requires that an assessment evaluate "[e]xisting designated areas located in the plan area including wilderness and wild and scenic rivers ***and potential need and opportunity for additional designated areas***."[15] This evaluation is intended to inform the plan revision process, which in turn requires the Forest Service to determine whether to designate or recommend for designation any additional areas:

> The responsible official shall: . . . (v) Identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any such lands for wilderness designation. (vi) Identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System . . . . (vii) Identify existing designated areas other than [Wilderness and Wild and Scenic Rivers] and determine whether to recommend any additional areas for designation. If the responsible official has the delegated authority to designate a new area or modify an existing area, then the responsible official may designate such area when approving the . . . plan revision.[16]

To comply with this mandatory duty, it is critical that the assessment effectively evaluate the potential need and opportunity for additional designated areas. Unfortunately, some early assessments under the 2012 planning rule have failed to do so.[17] The best effort so far to comply with this requirement was done by the Rio Grande National Forest.[18] To effectively evaluate the

[15] 36 C.F.R. § 219.6(b)(15) (emphasis added).
[16] 36 C.F.R. § 219.7(c)(2)(v)-(vii). The 2012 rule defines "designated area" as "[a]n area or feature identified and managed to maintain its unique special character or purpose." *Id.* § 219.19. The definition further explains that "[s]ome categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch." *Id.* (listing examples of statutorily and administratively designated areas). See FSH 1909.12, Exhibit 14 01 for more detail on designation authority.
[17] *See, e.g.*, Final Sierra National Forest Assessment at 199-221, *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5444580.pdf (describing existing designated areas, including their "existing conditions and future trends" and "contribution[s] . . . to "ecological, social or economic sustainability," but not evaluating potential need and opportunity for *additional* designated areas); Sequoia National Forest Assessment at 201-219 (Dec. 2013), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5444840.pdf (same).
[18] See Rio Grande National Forest Assessment Report Chapter 15 available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd489288.pdf.

potential need and opportunity for additional designated areas, we recommend that the assessment identify and strive to answer the following questions:

A. What areas of the forest outside of designated wilderness have roadless character (both inventoried and un-inventoried)?
B. What ecosystem and habitat types exist across the forest, and what are their levels of protection within the forest and throughout the region? What types are least represented in designated areas?
C. What unique features, values, or resources exist across the forest – including but not limited to the examples listed below – and what is their current status of protection?
    - Botanical, geological, historical, cultural, paleontological, recreational, scenic, aquatic, or zoological resources
    - Climate refugia, migratory corridors, rivers and streams, and other features that enhance species protection and habitat connectivity
D. Has the forest conducted a systematic inventory of rivers eligible for inclusion in the National Wild and Scenic Rivers System, and, if so, are there changed circumstances that warrant additional review?
E. Do existing Research Natural Areas satisfy the objectives listed in Forest Service Manual 4063.02?
F. What are the socio-economic factors relevant to protecting national forest lands through conservation designations (e.g., recreation trends, public sentiment, etc.)?

This list of recommended questions is non-exclusive and is intended to focus the assessment on the relevant substantive and procedural requirements of the 2012 rule, the corresponding directives contained in Forest Service Handbook (FSH) 1909.12, and other federal laws and policies. Each of the questions is addressed in more detail below. Collectively, the answers to the questions, as informed by the best available science, demonstrate a potential need and opportunity for additional designated areas – including recommended wilderness and eligible wild and scenic rivers – on the GMUG National Forest. This need and opportunity is consistent with the forest's findings in its 2006 Comprehensive Evaluation Report (CER) that was developed prior to a planned (but never completed) land management plan revision. The Forest Service, in the CER section on roadless lands, found that the 1983 plan (as amended in 1991) did not "reflect the stakeholder support and public comment favoring retention and preservation of undeveloped areas. Ecological sustainability factors also support preservation of areas for wildlife and native species habitat value."[19]

A. What areas of the forest outside of designated wilderness have roadless character?

The GMUG National Forest currently has 556,641 acres of designated wilderness – or about 17% of the forest. Yet the forest also has significant unprotected and undeveloped acreage that may be suitable for additional protection through the forest planning process. For example, the

[19] Comprehensive Evaluation Report, July 2006. Human Dimension Components, page 3 of 72.

GMUG has 901,100 acres of Colorado Roadless Areas (CRAs) identified under the 2012 Colorado Roadless Rule, or approximately 28% of the forest.[20] The forest also contains significant additional roadless lands outside CRAs that should be identified through the Chapter 70 wilderness inventory process. In total, there are likely at least one million acres of potential wilderness-quality lands on the GMUG.

Since the GMUG's last plan revision, the GMUG has had an aggressive and commendable land adjustment program that has resulted in many thousands of acres of acquisitions via purchase and exchange. These include the Red Mountain project, Ophir Valley purchases, and Wilson Peak exchange, among others.[21] The consolidated land ownership pattern provides new opportunities for designations and other management actions in the new plan, and should be recognized in the assessment chapter as offering a potential need and opportunity for additional designated areas.

There are numerous areas on the GMUG that have garnered wilderness recommendations from the public and the Forest Service in the recent past. As part of the mid-2000s GMUG revision process, citizens and scientists developed the *Mountains to Mesas* (M2M) conservation management alternative, which was submitted to the agency in June 2005.[22] A key component of this citizen proposal was its identification of potential wilderness additions on the GMUG, totaling 787,528 acres.[23] M2M "makes wilderness recommendations for lands that possess outstanding ecological, geologic, aesthetic or scenic qualities, and remain pristine in character. All proposed areas are at least 1,000 acres in size for additions to existing wilderness, or 5,000 acres for stand-alone areas."[24] We encourage the Forest Service to revisit and reference this citizen proposal and its recommendations as part of the forest assessment.

In addition, the Forest Service in its proposed 2007 GMUG Forest Plan recommended approximately 125,000 acres in 19 areas for additional wilderness.[25] The combination of established local interest, previous agency recommendations, and positive public opinion supporting wilderness demonstrate a need and opportunity for expanded landscape-level conservation on the GMUG.

New information in the past decade since the prior planning effort includes the 2009 legislation that created Dominguez-Escalante National Conservation Area and Dominguez Canyon Wilderness administered by the Bureau of Land Management. The GMUG shares 30 miles of boundary with the NCA, and contains the roadless headwaters of Little Dominguez Creek adjacent to BLM's designated wilderness area. BLM finalized its Resource Management Plan in

[20] 77 Fed. Reg. 39583 (July 3, 2012).
[21] *See* https://www.tpl.org/media-room/ophir-valley-mining-claims-protected; http://ocs.fortlewis.edu/redmountainproject/; https://www.tpl.org/media-room/662-acres-protected-red-mountain-co.
[22] High Country Citizens' Alliance, Sheep Mountain Alliance, Southern Rockies Ecosystem Project, Western Colorado Congress, Western Slope Environmental Resource Council, *Mountains to Mesas: Conservation Management Alternative for the GMUG* (June 2005). [Hereinafter M2M] (Appendix 6)
[23] M2M at 49.
[24] M2M at 50.
[25] U.S. Forest Service, *Proposed Land Management Plan, Grand Mesa, Uncompahgre, and Gunnison National Forests* (March 2007), at 93, 152. [Hereinafter 2007 Forest Plan]

2016.[26] The assessment should incorporate relevant information about the wilderness contribution of ecological and wildlife resources documented in the RMP, such as shared big game and desert bighorn habitat that crosses unit boundaries as well as fisheries for streams that arise on the national forest and flow downstream into the NCA.

Another source of new information the assessment should reference is the pending San Juan Mountains Wilderness Act, which includes legislative designations for new wilderness additions and a special management area covering about 33,600 acres on the GMUG. The bill was favorably reported out of the Senate Energy Committee in 2013.[27] The bill designates wilderness additions to Mount Sneffels Wilderness in the amount of 13,000 acres for Whitehouse Mountain and 7,438 acres for the Last Dollar and Liberty Bell units; 3,350 acres of additions to Lizard Head Wilderness in Silverpick Basin and along Highway 145; and 9,800 acres on the GMUG portion of the Sheep Mountain Special Management Area that would be withdrawn from minerals, and off-limits to new roads and motorized/mechanized transportation. The wilderness designations in the San Juan Mountains Wilderness Act largely conform with wilderness recommendations contained in the draft 2007 GMUG plan, particularly for Whitehouse Mountain, Last Dollar, and Silverpick Basin.

The following list highlights just some of the opportunities for additional recommendations. It is far from exhaustive, but indicative of several areas already identified through citizen proposals and/or past agency planning efforts.

- Sawtooth Mountain – This is an important cross-basin connector within the eastern portion of the Gunnison Basin, and is well-known for its excellent elk hunting and pristine habitat. M2M recommends 28,199 acres for wilderness, and the 2007 GMUG Forest Plan recommends 22,800 acres.[28]

- Cochetopa Hills – This area is clad in rolling mixed-conifer and spruce-fir forests, and is an important regional wildlife corridor between the Rio Grande/San Juan Basin to the south, and the Gunnison Basin to the north. One of the lowest points on the Continental Divide in Colorado, Cochetopa Hills is a natural crossing point for many wildlife species in and out of the Gunnison Basin, and forms an important ecological link from the La Garitas to the west, and towards Fossil Ridge to the north. M2M recommends 78,084 acres for wilderness.[29]

- La Garita Addition (Cochetopa Creek/Middle Fork) - This addition to the La Garita Wilderness includes a pristine stretch of Cochetopa Creek. Vegetative communities unique to the Gunnison area are found here, including bristlecone, limber and lodgepole pine. Rare and sensitive plant species including moonwort and Colorado tansy aster are

[26] U.S. Department of Interior, Bureau of Land Management, *Dominguez-Escalante National Conservation Area Proposed Resource Management Plan and Final Environmental Impact Statement*, June 2016.
[27] U.S. Senate Committee on Energy and Natural Resources, Report No. 113-99, Sept. 10, 2013.
[28] M2M at 48, 53; 2007 Forest Plan at 93.
[29] M2M at 49, 51.

also present. M2M recommends 12,079 acres for wilderness, and the 2007 GMUG Forest Plan recommends 1,600 acres.[30]

- La Garita Addition (Mineral Mountain) – This addition includes the gentle slopes below Mineral Mountain and spruce-fir and aspen forest along the Spring Creek Valley. M2M recommends 1,471 acres as wilderness.[31]

- Uncompahgre Addition (Failes Creek/Soldier Creek) – This is an important area for maintaining lynx habitat. Steep forested hills tower above the flats of the Alpine Plateau, affording good denning and foraging sites for lynx and other wildlife. M2M recommends 7,728 acres for wilderness, and the 2007 GMUG Forest Plan recommends 6,200 acres.[32]

- Uncompahgre Addition (Turret Ridge) - At 12,260 feet, Turret Ridge itself is one of the most challenging technical peak climbs in Colorado. This area offers solitude and challenging hiking and climbing in a remote setting. M2M recommends 5,114 acres as wilderness, and the 2007 GMUG Forest Plan recommends 5,170 acres.[33]

- Uncompahgre Addition (Little Cimarron) - The area provides summer habitat for black bear, turkey, mule deer, and elk. It includes the watershed around East Fork of the Cimarron River. The 2007 GMUG Forest Plan recommends 4,220 acres for wilderness.[34]

- Uncompahgre Addition (Matterhorn) – The area is bounded by Wilderness on three sides. The 2007 GMUG Forest Plan recommends 3,590 acres for wilderness.[35]

- Fossil Ridge Addition (Lottis Creek) – This is a small addition to the northeast corner of the Fossil Ridge Wilderness area. M2M recommends 1,700 acres for wilderness, and the 2007 GMUG Forest Plan recommends 1,560 acres.[36]

- Mount Antero - This area is composed of high alpine tundra along the Continental Divide, but has dense conifer forests in the south near No Name Creek. M2M recommends 6,387 acres for wilderness.[37]

- West Elk Additions - These areas are lower-elevation additions to the West Elk Wilderness Area, providing critical big game winter and summer range for a wide variety

[30] M2M at 48, 52; 2007 Forest Plan at 93.
[31] M2M at 49, 54.
[32] M2M at 49, 50 (labeled "Alpine Plateau"); 2007 Forest Plan at 93.
[33] M2M at 49, 55; 2007 Forest Plan at 93.
[34] 2007 Forest Plan at 93.
[35] 2007 Forest Plan at 93.
[36] M2M at 48, 52; 2007 Forest Plan at 93 (labeled "Union").
[37] M2M at 49, 54.

of wildlife species. M2M recommends over 70,000 acres for Wilderness across several additions, while the 2007 GMUG Forest Plan recommends approximately 15,000 acres.[38]

- Carson Peak (Cataract) – This area possesses very high wilderness qualities owing to its striking scenery and accessibility. In addition, Carson Peak is the site of the Wager Gulch Iron Fen. M2M recommends 9,419 acres for wilderness, and the 2007 GMUG Forest Plan recommends 9,980 acres.[39]

- Unaweep - With expansive views of the La Sal Mountains, Dolores River Valley, and Divide Creek area, Unaweep and the Calamity Basin encompass an inspiring corner of the Uncompahgre Plateau. The area has important as year-round wildlife habitat, including elk calving grounds. M2M recommends 28,160 acres for wilderness, and the 2007 GMUG Forest Plan recommends 8,350 acres.[40]

- Dominguez - This area forms the upper watershed of Dominguez Creek, the largest perennial creek on the Uncompahgre Plateau. It is contiguous with the BLM Dominguez Canyon Wilderness, and therefore offers important continuity with a large, wild roadless area. It almost entirely consists of poorly represented (< 5%) ecosystem types, e.g., gambel oak woodlands and pinyon-juniper woodlands. M2M recommends 15,164 acres for Wilderness.[41]

- Kelso Mesa - The largest roadless area on the Uncompahgre Plateau, Kelso Mesa contains several long canyons that are headwaters of Escalante Creek and adjoins BLM's Dominguez-Escalante NCA. The area largely consists of ecosystem types poorly represented in existing wilderness, e.g., gambel oak woodlands and pinyon-juniper woodlands. It offers outstanding opportunities for solitude, quiet-use recreation, and horse pack-in hunting. M2M recommends 49,149 acres for Wilderness. [42]

- Kannah Creek - This large area occupies the western slopes of the Grand Mesa, exhibiting a vast diversity of habitat from piñon-juniper and riparian to aspen and spruce-fir. Kannah Creek is important for the wildlife habitat and quiet recreation it provides, and is a municipal water source for Grand Junction. M2M recommends 40,766 acres for Wilderness.[43]

- Priest Mountain - Forming graceful flat-topped rises, Priest Mountain is at the heart of the Grand Mesa National Forest. The area is made up of four distinct roadless core areas with established motorized corridors in between. The area is dominated by conifers and

[38] M2M at 48, 49, 51, 53, 54; 2007 Forest Plan at 93.
[39] M2M at 49, 50; 2007 GMUG Forest Plan at 93.
[40] M2M at 49, 55; 2007 Forest Plan at 93.
[41] M2M at 48, 55.
[42] M2M at 48, 55.
[43] M2M at 49, 56.

aspen, with interspersed open meadows. M2M recommends 90,956 acres for Wilderness.[44]

Please see *Mountains to Mesas* (Appendix 6) beginning on page 46 for the complete list and descriptions of citizen proposals for wilderness, an effort that was an integral part of public participation in the GMUG's last comprehensive planning effort. That effort, coupled with lands recommended for wilderness by the agency itself in its Draft 2007 GMUG Forest Plan, establish a need and opportunity for additional designations on the forest.

As described in more detail below, these and other undeveloped parcels presents a significant opportunity to recommend for wilderness or other conservation designations additional areas and to enhance the myriad ecological and social benefits associated with conservation of roadless lands. A robust assessment of the need and opportunity to further protect these roadless lands through conservation designations is an integral prerequisite to satisfaction of the Forest Service's substantive obligations under the 2012 planning rule to provide for ecological integrity, species diversity, and social, economic, and ecological sustainability.[45] As the Forest Service has recognized, such roadless areas "provide large, relatively undisturbed blocks of habitat for a variety of terrestrial and aquatic wildlife and plants, including hundreds of threatened, endangered, or sensitive species[,] . . . function as biological strongholds and refuges for a number of species, and . . . play a key role in maintaining native plant and animal communities and biological diversity."[46]

1. <u>The GMUG National Forest presents cross-boundary opportunities to protect regionally significant roadless areas.</u>

The GMUG National Forest has a significant number of roadless areas located adjacent to other roadless public lands. These contiguous or proximal Forest Service and BLM roadless areas provide potential opportunities to protect larger roadless tracts that include lower and higher elevation lands and provide conduits for wildlife between those elevation gradients and ecosystem types. Figure 1 is a map depicting the location of CRAs on the GMUG National Forest in relationship to CRAs on the adjacent/proximal national forests, adjacent/proximal BLM lands with wilderness characteristics, and designated and recommended wilderness areas.[47] The map demonstrates that the lands within the GMUG are important pieces in a larger network of

[44] M2M at 49, 56.
[45] *See* 36 C.F.R. §§ 219.8-219.9.
[46] Roadless Area Conservation Rule, Final Environmental Impact Statement, Summary, at 17, *available at* http://www.fs.usda.gov/roaddocument/roadless/2001roadlessrule/finalruledocuments.
[47] 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 Columbine Lake/Lookout Peak area are less than 5,000 acres respectively. The entire area, however, exceeds 5,000 acres in size.

wild lands throughout the southern Rockies and Colorado Plateau regions of western Colorado and eastern Utah including lands with wilderness character, Wilderness Study Areas, and Areas of Critical Environmental Concern. In its final assessment report, the Carson National Forest recently recognized similar cross-boundary conservation opportunities throughout northern New Mexico and southern Colorado:

> The Carson NF is located between the Rio Grande NF to the north and the Santa Fe NF to the south. The recently designated Rio Grande del Norte National Monument managed by BLM is located in the middle of the Carson NF. Collectively these lands along with State Trust and Tribal Lands and potentially some private lands are a part of the Upper Rio Grande Watershed and maintain an important ecological corridor for wildlife, plants, and water.[48]

Enhancing these cross-boundary opportunities is the fact that the GMUG National Forest has regionally significant wild areas. In 2000, Aplet *et al.* applied an index to map "wildness" across the contiguous United States. The index was based on aggregated values for six attributes: solitude, remoteness, uncontrolled processes, natural composition, unaltered structure, and pollution (Aplet *et al.* 2000). Although there are a number of wildness indices in the literature, Aplet's index in particular enables a consistent comparison of wildness values across a region and the country, and highlights larger landscapes with wildness values and the potential to connect them. With respect to the region encompassing the GMUG National Forest, Aplet's index shows that the GMUG contains some of the wildest areas in Colorado (see Figure 2).

In sum, with somewhere close to one million acres of roadless and potential wilderness lands – some of which are contiguous or proximal to other Forest Service or BLM wild lands – the GMUG National Forest clearly has potential opportunity for additional wilderness and other designated areas. This opportunity is enhanced by the fact that the GMUG National Forest contains lands that are wild relative to other public lands regionally and nationally. And it is consistent with the forest's wilderness heritage and distinctive role and contribution as a vast, wild, and remote ecological stronghold and backcountry recreation destination.

2. <u>Establishing additional designated areas to conserve undeveloped lands will help address current ecological needs relevant to biodiversity, connectivity, and climate change adaptation.</u>

Undeveloped natural lands provide numerous ecological benefits. They safeguard biodiversity, enhance ecosystem representation (see discussion below), facilitate connectivity (USDA Forest Service 2016; Loucks *et al.* 2003; USDA Forest Service 2001; Crist *et al.* 2005; Wilcove 1990; The Wilderness Society 2004; Strittholt and DellaSala 2001; DeVelice and Martin 2001), and provide high-quality or undisturbed water, soil, and air resources (Anderson *et al.* 2012;

[48] Carson National Forest, *Final Assessment Report of Ecological/Social/Economic Sustainability Conditions and Trends*, at 485 (September 2015), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd475212.pdf.

DellaSala *et al.* 2011). They also serve as ecological baselines to facilitate better understanding of our impacts to other landscapes (Arcese and Sinclair 1997).

Forest Service roadless lands, in particular, are heralded for their conservation values. Those values are described at length in the preamble of the Roadless Area Conservation Rule (RACR)[49] and in the Final Environmental Impact Statement (FEIS) for the RACR.[50] They include: high-quality or undisturbed soil, water, and air; sources of public drinking water; diverse plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified unique characteristics (e.g., uncommon geological formations, unique wetland complexes, exceptional hunting and fishing opportunities).

Numerous articles in the scientific literature similarly recognize the contribution of roadless and undeveloped lands to biodiversity, connectivity, and conservation reserve networks. For example, Loucks *et al.* (2003) examined the potential contributions of roadless areas to the conservation of biodiversity, and found that more than 25% of Inventoried Roadless Areas (IRAs) are located in globally or regionally outstanding ecoregions[51] and that 77% of IRAs have the potential to conserve threatened, endangered, or imperiled species. Arcese and Sinclair (1997) highlighted the contribution that IRAs could make toward building a representative network of conservation reserves in the United States, finding that protecting those areas would expand eco-regional representation, increase the area of reserves at lower elevations, and increase the number of large, relatively undisturbed refugia for species. Crist *et al.* (2005) looked at the ecological value of roadless lands in the Northern Rockies and found that protection of national forest roadless areas, when added to existing federal conservation lands in the study area, would: (1) increase the representation of virtually all land cover types on conservation lands at both the regional and ecosystem scales, some by more than 100%; (2) help protect rare,

[49] 66 Fed. Reg. at 3245-47.
[50] Final Environmental Impact Statement, Vol. 1, 3–3 to 3–7, *available at* http://www.fs.usda.gov/roaddocument/roadless/2001roadlessrule/finalruledocuments.
[51] Loucks *et al.* utilized an ecosystem ranking system developed by Ricketts *et al.* (1999):

> Ricketts *et al.* (1999) classified the biological importance of each ecoregion based on species distribution, i.e., richness and endemism, rare ecological or evolutionary phenomena such as large-scale migrations or extraordinary adaptive radiations, and global rarity of habitat type, e.g., Mediterranean-climate scrub habitats. They used species distribution data for seven taxonomic groups: birds, mammals, butterflies, amphibians, reptiles, land snails, and vascular plants (Ricketts *et al.* 1999). Each category was divided into four rankings: globally outstanding, high, medium, and low. The rankings for each of the four categories were combined to assign an overall biological ranking to each ecoregion. Ecoregions whose biodiversity features were equaled or surpassed in only a few areas around the world were termed "globally outstanding." To earn this ranking, an ecoregion had to be designated "globally outstanding" for at least one category. The second-highest category, or continentally important ecoregions, were termed "regionally outstanding," followed by "bioregionally outstanding" and "nationally important" (Ricketts *et al.* 1999).

species-rich, and often-declining vegetation communities; and (3) connect conservation units to create bigger and more cohesive habitat "patches."

Roadless lands are also responsible for higher quality water and watersheds. Anderson *et al.* (2012) assessed the relationship of watershed condition and land management status, and found a strong spatial association between watershed health and protective designations. DellaSala *et al.* (2011) found that undeveloped and roadless watersheds are important for supplying downstream users with high-quality drinking water, and that developing those watersheds comes at significant costs associated with declining water quality and availability. The authors recommend a light-touch ecological footprint to sustain healthy watersheds and the many other values that derive from roadless areas.

The Forest Service, National Park Service, and U.S. Fish and Wildlife Service recognize that protecting and connecting undeveloped areas is an important action agencies can take to enhance climate change adaptation. For example, the Forest Service National Roadmap for Responding to Climate Change establishes that increasing connectivity and reducing fragmentation are short- and long-term actions the agency should take to facilitate adaptation to climate change (USDA Forest Service 2011b). The National Park Service also identifies connectivity as a key factor for climate change adaptation, along with establishing "blocks of natural landscape large enough to be resilient to large-scale disturbances and long-term changes."[52] The agency states that "[t]he success of adaptation strategies will be enhanced by taking a broad approach that identifies connections and barriers across the landscape. Networks of protected areas within a larger mixed landscape can provide the highest level of resilience to climate change."[53] Similarly, the Climate Adaptation Strategy adopted by a partnership of governmental agencies including the U.S. Fish and Wildlife Service calls for creating an ecologically connected network of conservation areas (National Fish, Wildlife and Plants Climate Adaptation Partnership 2012).[54] The 2012 planning rule's substantive ecological sustainability provision sanctions this reserve design and landscape connectivity approach, requiring the Forest Service to formulate "plan components, including standards and guidelines, to maintain or restore [the] structure, function, composition, and

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[52] National Park Service, Climate Change Adaptation webpage, http://www.nps.gov/subjects/climatechange/adaptation.htm (last visited Dec. 20, 2016).

[53] *Id*. *See also* USDOI National Park Service (2010) (Objective 6.3 of agency's Climate Change Response Strategy is to "[c]ollaborate to develop cross-jurisdictional conservation plans to protect and restore connectivity and other landscape-scale components of resilience").

[54] Relevant goals and strategies include:

> Goal 1: Conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate.
>
> > Strategy 1.1: Identify areas for an ecologically-connected network of terrestrial, freshwater, coastal, and marine conservation areas that are likely to be resilient to climate change and to support a broad range of fish, wildlife, and plants under changed conditions.
> >
> > Strategy 1.2: Secure appropriate conservation status on [high priority areas] to complete an ecologically-connected network of public and private conservation areas that will be resilient to climate change and support a broad range of species under changed conditions.
> >
> > Strategy 1.4: Conserve, restore, and as appropriate and practicable, establish new ecological connections among conservation areas to facilitate fish, wildlife, and plant migration, range shifts, and other transitions caused by climate change.

connectivity" of terrestrial and aquatic ecosystems and watersheds, taking into account stressors such as climate change.[55]

B. What ecosystem and habitat types exist across the GMUG, and what are their levels of protection within the GMUG and throughout the region? What types are least represented in designated areas?

As described in more detail in Appendix 1, protection of diverse ecosystem and habitat types through wilderness and other designations is a cornerstone of regional, national, and international efforts to conserve biological diversity and ecological processes of natural ecosystems (Bertzky *et al.* 2012). For protected areas to conserve genetic, species, and community diversity – as well as the composition, structure, function, and evolutionary potential of natural systems – they must encompass the full variety of ecosystems (Olson and Dinerstein 1998; Margules and Pressey 2000). Indeed, protecting ecosystem diversity is a central purpose of forest planning under the 2012 planning rule:

> Plans will guide management of [National Forest System] land so that they are ecologically sustainable and contribute to social and economic sustainability; ***consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities***; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.[56]

To that end, a forest assessment's evaluation of the potential need and opportunity for additional designated areas should consider whether there are "specific land types or ecosystems present in the plan area that are not currently represented or minimally represented."[57] That analysis of ecosystem representation in turn will help inform the Forest Service's determination during the plan revision process whether to designate or recommend for designation additional areas.[58] It will also assist the agency in satisfying its substantive planning mandates to provide for ecological sustainability and integrity and "the diversity of plant and animal communities and the persistence of native species."[59]

To provide the agency with what we believe to be the best available science on this issue, we conducted an analysis of ecosystem representation in the National Wilderness Preservation System (NWPS) at the national- and forest-level scales (Appendix 1; Dietz *et al.* 2015; Belote *et al.* 2015). That analysis shows that the NWPS suffers from a significant under-representation of many ecosystems. Specific to the GMUG National Forest, our analysis found that only 11 of the

[55] 36 C.F.R. § 219.8(a)(1).
[56] 36 C.F.R. § 219.1(c) (emphasis added).
[57] FSH 1909.12, ch. 10, § 14(4)(c).
[58] *See, e.g.*, FSH 1909.12, ch. 70, § 72.1(4) (agency must "[e]valuate the degree to which [potential wilderness areas] may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value," which "may include[r]are plant or animal communities or rare ecosystems").
[59] 36 C.F.R. §§ 219.8-219.9; *see also id.* § 219.9(a)(2) (plans "must include plan components . . . to maintain or restore the diversity of ecosystems and habitat types").

47 ecosystem types found on the GMUG are adequately represented in wilderness on the forest level (Appendix 1: Table 3, Tabs 1 & 2). The story is even more extreme on the federal level, with only 7 out of the 47 ecosystems showing adequate representation (Appendix 1: Table 3, Tabs 1 & 3). Underrepresented ecosystems on the forest level cover over 58% (1,718,474 acres) of the GMUG, with federally underrepresented ecosystems spanning over 41% (742,213 acres) of the forests.

A majority of the CRAs contain high proportions of inadequately represented ecosystems at both the forest-level and national scales (Appendix 1: Tables 1 & 2; Maps 2 & 3). Additionally, all of the CRAs contain at least one underrepresented ecosystem. Out of the 76 CRAs on the GMUG, over half of the units are mostly (>50%) composed of underrepresented ecosystems on both forest and federal levels. Additionally, over 550,000 acres of the 900,100 acres of CRAs on the forest have ecosystems that are underrepresented on forest and federal levels.

In many instances, the addition of one CRA would elevate particular ecosystems into adequate representation (Appendix 1: Table 4). For example, adding Kannah Creek CRA into the NWPS would elevate the Inter-Mountain Basins Mat Saltbush Shrubland into adequate representation (>20% representation). Even one of the more prevalent ecosystems on the GMUG, the Colorado Plateau Pinyon-Juniper Woodland, could achieve adequate representation with the addition of 3 CRAs (Kannah Creek, Sunnyside, and Kelso Mesa). In addition to these ecosystems, 7 others could achieve adequate representation on the forest level with the addition of one CRA.

Notably, many under-represented ecosystem types on the GMUG are also some of the most common (Appendix 1: Table 3, Tabs 2 & 3). The most prevalent ecosystem on the GMUG, the Rocky Mountain Aspen Forest and Woodland, covers over 17% (524,280 acres) of the GMUG but is underrepresented on the both forest and federal levels. Four other ecosystems span over 100,000 acres of the forest but are inadequately represented on forest and federal levels and include the Rocky Mountain Gambel Oak-Mixed Montane Shrubland, the Rocky Mountain Lodgepole Pine Forest, the Inter-Mountain Basins Montane Sagebrush Steppe, and the Colorado Plateau Pinyon-Juniper Woodland.

Appendix 1 includes the following maps and tables that depict these results in detail as follows:

- Map 1 “CO Roadless Units, GMUG National Forest”: Depicts each unit (polygon) in CRA inventory, outlined in black with hash marks, and with the forest boundary shaded green.

- Map 2 “Ecosystem Representation on the Federal Level”: Color depiction of the results of Equation 1 (above), showing the level of representation in the NWPS of each ecosystem type at the national scale. For example, areas shown in red depict ecosystems that are represented in the NWPS at less than 5% of all available federal land. [CRAs outlined in black with cross-hatching]

- Map 3 "Ecosystem Representation on the Forest Level": Color depiction of the results of Equation 2 (above), showing the level of representation in the NWPS of each ecosystem type at the forest level. [CRAs outlined in black with cross-hatching]

- Table 1, Tabs 1 & 2 "GMUG CRAs Representation": Proportion (%) and acreage of each CRA composed of under-represented ecosystem types on the GMUG National Forest based on forest-level (Tab 1) or national-level (Tab 2) representation. Representation of each ecosystem type was quantified based on all available area on federal land and the individual forest. All ecosystems with <20% representation in the NWPS at each scale were broken into 3 levels of representation (<5%, 5-9.9%, and 10-19.9%). This table allows one to prioritize CRAs by proportion of land area as well as acreage that is composed of underrepresented ecosystems, at three levels.

- Table 2 "Ecosystem Composition of Colorado Roadless Areas": Values within the matrix are the estimated acres of each ecosystem type occurring within each CRA. This table depicts the specific ecosystem composition of each CRA.

- Table 3, Tabs 1-3 "GMUG National Forest Ecosystems Representation": These tables depict which ecosystems are under-represented at the forest-level and national scales. Tab 1 shows a complete list of ecosystem types found on the GMUG National Forest, and the proportion of each type in the NWPS at the forest-level and national scales. Tabs 2 and 3 show representation breakdowns at the three levels (<5%, 5-9.9%, and 10-19.9%) at the forest-level and national scales.

- Table 4 "CRA Analysis of Ecosystem Composition": This table shows the estimated acres of each ecosystem type occurring within each CRA unit. This table also shows how many acres of additional protection are needed to elevate a particular ecosystem into adequate representation, and how many units would be needed (if applicable) to achieve adequate representation on the forest level.

Overall, our ecosystem representation analysis and results highlight a need and opportunity to conserve under-represented ecosystem types on the GMUG National Forest. Consistent with the forest's distinctive role and contribution, the plan revision process presents an important opportunity to begin to remedy the under-representation of certain ecosystems in the NWPS – most immediately through an assessment of the need and opportunity for additional designated areas that prioritize protection of ecosystem diversity.

The GMUG assessment report should document this information. In particular, the report should identify the ecosystems under-represented in designated Wilderness on the GMUG, the acres needed to elevate a particular ecosystem into adequate representation, and the amount of each CRA composed of under-represented acres.

C. What unique or special features, values, or resources exist across the forest, and what is their current status of protection?

The 2012 planning rule defines designated area as "[a]n area or feature identified and managed to maintain its unique special character or purpose."[60] Accordingly, to properly assess the need and opportunity for additional designated areas, the forest assessment must identify those areas and features with unique, special character and evaluate their current status of protection.

In identifying and assessing unique and outstanding areas and features, the Forest Service should take a broad and inclusive approach. The Forest Service Manual addressing special recreation designations describes *some* of the potential types of special character that may warrant protective designation: areas with "scenic, geological, botanical, zoological, paleontological, archaeological, or other special characteristics or unique values" should be "protect[ed] and manage[d] for public use and enjoyment [as] special recreation areas."[61] The planning directives at FSH 1909.12, section 14 identify the following types of areas that can be designated by the Regional Forester: botanical, geological, scenic, zoological, paleontological, historical, and recreational. Those categories, however, are in no way an exhaustive list of the types of special features, values, or resources the Forest Service should identify in the assessment report, and special recreation designations are just one of a slate of potential designations that the agency should consider during the plan revision process.[62] Thus, in addition to scenic, geological, botanical, zoological, paleontological, and archaeological resources, the Forest Service should consider historical and cultural (including tribal) resources, aquatic resources, other recreational or educational resources, and any other unique or special features, values, or resources across the forest.

The Forest Service's assessment of areas and features with unique, special character should also consider climate refugia, migratory corridors, landscape linkages, rivers and streams, and other features that enhance species protection and habitat connectivity. As described above, a robust, connected network of protected conservation lands is necessary to satisfy the 2012 planning rule's substantive ecological integrity, sustainability, and diversity mandates.[63] Particularly as climate change alters and makes more vulnerable ecological systems, habitats, and species composition and distribution, there is an acute need to conserve migratory corridors, replication and representation within protected areas, larger protected tracts, and more connections between them (Mawdsley *et al.* 2009). In this context, and given their numerous environmental and social benefits, the forest assessment should recognize the unique, special character of roadless and other undisturbed forest lands.

In identifying areas and features with unique special character, the Forest Service should make sure to assess information on biodiversity and ecologically important areas, including corridors. For example, the assessment should include information from the Colorado Natural Heritage Program on species and potential conservation areas – areas that focus on capturing the

[60] 36 C.F.R. § 219.19.
[61] Forest Service Manual 2372.02.
[62] *See* 36 C.F.R. § 219.7(c)(2)(vii) (broad, non-discretionary duty to "[i]dentify existing designated areas other than [Wilderness and Wild and Scenic Rivers]" and "determine whether to recommend any additional areas for designation"); *see also, e.g.*, FSH 1909.12, ch. 20, § 24, Exhibit 01 (providing a non-comprehensive list of "some types of designated areas that the Responsible Official may consider" during the forest plan revision).
[63] 36 C.F.R. §§ 219.8 – 219.9.

ecological processes that are necessary to support the continued existence of a particular element of natural heritage significance. Potential conservation areas may include a single occurrence of a rare element or a suite of rare elements or significant features.[64] We are told that the Region 2 office has purchased this data to inform land management planning within Colorado.

In addition to this incredibly useful data source, the Forest Service should include information from other regional ecological analyses. These include:

- The Southern Rockies Wildlands Network Vision.[65] A collaborative effort between the Denver Zoo, the Southern Rockies Ecosystem Project, and the Wildlands Project, the Vision presents the case for a conservation network of lands, and proposes tangible steps for implementing it. Designated areas can supplement Wilderness, recommended Wilderness, and Research Natural Areas in filling out a conservation network designed to maintain, restore and protect species and habitats of concern.
- The Colorado State Wildlife Action Plan (SWAP).[66] Developed as a collaborative endeavor by the Colorado Department of Parks and Wildlife, the SWAP uses statewide data sets to identify the top priority species and habitats that need conservation efforts in the state, and the potential conservation actions that can address the threats these species and habitats face. Chapter 8 offers a series of maps to help guide conservation efforts across the state. The first six maps indicate relative condition of freshwater, terrestrial upland, and wetland/riparian habitats. This information can be used to identify areas at a broad scale that are likely to be in higher quality condition, and therefore good candidates for land protection strategies, as well as those that are more likely in degraded condition and in need of restoration. The last two maps display SGCN concentration areas for aquatic and terrestrial species, respectively. These maps are useful for broad-scale analysis of where conservation efforts might be most warranted and most successful. All of these maps are very useful in identifying places that might benefit from a conservation designation and further the 2012 planning rule's species requirements.
- The Nature Conservancy's Southern Rocky Mountains: An Ecological Assessment and Conservation Blueprint.[67] The Nature Conservancy convened a multi-state team in January, 2000, to compile and analyze biological and ecological data and develop an ecoregional assessment for the Southern Rocky Mountains, with funding from the U.S. Forest Service, Colorado Division of Wildlife, and the Bureau of Land Management. The objective of this assessment was to use a science-based approach to design a portfolio of conservation areas for the Southern Rocky Mountains that, with proper management,

[64] *See* http://www.cnhp.colostate.edu/download/dictionary/Data%20Dictionary%20for%20PCA%20Reports.pdf. Individual PCA reports are available at: http://www.cnhp.colostate.edu/download/gis/pca_reports.asp. GIS data are available at: http://www.cnhp.colostate.edu/download/gis.asp.

[65] Miller, Brian, Michelle Fink, Doug Shinneman, Dave Foreman, Jean Smith, Margaret DeMarco, Michael Soule, and Robert Howard, 2003. Southern Rockies Wildlands Network Vision, A Science-Based Approach to Rewilding the Southern Rockies. Available at https://www.researchgate.net/publication/280624193_Southern_Rockies_Wildlands_Network_Vision_A_science-based_approach_to_rewilding_the_Southern_Rockies.

[66] The SWAP is available at http://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx.

[67] *Available at:* http://azconservation.org/dl/TNCAZ_Ecoregions_Assessment_Southern_Rocky_Mtns.pdf.

would ensure the long-term persistence of the ecoregion's species, communities, and ecological systems. The ultimate goal is to conserve the full portfolio of conservation areas identified through this assessment process.[68]

- Intermountain Region Herbarium Network.[69] The website provides plant inventories at specific locations in Colorado including some in the GMUG National Forest.
- The Nature Conservancy's Rare Plant Conservation Strategy.[70] The first recommended action in this strategy is to "Secure on-the-ground, site-specific habitat protection and/or management for all of Colorado's imperiled plants." Designating administrative conservation areas in land management plans can be a useful mechanism to do this. Page 29 provides a map of rare plant areas in Colorado based on CNHP data.
- The GMUG's fen study that estimates over 11,000 acres of fen on the forest.[71]
- The Audubon important bird area inventory. Audubon lists an Important Bird Area for the Gunnison Basin that captures habitat for the Gunnison Sage Grouse along with some other birds.[72]

Consistent with the requirement under the 2012 planning rule that plans provide for sustainable recreation and opportunities to connect people with nature,[73] the assessment should also include information from the Forest Service's 2010 Framework for Sustainable Recreation when identifying special features, values, and resources. The framework highlights the importance of investing in special places and commits the agency to "evaluat[ing] other areas within the National Forest System that have outstanding recreational, scenic, historic, or other values of high attractiveness for designation and management as special areas" (USDA Forest Service 2010a). More generally, the assessment of recreation settings, opportunities and access, and scenic character should be integrated into the assessment of the need and opportunity for additional designations.[74]

More specifically, the GMUG National Forest boasts a treasure trove of unique and special features, values, and resources including, among many others:

- Grand Mesa, the largest flat-top mountain in the world;
- Bridal Veil Falls, one of the most scenic waterfalls in Colorado;

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[68] *Ibid.* Pages xi-xii.
[69] *Available at:* http://intermountainbiota.org/portal/index.php.
[70] Neely, B., S. Panjabi, E. Lane, P. Lewis, C. Dawson, A. Kratz, B. Kurzel, T. Hogan, J. Handwerk, S. Krishnan, J. Neale, and N. Ripley. 2009. Colorado Rare Plant Conservation Strategy. Developed by the Colorado Rare Plant Conservation Initiative. The Nature Conservancy, Boulder, Colorado. 88 pp. Available at http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/Colorado/Pages/corareplant.aspx.
[71] Barry C. Johnston, Benjamin T. Stratton, Warren R. Young, Liane L. Mattson, John M. Almy, Gay T. Austin, 2012. Inventory of Fens in a Large Landscape of West-Central Colorado -- Grand Mesa, Uncompahgre, and Gunnison National Forests. July 2012. *Available at* http://www.fs.usda.gov/detailfull/gmug/landmanagement/resourcemanagement/?cid=stelprdb5363685&width=full
[72] *Available at:* http://www.audubon.org/important-bird-areas/gunnison-basin
[73] 36 C.F.R. §§ 219.8(b)(2) & (6), 219.10(b)(i).
[74] *See* 36 C.F.R. § 219.6(b)(9); Section V below.

- The Kebler Pass aspen forest, one of the largest contiguous aspen groves in the world, and a delight to autumn visitors;
- Dry Mesa Dinosaur Quarry, where some of the world's largest dinosaur bones have been found;
- Slumgullion Earthflow, a 700-year old active earthflow that formed Lake San Cristobol;
- 14,321-foot Uncompahgre Peak, along with other "14-ers", attracting hikers and mountaineers;[75]
- World class fishing in the Gunnison River, Taylor River, and other headwaters of the Colorado River watershed;
- Denning habitat for Canada lynx;
- Some of the last intact sagebrush habitat for the imperiled Gunnison Sage-grouse;
- Over 11,000 acres of fens, a critical wetland habitat, including those identified in the Research Natural Area section in the 2006 Comprehensive Assessment[76];
- The Alpine Tunnel, the highest railroad tunnel in North America;
- Internationally recognized big-game populations, attracting hunters and wildlife enthusiasts; and
- The longest extent of the Continental Divide and Continental Divide National Scenic (CDNST) Trail in Colorado.

D. Has the forest conducted a systematic inventory of rivers eligible for inclusion in the National Wild and Scenic Rivers System, and, if so, are there changed circumstances that warrant additional review?

Dam construction and other development along America's rivers threaten fish and wildlife, natural habitats, and drinking water. To balance the widespread development of rivers across the country, Congress enacted the Wild and Scenic Rivers Act in 1968 to protect "free-flowing" rivers and streams with "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values . . . for the benefit and enjoyment of present and future generations."[77] The Act permits Congress (or the Secretary of Interior, via application by a state governor and where the state has already protected the river under its laws) to designate qualifying river segments into the National Wild and Scenic River System, thereby affording permanent protection for their free-flowing nature and outstandingly remarkable values.[78]

Federal land management agencies are required to identify and protect rivers that are "eligible" to be included in the National Wild and Scenic River System. A river is eligible if it is free-flowing and has at least one river-related outstandingly remarkable value of national or regional significance.[79] Under the 2012 planning rule, the Forest Service is required to evaluate eligibility

[75] *See* http://landslides.usgs.gov/docs/schulz/FieldTrip_C.pdf for more information.
[76] *Available at* http://www.fs.usda.gov/detail/gmug/landmanagement/planning/?cid=fseprd502008 (click on Research Natural Area link).
[77] 16 U.S.C. § 1271.
[78] 16 U.S.C. §§ 1271, 1273(a), 1278, 1281, 1283(a).
[79] 16 U.S.C. §§ 1273(b), 1276(d); FSH 1909.12, ch. 80, § 82.

as part of a forest plan revision: "the responsible official shall . . . [i]dentify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, unless a systematic inventory has been previously completed and documented and there are no changed circumstances that warrant additional review."[80] It is possible that earlier assessments of potential wild and scenic rivers lacked access to the now readily available data on river-related values and did not account for the impacts of climate change or other changed circumstances, warranting a second look at high-value streams on national forests and other federal public lands. Chapter 80 of the planning directives provides detailed guidance on the required inventory of eligible rivers and interim management of those rivers to protect their outstandingly remarkable values and free-flowing nature.

To prepare for the required inventory and evaluation of eligible river segments as part of the plan revision process, the assessment must "identify and evaluate . . . [e]xisting designated areas located in the plan area including . . . wild and scenic rivers and potential need and opportunity for additional designated areas."[81] The assessment also must include existing information on aquatic ecosystems, watersheds, water resources, climate change and other stressors and the ability of ecosystems to adapt to those stressors, imperiled species, benefits people obtain from the forest, and recreation settings, opportunities and access, and scenic character.[82] This information necessarily will inform the required evaluation of the need and opportunity for additional eligible wild and scenic rivers.

As part of identifying existing and the need and opportunity for additional eligible wild and scenic rivers, the assessment necessarily should describe previous eligibility evaluations. This includes identifying whether the forest has completed and documented a systematic inventory and, if so, any changed circumstances – both forest-wide and river-specific – that may warrant additional review.[83] Changed circumstances may warrant additional review of previous eligibility and/or suitability determinations.[84] "Changed circumstances are changes that have occurred to the river or the river corridor that have affected the outstandingly remarkable values" in either a positive or a negative way.[85]

According to the 2006 Comprehensive Evaluation Report prepared in preparation for the 2007 land management plan revision, the GMUG evaluated all of the rivers for eligibility and found 19 segments totaling over 80 miles were eligible. The assessment report should provide a summary of the 2005 eligibility evaluation (process and findings) and make available to the public the reports and documents related to the 2005 eligibility evaluation. It should also provide information on any changed circumstances that may warrant a re-evaluation.

[80] 36 C.F.R. § 219.7(c)(2)(vi).
[81] 36 C.F.R. § 219.6(b)(15).
[82] 36 C.F.R. § 219.6(b)(1)-(3), (5), (7) & (9).
[83] *See* 36 C.F.R. § 219.7(c)(2)(vi).
[84] FSH 1909.12, ch. 80, §§ 82.4, 83.11.
[85] FSH 1909.12, ch. 80, § 82.4. Section 82.4 of the Chapter 80 directives provides a non-exclusive list of examples that include listing or de-listing of a species, changes that make the river's values more unique or common, events that enhance or diminish recreational opportunities, and commitments made through settlement agreement or appeal decisions.

The 2007 GMUG Forest Plan, in both the Plan's part 1.A.16.2 "Desired Conditions" and Chapter 6 of the assessment document, found 18 stream segments eligible for further consideration as Wild and Scenic Rivers. These are:

- Oh Be Joyful, 4 segments
- Slate River, 1 segment
- East River, 1 segment
- Lower Taylor River, 1 segment
- West Elk Creek, 1 segment
- Upper West Soap Creek, 1 segment
- Tabeguache Creek, 1 segment
- Escalante Creek, 1 segment
- Bear Creek (Ouray), 1 segment (Note that 2.8 miles of another segment – Bear Creek (Telluride) – is listed as eligible in the 2006 Comprehensive Evaluation Report[86] at page 7, but inexplicably dropped from the other planning documents. Hence the discrepancy in number of eligible segments).
- Cow Creek, 1 segment
- Wetterhorn Creek, 1 segment
- Wildhorse Creek, 1 segment
- Difficulty Creek, 1 segment
- Bridal Veil Creek (falls)
- Ingram Falls.

It is important to note that this 2007 list may not be exhaustive. For example, the GMUG 2006 assessment report's list of eligible rivers does not include several San Miguel tributaries that are specifically listed in *Mountains to Mesas* (M2M).[87] These are:

- Fall Creek
- Deep Creek
- Specie Creek
- Beaver Creek
- Horsefly Creek
- Cottonwood Creek.

Tabeguache Creek, listed in M2M, is included in the 2006 eligibility assessment. The Assessment Report should identify the streams found eligible in 2006, and the stream segments identified by citizens in the M2M as potentially eligible.

[86] *See* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd502118.pdf.
[87] *See* M2M at 66-67.

In addition, it is important that the Forest Service take a careful look at current revision efforts for the BLM Uncompahgre Field Office (UFO) Resource Management Plan (RMP) pertaining to Wild and Scenic River analysis. The draft Resource Management Plan and Draft Environmental Impact Statement found 29 segments eligible. See Table 2. Of those BLM eligible stream segments, 11 also flow across the GMUG. These are:

Tributaries to Gunnison River

- Monitor Creek
- Potter Creek
- Roubideau Creek

Gunnison River basin, in Dominguez-Escalante NCA

- Cottonwood Creek (found *suitable in final Dominguez-Escalante NCA RMP*)
- Escalante Creek (was *eligible, but not found suitable in final Dominguez-Escalante NCA RMP*)
- Rose Creek (was *eligible, but not found suitable in final Dominguez-Escalante NCA RMP*)

Tributaries to North Fork Gunnison River

- Deep Creek *(via Muddy Creek*)
- West Fork Terror Creek

Tributaries to San Miguel River

- Naturita Creek
- San Miguel River Segment 2 (several *tiny crossings through the forest; Forest Service segment in Township 46 N, Range 13W, Section 34 most important, intersecting with BLM's San Miguel River Segment 2*)
- Tabeguache Creek (*already included on GMUG's 2006 eligibility findings*)

The Assessment Report should identify the river segments that were found eligible by adjacent BLM units and that cross into the GMUG.

E. Do existing Research Natural Areas satisfy the objectives listed in Forest Service Manual 4063.02?

A Research Natural Area (RNA) is "[a] physical or biological unit in which current natural conditions are maintained insofar as possible . . . by allowing natural physical and biological processes to prevail without human intervention."[88] RNAs should be "large enough to provide essentially unmodified conditions within their interiors . . . and to protect the ecological processes, features, and/or qualities for which the [RNAs] were established."[89] As Forest Service Manual 4063.1 explains, "[l]andscape-scale [RNAs] that incorporate several ecosystem elements

[88] Forest Service Manual (FSM) 4063.05.
[89] FSM 4063.1.

are ideal, where feasible." Collectively, RNAs comprise "a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity."[90]

Forest Service Manual 4063.02 enumerates eight objectives for establishing RNAs:

- Maintain a wide spectrum of high quality representative areas that represent the major forms of variability . . . that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity
- Preserve and maintain genetic diversity
- Protect against human-caused environmental disruptions
- Serve as reference areas for the study of natural ecological processes including disturbance
- Provide onsite and extension educational activities
- Serve as a baseline area for measuring long-term ecological changes
- Serve as control areas for comparing results from manipulative research
- Monitor effects of resource management techniques and practices

As described above and highlighted by these objectives, a robust, connected network of protected natural areas that represent the full spectrum of ecosystem and habitat types is critical to conserving biological diversity and enhancing climate change adaptation. Such a network is especially important for purposes of scientific observation and study in light of anticipated alternations in vegetation and species types and distributions related to climate change.

Accordingly, to properly assess the need and opportunity for additional RNAs, the forest assessment should evaluate and document whether the size, distribution, and representation of its two designated RNAs satisfy each of the objectives enumerated in Forest Service Manual 4063.02.[91] In doing so, the Forest Service should pay particular attention to: the need for and adequacy of connectivity between existing RNAs; how or whether those RNAs fit into a larger network of protected lands and corridors; and whether the RNAs encompass entire small drainages,[92] exist or could be extended to a landscape scale,[93] and are large enough to continue to represent the identified ecosystem(s) even with anticipated climate change effects. The RNA system on the GMUG should include representations of all major ecosystems and as many other ones as is feasible. In addition, the Forest Service should compare its RNA network to state natural resource assessment priority areas and biodiversity data to identify potential deficiencies, and share that information in the assessment.

[90] FSM 4063.
[91] The GMUG has two designated RNAs according to the 2006 Comprehensive Assessment on Research Natural Areas: Gothic and Escalante Creek on the Gunnison and Ouray Districts, respectively. These RNAs total approximately 1130 acres.
[92] FSM 4063.2 ("Where possible, select entire small drainages because they maintain interrelationships of terrestrial and aquatic systems.").
[93] FSM 4063.1. ("Landscape-scale Research Natural Areas that incorporate several ecosystem elements are ideal, where feasible").

F. What are the socio-economic factors relevant to protecting national forest lands through conservation designations (e.g., recreation trends, public sentiment, etc.)?

In addition to their ecological values, areas protected through conservation-oriented designations, including wilderness, contribute to social and economic well-being. A proper assessment of the need and opportunity for additional designated areas must identify and evaluate these benefits. In particular, the assessment should consider recent trends in recreation, public opinion and values, and the economic contributions associated with wilderness and other conservation designations. A robust assessment of those benefits is a necessary prerequisite to satisfaction of the Forest Service's substantive planning mandate to provide for social and economic sustainability, including sustainable recreation, ecosystem services, and opportunities to connect people with nature.[94]

1. Public opinion shows a need for additional wilderness.

Surveys consistently show that Americans value wilderness and generally favor the designation of additional wilderness. For instance,

- In Chapter 7 of Cordell's *Multiple Values of Wilderness* (2005), Schuster *et al.* addressed the social values of wilderness by looking at survey results at the national, regional, and state levels. They found that: (a) overall there is consensus across groups within the American population that there is not enough wilderness, regardless of how the data are stratified; (b) residents generally support designating more wilderness in their respective states; and (c) Americans are willing to make unspecified monetary tradeoffs to gain additional wilderness.

- As of 2006-2007, more than two-thirds of American citizens (67%) nationally supported the designation of additional wilderness in their home state (Cordell 2008b).[95]

- As of 2001, the majority of Americans felt that the current percentage of the National Forest System designated as wilderness was not enough (Scott 2003).[96]

[94] 36 C.F.R. § 219.8(b).

[95] When asked how they felt about designating more of the federal lands as wilderness in their home state, 67% of National Survey on Recreation and the Environment (NSRE) respondents indicated they somewhat or strongly favor more.

[96] Question: "Currently, 18% of the land in the United States' national forests is permanently protected from logging and other development. Do you think the U.S. has too much permanently protected areas in the national forests, not enough protected areas in the national forest, or the right amount of permanently protected areas in the national forests, or aren't you sure about that?" N=1,000 likely voters.

- Over half of Americans (almost 51%) indicated there is not enough wilderness, while only 4% expressed the opinion that there is too much (Cordell 2008b).[97]

- Americans are willing to accept higher costs for electricity, gasoline, and other consumer products to have more wilderness lands designated and to have higher quality air over and near wilderness (Scott 2003).

At a regional level, we see that:

- 70% of west slope Colorado residents support efforts to protect additional deserving public lands as wilderness in or near the county where they live.[98]

- 71% agree wilderness-quality lands are more important for recreation, tourism, and wildlife than for energy development. Majority support was found across all geographical regions and party affiliations (85% Democrat support, 76% Independent support, and 52% Republican support).[99]

- 90% agree that wilderness areas were important economically for the hunting, fishing, and tourism they support.[100]

- 71% believe that wilderness areas should not be sacrificed for energy development, and that clean energy alternatives should be pursued instead. In a different question, only 33% of respondents agree that wilderness-quality lands are needed for domestic energy development.[101]

- 85% of Coloradoans report that Wilderness areas or open lands with little to no development and opportunity for solitude are moderately to very important to them, while 53% felt it was extremely important.[102]

[97] NSRE respondents were asked their opinions about whether they saw the amount of federal land now designated as wilderness as too little, about right, or too much. Over half in 2006-2007 (almost 51%) indicated there is not enough wilderness, and 35% indicated the amount is about right. Only 4% expressed the opinion that there is already too much.
[98] See attached survey results of survey conducted by Talmey-Drake Research & Strategy, Inc., a public opinion and market research firm in Boulder, Colorado. (Appendix 5).
[99] Ibid.
[100] Ibid.
[101] Ibid.
[102] Colorado Parks and Wildlife, Research, Policy and Planning Unit. 2014. 2013 Outdoor Recreation Participation Public Survey Summary Report. Question 11. *Available at* http://cpw.state.co.us/Documents/Trails/SCORP/2013PublicSurveySummaryReport.pdf.

- 90% of Coloradoans feel that Wilderness areas or open lands with little to no development and opportunity for solitude are a moderate to high priority for future investment, while 45% felt it was an essential priority.[103]

- 81% of Coloradoans feel that nature or wildlife viewing areas should be a moderate to high future investment priority in their local communities.[104]

- The results from the 2012 Colorado College State of the Rockies Conservation in the West poll found that Colorado voters across the political spectrum view Colorado's parks and public lands as essential to the state's economy. Of voters surveyed, 93 percent agreed that "Our national parks, forests, monuments, and wildlife areas are an essential part of Colorado's economy." And 75% said that Colorado should maintain protections for land, air and water in the state rather than reduce them in an effort to create jobs as quickly as possible (Colorado College 2012).

These survey and poll results affirm the conclusions in the GMUG's 2006 Comprehensive Evaluation Report. The Human Dimensions chapter summarizes the state of the forest and its management for a suite of designated areas including roadless areas and special interest areas. The report documents that public sentiment has changes since the GMUG's current 1983 land management plan and its 1991 amendment were developed in that the public wants more protection of lands for conservation. For example, in discussing roadless areas, the report states that "The current plan direction does not reflect the stakeholder support and public comment favoring retention and preservation of undeveloped areas. Ecological sustainability factors also support preservation of areas for wildlife and native species habitat values." (Page 3) Similarly, in the section on Special Interest Areas, the report finds that "Social values have changed since the last Forest Plan decision. There is an increase in biological, scenic, and recreational values that was not accounted for during the last planning effort." (Page 19)

2. <u>Participation in outdoor, nature-based recreation is steady or on the rise.</u>

Recreational surveys show that Americans are participating in increasing numbers in recreational pursuits that natural areas such as wilderness provide. According to Cordell (2008b), both the total number of Americans participating and the total number of days annually in which we participate in nature-based recreation have grown since 1994. For example, viewing, photographing, and studying nature (e.g., wildlife and birds), have grown strongly, while primitive camping and backpacking days increased 12% and 24%, respectively, between 2000 and 2008 (Cordell 2008b).

In addition, a significant percentage of Americans participate in outdoor recreation. For instance,

- Across the country, an estimated 35% of Americans, both urban and rural residents, participated in birding between 2004 and 2007 (Cordell 2008c).

[103] Ibid. Question 12.
[104] Ibid. Question 13.

- More than 90 million U.S. residents participated in some form of wildlife-related recreation in 2011. Participation is up three percent from five years earlier: the number of Americans who hunted or fished rose from 33.9 million in 2006 to 37.4 million in 2011. 27 million freshwater anglers logged an average of 16 days of fishing each in 2011 (USDOI Fish & Wildlife Service and USDOC Census Bureau 2011).

- Americans take between 16 and 35 million trips to wilderness each year on their own or with a guide to hike, backpack, camp, climb mountains, ride horses, ski, raft, canoe, take pictures, view wildlife, or stargaze (Cordell 2005).

- Water paddling sports are popular in the United States, with 10.3 million people participating in kayaking and 3.7 million people participating in rafting – about six percent of the population (Outdoor Foundation 2013). According to National Visitor Use Monitoring data, about three percent of National Forest visitors participate in non-motorized water sports.

Specific to Colorado, recent surveys demonstrate that Coloradoans are very active in the outdoors:

- Coloradoans are outdoor recreation enthusiasts. In 2013, 90% of Coloradans reported participating in some form of outdoor recreation in Colorado in the previous year, about 66% reported recreating in the outdoors at least one day a week on average, and 60% said that they will either greatly increase or somewhat increase their participation in outdoor recreation over the next five years.[105]

- Wilderness-compatible activities are the most popular outdoor recreation pursuits of Coloradoans with hiking, walking, hiking/backpacking, picnicking, and fishing making up the four most popular outdoor recreation activities, as calculated by total statewide activity days, in each one of the state's regions. Tent camping is the most popular overnight accommodation.[106]

- After downhill skiing, wilderness compatible activities are the most popular activities on the GMUG (see Table 1).[107]

Specific to the GMUG National Forest, the forest's 2014 National Visitor Use Monitoring Report cites the three most popular recreational activities after downhill skiing as hiking/walking (15% main activity; 26% participation), viewing natural features (6% main activity, 26% participation), and viewing wildlife (.5% main activity; 18% participation). This compares to 1%

[105] Colorado Parks and Wildlife, 2013 Outdoor Recreation Participation Public Survey Summary Report. Questions 2 and 14. Available at https://cpw.state.co.us/Documents/Trails/SCORP/2013PublicSurveySummaryReport.pdf.
[106] Colorado Parks and Wildlife, 2013 Outdoor Recreation Participation Public Survey Summary Report. Page 2.
[107] USDA Forest Service, 2014. National Visitor Use Monitoring Report. Available at https://apps.fs.usda.gov/nfs/nrm/nvum/results/A02004.aspx/FY2014.

of visitors who reported off-road vehicle riding as their main activity (3% reported participation).[108]

3. Wilderness visitation is predicted to continue growing.

- The number of days Americans visited wilderness and other primitive areas increased 12% between 2000 and 2008. The number of participants visiting a wilderness area increased 3% in the same time period (Cordell 2008a).

- Bowker predicts that population growth in expanding cities in the West and Southwest in particular will result in increased use in wildernesses in the vicinity (Bowker *et al.* 2006).

- It can also be expected that population increases in the communities adjacent to national forests will occur because of their attractiveness in terms of the availability of quality outdoor recreation experiences, clean air and water, and a natural setting (USDA Forest Service 2005).

4. Economic benefits of protected public lands.

Based on a wealth of existing, scientifically validated research, the general rule is that there is a neutral-to-positive relationship between the presence and extent of wilderness, wild and scenic rivers, and other protected areas on one hand, and the economic performance of local economies and economic benefits available to nearby residents on the other (see Appendix 2). Here are a few examples from this body of research:

- Protected lands such as wilderness are vital economic assets to the western communities that are prospering the most (Rasker *et al.* 2004).

- From 1970 to 2010, western non-metro counties with more than 30% of their land base in federal protected status increased jobs by 345%. As the share of federal lands in protected status goes down, the rate of job growth declines as well. Non-metro counties with no protected federal land increased jobs by 83% over the same time period (Headwaters Economics 2012).

- Protected public lands play an important role in stimulating local economic growth – especially when combined with access to markets and an educated workforce – and are associated with some of the fastest growing communities in the West (Rasker 2006; Rasker *et al.* 2009).

- Wilderness designation enhances nearby private property values (Phillips 2004).

[108] *Ibid.*

- Wilderness and conservation lands are associated with rapid population, income, and employment growth relative to non-wilderness counties (Lorah and Southwick 2003; Lewis, Hunt, and Plantinga 2002).

- There is no evidence of job losses associated with wilderness, or that counties more dependent on logging, mining, or oil and gas development suffered job losses as a result of wilderness designation in 250 non-urban counties in the Rocky Mountains (Duffy-Deno 1998).

- More than 1.1 million jobs are created nationally through spending on fishing and watersports (Southwick Associates 2012).

- Property values have either remained stable or increased after wild and scenic river designations (USDOI National Park Service 2001).

- The Rogue River in Josephine County, Oregon generates at least $30 million a year in total economic output related to rafting, boating, fishing, and hiking, including $15.4 million in personal income and 445 full-time and part-time jobs (ECONorthwest 2009). Visitors to the Wild and Scenic section of the Rogue River accounted for three-quarters of all lodging guests in the county during the summer and fall seasons.

- Improvements to a river's flow can increase the tourism value of the area. In a study of the Cache la Poudre River in northern Colorado, the level of fishing and white-water use – and tourists' willingness to pay for that use – rose and fell depending upon the level of river flow (USDOI National Park Service 2001).

On a more local scale, a 2014 socioeconomic assessment of the GMUG National Forest found that the forest contributes directly or indirectly an estimated 3,140 jobs and approximately $100 million to local economies, with recreational and visitor spending the largest source of activity, contributing about 38% of the jobs and 32% of the labor income associated with the forest.[109]

Headwaters Economics' Economic Profile System Human Dimensions Toolkit (EPS-HDT) provides an easy-to-digest and comprehensive look at the economic situation in and around the GMUG National Forest. As explained on Headwaters Economics' website:

> EPS-HDT is a free, easy-to-use software application that runs in Excel, from your desktop, and produces detailed socioeconomic reports of communities, counties, states, and regions, including custom aggregations and comparisons. EPS-HDT uses published statistics from federal data sources, including the Bureau of

[109] *See* GMUG NFs Job and Income Contributions for 2014 At A Glance. *Available at* https://www.fs.fed.us/emc/economics/contributions/documents/at-a-glance/508/rockymountain/AtaGlance-508-GMUG.pdf.

Economic Analysis and Bureau of the Census, U.S. Department of Commerce; Bureau of Labor Statistics, U.S. Department of Labor; and others.[110]

EPS-HDT can produce 14 separate reports for each county in and around the GMUG National Forest and for the region (Delta, Mesa, Montrose, Hinsdale, Gunnison, San Miguel, Saguache, San Juan, Ouray, Gunnison counties aggregated) on a variety of relevant topics such as long-term economic trends, demographics, amenities, land use, non-labor income, development and wildfire, and payments in lieu of taxes. We have included those reports for the ten aggregated counties in Appendix 3 to illustrate the utility of this application. The reports show, for example, that:

- Approximately 71% of the land across the ten counties is under federal ownership, including nearly 40% Forest Service, while lands under private ownership comprise about 25%.[111]

- As of 2014, travel and tourism was responsible for 21% of total private employment across the ten counties; in some counties, this figure was substantial – for instance, in San Miguel, San Juan, and Hinsdale Counties travel and tourism accounted for 54%, 70%, and 48%, respectively. In comparison, mining including oil and gas was responsible for about 5%, agriculture for 4%, and timber 0.3% across the ten counties. The proportion of employment associated with tourism has remained relatively stable since 1998.[112]

- As of 2014, non-labor (e.g., investments) percentage of personal income across the ten counties was 43%. Service jobs account for 65% of total employment, while government jobs account for 13%. Unemployment across the ten counties in 2015 was 5%, and per capita income in 2014 was $39,412.[113]

- Land area covered by residences across the ten county region grew by 39% between 2000 and 2010, with residential land in Gunnison, Hinsdale, and Saguache Counties growing by 63%, 62%, and 78%, respectively.[114]

[110] *See* https://headwaterseconomics.org/tools/economic-profile-system/about/.
[111] Appendix 3, EPS-HDT, Profile of Public Land Amenities & Summary Profile for Delta, Mesa, Montrose, Hinsdale, Gunnison, San Miguel, Saguache, San Juan, Ouray, Gunnison Counties.
[112] *Ibid.*
[113] *Ibid.*
[114] *Ibid.*

- Collectively, the ten counties received approximately $16 million in federal land payments in fiscal year 2014, with 27% of that total coming from Forest Service payments.[115]

More information on the application as well as free downloads are available at http://headwaterseconomics.org/tools/eps-hdt.

IV. Transportation Infrastructure

The 2012 planning rule requires assessments to address forest infrastructure, including "recreational facilities and transportation and utility corridors."[116] As the Forest Service directives governing the assessment recognize, "[i]nfrastructure within the plan area can have a substantial impact on social, cultural, economic, and ecological conditions both within the plan area and in the broader landscape."[117] Given the extensive and decaying nature of the Forest Service road system and its significant aggregate impacts on landscape connectivity, ecological integrity, water quality, species viability and diversity, and other forest resources and ecosystem services, a robust assessment of transportation infrastructure is necessary to ensure the forest plan revision complies with the relevant substantive provisions of the 2012 planning rule and other regulatory requirements. To provide necessary context for the Forest Service's assessment of transportation infrastructure, those legal obligations are described briefly below.

To address the Forest Service's unsustainable and deteriorating road system, "subpart A" of the Travel Management Rule, 36 C.F.R. part 212, is designed to shrink the size of the system. It requires each forest to conduct "a science-based roads analysis," generally referred to as a "travel analysis process" or "TAP."[118] Based on that analysis, forests must "identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands."[119] Forests must then "identify the roads . . . that are no longer needed to meet forest resource management objectives and that, therefore, should be decommissioned or considered for other uses, such as for trails."[120] With forest plans determining the framework for integrated resource management, the plan revision is the appropriate place to ensure that the requirements of subpart A are satisfied and to establish

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[115] *Ibid.*
[116] 36 C.F.R. § 219.6(b)(11).
[117] FSH 1909.12, ch. 10, § 13.13.
[118] 36 C.F.R. § 212.5(b)(1); *see also* Memorandum from Joel Holtrop to Regional Foresters *et al.* re Travel Management, Implementation of 36 CFR, Part 212, Subpart A (Nov. 10, 2010); Memorandum from Leslie Weldon to Regional Foresters *et al.* re Travel Management, Implementation of 36 CFR, Part 212, Subpart A (Mar. 29, 2012); Memorandum from Leslie Weldon to Regional Foresters *et al.* re Travel Management Implementation (Dec. 17, 2013) (outlining expectations related to travel analysis reports).
[119] 36 C.F.R. § 212.5(b)(1) (further defining the minimum road system as that "determined to be needed [1] to meet resource and other management objectives adopted in the relevant land and resource management plan . . . , [2] to meet applicable statutory and regulatory requirements, [3] to reflect long-term funding expectations, [and 4] to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance").
[120] 36 C.F.R. § 212.5(b)(2).

direction for achieving a sustainable minimum road system. The GMUG National Forest has completed the first step towards subpart A compliance – that is, published a travel analysis report; remaining is the requirement to identify a minimum road system and unneeded roads for decommissioning or conversion. Forest Service leadership is requiring a NEPA process to meet this requirement.[121]

The substantive ecological integrity and ecological and fiscal sustainability provisions of the 2012 planning rule complement and reinforce the requirements of subpart A of the Travel Management Rule. For example, forest plans must include standards and guidelines that maintain or restore healthy aquatic and terrestrial ecosystems, watersheds, and riparian areas, and air, water, and soil quality, taking into account climate change and other stressors.[122] Plans also must implement national best management practices (BMPs) for water quality; ensure social and economic sustainability, including sustainable recreation and access and opportunities to connect people with nature; and provide for "[a]ppropriate placement and sustainable management of infrastructure."[123] As documented in more detail below and in the literature review attached as Appendix 4, the adverse environmental and fiscal impacts associated with existing transportation infrastructure (e.g., erosion, compaction, sedimentation and impairment of water quality; fragmentation of wildlife habitat; and interference with feeding, breeding, and nesting, and spread of invasive species) directly implicate these substantive requirements.

To provide the information necessary to satisfy the legal obligations described above, we recommend that the assessment identify and strive to answer the following questions, each of which is addressed in more detail below:

A. What transportation infrastructure exists on the forest?
B. What is the physical condition of the existing transportation infrastructure?
C. What is the annual maintenance revenue and cost, and what are the current and predicted maintenance needs and backlog over the life of the plan?
D. How climate resilient is the transportation system?
E. What is the minimum road system pursuant to 36 C.F.R. part 212, subpart A, and what is the deviation between the minimum road system and the current road system?
F. Does the current transportation system provide sustainable access and opportunities to connect people with nature?
G. What effects does the transportation system have on the ecological integrity of aquatic and terrestrial systems? For example:
    1. What are the motorized route densities across the forest, and where do they exceed accepted scientific thresholds for aquatic and terrestrial integrity?

[121] *See* Memorandum from Leslie Weldon to Regional Foresters *et al.* re Travel Management Implementation (Dec. 17, 2013) (outlining expectations related to travel analysis reports).
[122] 36 C.F.R. § 219.8(a)(1)-(3).
[123] 36 C.F.R. §§ 219.8(a)(4), 219.8(b), 219.10(a)(3).

2. What are the impacts of transportation infrastructure on watershed conditions across the forest, as identified by the "Roads and Trails" indicator of the Forest Service's Watershed Condition Framework and other information sources?
3. How many miles of roads are connected by direct surface flow to streams, and how many road/stream crossings exist?
4. What percent of the current transportation infrastructure system is meeting required BMPs for water quality, and what is the effectiveness of the BMPs?
5. Are there Clean Water Act section 303(d) impaired streams or stream segments on the forest where the cause of impairment is sediment and/or temperature attributable at least in part to roads?
6. How significantly is the transportation system contributing to the spread of invasive species?
7. How much is the current transportation system impairing species migration and ecological integrity at a landscape scale, and could modification of the system contribute to landscape-scale restoration?

For each question, the agency should identify the best available scientific studies and reports that document the relevant condition, costs, benefits, and needs of the transportation system.[124] Principal sources of information for the GMUG National Forest include, but are in no way limited to, the forest's Travel Analysis Process Report and appendices (finalized 9/30/2015) and Travel Management Plans, including the environmental impact statement, record of decision, and associated specialist reports addressing resources such as aquatics, recreation, wilderness, invasive species, roads, watershed, soils, wildlife, and socio-economics.

As described below, the best available scientific information shows that the transportation system on the GMUG National Forest is too large for available budgets, and is causing adverse impacts to specific species and water bodies. This information highlights an acute need for the forest plan revision to comprehensively address and provide management direction aimed at making the road system considerably more sustainable – both ecologically and fiscally – and resilient to climate change stressors.

A. What transportation infrastructure exists on the forest?

Understanding the baseline system of transportation infrastructure is a necessary first step in a robust assessment of forest infrastructure – and eventual compliance with the Forest Service's legal obligation to provide for a well-maintained system of needed roads that is fiscally and environmentally sustainable and provides for safe and consistent access for the utilization and protection of the forest. Accordingly, the forest assessment should first describe existing infrastructure, including the number, condition, status (e.g., open or closed; permitee or administrative use only), maintenance level, purpose (e.g., leads to recreational destination,

[124] *See* 36 C.F.R. § 219.3.

commercial use) and density of roads and trails.[125] The assessment should address *all* motorized routes. This includes Maintenance Level (ML) 1-5 system roads, motorized trails, non-system roads and temporary roads. Lastly, the assessment should describe how many roads are likely not needed and likely needed per the GMUG Travel Analysis Process Report (TAP).

According to the forest's 2015 TAP, the GMUG's road system consists of 3,795 miles, 3,744 of which are open to public use, 51 miles of which are closed ML1 roads.[126] The forest also contains roads identified for decommissioning in prior NEPA decisions that still remain on the system, along with temporary roads and roads under other jurisdictions (state, county, private). The TAP does not specify the mileages of the roads in any of these categories. The GMUG National Forest manages 62 miles of rights-of-ways outside of the proclaimed forest boundary.[127]

Although the TAP includes motorized trails in its analysis, it does not report on these mileages, condition, or location of these trails.[128] According to the Uncompahgre National Forest's 2002 Travel Management Plan Record of Decision, the forest has approximately 633 miles of non-motorized trails and 249 miles of motorized off-road vehicle trails.[129] Similarly, the Gunnison National Forest has 559 miles of motorized trails and 409 miles of non-motorized trails[130], and the Grand Mesa National Forest has somewhere between 200 and 300 miles of motorized trails and 119 miles of non-motorized summer trails.[131]

B. What is the physical condition of the existing transportation infrastructure?

After identifying existing transportation infrastructure, the forest assessment should evaluate the physical condition of that infrastructure.[132] The physical condition of forest roads has important implications for the fiscal and ecological sustainability of the system. Inadequately maintained roads are more likely to fail, causing corresponding damage to aquatic and other ecological systems, endangering public safety, and requiring additional funds to remediate damage and hazardous conditions. Particularly given the general state of disrepair of much of the National Forest road system and anticipated climate change stressors, understanding the baseline physical

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[125] *See* FSH 1909.12, ch. 10, § 13.6(1) (Assessment "should identify and evaluate available information such as [t]he location and condition of infrastructure within the plan area . . . includ[ing] the forest road system [and] recreational infrastructure . . . . This information is for basic understanding of the role of infrastructure in the plan area . . . .").
[126] GMUG National Forest, *Final Travel Analysis Report*, at 5 (September 30, 2015 ("GMUG TAP").
[127] *Ibid.* Page 6.
[128] *Ibid.* Page 2 ("National Forest System Trails receiving motorized travel were incorporated into the Risk assessment, specifically road density calculations.")
[129] Uncompahgre National Forest Travel Plan Record of Decision, 2002.
[130] Gunnison National Forest, 2009. *Final Environmental Impact Statement for the Travel Management Plan*, at 50. *Available at:* http://www.fs.usda.gov/detail/gmug/landmanagement/projects/?cid=stelprdb5173074.
[131] Grand Mesa National Forest, 1994. Decision Notice and Finding of No Significant Impact, Travel Management Plan Revision at 5. *Available at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd489385.pdf*. This decision designated 198 miles of motorized trails. It was followed by a decision in 2003 that designated up to about 100 miles more. The documentation for the 2003 decision is not available online (weblinks do not work).
[132] *See* FSH 1909.12, ch. 10, § 13.6(1) (assessment "should identify and evaluate available information such as [t]he location *and condition* of infrastructure . . . includ[ing] the forest road system" (emphasis added)).

condition of the system is necessary to ensure the plan revision ultimately provides for an ecologically and fiscally sustainable transportation system.[133] Accordingly, the assessment should identify, for example, the percentage of the system that is: (1) maintained to standard annually; (2) in urgent need of work; (3) operating below objective maintenance level; and (4) with adequately performing BMPs in place. The assessment should also identify the physical condition of the motorized and non-motorized trail systems.

This important information is not provided in the GMUG TAP, although the TAP does show that 12% (455 miles) of the existing road miles pose a high environmental risk and 80% (3035 miles) pose a moderate risk, and that 95% of the high risk roads are ML2. The GMUG National Forest should strive to find this information and present it in the TAP to inform the need for change and proposed action.

C. What is the annual maintenance revenue and cost, and what are the current and predicted maintenance needs and backlog over the life of the plan?

As described above, the Forest Service must provide for the fiscal sustainability of its transportation network. With the significant maintenance needs associated with the Forest Service's vast and deteriorating road system, understanding the maintenance and management budget for the system is a prerequisite to ensuring fiscal sustainability. Accordingly, Forest Service directives require that the assessment include "[i]nformation about the sustainability of the infrastructure, including planning unit's fiscal capability to maintain existing infrastructure and the current backlog of infrastructure maintenance."[134] More specifically, the assessment should identify annual maintenance revenue and cost, as well as the current and predicted maintenance backlog over the life of the plan.

Nationally, the 370,581-mile National Forest road system suffers an extraordinary maintenance backlog of nearly $3 billion.[135] Although we suspect that the story on the GMUG is similar, we cannot tell from the TAP. The TAP does not provide adequate information to ascertain how severe the annual fiscal gap between road revenues and road expenses is. The TAP shows that it costs annually $1.464 million to maintain 25% of "roads needed and opened for public use (2719) in 2015" but does not explain whether maintaining 25% is adequate to maintain road standards and conditions, or whether it should have to increase this figure to achieve a well-maintained system. It also does not provide any information on the current road and trail maintenance backlogs or anticipated changes in the backlog in the future. In addition, the TAP does not show clearly the past and anticipated revenues. The assessment report should provide

[133] *See* 36 C.F.R. § 219.1(g) (plan components generally must be "within . . . the fiscal capability of the unit"); *id.* § 219.8 (plans must provide for ecological, social, and economic sustainability); 36 C.F.R. § 212.5(b)(1) (minimum road system must "reflect long-term funding expectations" and "minimize[] adverse environmental impacts"); FSH 1909.12, ch. 20, § 23.23l (plan components for roads and trails infrastructure "must be within the fiscal capability of the planning unit").
[134] FSH 1909.12, ch. 10, § 13.6(4).
[135] USDA, Forest Service, National Forest System Statistics FY 2015.

this information, as it is required to inform the need for change, proposed action, and the land management plan revision.

The Forest Service also suffers from a serious trail maintenance deficit and backlog. In 2012, the Government Accountability Office published a report in which it estimated the value of the Forest Service's national trail maintenance backlog to be $314 million, excluding an additional $210 million deficit for annual maintenance, capital improvements, and operations (Government Accountability Office 2013). The report estimated that nationally only about 25% of trails meet agency standards and cautioned that "[t]rails not maintained to the Forest Service's standards have a range of negative effects, including inhibiting trail use and posing potential safety hazards, harming natural resources, and adding to agency costs." We have been unable to locate information on the trail maintenance backlog for the GMUG National Forest, and the assessment should include that information.

D. How climate resilient is the transportation system?

Climate change generally intensifies the adverse impacts associated with roads. In particular, the warming climate is expected to lead to more extreme weather events, resulting in increased flood severity, more frequent landslides, altered hydrographs, and changes in erosion and sedimentation rates and delivery processes.[136] As the Council on Environmental Quality's guidance on climate change recognizes, "[c]limate change can make a resource, ecosystem, human community, or structure more susceptible to many types of impacts and lessen its resilience to other environmental impacts apart from climate change."[137]

Many national forest roads were not designed to current engineering standards (or, in some cases, any engineering standards), making them particularly vulnerable to climate-induced hydrologic shifts. That vulnerability is further exacerbated by the deteriorating physical condition of the system and significant maintenance backlog, as described above. Moreover, even those roads designed to current engineering standards and hydrologic conditions may fail under future weather scenarios, further intensifying adverse ecological impacts, public safety concerns, and maintenance needs (USDA Forest Service 2010b).

Given these stressors, the forest assessment should address the extent to which the existing transportation system is designed to accommodate projected hydrologic changes resulting from climate change. To the extent the system is not designed to accommodate projected climate changes, the assessment should describe implications of the status quo to sustainable access and

[136] Appx. 4, Lit. Review at 9-14.

[137] Council on Environmental Quality, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, pp. 21-22 (Aug. 1, 2016), *available at* https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance (further explaining that "[t]his increase in vulnerability can exacerbate [other] effects [associated with a] proposed action" and that "[s]uch considerations are squarely within the realm of NEPA and can inform decisions on whether to proceed with, and how to design, the proposed action to eliminate or mitigate impacts exacerbated by climate change," as well as "possible adaptation measures to address the impacts of climate change, ultimately enabling the selection of smarter, more resilient actions.").

ecological integrity of aquatic and terrestrial systems, and describe what changes are required to adapt the system.

The 2015 TAP does not address the extent to which the existing transportation system is designed to accommodate climate stressors. The Gunnison FEIS for the 2009 Travel Management Plan offers the following statement without substantiation or evidence: "It is not anticipated that climate change would have an effect on public travel at the level of analysis being conducted for Gunnison travel management planning. Public travel, as it is evaluated for this travel management decision (e.g. remain open, mode of travel, and seasonal restrictions), is expected to continue into the near future much as it does under existing conditions regardless of changes in climate."[138]

To the contrary, it is widely understood in the scientific and engineering fields that infrastructure, and especially roads, are highly vulnerable to climate change effects. For instance, see the opinion piece in the Boulder Transcript by University of Colorado Professor Dr. Paul S. Chinowsky entitled *Resiliency Starts with Infrastructure*[139] where he predicts roads, in particular, will be damaged: "Although much of our infrastructure will be affected by these changes, two sectors are of particular concern and as such need to be a priority for resiliency actions — roads and public buildings." The Colorado Climate Change Vulnerability Study, published in 2016, devotes and entire chapter to the transportation sector, and describes its vulnerability from flooding caused by shifting precipitation patterns and from more intense drought periods (Gordon and Ojima 2015).

In 2013, the Colorado Front Range received several days of sustained rainfall that caused severe flooding and infrastructure damage to the entire area including the Arapaho-Roosevelt National Forest. In a Flood Assessment Report, the Arapaho-Roosevelt National Forest estimated $15 million in damage to ML 3-5, high priority ML 2 roads, and trails.[140] Damage to ecological resources such as fisheries was not calculated. While we can speculate whether this storm's intensity was a result of a changing climate, we do know that climate scenarios anticipate more intense storms and that the 500-year storm of the past will have a shorter interval in the future. The situation on the Arapaho-Roosevelt National Forest should be a warning to other forests that infrastructure is vulnerable, and that necessary access routes need to be made climate-ready while unneeded routes should be removed.

Forest Service reports affirm that infrastructure is vulnerable to climate change. For example, a 2010 southwest region climate change report predicts more extreme weather events resulting in "changes in the composition and diversity of desired ecosystems; destruction of habitat; timber loss; increasing damage to infrastructure such as trails, facilities, and roads; and loss of

[138] USDA and USDOI, 2010. *Final Environmental Impact Statement Gunnison Basin Federal Lands Travel Management, April 2010.* Page 248.
[139] Boulder Transcript, 5/2/2015. *Available at* http://www.dailycamera.com/editorial-roundtables/ci_28037562/paul-s-chinowsky-resiliency-starts-infrastructure-climate-change.
[140] USDA, 2013. *Flood Impact Assessment Report Arapaho and Roosevelt National Forests and Pawnee National Grassland, October 2013 -DRAFT. Available at:* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5440234.pdf.

recreation opportunities" (USDA Forest Service 2010c). The report goes on to describe how "[h]eavy rains and higher flood levels can affect maintenance and structural integrity of built infrastructure and slow progress towards improvements," as well as threaten aquatic and riparian ecosystems. It recommends that national forests "[p]lan for extreme [weather] events" and "[a]ssess and maintain infrastructure that could be affected by flooding (dams, bridges, roads, culverts)." Also, the Intermountain Region is in the process of conducting a climate vulnerability assessment through a science-management collaborative effort known as the "Intermountain Adaptation Partnership." With respect to infrastructure, the partnership's 2016 draft assessment summary concludes:

> Warming temperatures will lead to decreased snowpack accumulation and earlier melt out, resulting in shifts in the timing and magnitude of streamflow. Increases in the occurrence and magnitude of winter and spring peak streamflows are likely. . . . With decreasing budgets, there is decreased capacity to maintain [roads near streams], and there is a backlog of deferred maintenance. . . . Increased peak flow makes infrastructure more vulnerable to effects ranging from minor washout to complete loss of road prism, with effects on public safety and access for resource management, and the environment. . . . Infrastructure, including roads near perennial streams, which are valued for public access and resource management, are likely to be impacted by higher winter and spring peak streamflows. Maintenance and repair costs will increase with increased damage to infrastructure. Damage to roads near streams often has ecological effects on stream water quality and aquatic habitats.[141]

The assessment should identify information addressing the extent to which the existing transportation system is designed to accommodate climate stressors and opportunities to adapt the system to be more resilient to those stressors.

E. What is the minimum road system pursuant to 36 C.F.R. part 212, subpart A, and what is the deviation between the minimum road system and the current road system?

As described above, each national forest is required to identify "the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands" along with unneeded roads for decommissioning or conversion.[142] With forest plans determining the framework for integrated resource management, the plan revision is the appropriate place to ensure that the forest has an identified minimum road system to carry out the revised plan's goals and objectives, and to provide direction for achieving that system. Accordingly, the assessment should identify the minimum road system pursuant to subpart A, the deviation between that system and the current road system, and the unneeded roads for decommissioning or conversion. If this information is not available, the assessment report should

[141] Intermountain Adaptation Partnership, Draft Vulnerability Assessment Summaries, p. 104 (April 2016), *available at* http://adaptationpartners.org/iap/docs/IAPVulnerabilityAssessmentSummariesDraft.pdf.
[142] 36 C.F.R. § 212.5(b)(1) and (2).

acknowledge the gap and the need to fully comply with subpart A under the revised plan. It should also identify relevant recommendations from the TAR, including the number, types, and locations of roads likely needed and not needed for future use.

The GMUG, as far as we know, has yet to identify a minimum road system and fully comply with subpart A. The completion of the GMUG TAP was an important first step in this process.

F. Does the current transportation system provide sustainable access and opportunities to connect people with nature?

Well-sited and maintained transportation infrastructure can provide important services to society, including access for the utilization, enjoyment, and protection of forest resources. To that end, the 2012 planning rule requires forest plans to provide for social and economic sustainability, including sustainable recreation and access, and integrated resource management for multiple use considering "[a]ppropriate placement and sustainable management of infrastructure, such as recreational facilities and transportation and utility corridors," and "[o]pportunities to connect people with nature."[143]

To comply with those mandates, the forest assessment should evaluate whether and how the current transportation system provides sustainable access.[144] Measures of sustainable access include the extent to which system routes: (1) are adequately managed and maintained; (2) are sited – and designated for specific uses and time of year – so that they do not interfere with important conservation resources or cause unnecessary conflict with other uses; (3) fulfill the access needs identified in the revised plan, and (4) connect people to nature.

G. What effects does the transportation system have on the ecological integrity of aquatic and terrestrial systems?

The 2012 planning rule requires that plans provide for the ecological integrity of aquatic and terrestrial ecosystems and watersheds, including maintaining or restoring their structure, function, composition, and connectivity, while taking into account factors such as climate change and other stressors, the broader landscape beyond the plan area, and opportunities for landscape-scale restoration.[145] To provide the information necessary to satisfy this substantive mandate, the forest assessment should evaluate impacts of the transportation system on the ecological integrity

[143] 36 C.F.R. §§ 219.8(b), 219.10(a)(3) & (a)(10).
[144] *See* FSH 1909.12, ch. 10, §§ 13.4(1)(d)-(e), 13.6(7) (assessment "should identify and evaluate . . . [t]he infrastructure's contribution to social and economic sustainability," including "[t]he nature, extent, and condition of trails, roads, facilities, and other transportation . . . infrastructure to provide recreational access" and "[t]he opportunities within the plan area to foster greater connection between people and nature through education, experience, recreation, and stewardship").
[145] 36 C.F.R. § 219.8(a)(1).

of the forest's aquatic and terrestrial systems.[146] The following questions are designed to assist the forest in that endeavor:

1. **What are the motorized route densities across the forest, and where do they exceed accepted scientific thresholds for aquatic and terrestrial integrity?**

The best available science shows that road density is one of the most important metrics of the ecological effects of roads on important watersheds, migratory corridors and other critical wildlife habitat, and other forest resources. Indeed, there is a direct correlation between road density and various markers for species abundance and viability, and adopting road density thresholds is one of the most effective strategies for achieving an ecologically sustainable road system.[147] Accordingly, Forest Service directives identify road density as one of the "[k]ey ecosystem characteristics [that] provide a mechanism for assessing status of ecosystem conditions regarding ecological integrity."[148] Because the ecological impacts associated with roads and motorized travel are not limited to open system roads, density thresholds should apply to all motorized forest routes, including closed, non-system, and temporary roads, and motorized trails.[149] Thus, the forest assessment should describe motorized route densities across the forest and identify where they exceed accepted scientific thresholds for aquatic and terrestrial integrity.

The GMUG TAP calculated the density of motorized system routes (ML1-5 roads and motorized trails) as a measure of risk to watersheds and wildlife.[150] However, the TAP does not provide the public with route density maps or calculations. This assessment report should include information on motorized route densities across the forest and any scientifically substantiated conclusions about ecological risk or benefit associated with the current route densities. In particular, the assessment report should highlight where road densities are exceeding scientifically accepted thresholds for wildlife and are at concerning levels for aquatic health.[151]

2. **What are the impacts of transportation infrastructure on watershed conditions across the forest, as identified by the "Roads and Trails" indicator of the Forest Service's Watershed Condition Framework and other information sources?**

The Forest Service's Watershed Condition Framework characterizes the health and condition of national forest watersheds as Class 1: Properly Functioning, Class 2: Functioning at Risk, or Class 3: Impaired, based on a set of twelve condition indicators (USDA Forest Service 2011a). Indicator #6 is the condition of forest roads and trails and provides an important measure of the

[146] *See* FSH 1909.12, ch. 10, § 13.6(6) (assessment "should identify and evaluate available information such as . . . [t]he impacts of infrastructure on ecological integrity and species diversity").
[147] Appx. 4, Lit. Review at 7-9 & Att. 2 (summarizing best available science on road density thresholds for fish and wildlife); *see also* USDA Forest Service (2011).
[148] FSH 1909.12, ch. 10, § 12.13, Exhibit 01.
[149] Appx. 4, Lit. Review Att. 2.
[150] GMUG TAP, pages 5-6.
[151] Appx. 4, Lit. Review at 7-9 & Att. 2 (summarizing best available science on road density thresholds for fish and wildlife); *see also* USDA Forest Service (2011).

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 3 depicts those conditions on the GMUG National Forest.[152] The map shows that the majority of the forest's watersheds (about 51%) 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. The assessment should include this information, as well as any other information relevant to watershed conditions associated with transportation infrastructure.

3. How many miles of roads are connected by direct surface flow to streams, and how many road/stream crossings exist?

As described above, the planning rule establishes a Forest Service obligation to provide for the ecological integrity of aquatic systems. In addition to route density (discussed above), scientifically credible, landscape-scale measures of risk to aquatic integrity include miles of road connected by direct surface flow to streams and the number of road/stream crossings by sub-watershed.[153] Accordingly, the assessment should report on these two metrics. The data related to system roads should be retrieved relatively easily through a GIS query. If necessary, road miles within 300 feet of streams and riparian areas can serve as a proxy for miles of road connected by direct surface flow to streams.[154]

While the GMUG TAP used stream crossings as a measure of water quality and stream health[155], the TAP does not actually provide the data used in the risk assessment. The GMUG, in developing the Gunnison Travel Management Plan in 2009, clearly assessed stream crossings and road density per watershed, although the information is presented only for select watersheds.[156] In addition, the recent Spruce Beetle Epidemic and Aspen Decline Management Response (SBEADMR) FEIS provides the number of road/stream crossings on the GMUG, broken down into six Geographic Areas.[157] The forest plan assessment should provide all relevant existing data and scientifically-grounded related conclusions about aquatic health. To the degree that the Forest Service has information on non-system roads, the assessment should also attempt to describe the impacts to aquatic resources from non-system roads. These include temporary roads (which the Forest Service should be tracking), unauthorized roads, and legal roads under other jurisdictions.

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[152] The relevant data can be found at http://www.fs.fed.us/publications/watershed/excel_WCC_attribute_info.xlsx.
[153] *See* USDA Forest Service (2012a); Gucinski *et al.* (2000); Appx. 4, Lit. Review at 4.
[154] The Watershed Condition Framework uses this approach. *See* USDA Forest Service (2011a).
[155] GMUG TAP at 2
[156] USDA and USDOI, 2010. *Final Environmental Impact Statement Gunnison Basin Federal Lands Travel Management, April 2010. See, for instance:* Pages 71-75, Table 3-20, and 3-21.
[157] *See* U.S. Dept. of Agriculture, *Spruce Beetle Epidemic and Aspen Decline Management Response Final Environmental Impact Statement* (February 2016), at 103-127 [hereinafter SBEADMR FEIS].

4. What percent of the current transportation infrastructure system is meeting required BMPs for water quality, and what is the effectiveness of the BMPs?

In addition to providing for the ecological integrity and protection of aquatic systems and water resources, the 2012 planning rule requires that plans implement national best management practices for water quality.[158] The Forest Service identified national "core" BMPs in a 2012 technical guide that also establishes expectations for monitoring and reporting into a national database (USDA Forest Service 2012b). The national BMPs for road management activities are designed "to avoid, minimize, or mitigate adverse effects to soil, water quality, and instream riparian resources" and include general, non-prescriptive practices for eleven categories of road management activities (USDA Forest Service 2012b). For example, unnecessary roads should be converted to trails or decommissioned entirely using hydrologically stable practices. Roads impacting water quality should be prioritized for maintenance. Stream crossings should be limited in number to the fewest necessary. And temporary roads should be decommissioned upon completion of their project use. Forests are to develop and implement site-specific prescriptions to achieve compliance with the national core BMPs, as well as any applicable regional, state, or local BMPs.

The forest assessment should identify existing water-quality BMPs applicable to road management activities and the percent of the current transportation system that is meeting those BMPs, and report on the effectiveness of the existing BMPs.[159] This information will help identify the impacts of the forest transportation system on water quality and ecological health, and provide important baseline information for establishing plan components that customize and implement the national BMPs as they relate to the forest's transportation infrastructure.

5. Are there Clean Water Act section 303(d) impaired streams or stream segments on the forest where the cause of impairment is sediment and/or temperature attributable at least in part to roads?

Forest roads have significant impacts on water quality, particularly sediment loads and water temperatures. Roads, especially in close proximity to water, are the dominant vector for sediment delivery to stream channels and wetland/fen resources.[160] Under section 303(d) of the Clean Water Act, states are required to identify "impaired waters" that are failing to meet applicable water quality standards and designated uses, and develop maximum amounts of pollutants ("total maximum daily loads") that those impaired waters can receive and still meet water quality

[158] 36 C.F.R. § 219.8(a)(4).
[159] As part of a two-year monitoring phase-in period for the national BMP program, some forests have recently reported on BMP implementation and effectiveness. *See, e.g.*, Mount Hood National Forest, *Water Quality Best Management Practices (BMP) Monitoring Report Fiscal Year 2013* (Aug. 2014), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3813091.pdf.
[160] Appx. 4, Lit. Review at 2-4 (citing Forest Service science concluding that roads contribute more sediment to streams than any other land management activity (Gucinski *et al.* 2000)).

standards.[161] Sediment is one of the primary causes of impairment for 303(d) listed waters.[162] Given the importance of water quality as a measure of ecosystem health and integrity, forest assessments should identify any 303(d) impaired streams or stream segments whose cause of impairment is sedimentation and/or temperature attributable at least in part to forest roads. This information is necessary to ensure that the plan revision ultimately "maintain[s] or restore[s] . . . water quality" and complies with the Clean Water Act.[163]

According to the State of Colorado's most recent list of impaired waters, there are 20 impaired waterbodies in GMUG National Forest watersheds, some of which may have pollution attributable to the forest's transportation infrastructure.[164] The Gunnison National Forest 2009 Travel Management Plan acknowledges that certain transportation routes are likely contributing to impairment.[165] The assessment report should include all available information on the impaired segments including needed restorative activities, and identify knowledge gaps and approaches to address them.

6. How significantly is the transportation system contributing to the spread of invasive species?

As part of its overarching ecosystem integrity goal, the 2012 planning rule specifically requires the responsible official to consider invasive species.[166] The introduction and spread of invasive species, however, poses a primary threat to the persistence of native species and the overall integrity of aquatic and terrestrial ecosystems. Indeed, in 2004, then Chief Dale Bosworth identified invasive species as one of the four primary threats facing our national forests.[167] By facilitating increased human intrusion into sensitive areas and species dispersal, motorized routes are the primary mechanism for spreading invasive species – which the Forest Service estimates infest an additional 4,600 acres in the western United States each day.[168] Accordingly, the forest assessment should describe how, where, and to what degree the transportation system (system and non-system) is contributing to the spread of invasive species.

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[161] 33 U.S.C. § 1313(d).
[162] U.S. Environmental Protection Agency, *National Summary of Impaired Waters and TMDL Information*, http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.control?p_report_type=T#causes_303d (last visited Aug. 11, 2015).
[163] 36 C.F.R. § 219.8(a)(2)(iii).
[164] *See* https://www.colorado.gov/pacific/sites/default/files/93_2016%2811%29.pdf for a list of impaired stream segments under the Clean Water Act in Colorado. *See also* SBEADMR FEIS pages 103-127.
[165] USDA and USDOI, 2010. *Final Environmental Impact Statement Gunnison Basin Federal Lands Travel Management, April 2010.* Page 66.
[166] 36 C.F.R. § 219.8(a)(1)(iv), 219.10(a)(8).
[167] USDA Forest Service, *Four Threats*, http://www.fs.fed.us/projects/four-threats/ (last visited Aug. 11, 2015). In announcing the Four Threats, Chief Bosworth stated, "Public lands—especially federal lands—have become the last refuge for endangered species—the last place where they can find the habitat they need to survive. If invasives take over, these imperiled animals and plants will have nowhere else to go." *See also* USDA Forest Service (2004) (describing strategies for controlling and managing the spread of invasive species).
[168] Forest Service video "Dangerous Travelers," mins. 2:07 & 3:57, http://www.fs.fed.us/invasivespecies/prevention/dangeroustravelers.shtml (last visited Sept. 2, 2015); *see also* Appx. 4, Lit. Review at 7, 10, 12.

The Forest Service notes that "Existing information on the GMUG for invasive species shows them primarily concentrated along roadways . . . and other areas with high levels of existing disturbance factors. It was found that these areas also correspond with existing infestations of priority management species."[169] Notably, riparian zones are known to be more vulnerable to infestation by invasive plants than adjacent upland sites.[170]

In 2011 the Forest Service finalized Forest Service Manual (FSM) 2900 for invasive species management. The manual articulates a coordinated and proactive management approach that includes, among other things, determining vectors and pathways that favor the establishment and spread of invasive species and designing management practices to minimize that risk. The agency's 2013 National Strategic Framework for Invasive Species Management likewise describes various strategies for prevention, including identifying high-risk pathways of movement and introduction.).[171] The Rocky Mountain Region's invasive species management strategy likewise recognizes the importance of controlling vectors, including roads and other transportation corridors.[172] Following this policy, many programs and projects involving invasive plants on the GMUG are done in cooperation with the state of Colorado or one or more of its counties. The GMUG should utilize the Colorado state noxious weed list to guide management of invasive plants.[173]

The assessment should include any existing information documenting the impact of the forest transportation system on the spread of invasive species. For example, from 1998-2013 the GMUG inventoried or treated 34 non-native invasive plant species. The GMUG's 2006 Comprehensive Evaluation Report showed an increase in invasive species, with "knapweed and thistle moving upward in elevation along forest roads."[174] The assessment should include the results of those inventories, as well as any other relevant information from local, state, regional, or national invasive species initiatives.

7. How much is the current transportation system impairing species migration and ecological integrity at a landscape scale, and could modification of the system contribute to landscape-scale restoration?

As a warming climate alters species distribution and forces shifts in wildlife migration, landscape connectivity is increasingly critical to species survival and the ability of ecosystems to adapt.[175] Yet one of the most significant impacts of the transportation system within the forest is to

[169] SBEADMR FEIS at 372.
[170] Stohlgren, T. J. & Chong, G. W. (2002). *Assessing vulnerability to invasion by nonnative plant species at multiple spatial scales*. Environmental Management 29(4): 566-577.
[171] *Available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd488910.pdf
[172] *Available at* https://www.fs.usda.gov/detail/r2/forest-grasslandhealth/invasivespecies/?cid=stelprdb5172596. For instance, see pages 11, 14, and 20.
[173] *See* https://www.colorado.gov/pacific/agconservation/noxiousweeds.
[174] USDA Forest Service. (July 2006d). *Proposed land management plan comprehensive evaluation report: Grand Mesa, Uncompahgre, and Gunnison National Forests*. Rocky Mountain Region.
[175] Appx. 4, Lit. Review at 9-14; *see also* Section III(A)(2) above (agency climate change strategies addressing connectivity).

fragment wildlife habitat (terrestrial and aquatic), thereby altering species distribution, interfering with life functions such as feeding, breeding, and nesting, and resulting in loss of biodiversity.[176]

Recognizing these threats, the 2012 planning rule requires that plan components "maintain or restore the structure, function, composition, and connectivity" of terrestrial, riparian, and aquatic ecosystems, taking into account climate change stressors and "opportunities for landscape scale restoration," and "provide for the diversity of plant and animal communities."[177] To provide the information necessary to address those substantive mandates during the plan revision process, the forest assessment should provide information on where and how the transportation system impedes landscape-scale fish or wildlife migration (e.g., where infrastructure such as culverts is impeding fish movement), and where and how it impairs terrestrial, riparian, or aquatic ecosystem integrity. Conversely, the assessment should also describe how modifications to the transportation system might provide opportunities for landscape-scale restoration. For instance, by removing unneeded routes in strategic locations (e.g., inventoried roadless areas, critical habitat, priority watersheds); adequately storm-proofing needed routes (e.g., relocating roads away from water bodies, and resizing or removing culverts); and constructing wildlife friendly structures (crossings with appropriate management on either side of the crossing) the Forest Service can reduce landscape-scale fragmentation, better enable landscape-scale processes such as floods, protect and restore aquatic and terrestrial habitats and habitat connections, and increase resilience.[178]

Aside from the road and route density calculations described above, neither the 2015 TAP nor the 1994 Grand Mesa, 2002 Uncompahgre, or 2010 Gunnison National Forest TMPs include a detailed assessment of landscape-scale ecological effects. Any relevant information addressing landscape-scale ecological impacts and opportunities for restoration should be included in the assessment. Some of this information may be available from the Colorado Department of Transportation and the Colorado Department of Parks and Wildlife.[179]

V. Recreation

The 2012 planning rule requires the plan "to provide for . . . [s]ustainable recreation,"[180] considering appropriate placement of infrastructure, such as recreational facilities, and opportunities to coordinate with neighboring landowners to link open spaces and to connect people with nature.[181] In the assessment phase, the rule requires forest assessments to address

[176] Appx. 4, Lit. Review at 4-7.
[177] 36 C.F.R. §§ 219.8(a)(1), 219.9.
[178] Appx. 4, Lit. Review at 10-12.
[179] Or instance, contact Brian McGee. Land Use Coordinator for the Southwest Region, at the Department of Parks and Wildlife at brian.magee@state.co.us and (970) 375-6707.
[180] 36 C.F.R. § 219.10(b)(1)(i). The rule defines sustainable recreation as "the set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations." 36 C.F.R. § 219.19.
[181] 36 C.F.R. § 219.10(a)(3), (4) & (10).

"[r]ecreation settings, opportunities, and access, and scenic character," as well as forest infrastructure, including "recreational facilities and transportation . . . corridors."[182]As the planning directives recognize, this requires the Forest Service to identify and evaluate information about existing conditions (e.g., settings, opportunities, access, demands), trends, and sustainability in both the plan area and the broader landscape.[183] The directives provide a very useful list of issues to assess related to settings, opportunities, ecological impacts, connections to nature, etc.[184] This information will be essential to inform the need for change and the development of plan components to meet the rule's substantive requirements.

Because of the significant potential impact of motorized recreation on ecological integrity, biodiversity, and recreational conflicts and sustainability, it is important that the Forest Service conduct a robust assessment of this issue. Executive Orders 11644 and 11989 and the Travel Management Rule, 36 C.F.R. part 212 subpart B, which guide the designation and management of off-road vehicle systems, establish that off-road vehicle trails and areas must be located to:

(1) minimize damage to soil, watershed, vegetation, or other resources of the public lands;
(2) minimize harassment of wildlife or significant disruption of wildlife habitats; and
(3) minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands.[185]

The executive orders also include protective mechanisms to ensure that off-road vehicle designations do not impair the protection of public lands. Specifically, they create a Forest Service duty to: (1) periodically monitor the effects of off-road vehicle use, and, based on the data, amend or rescind the off-road vehicle designations;[186] and (2) immediately close areas and trails to off-road vehicles where that use "will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands" until those effects are eliminated and measures are implemented to prevent future recurrence.[187]

To ensure a robust assessment of recreation settings, opportunities, and access, the Forest Service in the assessment report should:

- Identify and evaluate information related to the issues listed in Forest Service Handbook 1909.12, § 13.4 (1) & (2); and

[182] 36 C.F.R. § 219.6(b)(9) & (11).
[183] FSH 1909.12, ch. 10, § 13.4.
[184] FSH 1909.12, ch. 10 § 13.4(1) & (2). Given the comprehensive nature of the directives on assessing recreation, we have not proposed questions related to this topic.
[185] Exec. Order No. 11644, § 3(a), 37 Fed. Reg. 2877 (Feb. 8, 1972), *as amended by* Exec. Order No. 11989, 42 Fed. Reg. 26,959 (May 24, 1977).
[186] Exec. Order No. 11644, § 8(a).
[187] Exec. Order No. 11644, § 9(a).

- Identify and evaluate information related to the compliance status with Executive Orders 11644 and 11989 and the Travel Management Rule, 36 CFR part 212 subpart B, including: (a) motorized use trends, impacts, and management, including implementation of the 2014 TMP and the degree to which off-road vehicle use on the designated system is minimizing impacts to forest resources and other existing and future recreational uses; and (b) the results of any monitoring of the effects of off-road vehicle use.

In addition to the issues listed in the handbook, we recommend that the Forest Service also make sure to explicitly discuss the GMUG's recreational niche within the National Forest System and the broader landscape,[188]current recreational settings and their sustainability (e.g., have they changed since the current plan was finalized), current management of recreational special use permits for events and outfitting/guiding, identification and management of anthropogenic noise, and existing recreation-related plans, analyses, or studies for the GMUG National Forest and/or the broader landscape. To that end, we point the Forest Service to the information provided in Section III(F)(1) and (2) of this letter related to recreation participation and preferences.

Lastly, in addressing the issue of connecting people with nature, the Forest Service should identify and evaluate how people (both those from the area and those traveling from further away) connect to nature and how and to what degree forest infrastructure and current recreation management facilitate or impede people connecting with nature.[189] This should include consideration of:

- Cross-jurisdictional provision and management of recreation settings, opportunities, and access;
- Use of gateway portals (e.g., visitor kiosks, centers, or services as gateways to the forest);
- Need and capacity analysis for outfitting and guiding;
- Areas with unique and outstanding characteristics that merit special designation to enable visitation, interpretation, and protection;
- Coordination with public schools and educational providers;
- Stewardship activities and opportunities; and
- The use of multi-cultural outreach tools.

It should also incorporate the principles and priorities articulated in the agency's 2010 Framework for Sustainable Recreation, including investing in special places, restoring and adapting recreation settings, enhancing and collaborating with communities, and developing a sustainable financial foundation (USDA Forest Service 2010a).

[188] *See* 36 C.F.R. § 219.2(b)(1) (plans must "reflect[] the unit's expected distinctive roles and contributions to the local area, region, and Nation"); *id.* § 219.7(f)(1)(ii) ("Every plan must . . . [d]escribe the plan area's distinctive roles and contributions within the broader landscape . . . .").

[189] FSH 1909.12, ch. 10, § 13.4(1)(e) (assessment should "identify and evaluate additional available information about . . . [t]he opportunities within the plan area to foster greater connection between people and nature through education, experience, recreation, and stewardship").

VI. Conclusion

Thank you for your consideration of the information in this letter. Although not comprehensive, we believe the information represents the best available scientific information that the agency must include in the upcoming forest assessment. We look forward to discussing this information further, and working with you throughout the planning process to ensure the revised forest plan reflects the GMUG's distinctive wilderness heritage and role and contribution as a vast, wild, and remote ecological stronghold.

Please contact Vera Smith, Forest Planning and Policy Director for TWS at vera_smith@tws.org or 303-650-5942, or Matt Reed, Public Lands Director for HCCA at matt@hccacb.org or 303-505-9917, with any questions.

Vera Smith
Forest Planning and Policy Director
The Wilderness Society
1660 Wynkoop St. #850
Denver, CO 80202
(303) 650-5942
vera_smith@tws.org

Matt Reed
Public Lands Director
High Country Conservation Advocates
PO Box 1066
Crested Butte, CO 81224
(303) 505-9917
matt@hccacb.org

Sloan Shoemaker
Executive Director
Wilderness Workshop
PO Box 1442
Carbondale, CO 81623
(970) 963-3977
sloan@wildernessworkshop.org

Alison Gallensky
GIS and IT Director
Rocky Mountain Wild
1536 Wynkoop St., Suite 900
Denver, CO 80202
(303) 546-0214
alison@rockymountainwild.org

Sherry Schenk
Grand Junction Chapter Leader
Great Old Broads for Wilderness
379 Ridge View Dr.
Grand Junction, CO 81507
(970) 596-8510
sherryleeschenk@gmail.com

Robyn Cascade
Northern San Juan Chapter Co-Leader
Great Old Broads for Wilderness
C/o PO Box 2924
Durango, CO 81302
(970) 385-9577
northernsanjuanbroadband@gmail.com

Steve Allerton
President
Western Colorado Congress
134 N 6th St
Grand Junction, CO 81502
(970) 256-7650
steve@wccongress.org

Jim Stephenson
Ridgway Ouray Community Council
PO Box 272
Ridgway, CO 81432
(970) 626-5594
jimphoto@montrose.net

The Wilderness Society ● Defenders of Wildlife ● High Country Conservation Advocates ● Wilderness Workshop ● Rocky Mountain Wild ● Great Old Broads for Wilderness ● Western Colorado Congress ● Ridgway Ouray Community Council ● Sheep Mountain Alliance ● Quiet Use Coalition ● Conservation Colorado ● Rocky Smith

Karen Tuddenham
Executive Director
Sheep Mountain Alliance
220 West Colorado Ave.
Telluride, CO 81435
(970) 728-3729
lexi@sheepmountainalliance.org

Lauren McCain
Federal Lands Policy Analyst
Defenders of Wildlife
535 16th St., Suite 310
Denver, CO 80202
(720) 943-0453
lmccain@defenders.org

Rocky Smith
Forest Management Analyst
1030 Pearl St. #9
Denver, CO 80203
(303) 839-5900
2rockwsmith@gmail.com

Tom Sobal
Director
Quiet Use Coalition
PO Box 1452
Salida, CO 81201
(719) 539-4112
quietuse@gmail.com

Scott Braden
Wilderness & Public Lands Advocate
Conservation Colorado
546 Main St. #404
Grand Junction, CO 81501
(720) 530-7473
scott@conservationco.org

List of Appendices

Appendix 1: Ecosystem Representation in the GMUG National Forest

Appendix 2: Annotated Bibliography on Economic Benefits of Protected Public Lands

Appendix 3: Sample reports from Headwater Economics EPS-HDT Application, available at http://headwaterseconomics.org/tools/eps-hdt

Appendix 4: Transportation Infrastructure and Access on National Forests and Grasslands: A Literature Review (May 2014)

Appendix 5: Survey conducted by Talmey-Drake Research & Strategy, Inc., a public opinion and market research firm in Boulder, Colorado

Appendix 6: Mountains to Mesas: Conservation Management Alternative for the GMUG (June 2005).

List of Attached Figures and Tables

Figure 1: Map depicting cross-boundary conservation opportunities in the GMUG National Forest Region

Figure 2: GMUG National Forest in Relation to Relative Wildness across Colorado (Aplet *et al.* 2000)

Figure 3: Map showing the Watershed Condition Framework indicator for roads and trails on the GMUG National Forest

Table 1: Activity participation on the GMUG National Forest

Table 2: Wild and Scenic River Segments Identified as Eligible in the Draft Resource Management Plan and Draft Environmental Impact Statement for the Uncompahgre Field Office, October 2016

Cited Materials

American Fisheries Society (n.d.). Policy Statement #9: Effects of Altered Stream Flows on Fishery Resources. Available at http://fisheries.org/docs/policy_statements/policy_9f.pdf.

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.

Aplet G.H., J. Thomson, and M. Wilbert. 2000. Indicators of Wildness: Using Attributes of Land to Assess the Context of Wilderness. USDA Forest Service Proceedings RMRS-P-15-VOL-2. Available at http://www.fs.fed.us/rm/pubs/rmrs_p015_2/rmrs_p015_2_089_098.pdf.

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.

Belote, R.T., M. Dietz, and G. Aplet. 2015. Allocating untreated "controls" in the National Wilderness Preservation System as a climate adaptation strategy: a case study from the Flathead National Forest, Montana. Northwest Science, 89(3). Pages. 239-254. Available at http://www.bioone.org/doi/full/10.3955/046.089.0311.

Bertzky, B., Corrigan, C., Kemsey, J., et al. 2012. Protected planet report 2012: tracking progress towards global targets for protected areas. IUCN, Gland, Switzerland and UNEP WCMC, Cambridge, UK.

Bowker, J.M., et al. 2006. Wilderness and Primitive Area Recreation Participation and Consumption: An Examination of Demographic and Spatial Factors. Journal of Agricultural and Applied Economics, 38(2): 317-326. Available at http://ageconsearch.umn.edu/bitstream/43765/2/317.pdf.

Burkhead, N. 2012. Extinction Rates in North American Freshwater Fishes, 1900-2010. BioScience, 62: 798-808.

Colorado College. 2012. "Conservation in the West Poll: Colorado Report." The Colorado College State of the Rockies Project. January 2012. Available at https://www.coloradocollege.edu/dotAsset/e4af72f6-baad-4b91-bb38-cbdba52aaa07.pdf.

Cordell, K.H., 2004. Outdoor Recreation for 21st Century America, A Report to the Nation: The National Survey on Recreation and the Environment. Venture Publishing, Inc., State College, PA.

Cordell, H.K., J.C. Bergstrom, and J.M. Bowker. 2005. The Multiple Values of Wilderness. Venture Publishing, Inc., State College, PA.

Cordell, H.K., C.J. Beltz, and G.T. Green. 2008a. Nature-based Outdoor Recreation Trends and Wilderness. International Journal of Wilderness, 14(2): 7-9, 13. Available at http://www.srs.fs.fed.us/pubs/ja/ja_cordell022.pdf.

Cordell, K.H., C.J. Betz, M.J. Fly, S. Mou, and G.T. Green. 2008b. How Do Americans View Wilderness: A Wilderness Research Report in the IRIS Series. Available at http://warnell.forestry.uga.edu/nrrt/nsre/IRISWild/IrisWild1rptR.pdf.

Cordell, K.H., T.L. Eubanks, C.J. Betz, G.T. Green, B. Stephens, and S. Mou. 2008c. American Birders – Their Numbers and Outdoor Activity Profiles. A Recreation Research Report in the IRIS Series. Available at http://warnell.forestry.uga.edu/nrrt/nsre/IRISRec/IrisRec2rpt.pdf.

Crist, M.R., B.O. Wilmer, and G.H. Aplet. 2005. Assessing the value of roadless areas in a conservation reserve strategy: biodiversity and landscape connectivity in the northern Rockies. Journal of Applied Ecology, 42: 181-191.

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.

DeVelice, R. and J.R. Martin. 2001. Assessing the extent to which roadless areas complement the conservation of biological diversity. Ecological Applications 11(4): 1008-1018. Available at http://www.jstor.org/stable/3061008?seq=1&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003975961#page_scan_tab_contents.

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.

Duffy-Deno, K. 1998. The Effect of Federal Wilderness on County Growth in the Intermountain Western United States. Journal of Regional Science, 38(1): 109-136. Available at http://onlinelibrary.wiley.com.ezproxy.princeton.edu/doi/10.1111/0022-4146.00084/epdf.

ECONorthwest. 2009. Regional Economic Impacts of Recreation on the Wild and Scenic Rogue River. Prepared for the Save the Wild Rogue Campaign.

Eric Gordon and Dennis Ojima. 2015. Colorado Climate Change Vulnerability Study, A Report by the University of Colorado Boulder and Colorado State University to the Colorado Energy Office. January 2015. Available at http://wwa.colorado.edu/climate/co2015vulnerability/co_vulnerability_report_2015_final.pdf.

Government Accountability Office. 2013. Forest Service Trails: Long- and Short-Term Improvements Could Reduce Maintenance Backlog and Enhance System Sustainability. GAO-13-618. Available at http://www.gao.gov/products/GAO-13-618.

Gucinski, M., M.J. Furniss, R.R. Ziemer, and M.H. Brookes. 2000. Forest Roads: A Synthesis of Scientific Information. PNWGTR-509: 33-35. Available at http://www.fs.fed.us/pnw/pubs/gtr509.pdf.

Headwaters Economics. 2012. West Is Best: Protected Lands Promote Colorado Jobs and Higher Incomes. Available at http://headwaterseconomics.org/land/west-is-best-value-of-public-lands-co.

Lewis, D.J., G.L. Hunt, and A.J. Plantinga. 2002. Public Land Conservation and Employment Growth in the Northern Forest Region. Land Economics 78(2): 245-259. Available at http://appliedecon.oregonstate.edu/sites/default/files/faculty/plantinga/migraton/LewisHuntPlantinga2002LE.pdf.

Lorah, P. and R. Southwick. 2003. Environmental protection, population change, and economic development in the rural western United States. Population and Environment 24(3): 255–272. Available at http://www.southwickassociates.com/wp-content/uploads/2011/10/Env-prot pop-change-in-western-us-RLPAreas.pdf.

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: 243 253. Available at http://www.nature.com/nature/journal/v405/n6783/full/405243a0.html.

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.

National Fish, Wildlife and Plants Adaptation Partnership, Climate Adaptation Strategy. 2012. Available at http://www.wildlifeadaptationstrategy.gov/strategy.php.

Neely, B., P. Comer, C. Moritz, M. Lammert, R. Rondeau, C. Pague, G. Bell, H. Copeland, J. Humke, S. Spackman, T. Schulz, D. Theobald, and L. Valutis. 2001. Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint. Prepared by The Nature Conservancy with support from the U.S. Forest Service, Rocky Mountain Region, Colorado Division of

Wildlife, and Bureau of Land Management. Available at http://palmerlandtrust.org/sites/default/files/documents/Southern%20Rocky%20Mountains%20An%20Ecoregional%20Assessment%20and%20Conservation%20Blueprint.PDF.

Olson, D.M. and E. Dinerstein. 1998. The global 200: A representation approach to conserving the Earth's most biologically valuable ecoregions. Conservation Biology, 12: 502-515. Available at http://www.jstor.org.ezproxy.princeton.edu/stable/2387232?seq=1#page_scan_tab_contents.

Outdoor Foundation. 2013. Special Report on Paddlesports. Available at http://www.outdoorfoundation.org/research.paddlesports.2013.html.

Phillips, S. 2004. Windfalls for Wilderness: Land Protection and Land Value in the Green Mountains. Ph.D. Dissertation. Virginia Polytechnic Institute and State University, Blacksburg, VA. Available at http://www.wilderness.net/library/documents/Phillips_2-33.pdf.

Rasker, R., B. Alexander, J. van den Noort, and R. Carter. 2004. Prosperity in the 21st Century West – the Role of Protected Public Lands. Sonoran Institute.

Rasker, R. 2006. An exploration into the economic impact of industrial development versus conservation on western public lands. Society & Natural Resources, 19(3): 191–207. Available at http://www.tandfonline.com/doi/abs/10.1080/08941920500460583?journalCode=usnr20#.VUjLrPlVhBc.

Rasker, R., P.H. Gude, J.A. Gude, and J. van den Noort. 2009. The Economic Importance of Air Travel in High-Amenity Rural Areas. Journal of Rural Studies, 25: 343-353. Available at http://headwaterseconomics.org/3wests/Rasker_et_al_2009_Three_Wests.pdf.

Ricketts, T. H., E. Dinerstein, D. M. Olson, C. J. Loucks, W. Eichbaum, D. DellaSala, K. Kavanaugh, P. Hedao, P. T. Hurley, K. M. Carney, R. Abell, and S. Walters. 1999. Terrestrial ecoregions of North America: a conservation assessment. Island Press, Washington, D.C.

Scott, D.W. 2003. A comprehensive review of recent public opinion research: A mandate to protect America's wilderness. Washington, DC: Campaign for America's Wilderness. Available at http://www.pewtrusts.org/our_work_report_detail.aspx?id=19224. Survey by Mellman Group, April 2001. As cited in Schuster, R.M., et al. Chapter 7: The Social Value of Wilderness in Cordell, K.H., et al. (2005) in Cordell et al. The Multiple Values of Wilderness (2005).

Southwick Associates. 2012. The Outdoor Recreation Economy: Technical Report on Methods and Findings. A study prepared for the Outdoor Industry Association.

Stein, B.A., P. Glick, N. Edelson, and A. Staudt (eds.). 2014. Climate-Smart Conservation: Putting Adaptation Principles into Practice. National Wildlife Federation, Washington, D.C.

Strittholt, J. and D. DellaSala. 2001. Importance of Roadless Area Conservation in Forested Ecosystems: Case Study of the Klamath-Siskiyou Region of the United States. In Conservation Biology 15(6): 1742-1754. Available at http://www.researchgate.net/publication/255439281_Importance_of_Roadless_Areas_in_Biodiversity_Conservation_in_Forested_Ecosystems_Case_Study_of_the_Klamath-Siskiyou_Ecoregion_of_the_United_States.

The Wilderness Society. 2004. Landscape Connectivity: An Essential Element of Land Management. Policy Brief. Number 1.

USDA Forest Service. 2001. Final National Forest System Road Management Strategy Environmental Assessment and Civil Rights Impact Analysis. Available at http://www.fs.fed.us/eng/road_mgt/Final-Forest-Service-EA/HTML/FINAL%20EA.htm.

USDA Forest Service. 2004. National Strategy and Implementation Plan for Invasive Species Management. Available at http://www.fs.fed.us/invasivespecies/documents/Final_National_Strategy_100804.pdf.

USDA Forest Service. 2005. Socio-Economic Assessment for the Apache-Sitgreaves National Forest. Available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_021473.pdf.

USDA Forest Service. 2010a. Connecting People with America's Great Outdoors: A Framework for Sustainable Recreation. Available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346549.pdf.

USDA Forest Service. 2010b. Water, Climate Change, and Forests: Watershed Stewardship for a Changing Climate. PNW-GTR-812. Available at http://www.fs.fed.us/pnw/pubs/pnw_gtr812.pdf.

USDA Forest Service. 2010c. Southwestern Region: Climate Change Trends and Forest Planning. Available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5284414.pdf.

USDA Forest Service. 2011a. Watershed Condition Framework Technical Guide, FS-978. Available at http://www.fs.fed.us/publications/watershed/watershed_classification_guide.pdf.

USDA Forest Service. 2011b. National Roadmap for Responding to Climate Change. Available at http://www.fs.fed.us/climatechange/advisor/roadmap.html.

USDA Forest Service. 2012a. Travel Analysis Process: A Guidebook. Guidance for Region 5 Forests to Complete Travel Analysis. Available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5435022.pdf.

USDA Forest Service. 2012b. National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide. Available at http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf.

USDA Forest Service. 2016. Visitor Use Report for Data collected FY 2014 for the GMUG National Forest.

USDOI Fish and Wildlife Service and USDOC Census Bureau. 2011. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Available at https://www.census.gov/prod/2012pubs/fhw11-nat.pdf.

USDOI National Park Service. 2001. Economic Benefits of Conserved Rivers: An Annotated Bibliography. Rivers, Trails & Conservation Assistance Program.

USDOI National Park Service. 2010. Climate Change Response Strategy. Available at http://www.nature.nps.gov/climatechange/docs/NPS_CCRS.pdf.

Vander Lee, B., R. Smith, and J. Bate. 2004. Chapters 2 & 11. In Ecological and Biological Diversity of National Forests in Region 3. The Nature Conservancy.

Wilcove, D.S. 1990. The role of wilderness in protecting biodiversity. Natural Resources and Environmental Issues: Vol. 0, Article 7. Available at http://digitalcommons.usu.edu/nrei/vol0/iss1/7/.

Williams, J.E., M.P. Dombeck, and C.P. Wood. 2012. My healthy stream: a handbook for streamside owners. Trout Unlimited.

List of Attached Figures and Tables

Figure 1: Map depicting cross-boundary conservation opportunities in the GMUG National Forest Region

Designated and Inventoried Conservation Lands in Colorado

N
W E
S

WYOMING

Medicine Bow-Routt National Forest

Arapaho National Wildlife Refuge

Arapaho and Roosevelt National Forests

Dinosaur National Monument

White River National Forest

White River National Forest

McInnis Canyon National Conservation Area

Pike and San Isabel National Forests

GMUG National Forests

Dominguez-Escalante National Conservation Area

Curecanti National Recreation Area

GMUG National Forests

Rio Grande National Forest

Pike and San Isabel National Forests

GMUG National Forests

Baca National Wildlife Refuge

Rio Grande National Forest

Great Sand Dunes National Park

San Juan National Forest

Canyons of the Ancients National Monument

Mesa Verde National Park

Craig
Hayden
Steamboat Springs
Meeker
Rangely
Kremmling
Gypsum
New Castle
Rifle
Glenwood Springs
El Jebel
Basalt
Aspen
Snowmass
Carbondale
Clifton
Grand Junction
Cedaredge
Orchard City
Hotchkiss
Montrose
Gunnison
Durango
Bayfield
Del Norte
Monte Vista
Alamosa
Center
Canon City
Penrose
Pueblo West
Pueblo
Colorado Springs
Fountain
Monument
Castle Rock
Parker
Denver
Aurora
Littleton
Evergreen
Lakewood
Golden
Arvada
Westminster
Thornton
Broomfield
Superior
Louisville
Lafayette
Boulder
Erie
Longmont
Firestone
Frederick
Dacono
Fort Lupton
Hudson
Brighton
Platteville
Johnstown
Milliken
Loveland
Greeley
Windsor
Fort Collins
Wellington
Shiprock
Kirtland
Aztec
Navajo
Dulce
Chama
Culebra Peak
Colorado City

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

0 10 20 30 40
Miles

Explanation of BLM map layer: FLPMA requires BLM to inventory and consider lands with wilderness characteristics during the land use planning process. 43 U.S.C. § 1711(a). Instructional Memorandum (IM) 2011-154 and Manuals 6310 and 6320 contain mandatory guidance on implementing that requirement. The IM directs BLM to "conduct and maintain inventories regarding the presence or absence of wilderness characteristics, and to consider identified lands with wilderness characteristics in land use plans and when analyzing projects under [NEPA]." BLM is required under agency policy to consider and respond to citizen inventory submissions. Neither BLM nor citizen inventory portfolio is close to complete in Colorado.

The map layer entitled "BLM and citizen-inventoried lands with wilderness characteristics" represents lands that have wilderness character as found in BLM or citizen inventories conducted following the direction in BLM Manual 6310. The BLM's lands with wilderness characteristic (LWC) inventory is ongoing in Colorado and is far from complete; hence, the map layer represents an incomplete inventory and should not be regarded as representing the full portfolio of BLM wild lands. The status of the LWC inventory in the three BLM field offices contiguous to the GMUG is:

- The Uncompahgre Field Office has updated its LWC inventory as part of the ongoing Uncompahgre Resource Management Plan revision process.
- The Gunnison Field Office conducted some inventory updates when the BLM's new LWC policy was issued. We expect the Gunnison field office will be continuing to update LWC inventory information in project-level analyses and upcoming planning.
- Citizens have submitted comprehensive inventory information to BLM for the Grand Junction field office, which the agency is currently reviewing in updating its Field Office-wide LWC inventory per agency policy.

Figure 2: GMUG National Forest in Relation to Relative Wildness across Colorado (Aplet et al. 2000)

GMUG National Forests in Relation to Relative Wildness across Colorado and New Mexico

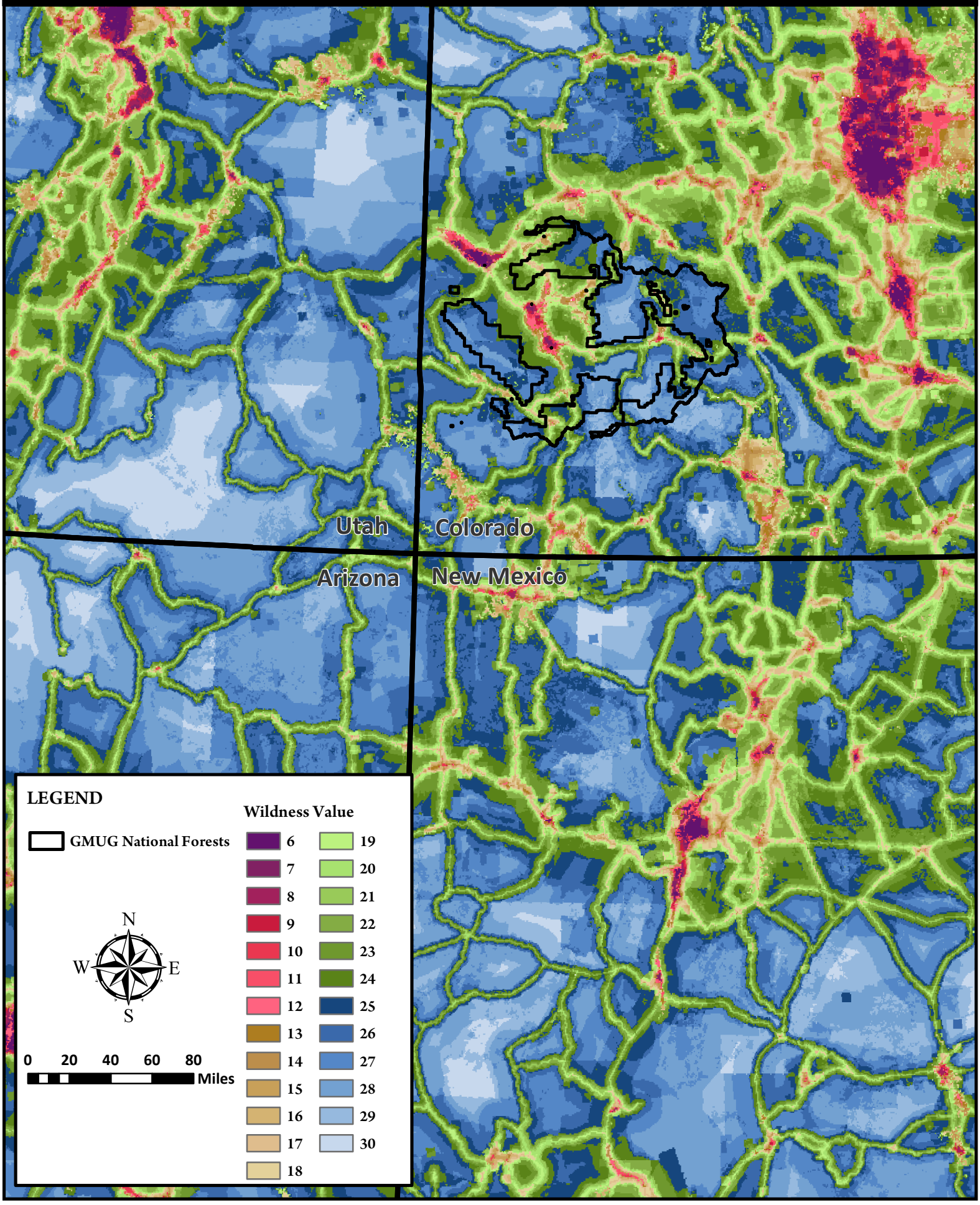
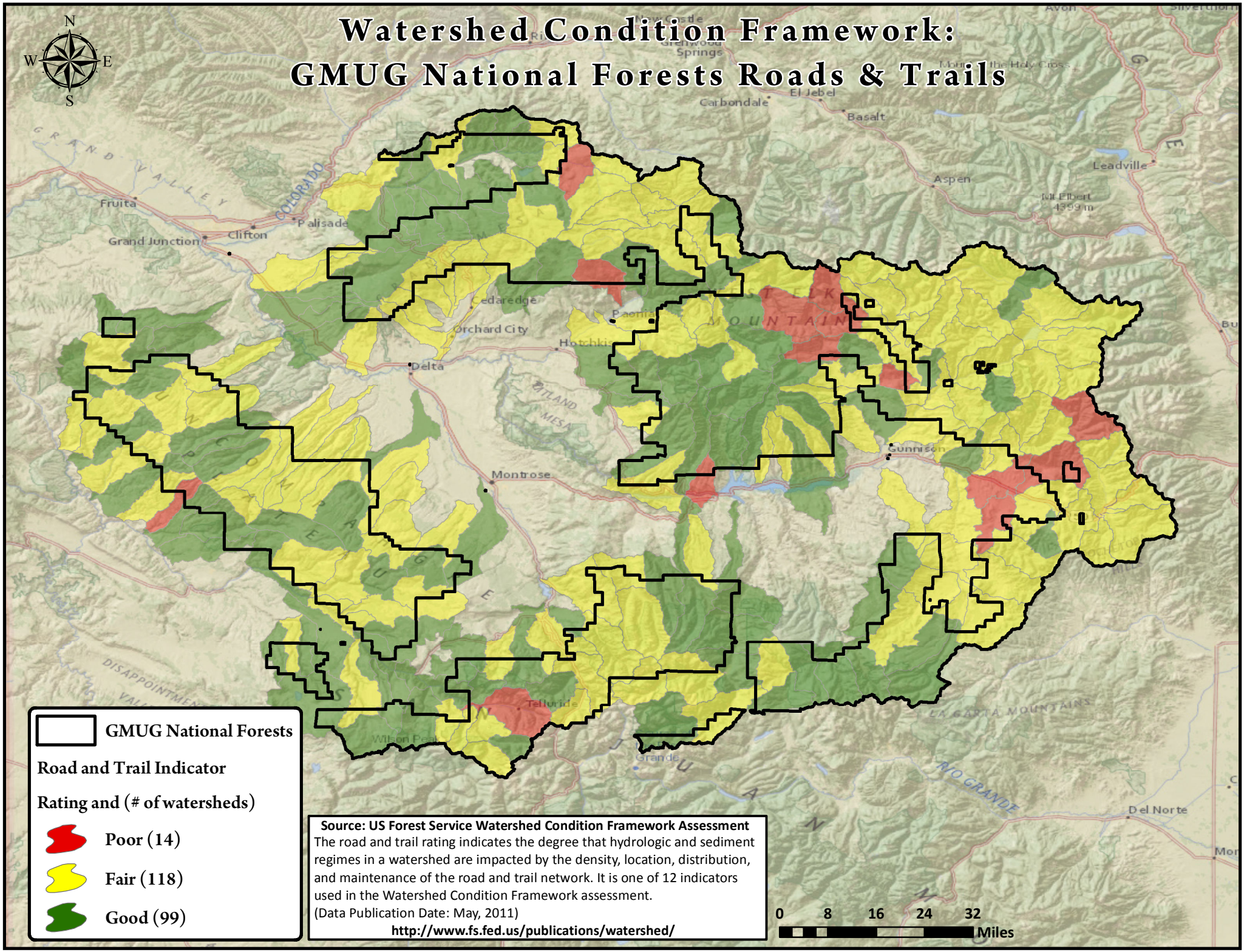


Figure 3: Map showing the Watershed Condition Framework indicator for roads and trails on the GMUG National Forest

Watershed Condition Framework:
GMUG National Forests Roads & Trails



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.

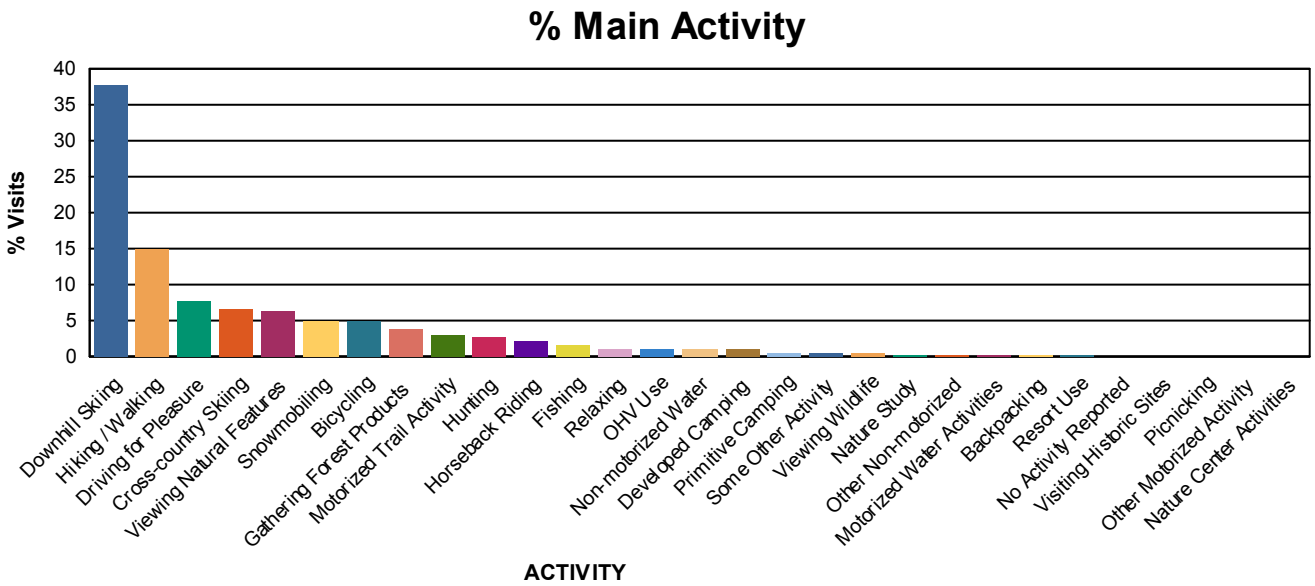
(Data Publication Date: May, 2011)

http://www.fs.fed.us/publications/watershed/

Table 1: Recreation Activity Participation as Reported in the 2014 National Visitor Use Monitoring Report for the GMUG.

Activity Participation

Activity	% Participation*	% Main Activity‡	Avg Hours Doing Main Activity
Downhill Skiing	38.4	37.7	5.0
Viewing Natural Features	25.6	6.2	2.9
Hiking / Walking	25.5	14.8	3.3
Viewing Wildlife	18.1	0.5	1.8
Relaxing	15.1	1.0	5.8
Driving for Pleasure	13.6	7.6	6.0
Cross-country Skiing	8.0	6.5	2.7
Snowmobiling	7.9	4.9	4.6
Picnicking	6.0	0.0	2.8
Bicycling	5.6	4.8	2.6
Motorized Trail Activity	5.4	2.9	5.8
Gathering Forest Products	4.6	3.8	1.8
Primitive Camping	3.7	0.5	18.7
Fishing	3.5	1.7	8.9
Visiting Historic Sites	3.3	0.0	8.0
OHV Use	3.2	1.0	7.4
Nature Study	3.0	0.3	2.0
Hunting	2.8	2.8	6.7
Developed Camping	2.8	0.9	21.0
Horseback Riding	2.2	2.2	3.4
Nature Center Activities	1.5	0.0	0.0
Some Other Activity	1.2	0.5	7.2
Non-motorized Water	1.0	0.9	2.5
Resort Use	0.7	0.1	12.7
Other Non-motorized	0.3	0.2	3.5
Motorized Water Activities	0.3	0.1	4.0
Other Motorized Activity	0.1	0.0	0.0
No Activity Reported	0.0	0.0	
Backpacking	0.0	0.1	14.6



Selected Forests:
Grand Mesa Uncomp Gunnison NF (FY 2014)

Activity Participation

* Survey respondents could select multiple activities so this column may total more than 100%.

‡ Survey respondents were asked to select just one of their activities as their main reason for the forest visit. Some respondents selected more than one, so this column may total more than 100%.

Table 2. Wild and Scenic River Segments Identified as Eligible in the Draft Resource Management Plan and Draft Environmental Impact Statement for the Uncompahgre Field Office, June 2016.[1]

River or Creek	Length on BLM Land (miles)	Area on BLM Land (acres)	Preliminary Classification	Outstandingly Remarkable Values
Gunnison River Segment 2	0.4	90	Recreational	Fish
Monitor Creek	9.4	2,610	Wild	Vegetation
Potter Creek	9.8	2,830	Wild	Vegetation
Roubideau Creek Segment 1	10.0	2,700	Wild	Recreational, Wildlife, Cultural, Vegetation
Roubideau Creek Segment 2	3.5	1,330	Scenic	Wildlife, Vegetation
Deep Creek	0.6	130	Scenic	Fish
West Fork Terror Creek	0.5	150	Scenic	Fish
Beaver Creek	14.2	3,710	Scenic	Vegetation
Dry Creek	10.4	2,640	Wild	Scenic, Geologic
Naturita Creek	10.0	3,240	Scenic	Fish
Saltado Creek	4.1	1,450	Wild	Vegetation
San Miguel River Segment 1	17.3	6,680	Recreational	Scenic, Recreational, Wildlife, Historic, Vegetation, Paleontology
San Miguel River Segment 2	3.6	1,110	Wild	Scenic, Recreational, Wildlife, Vegetation
San Miguel River Segment 3	5.3	1,880	Scenic	Recreational, Fish, Wildlife, Vegetation
San Miguel River Segment 5	2.6	2,660	Recreational	Recreational, Fish, Historic, Vegetation
San Miguel River Segment 6	2.3	810	Recreational	Recreational, Fish, Historic, Vegetation
Tabeguache Creek Segment 1	3.6	1,080	Wild	Vegetation
Tabeguache Creek Segment 2	7.9	2,480	Recreational	Cultural, Vegetation

[1] Excerpted from the BLM Draft Resource Management Plan and Environmental Impact Statement for the Uncompahgre Field Office, BLM/CO/PL-16/006. June 2016. *Available at:* https://www.blm.gov/co/st/en/fo/ufo/uncompahgre_rmp.html#Planning_Documents. Table 3-43.

Lower Dolores River	6.9	1,990	Scenic	Scenic, Recreational, Geologic, Fish, Wildlife
North Fork Mesa Creek	5.8	1,740	Scenic	Vegetation
Dolores River Segment 1a *(portion within the Dolores River Canyon WSA)*	8.7	1,880	Wild	Recreational, Scenic, Fish, Wildlife, Geology, Ecologic, Archaeology
Dolores River Segment 1b *(portion from the Dolores River Canyon WSA to Bedrock)*	0.9	460	Recreational	Recreational, Scenic, Fish, Wildlife, Geology, Ecologic, Archaeology
Dolores River Segment 2	5.4	1,820	Recreational	Scenic, Recreational, Geologic, Fish, Wildlife, Vegetation
Ice Lake Creek Segment 2	0.3	100	Scenic	Scenic
La Sal Creek Segment 1	0.6	720	Recreational	Fish, Vegetation
La Sal Creek Segment 2	3.8	1,030	Scenic	Fish, Vegetation
La Sal Creek Segment 3	3.4	900	Wild	Scenic, Recreational, Fish, Cultural, Vegetation
Lion Creek Segment 2	1.3	400	Scenic	Vegetation
Spring Creek	1.5	630	Recreational	Vegetation
Sources: BLM 2010d; BLM and Forest Service 2007				