Dan Dallas, Supervisor Erin
Minks, Forest Planner
Rio Grande National Forest
1803 W. Highway 160
Monte Vista, CO 81144

April 24, 2016

Dear Supervisor Dallas and Ms. Minks:

We appreciate you considering the following comments on the Rio Grande National Forest (RGNF) Draft Assessment (Assessment) and Draft Need for Change (NFC) statements provided to the public throughout the course of the last few months. We appreciate the significant time and effort that the RGNF Planning Team has devoted to developing its informative, comprehensive Assessment of conditions on the Forest. We commend members of the Planning Team and other Forest Service personnel for offering many opportunities for the public to provide input on the Forest's management plan revision, including the Assessment and NFC statements. We are looking forward to continuing our participation in the plan revision process.

Founded in 1947, Defenders of Wildlife (Defenders) is a national conservation organization focused solely on wildlife and habitat conservation and safeguarding biodiversity. Defenders is deeply involved in public lands management related to vulnerable species and ecosystem protection. Defenders works on behalf of more than 1.2 million members and supporters nationwide, including over 11,000 in Colorado.

Please do not hesitate to contact Lauren McCain with any questions pertaining to these comments.

Sincerely,

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Defenders of Wildlife
Comments on the Rio Grande National Forest Draft Assessment and Draft Need for Change Statements

I. Introduction

Developing and implementing robust, science-based forest plan decisions under the 2012 planning rule (planning rule) will result in public confidence that the Forest Service is fulfilling its mission and conservation obligations and enabling integrated landscape-level decision making and more efficient project-level implementation. The assessment should present information provided by monitoring and other data collection and information to allow the Responsible Official and interested parties to identify the on-the-ground results of management under the current forest plan, the RGNF's 1996 Land and Resource Management Plan (1996 LRMP). The Responsible Official must identify a) how current conditions outlined in the Assessment are related to or caused by current, specific forest plan direction; b) how such conditions or trends can be influenced directly or indirectly by Forest Service management; and c) based on this, identify specific needs for change in management, including type of plan components, information needs, difference in management needed for different forest areas, and changes in management focus or urgency.

These comments focus particularly on aspects of the Assessment and NFC that pertain to at-risk wildlife and ecosystem integrity. The comments include a series of questions that we ask the Responsible Official and other members of the RGNF Planning Team to address, to the extent possible, in future iterations of the Assessment as well as additional best available scientific information (BASI) that we believe is important to incorporate. We suspect that information to answer these questions may already exist, and we have not intentionally posed any questions that cannot be answered with an assessments of existing information. We raise points about the draft NFC statements that we hope will inform scoping and the development of a Proposed Action.

II. Status of the draft Assessment and NFC identification

The draft Assessment presents substantial information and analyses regarding the social, cultural, economic, and ecological conditions on the Forest. While we realize and accept that the Assessment is a work-in-progress, we are concerned that the short timeline within which the Responsible Official and Planning Team have to develop the Proposed Action will not provide adequate time to incorporate additional information and to have ready a more complete assessment that will better inform this process. For example, Draft Assessment 5: Identifying and Assessing At-risk Species (Assessment 5) acknowledges that its information and analyses are incomplete.

The Assessment should reveal aspects of the existing management plan that are and are not providing for ecological sustainability and the diversity of plant and animal communities. Some needs for change specifically identified or indicated by the Assessment are not captured in NFC statements, and we provide examples of such cases below. We believe some important existing information, particularly the Forest's annual monitoring reports, have not been sufficiently analyzed and incorporated into the Assessment. We believe a more thorough assessment of such existing information may point to additional areas of the plan where plan components need to change. As we illustrate below, the Responsible Official has, in many cases, not clearly identified the BASI that will be used to make decisions about changing the plan. Until these issues are addressed, we are not confident that the Assessment provides a sufficient basis to complete a comprehensive NFC

analysis. Again, we are concerned that the constricted timeline will not allow the Responsible Office to address these issues.

That said, we believe many, if not most, of the NFC statements identify aspects of the 1996 LRMP that do need to change. We are primarily concerned that the Assessment information and analyses are not sufficient to guide *how* the plan needs to change in several cases.

III. Integration of assessment topics

The planning directives provide direction for integrating assessment topics (FSH 1909.12, ch. 10, 11.3 and 12). Such integration is particularly important for assessment topics 1, 3, and 5 because these serve as the basis for evaluating the ecological conditions of the Forest. The key ecosystem characteristics that are essential for the conservation and recovery of federally protected species and the persistence of species of conservation concern (SCC) should be used to select the key ecosystem characteristics for the evaluation of terrestrial ecosystems, aquatic ecosystems, and watersheds. Integration that establishes crosswalks between topics 1, 3, and 5 upholds the intent of the planning rule—the adoption of "a complementary ecosystem and species-specific approach to maintaining the diversity of plant and animal communities and the persistence of native species in the plan area" (36 C.F.R. 219.9). We are concerned that because Assessment 5 and Assessments 1 and 3: Ecosystem Integrity, Systems Drivers and Stressors for Terrestrial Ecosystems (Assessments 1 and 3 (Terrestrial)) and Assessments 1 and 3: Aquatic and Riparian Ecosystem Integrity, Systems Drivers and Stressors (Assessments 1 and 3 (Aquatic and Riparian)) were drafted separately that the information they provide is not well integrated.

Currently, the Assessment does not provide the synthesis of ecosystem, habitat, and species conditions necessary to evaluate the current plan's contribution to ecological integrity and ecological diversity, or to build effective and sufficient coarse-filter plan components to meet regulatory diversity requirements. To a limited extent, the Assessment characterizes species at-risk Assessment 5, but neglects to link those species (as well as less vulnerable species) to the ecosystems/habitat types and their reference or future condition under the current plan (i.e., their structure, function, composition, and connectivity), and drivers/stressors that are (or should be) identified in Assessment 1 and 3. It is critical for the assessment to establish the connection between coarse-filter ecosystem characteristics/habitat conditions and the species that depend upon them for persistence so that one can,

- Discuss reference conditions and evaluate the condition and trend of the landscape; and
- Use the assessment to then determine if the likely future condition under the current plan satisfies the requirements for ecological integrity and ecological diversity established in the planning rule, including whether future ecological conditions under the current plan will meet species diversity requirements (e.g. viability of species of conservation concern).

In particular, the assessment should evaluate the connection between ecological conditions (current and expected future conditions under the current plan) and changes to species populations, as outlined in the directives. The assessment should project long-term conservation outcomes for at-risk species, factoring in selected scenarios for uncontrollable stressors (e.g. climate impacts). For species of conservation concern, the assessment should project viability using the parameters found in the definition of viability in the planning regulation (i.e. under present plan components, will future distribution of species of conservation concern be sufficient for the population to be resilient

and adaptable to stressors and likely future environments?). Without this information, it will be challenging to develop plan components to sustain at-risk species. The assessment should document the assumptions inherent in the relationship between ecological conditions and changes in population so that those can be tested through monitoring and adaptive management.

IV. Use and documentation of best available scientific information

It is not always clear from the array of sources cited in the Assessment (particularly those cited in Assessments 1 and 3), what particular scientific information the Responsible Official has determined to be the BASI for making planning decisions, as required by the planning rule (36 C.F.R. 219.3). We urge the Responsible Office to clarify and highlight explanations of BASI determinations and explanations of applications of BASI, also rule requirements. The following example illustrates our concern.

Assessments 1 and 3 (Terrestrial) present data from vegetation modeling conducted (based on LANDFIRE data) specifically for the Assessment. Below are a few passages from Assessments 1 and 3 (Terrestrial) (p. 18) regarding the vegetation modeling intended to assess ecosystem departures from Natural Range of Variability (NRV),

> The vegetation modelling suggests that the spruce-fir forest ecosystem is currently substantially departed from the natural range of variation due to the effects of recent wildfires and a large, multi-year spruce beetle outbreak, which caused substantial spruce mortality, opened canopy conditions, and created patches of grass/shrub across wide areas. …
>
> This result is not necessarily in agreement with the published literature. The modelling of historic conditions included moderate spruce beetle outbreaks, but did not include the rare, extreme spruce beetle outbreaks like the one the Rio Grande National Forest is currently experiencing. Literature (Eager et al. 2012, Romme et al. 2009) indicates that in these spruce-fir forests, spruce beetles generally persist in low-level, widespread populations that have little effect on forest structure, but that they periodically have very large outbreaks, where the "beetles may kill millions of mature pine or spruce trees over areas of thousands of hectares." Since the modelling did not include these large, explosive outbreaks, the spruce-fir forests may not be nearly as departed from the natural range of variation as the modelling suggests.

Assessments 1 and 3 (Terrestrial) (p. 18) state,

> It is difficult to determine whether the terrestrial ecosystems on the Rio Grande National Forest are within the range of what would occur naturally. Modelling results indicate that the terrestrial ecosystems on the Rio Grande National Forest are, in general, moderately to substantially departed from what would occur naturally. However, the determination of the range of natural conditions is not an exact science. The spruce beetle modelling did not include the rare, extreme spruce beetle outbreaks like the one we are currently experiencing, but more moderate outbreaks. We know that these large spruce beetle outbreaks happened historically and this suggests, along with the long fire return interval in spruce-fir, that this ecosystem is not departed from historic conditions. In the end, we don't really know with

any certainty what effect past logging has had in these forests and whether this latest spruce beetle outbreak is a completely natural phenomenon or one influenced by climate change.

In other cases as well, the published literature is not necessarily in agreement with the modelling we used here, making it difficult to know with any certainty how departed some of these types are from the natural range of variation.

We appreciate that the Assessment acknowledges problems with assessing departures from NRV. We are also sympathetic regarding the difficulties. But these statements raise questions.

Question: Given the lack of agreement between modeling data and published literature, what sources and data does the Responsible Official consider to be the BASI, upon which key decisions will be made in revising the management plan?

Question: How will the Responsible Official reconcile disagreements, inconsistencies, and uncertainties in the science?

We note that Appendix B in Assessments 1 and 3 (Terrestrial) explains alterations in the model. In the case of the wildfire analysis, new modeling is abandoned, and analysis rely on the published literature and expert opinion. In this case, the Assessment provides some clarity regarding determination of BASI. This may be a trivial point, but the BASI selected regarding fire disturbance are not explained in the main body of the Assessment—the part of the Assessment that is more accessible to interested members of the lay public. Understanding the Appendices requires specialized technical knowledge. We appreciate the inclusions of these technical explanations of the vegetation modeling methodology, modifications of the model, and data sources in the Appendices, which provide an essential level of transparency in the Assessment. We recommend that the Responsible Official be clearer regarding documentation and use of BASI in the main body of the Assessment, in terms that are accessible to the public.

We also recommend that the Responsible Official and Planning Team elicit expertise from within and outside the Forest Service to review areas of the Assessment where disagreements, questions, and uncertainties in the available science in order to help provide guidance as to the best science that should be used for decision making. The Assessment should document how such expert opinion is utilized.

V. Use of prior monitoring information in the Assessment

We are surprised that the Assessment did not more fully evaluate and utilize information that exists in RGNF annual monitoring reports, as recommended in the planning directives (FSH 1909. 12, ch. 10, 11). It is not clear that relevant information from prior monitoring has been appraised and incorporated into Assessments 1 and 3, both Terrestrial and Riparian and Aquatic, and Assessment 5. The monitoring reports provide significant data about the effects of management actions on the Forest during the life of the 1996 LRMP and how conditions have changed. We urge the Planning Team to better exploit the valuable information in RGNF monitoring reports in revisions of the Assessment and use this information to further evaluate needs for change. A synthesis of this information in the Assessment may go a long way toward answering some of the questions we raise below.

VI. Incorporating key state and regional information resources

We anticipate that in subsequent drafts of the Assessment that the Forest Service will avail itself of relevant, quality, existing information that pertains to the Forest. Key sources include:

- The Forest Service, Rocky Mountain Region (Region 2) Species Conservation Assessments.[1]
- Colorado's State Wildlife Action Plan (2015) by Colorado Parks and Wildlife.[2]
- The Colorado Rare Plant Guide by the Colorado Natural Heritage Program.[3]

These sources provide a selection of BASI, species profiles, species and habitat threats, management recommendations, and other information that should be considered in the Assessment and provide guidance for developing plan components. These resources seem to have been overlooked or underutilized in the Assessment.

VII. Wildlife specific comments

a. Federally protected species

We appreciate that the Responsible Official recognizes the duty to conserve and contribute to the recovery of species protected under the Endangered Species Act (ESA) as required under the planning rule as well as the ESA. We agree with the NFC statement,

> *A4. Update plan direction to further promote the recovery and conservation of federally recognized threatened, endangered, proposed, and candidate species (Draft NFC 2016: 3, Table A)*

We have a few questions and recommendations regarding the Assessment and NFC that pertain to some federally protected species that occur on the Forest.

i. Consultation with the US Fish and Wildlife Service

Under Section 7 of the ESA, the Forest Service has a legal duty to "carry out programs for the conservation" (16 U.S.C. §§ 1536(7)(a)(1)) for endangered and threatened species. The planning rule requires the Forest Service to "contribute to the recovery of federally listed threatened and endangered species" (16 U.S.C. §§ 1536(7)(a)(1)).

We urge the Responsible Official to begin informal consultation with the USFWS over the RGNF's listed species now—before completing the next iteration of the Assessment. The assessment phase provides an ideal opportunity for the Planning Team to seek and utilize species-specific information from consulting agencies that may be used to design the forest plan. Early engagement with these government agencies complies with the planning rule.[4] Early contributions to a forest plan by the consulting agencies can help streamline the Section 7(a)(2) consultation process for the plan and

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1 http://www.fs.usda.gov/detail/r2/landmanagement/?cid=stelprdb5177128.

2 http://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx.

3 http://www.cnhp.colostate.edu/rareplants/.

4 36 C.F.R. § 219.4(a)(1) directs the responsible official to "engage the public—including" … "Federal agencies"… "early and throughout the planning process where feasible and appropriate." Under 219.6(a)(2), the regional forester should coordinate with and provide opportunities for government agencies "to provide existing information for the assessment."

increase the likelihood of contributing to recovery of listed species under Section 7(a)(1) of the ESA (16 U.S.C. §§ 1536(7)(a)(1)-(2)) and avoiding listing of proposed and candidate species. Federally recognized species must be addressed by plan components if they "may be present" in the plan area (50 C.F.R. 402.12(c)(1), (d)) and should be included as target species documented in the assessment.

The Forest Service must use its authorities, including the National Forest Management Act and its planning process and resulting plans, in furtherance of recovery of listed species.[5] There is an existing process for interagency coordination that could be used to answer the question that the planning rule poses: does a forest plan contribute to recovery of listed species? The Consultation Handbook[6] describes "proactive conservation reviews" under ESA Section 7(a)(1). According to this Handbook, such reviews are appropriate for major national programs, and they are also "appropriate for Federal agency planning." They would be especially helpful in identifying the ecological conditions necessary for recovery of listed species.[7] The Forest Service Planning Handbook recognizes recovery plans by stating that their "conservation measures and actions" should be considered.[8] And, in the absence of recovery plans, the conservation review can assist in developing and implementing recovery actions.

The assessment should provide the basis for this consideration. The assessment should also evaluate progress made by the Forest Service under the current plan to conserve and recover federally protected species.

ii. Canada lynx

Evidence supports that Canada lynx (*Lynx canadensis*) (lynx) were once common residents of Colorado (Ruediger et al. 2000; Meaney 2002; Devineau et al. 2010; Shenk 2014). Despite significantly depressed numbers, the species persisted in Colorado up to and throughout the time period of the Colorado Division of Wildlife (now Colorado Parks and Wildlife, "CPW") efforts to reestablish a viable population in the state, beginning in 1999. Data also indicate that lynx have continually inhabited the San Juan Mountains, even before the reintroduction (Carney 1993).

Assessment 5 provides an important overview of the recent history of lynx in the Forest (since reintroduction), a comprehensive description of key ecological conditions thought to be required for lynx suitable habitat and persistence, and an acknowledgement of uncertainties and knowledge gaps related to lynx on the RGNF. Below we recommend incorporating some additional existing scientific information sources and addressing a few key questions in subsequent phases of assessment five.

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[5] 36 C.F.R. § 219.9(b)(1) requires that each forest plan include plan components that "provide the ecological conditions necessary to contribute to the recovery of threatened and endangered species …"

[6] https://www.fws.gov/ENDANGERED/esa-library/pdf/esa_section7_handbook.pdf

[7] The Consultation Handbook also encourages consultation at broader scales such as "ecosystem-based" consultations.

[8] FSH 1909.12, ch. 20, 23.13a, and additionally, the Handbook also suggests consideration of "limiting factors" and "key threats" (which should include those that were the basis for listing the species). Finally, the Handbook states that the planning team should, "Engage with the U.S. Fish and Wildlife Service and National Marine Fisheries Service, as appropriate, in the evaluation of existing conditions for threatened and endangered species. The direct use of recovery plans for forest planning should be a goal, and more than a "consideration," but it is unlikely that recovery plans would provide complete answers to what the necessary ecological conditions are in the plan area.

1. Assessing effects of current management plan components on lynx and lynx habitat

Assessment 5 outlines "some ecological conditions considered important on the forest" (Assessment 5: 12). The document also states, "[a]ll key criteria in the Southern Rockies Lynx Amendment [SRLA] management direction (objectives, standards, and guidelines) should be considered for local conservation and recovery efforts, but are too numerous to mention here" (Assessment 5: 12). Additionally, Assessment 5 indicates changing management direction under the SRLA may not be necessary (Assessment 5: 14).

We acknowledge that the rapidly changing conditions on the forest related to the widespread spruce beetle outbreak confound the ability to determine how these conditions are affecting lynx persistence, if at all. The nature of lynx makes them difficult to study regardless of forest conditions. Assessment 5 states that lynx are continuing to use the forest and reproduce.

However, the Assessment should evaluate how and to what extent current management direction under the SRLA standards and guidelines has affected the ecological conditions outlined. This type of analysis is essential for revealing whether and how the current plan components must change to in order to contribute to conserving and recovering the species. The points outlined in Assessment 5 (p. 12) have raised the following questions for us.

Assessment 5 states, "… lynx conservation and recovery is a multi-unit landscape-scale issue that involves cross-boundary coordination and consistency."

Question: Does SRLA direction require and promote broad-scale management and monitoring as required under the planning rule?

Assessment 5 states, "[c]onnectivity attributes that facilitate movement should be further defined and mapped across the Unit and adjoining unit landscapes." Existing knowledge should be used to identify movement corridors to the extent possible.

Questions: What does "further defined and mapped" mean in this context? Is the RGNF conducting this mapping? Will it occur with sufficient time to inform the plan revision process?

Questions: What existing information about lynx movement and habitat connectivity already exists? What information is currently known about lynx movement in the Forest?

Assessment 5 states, "[r]ecognition of high-value movement and dispersal areas that may require a management focus even when outside of existing lynx analysis units or known occupied reproductive habitat. A local example is the North Pass area on the Saguache Ranger District that may provide for dispersal and ingress of lynx in and out of the local core area." This statement indicates that current plan components may need to change to be more protective of this area.

Question: Does the SRLA have sufficient mechanisms to protect movement and dispersal areas outside existing LAUs?

Assessment 5 includes, "[u]ncompacted snow conditions and management of over-the-snow vehicle route densities" as a key ecological condition.

Question: How is recreational OSV use affecting snow conditions in lynx habitat?

Additionally, we have a few questions related to applying the SRLA to the Rio Grande that we believe should be answered in the Assessment.

Question: To what extent has the Forest Service utilized the exemptions and exceptions to SRLA plan components when developing and implementing projects on the RGNF?

Question: How well does the SRLA restore or maintain lynx winter habitat? (See Squires et al. 2010 on the importance of maintaining and restoring winter habitat.)

Question: How well does the SRLA restore or maintain lynx denning habitat? For example, to what extent is the RGNF following SRLA Guideline VEG G11, which pertains to denning habitat?

Question: How well is the SRLA restoring or maintaining lynx linkage areas and other movement corridors?

The assessment phase provides an excellent opportunity to comprehensively evaluate how the provisions in the SRLA have been applied and implemented and the extent to which they have resulted in lynx habitat protection on the Forest.

Assessment 5 (p. 14) lists a series of "threats and risk factors in the post spruce beetle environment." The list synthesizes several uncertainties. We acknowledge that additional scientific data would be helpful to better inform lynx habitat management and possibly address uncertainties. However, given the proposed timing of the plan revision and potential timing of the release of results from ongoing research—after the plan is revised—new science may not be available before the revised plan is finalized. Nonetheless, plan components must be retained, developed, and/or augmented in a way that guides project-level decisions based on the current BASI. Additionally, given these uncertainties, the revised assessment should discuss how an adaptive management framework might be incorporated into a revised plan under the planning rule that advances lynx recovery as new science becomes available.

2. Additional best available scientific information related to Canada lynx

We recommend the following sources be considered in the next revision of the Assessment. We draw particularly from the 2013 Lynx Conservation Assessment and Strategy (LCAS 2013) as well as some literature published subsequently. An update to the 2000 LCAS, the LCAS 2013 synthesized a comprehensive set of the BASI on Canada lynx.

Assessment 5 references the 2000 LCAS (Ruediger et al. 2000) in identifying risk factors affecting lynx in the Southern Rockies. To summarize from the Assessment 5 (pp. 13-14), these include,

- Unmanaged domestic and wild ungulate grazing
- Activities that result in snow compaction such as roads, trails, and recreation
- Legal and illegal predator control
- Mountain lion predation
- Vehicle collisions on major highways

- Habitat fragmentation

The LCAS 2013 (ILBT 2013: 55-56) outlined several "[h]uman activities and developments specific to the Southern Rockies," that highlight information and science unique to the Southern Rockies. We summarize these below,

- Climate change that may lead to a "persistent snow" decline by 40% (citing McKelvey et al. 2011)
- Historic impacts of extensive mining and logging that are still evident
- The Southern Rockies Lynx Amendment
- Lodgepole pine mortality from a mountain pine beetle epidemic
- Salvage logging of beetle-killed lodgepole pine trees
- Vehicle mortality due to several high-volume highways
- More recreation and development than occurs in other areas of the species' range
- Colorado's trapping prohibition
- Predator control primarily related to domestic sheep grazing

The LCAS 2013 also examined "anthropogenic influences that may affect lynx and lynx habitat" and categorized these by "those that have the potential to negatively effect [*sic*] lynx populations and habitat" (first tier) and "those that may affect individual lynx but are not likely to have a substantial effect on lynx populations and lynx habitat" (second tier) (ILBT 2013: 68). We ask that revisions of the Assessment incorporate relevant new scientific information as it applies to the RGNF, including the 2013 LCAS. We have provided some examples below that summarizes some key information from the LCAS 2013 as well as other sources.

a. Climate change

LCAS 2013. Alpine ecosystems may be among the most vulnerable (citing Gitay et al. 2002; Diaz and Millar 2004), and changes due to such factors as warming temperatures and early snow melt may reduce habitat and shift lynx distribution (citing Hoving et al. 2005; McKelvey et al. 2011) and also reduce the abundance of snowshoe hares (citing Gonzalez et al. 2007). Climate change may affect lynx habitat by increasing the duration and frequency of wildfires (citing McKenzie et al. 2004; Westerling et al. 2006). The LCAS 2013 pointed out, "it is possible that interactions between these variables may intensify their effects" (ILBT 2013: 69).

Additional scientific information. Koen et al. (2014) predicted that changing conditions due to climate change may reduce genetic diversity and adaptive potential in lynx.

b. Vegetation management

LCAS 2013. The LCAS 2013 (ILBT 2013: 71) stated, "Management activities uninformed by consideration of negative impacts to the species were identified as being of greatest potential concern to lynx conservation (Federal Register, July 3, 2003, vol. 68, no. 28, pp. 40076-40101)." Though timber management activities may approximate natural disturbance, they are not ecological equivalents and, unlike natural disturbance, may,

- Alter nutrient cycling and microsite conditions by removing standing biomass and down wood
- Fragment habitat by creating smaller patches that are more dispersed
- Increase runoff and inhibit tree growth by compacting and disturbing soil with heavy equipment
- Reduce structural complexity of forests by thinning, harvesting, planting, and applying herbicides

Research has emphasized the importance of dense horizontal cover and high stem density for snowshoe hares (citing Hodges 2000a; Mowat et al. 2000; Homyack et al. 2006; Robinson 2006; Fuller et al. 2007; Homyack et al. 2007; Scott 2009; McCann and Moen 2011). The current BASI has demonstrated that pre-commercial thinning degrades snowshoe hare habitat (citing Sullivan and Sullivan 1988; Hodges 2000b; Griffin and Mills 2004; Ausband and Baty 2005; Griffin and Mills 2007; Homyack et al. 2007; Ellsworth 2009) can significantly deplete snowshoe hare numbers (citing Griffin and Mills 2004, 2007; Homyack et al. 2007) across the entire lynx range (Griffin and Mills 2007). The LCAS 2013 (ILBT 2013: 73-74) stated,

> If removal of large trees opens the canopy to the extent that the patch functions as an opening, this may discourage use by lynx (Koehler 1990a, von Kienast 2003, Maletzke 2004, Squires et al. 2010). Removal of larger trees from mature multi-story forest stands to reduce competition and increase tree growth or resistance to forest insects may reduce the horizontal cover (e.g., boughs on snow), thus degrading the quality of winter habitat for lynx (Robinson 2006, Koehler et al. 2008, Squires et al. 2010). Similarly, removing understory trees from mature multistory forest stands reduces the dense horizontal cover selected by snowshoe hares, and thus reduces winter habitat for lynx (Koehler et al. 2008, Squires et al. 2010).

The LCAS 2013 (ILBT 2013: 73-74) also stated,

> In the western United States, projects designed to restore forests to a condition more representative of the historical range of variability are generally targeted to drier, lower-elevation forests affected by fire suppression (Hessburg et al. 2005), which are not lynx habitat. Lynx habitats in higher-elevation spruce-fir forests have been less affected by past fire suppression and are mostly within the historical range of variability (Agee 2000). Fuels treatments may be needed to protect human communities and capital improvements by reducing the intensity and rate of spread of a fire, affording control actions with a higher probability of success and providing safer conditions for fire fighters. By removing or reducing the understory and ladder fuels to meet those objectives, dense horizontal cover important to snowshoe hares is reduced and habitat value is diminished for hares and lynx.

Additional scientific information. Abele et al. (2013) found that pre-commercial thinning leads to significant losses in hare abundance in treated areas. Johnson et al. (2015) found that managing for uneven aged stands in subalpine forests regenerating from beetle mortality may be important for red squirrels, which can be an important food source for lynx.

c. Fragmentation of habitat

LCAS 2013. Lynx and snowshoe hares tend to avoid large forest openings and prefer contiguous habitat (citing Koehler 1990; Mowat et al. 2000; von Kienast 2003; Maletzke 2004; Squires and Ruggiero 2007; Squires et al. 2010; Lewis et al. 2011; Simons 2009). Openings that result in distance to cover of >328 ft (100 m) may affect lynx use and movement patterns (citing Koehler 1990). The LCAS 2013 (ILBT 2013: 77) stated,

> At some point, landscape-scale fragmentation can make patches of foraging habitat too small and too distant from each other to be effectively accessed by lynx as part of their home range. Maintaining preferred habitat patches for lynx and hares within a mosaic of young to old stands in patterns that are representative of natural ecological processes and disturbance regimes would be conducive to long-term conservation.

Additional scientific information. Squires et al. (2013: 187) highlighted the value and fragility of species at the periphery of their ranges,

> Populations at the periphery of species' ranges are important for long-term conservation due to a greater potential for speciation and potentially greater survivorship than core populations when species experience sharp range contractions (Lesica and Allendorf, 1995; Channell and Lomolino, 2000; Carroll, 2007). Peripheral populations often occupy suboptimal habitats (Brown, 1984), making them vulnerable to a loss of connectivity with larger source populations (Root, 1998; Thomas et al., 2001). Moreover, peripheral populations may be particularly at risk where they face high levels of anthropogenic disturbance (Channell and Lomolino, 2000; Shaefer, 2003).

He added, "…maintaining connectivity for lynx may become increasingly difficult due to climate and anthropogenic change, as evidenced by reduced connectivity of other boreal species (van Oort et al., 2011)" (Squires et al. 2013: 187) and, "…managers need approaches and tools that identify and maintain connectivity for such species across difference spatial scales (Carroll et al., 2010)." Squires (2013) put forth a model for identifying lynx corridors (c.f., Chetkiewicz et al. 2006; Fahrig 2007; Beier et al. 2009; Chetkiewicz and Boyce 2009; Rabinowitz and Zeller 2010; Richard and Armstrong 2010; Dancose et al. 2011). Kosterman (2014) found that connected mature forest is the key predictor for overall success in lynx reproduction. See also Row et al. (2012) and Walpole et al. (2012).

d. Recreation

LCAS 2013. Constructing or expanding ski resorts, ski huts, or campgrounds removes forest cover and can lead to decreases in prey, increase habitat fragmentation, and affect lynx movement; lynx are believed to avoid developed ski resorts. Lynx are sensitive to human disturbance, especially when denning with young and often move dens when they are approached by humans (citing Olson et al. 2011), though moving kittens from natal to maternal dens is not atypical. Snow compaction by snowmobiles can cause lynx to lose their advantage over competitors and predators, such as coyotes, who avoid deep, loose snow (citing Buskirk et al. 2000; Bunnell et al. 2006; Burghardt-Dowd 2010; and others, see pp. 80-81).

iii. Gunnison sage-grouse

As Assessment 5 points out, Gunnison sage-grouse have had a tenuous existence on the Rio Grande National Forest. The Poncha Pass area is within the species' historic range (see 79 Fed. Reg. 69192: 69194, 2014), though habitat conditions must be improved to support a viable population (79 Fed. Reg. 69313, 2014). Higher elevation sagebrush steppe like Poncha Pass may be key to the species' persistence as climate change continues to affect lower elevation habitat elsewhere. Including lands managed by the Bureau of Land Management (48%), the Forest Service (26%), private parties (24%), and the Colorado State Land Board (2%), GSRCS (2005) estimated the range of the population to be 20,400 acres. We acknowledge that the US Fish and Wildlife Service does not believe that the Poncha Pass area can support a Gunnison sage-grouse population (79 Fed. Reg. 69313, 2014). However, we contend that it is premature to write off this area.

A more detailed evaluation of how human uses in the area have affected sagebrush habitat and sage-grouse is warranted. Assessment 5 (pp. 20-21) states, "[t]here is some threat from cumulative physical disturbances associated with recreation in the area." Gunnison sage-grouse are highly sensitive to human disturbance, including those from recreational activities.

Question: What is the nature and level of this threat to the birds and their habitat?

Assessments 1 and 3 (Terrestrial) conveys that the sagebrush shrubland ecosystem is slightly departed from NRV conditions based on succession class.

Question: To what extent could this departure be affecting the persistence of sage-grouse in the area?

Assessments 1 and 3 (Terrestrial) predicts that livestock grazing will replace wildlife fire as the dominant driver of the sagebrush system. Livestock grazing may not be a compatible use of sage-grouse habitat.

Question: How much livestock grazing is occurring in the Poncha Pass area?

There are habitat requirements or key ecosystem characteristics necessary to sustain sage-grouse populations that are not currently considered in the Assessment (See SGITT 2013).

Assessment 5 (p. 20) outlines the range of strategies proposed by the Gunnison Sage-grouse Rangewide Conservation Plan (GSRSC 2005).

Question: To what extent has Forest Service adopted and followed these strategies for managing sage-grouse and sagebrush habitat on the RGNF?

Question: If it has not implemented the GSRSC strategies, how has the Forest Service managed the Poncha Pass area to contribute to the conservation and recovery of Gunnison sage-grouse?

We recommend the Forest Service review additional BASI as it continues to evaluate key characteristics for sage-grouse persistence to incorporate into the Assessment and develop plan components that contribute to the conservation and recovery of the species. See: Beck and Mitchell (2000); Connelly et al. (2000); Braun et al. 2005; Holloran (2005); Braun 2006; Hagen et al. (2007); Walker et al. (2007); Aldridge et al. (2008); Doherty (2008); Doherty et al. (2010); Reisner (2011);

SGNTT (2011); Patricelli et al. (2012); Baruch-Mordo et al. (2013); Caudil et al. (2013); Reisner et al. (2013).

iv. Uncompahgre Fritillary

Assessment 5 provides an account (pp. 6-7) of the federally endangered Uncompahgre fritillary butterfly, which is dependent on large snow willow patches for persistence. Assessment 5 account includes a recent history of known Uncompahgre fritillary populations on the forest, including possible extirpated populations, and a summary of threats and risk factors, such as livestock grazing, trampling by humans, and climate change.

The USFWS Uncompahgre Fritillary Butterfly Recovery Team finalized a recovery plan for the species in 1994 (UBRT 1994). The recovery plan lists a set of responsibilities assigned to the Forest Service for contributing to the species' recovery (UBRT 1994: 16-18). The Assessment is not clear regarding how the Forest Service is meeting these recovery plan obligations.

Question: What recovery actions in the Uncompahgre fritillary recovery plan apply to the RGNF?

Question: To what extent is the Forest Service implementing and completing its Uncompahgre fritillary recovery plan actions?

Assessments 1 and 3 (Terrestrial) (p. 4) does not evaluate the conditions of snow willow habitat but highlights the threat of climate change to the species:

We think some ecosystems are particularly susceptible to climate change-related impacts. Plant and animal species in high-elevation alpine ecosystems, such as the Uncompahgre Fritillary Butterfly, may be pushed to extinction if warming temperatures reduce their habitat (Alexander and Keck 2015).

Assessment 5 identifies "large patches of snow willow" as a feature not addressed in Assessments 1 and 3. The combined assessments do not answer a key question that may inform plan revision.

Question: How much potential unoccupied habitat should be considered recovery habitat where the species could recolonize or be reintroduced?

The RGNF assessment should also consider whether the 1996 LRMP plan components are sufficient to contribute to the species' conservation and recovery. We believe these plan components need to change to meet the planning rule requirements. That some colonies on the forest may have been extirpated indicates that standards and guidelines may be inadequate, and if so, should change. Wildlife – Standard 13 (RGNF 1996: III-28) states,

> No ground-disturbing activity shall be allowed in potential Uncompahgre fritillary butterfly habitat unless a survey is conducted to determine the existence of the species. Ground-disturbing activities include trail building, livestock driveways, or domestic sheep bedding grounds. The usual grazing associated with livestock in the area is not considered ground disturbing. Potential habitat definitions and survey protocols are found in the *Uncompahgre Fritillary Butterfly Recovery Plan*.

However if ground disturbing activities are allowed to occur in unoccupied potential habitat, this may precluded the restoration and recolonization of potential habitat and hinder the butterfly's recovery. Wildlife – Standard 14 (RGNF LRMP 1996: III-28) states, "[i]f any new Uncompahgre fritillary butterfly populations are discovered, a "No Butterfly Collecting" regulation shall be imposed on the area." It follows that "ground-disturbing activity" restrictions should apply to the habitat of newly discovered populations not solely collection restrictions.

v. Southwestern willow flycatcher

The Southwestern willow flycatcher has been documented to occur on the Forest (Assessment 5: 25). Though the 1995 LRMP has no standards and guidelines specific to Southwestern willow flycatcher conservation and recovery, some do relate to riparian area habitat integrity. However, the RGNF management plan will likely need to change to include standards and guidelines to protect the species and its habitat.

Assessment 5 (p. 25) quantifies suitable habitat on the RGNF,

> Biologists have identified approximately 1,762 acres of suitable and 947 acres of potential willow flycatcher habitat on the forest to date (2,709 acres total, Figure 5). Approximately 1,428 acres (81 percent) of the suitable habitat and 93 acres (10 percent) of the potential habitat has received species protocol surveys for at least two consecutive years. As of the end of the 2014 field season, mapping efforts indicate that approximately 81 to 85 percent of the potential habitat on the forest has been evaluated (Ghormley 2015).

Questions: What does "approximately 81 to 85 percent of the potential habitat on the forest has been evaluated" mean? What was the nature of the evaluation?

Question: What are the ecological conditions of suitable and potential habitat on the Forest? To what extent are these conditions departed from the Natural Range of Variation?

Here is an instance where the Assessment would benefit from stronger integration between topics. Assessment 5 provides a comprehensive description of the species and details about key habitat characteristics. As with other species, Assessment 5's evaluation of "current conditions and trends" does not present an account of current conditions of Southwestern willow flycatcher habitat on the Forest. Assessments 1 and 3 (Aquatic and Riparian), including Appendix 1, provides more detail about riparian conditions on the Forest with reference to specific areas.

Questions: What information does the aquatic and riparian condition evaluations conducted for Assessments 1 and 3 provide about conditions of the 1,762 acres of suitable habitat and 947 acres of potential habitat for the Southwestern willow flycatcher? For example, are there impaired stream segments identified in Assessments 1 and 3 (Aquatic and Riparian) (p. 11) that include some of this habitat?

vi. Other federally protected species

We ask that the Forest Service include in revisions of the Assessment an accounting of the habitat conditions for other endangered, threatened, proposed, or candidate species that may be relevant to the Forest, such as the black-footed ferret, New Mexico meadow jumping mouse, Mexican spotted owl, and yellow-billed cuckoo—all discussed in Assessment 5.

b. Species of Conservation Concern

We agree with the draft NFC statement,

> *A5. Revise the previous plan to provide management direction to manage habitat to ensure viable populations of species of conservation concern (Draft NFC 2016: 3, Table A)*

We have a few comments regarding the selection of SCCs as well as additional BASI and points to consider in the next phases of planning.

i. SCC identification

We appreciate that Assessment 5 lists the criteria for identifying species that will be further considered for SCC selection as the plan revision process continues. These criteria follow the planning directives, and it is evident that the Forest Service applied these criteria systematically to develop the draft SCC list (Assessment 5: 36-51, Table 3).

We believe the Service has rightly included in its list species designated as Regional Forester Sensitive Species. The Sensitive Species designation indicates that there is a substantial concern about these species' persistence on the forest. We recommend the Service retain all Sensitive Species as SCC.

We do have some concerns about Assessment 5, primarily regarding the process for removing species from consideration as SCC and the documentation of BASI used to justify removing species from consideration. We ask that the following concerns and recommendations be addressed in the next iteration of the assessment.

ii. Documentation of best available scientific information

The use of BASI is required for all planning actions and explicitly required for the determination of SCC.[9] The rationales in the assessment consist of conclusory statements and do not reference supporting science. However, "species overviews" have been prepared for each species considered for SCC and would presumably include the scientific basis for the rationale, though the specific scientific information is not identified in the assessment.

One rationale for removing species from SCC consideration is: "[n]ot documented on the Rio Grande National Forest" (Assessment 5: 32-34, Table 2). It is not clear what "not documented" on the forest means, and the Service has used this rationale to remove species from consideration in several cases.

Questions: Does "not documented" mean that documentation exists to support the contention that the species does not occur on the forest (e.g., from regular monitoring or survey data)? In these instances, we would have expected specific references to the BASI be included in the rationale. Or, does "not documented" indicate a lack of information?

[9] 36 C.F.R. § 219.3; FSH Ch. 10, 12.53b(3 and 4).

Similarly, it is not clear if "[n]o known substantial conservation concern on the Rio Grande National Forest" means there is BASI that supports a determination of no substantial concern or if this indicates a lack of information.

iii. Consideration of all species relevant to the plan area

We acknowledge that the Forest Service undertook a rigorous, comprehensive analysis of species it included for SCC consideration. We would like to know how the Service made its initial selections. We are interested because our own analysis of vulnerable species believed to occur in the plan area revealed a few additional species that we had expected to be considered. These include,

- Silky pocket mouse (*Perognathus flavus*), NatureServe: G5, S1
- Brazilian free-tailed bat (*Tadarida brasiliensis*), NatureServe: G5, S1
- Xanthus Skipper (*Pyrgus xanthus*), NatureServe: G3G4, S3
- Three-toed woodpecker (*Picoides tridactylus*), NatureServe: G3G4, S3S4B (vulnerable)
- Dwarf hawksbeard (Askellia nana), NatureServe: G5, S2
- Pale moonwort (*Botrychium pallidum*), NatureServe: G3, S2
- Winding mariposa lily (*Calochortus flexuosus*), NatureServe: G4, S2

We request that the revised assessment include a brief explanation of the methodology for initial selection and also evaluate the above listed species for consideration as SCC.

iv. Determinations of occurrence on the Forest

As noted above, we request additional explanation of what "not documented" on the forest means as a rationale for removing species from consideration as well as the scientific documentation used to make such judgements.

The directives are clear that species may be excluded if they are "accidental" or "transient," or are "well outside the species' existing range." However, the basis in the draft assessment for several species not selected is occurrence that is "peripheral," "very few documented," or "very limited." These cases may not meet the criteria in the directives.

Where occurrence records are old, this could substantiate the decline of the species and suggest potential recovery and restoration needs. Age of occurrence records should not be a justification for ignoring a species in the planning process without demonstrating that the likelihood of future occurrence is remote.

The basis for not including several vulnerable species was "very little suitable habitat on the Rio Grande National Forest." Infrequent presence or limited habitat in the plan area, and lack of threats from national forest management activities are insufficient to demonstrate that species vulnerable at a broader scale are secure in the plan area. Limited habitat might suggest the opposite. If a species is "known to occur" in a plan area, the apparent absence of habitat is not a relevant justification. (It may be appropriate to consider when developing plan components.)

The directives specifically recognize climate change as an example of a threat to a species that might warrant identifying it as a SCC even though it is beyond the control of national forest management

actions. For example, the sage sparrow was not identified as a SCC because of "very limited ability to influence species through management actions of Rio Grande National Forest."

v. Judgements of substantial concern

With regard to SCC, documentation must explain how the BASI indicated or did not indicate "substantial concern about the species' capability to persist over the long-term in the plan area." This is referring to scientific concern that has been expressed that is applicable to species persistence in the plan area, not a subjective perception of concern by the regional forester.

The directives make an important distinction between species of broader-scale concern and those where there is local conservation concern. All but one of the categories in the directives address the former by encompassing concerns expressed by NatureServe or government agencies about viability of the species at a broader scale than the plan area. The overall approach is to cast a wide net so that the Regional Forester can consider species where concern about persistence is indicated for either or both of these reasons. Local conditions in a plan area are relevant at the SCC identification stage as a basis for including additional species for which there might not be broader concern; *not as a sole basis for rejecting species for which there is a broader concern.*

In Assessment 5, a "basis" is provided for each species "not carried forward for analysis as SCC" that addresses both regulatory criteria for each species. However, the criteria listed for "determining 'substantial concern'" are only the criteria designated in the directives to be used for species of "local concern" (FSH 12.52d(3)(f)). Thirty-seven species were considered but not carried forward.

Localized trends are relevant to adding a SCC that is secure at a broader scale but may be at risk in the plan area (FSH 12.52d(3)(f)). However, localized trends do not counter broader scale circumstances. Using the directives' criteria for including additional species, the Responsible Official excluded species of concern at a broader scale but having stable populations on the forest or because they are "widespread," "common," or had "good viability" on the Forest.

vi. Concerns about expanding list of species to consider as SCC

Overall, the process developed by the Forest Service is very expansive and inclusive in identifying SCC. The actual needs of these species related to management of the national forest may then be determined when plan components are being developed. Having a large number of SCC does not necessarily lead to pages of plan components if their necessary ecological conditions can be provided by ecosystem plan components.

c. Evaluating conditions necessary to sustain at-risk species

As stated above, we believe a drawback of the Assessment is the lack of integration between topics, particularly Assessment 5 and Assessments 1 and 3. Assessment 5 (pp. 68-71) lists conditions and features that are necessary for at-risk species. Assessment 5 (p. 71) also lists those "conditions and features that do not overlap with the ecosystem and ecosystem drivers described and analyzed in Assessments 1 and 3," for example "presence of non-native fish and amphibians," "vegetation that overhangs water," and "Northern flicker cavities." These characteristics are not evaluated in the Assessment. And, the characteristics selected to measure the integrity of forest ecosystems are not evaluated in such a way that enables an understanding of how conditions are meeting the habitat needs of at-risk species. See more on this below.

VIII. Comments on assessing ecosystem integrity to inform needs for change

a. Vegetation modelling

We strongly recommend that the Responsible Official not rely on the modeling results presented in Assessments 1 and 3 (Terrestrial) to make planning decisions. Assessment 1 and 3 (Terrestrial) acknowledges limitations of the results and that they are not always consistent with relevant peer-reviewed literature (for example, at p. 18 and pp. 22-23). We recommend that the Responsible Official make better use of the available literature synthesizing results of these analyses and making determinations regarding which of these sources constitute the BASI for decision making. The Assessment references many key sources that would serve as a basis for a more in depth assessment of relevant science.

b. Identification and use of key ecosystem characteristics in the Assessment

Assessments 1 and 3 (Terrestrial) (p. 3) states,

> In order to assess the ecological integrity of the terrestrial ecosystems, we chose key ecosystems characteristics. These are attributes that we can use to predict whether future conditions will have ecological integrity.

These are the characteristics chosen:

- Diversity of vegetation – amount and distribution of vegetation structural stages
- Landscape Disturbances and Patterns
- Connectivity and Human-caused Fragmentation
- Late successional habitats
- Snags and down woody material
- Rare communities and special habitats

Question: How is the Assessment evaluating compositional characteristics?

Question: How do the Assessment analyses of "diversity of vegetation" and "late successional habitats" differ?

We have questions about some of the "diversity of vegetation" analyses and their implications for future management direction. We outline a few examples to illustrate some concerns.

Regarding the pinyon-juniper ecosystem, we are confused about some of the statements that we hope revisions in the Assessment will clarify. Assessment 1 and 3 (Terrestrial) (p. 12) states,

> Expansion of pinyon and juniper woodlands is a concern in some areas, such as lower elevation meadows and areas with grassy understories. Although pinyon-juniper density has likely increased to some extent in the recent past on the Rio Grande National Forest, the current extent compared to past distribution has not been well analyzed. Fire exclusion in pinyon and juniper systems cannot be the primary mechanism for expansion and infill of these woodlands as fire was never very frequent in these systems and therefore they are not likely departed from historic fire return intervals in most places (Romme et al. 2008), though

there is less certainty in pinyon-juniper savannas. Other drivers of expansion may be ongoing natural expansion, recovery from heavy grazing or tree removal, climate change or elevated carbon dioxide levels (Romme et al. 2009).

Assessment 1 and 3 (Terrestrial) (p. 20) states,

> Modelling suggests that historically 5 percent of the pinyon-juniper woodland was in grass/shrub, 35 percent in open canopy cover and 60 percent in mid canopy cover. Most of the area was dominated by mature trees.
>
> Current conditions are highly departed from the natural range of variation in the pinyon-juniper woodland ecosystem, with a much higher amount (60 percent) of the area in grass/shrub. Of the remaining landscape, almost all contains open cover woodlands, with smaller sapling-pole trees dominant. The high level of departure is at least partially related to the assignment of the low-elevation grasslands land type association to the pinyon-juniper woodland ecosystem. If some of the mapped grass/shrub areas are actually natural grasslands and had been classified into a grassland ecosystem instead, the level of departure from the natural range of variation would be lower.
>
> Under future projections, the pinyon-juniper woodland recovers from highly departed current conditions over several centuries. Long-term projections indicate future conditions within the natural range of variation. However, the trend toward increasing tree cover may not actually occur if the grassland land type association is not at least moderately susceptible to tree invasion.
>
> Succession and insect outbreaks, such as pinyon ips, were the most influential drivers of vegetation dynamics in the pinyon-juniper woodland ecosystem, with wildfire relatively rare. Management treatments in the no-action scenario include broadcast burning, mastication, and thinning, summing to an annual treatment rate of 0.4 percent (443 acres per year).

Question: The text on page 12 suggests that pinyon-juniper woodlands are expanding and densifying, while findings of the modeling suggest departure from NRV is due to a higher amount grass and shrubs, but this apparent discrepancy may just require some additional explanation. However, how do the model results square with the published literature and field expertise?

Question: The second paragraph indicates some potential problems with inputs to the model; given this vegetation classification issue, how will these results be used to inform management direction decisions?

Question: Management under the 1996 LRMP includes burning, mastication, and thinning, which do not seem consistent with modeling results; does this indicate a need to change management direction for pinyon-juniper woodlands?

To reiterate, we recommend the Responsible Office rely more heavily on available literature instead of the vegetation model.

The type of vegetation modeling used in Assessment may not be appropriate to evaluate grassland (as well as shrubland) conditions, and the Assessment acknowledges less confidence in these results. We believe that a different set of key characteristics are more appropriate to evaluate the conditions

of grasslands (and also shrublands), such as species composition, species richness and biodiversity; the proportion of cover to bare ground; seasonal grass height; and proportion of native grass species, forbs, shrubs, trees, and non-native annual grasses. See also Browder et al. (2002) and Coppedge et al. (2006).

The Assessment provides no analysis of ecosystem connectivity and/or fragmentation for the Forest. The amount of land area in designations, such as wilderness, and acres covered by roads are not measures of connectivity and fragmentation (Assessment 1 and 3 (Terrestrial): 33-34). We have provided comments (see The Wilderness Society, Defenders of Wildlife, and the Center for Large Landscape Conservation comments on the RGNF Assessment 15 – Designations, dated February 9, 2016) that included specific information about connectivity related to the Forest. We hope the Planning Team will use this information as guidance for ways to assess connectivity and fragmentation. Additionally, we believe that the Assessment could provide an analysis of habitat connectivity on the Forest with existing information, and suggest the following papers to serve as a starting point: Calabrese and Fagan (2004) and Kupfer (2012).

i. Rare communities and special habitats

The planning directives necessitate the Responsible Official to consider rare or at risk unique ecosystems and habitat types (FSH 1909.12, ch. 20, 23.1, 23.11d). The Assessment lists some of these habitats (Assessments 1 and 3 (Terrestrial): 42) and provides a more thorough evaluation of some of these habitats, including fens and beaver influenced habitats. The 1996 LRMP has several standards and guidelines in place intended to protect, for example, wetlands, wet meadows, cliffs (particularly for peregrine falcons), and caves and mines. Given the draft NFC document did not identify these components as needing to change, we would expect the revised plan to retain these standards and guidelines. A more detailed identification rare and at risk unique habitat types and accounting of the degree to which they are departed from their natural ranges of variation would be helpful to enable the public to understand why standards and guidelines are necessary to protect them.

Statements in Assessments 1 and 3 (Aquatic and Riparian), see below, indicate that existing plan components may be inadequate to maintain the integrity of these systems and needs for change.

> Low-elevation seeps and springs frequently used for livestock and/or wildlife troughs were not included in the Colorado Natural Heritage Program assessment. Although condition data is lacking for these types of systems, we consider their ecosystem integrity low due to water diversions, trampling, and other impacts. We find this situation most often in drier areas where free-flowing water is limited. (Assessments 1 and 3 (Aquatic and Riparian): 4)
>
> To mitigate the impacts of potentially reduced flows due to climate change, we can focus management on maintaining stream structure and surrounding vegetation within their perceived natural range of variation particularly for vulnerable streams, wetlands and riparian areas (Dawson, 2011). (Assessments 1 and 3 (Aquatic and Riparian): 4)
>
> Pugging in saturated soil areas is readily observable in some montane springs and meadow areas where livestock and native ungulates congregate. Heavy cattle use in palustrine systems can alter the hydrology by damaging soils. Soil compaction and pugging of the peat layer will change surface water flow. Heavy cattle use can also alter the successional processes within

> the sedge- dominated area of a fen. Cattle hoof action can lead to pugging and hummocking, creating microsites where shrubs can become established, changing the sedge-dominated meadow to carr shrubland. (Assessments 1 and 3 (Aquatic and Riparian): 4-5)

We understand that information about the condition of some of these ecosystems is lacking, such as data about seeps and springs, which indicates that in such cases monitoring questions should be included that address these information gaps.

Below are additional comments on some of these habitat types.

1. Riparian areas

Under the planning rule, plan components must be developed "to maintain or restore the ecological integrity of riparian areas" (36 C.F.R. 219.8(a)(3)). The planning rule is quite specific as to what characteristics must be considered in the development of plan components (36 C.F.R. 219.8(a)(3)(A) – (G)). Though the 1996 LRMP has a set of standards and guidelines related to protecting aquatic and riparian ecosystems, the Assessment pointed out that the plan needs to change based on its evaluation of aquatic and riparian conditions (Assessments 1 and 3 (Aquatic and Riparian): 32). Some additional statements in the Assessment reflect this need.

> … it is estimated that there are approximately 468 miles of impaired waterbodies (303(d) listed) within the Rio Grande River Basin, some of which are within the Rio Grande National Forest (Colorado Department of Public Health and Environment 2012). These listed waterbodies are mostly associated with historical mining and are in the Alamosa, Willow, and Kerber Creek watersheds, although the upper Hot Creek subwatershed is also noted in the aquatic report by Winters et al. (2016). (Assessments 1 and 3 (Aquatic and Riparian): 11)

> We are part of a signed interagency conservation agreement to improve and maintain habitat conditions and populations of the Rio Grande cutthroat trout. This species is currently a primary focus for restoration opportunities in the upper Rio Grande Basin. (Assessments 1 and 3 (Aquatic and Riparian): 11)

> There are approximately 680 miles of rivers and streams on the Rio Grande National Forest that sustain populations of nonnative trout. (Assessments 1 and 3 (Aquatic and Riparian): 12)

> To mitigate the impacts of projected reduced flows, our management should focus on maintaining stream structure and surrounding vegetation within the natural range of variation; particularly at streams, wetlands and riparian areas thought to be more vulnerable to climate change (Dawson 2011). We should manage keystone species such as beaver, which restore streams to more natural flow rates and water table levels, to maintain stream function and store water naturally on the landscape. (Assessments 1 and 3 (Aquatic and Riparian): 42)

We recommend that the Responsible Official, as the plan revision process continues, include needs to change plan components that direct management of aquatic and riparian ecosystems in future NFC statements and decisions.

2. Caves and mines

Assessments 1 and 3 (Terrestrial) noted that of 11 bat species, several depend on mines and caves for habitat. The Townsend's big-eared bat and fringed myotis—both included in the RGNF draft SCC list—depend on caves and mines. We urge the Planning Team to include an evaluation of the conditions and tends in the conditions of the Forest's caves and mines as bat habitat in order to help appraise how well standards and guidelines pertaining to caves and mines have protected conditions favorable to bats; or, explain why such an evaluation is not possible.

3. Bog violet (Viola nephrophylla) habitat

We urge the Forest Service to consider this rare and at risk habitat not currently addressed in the Assessment or draft NFC statements. The Great Basin silverspot butterfly (*Speyeria nokomis nokomis*) recently received a positive 90-day finding by the Fish and Wildlife Service (81 Fed. Reg. 1368, 2016), indicating the species may warrant listing under the Endangered Species Act. The species is dependent on the bog violet as media for laying eggs and as a larval food source. Several records of bog violet occur on the RGNF, and protecting bog violet habitat with plan standards and guidelines will likely be necessary to protect the Great Basin silverspot.

4. Prairie dog colony ecosystems

We encourage the Forest Service to consider prairie dog colonies as important, rare ecosystems that provide habitat for a range of grassland species. The Forest Service has carried forward the Gunnison's prairie dog as a species on its draft SCC list. Biologists consider prairie dogs keystone species (Miller et al. 1994; Kotliar et al. 1999; Kotliar et al. 2000; Miller et al. 2000; Davidson and Lightfoot 2006). At least nine species depend on prairie dogs and their colonies (Kotliar et al. 1999) and over 100 may benefit from these ecosystems (Miller et al. 1994). The Forest Service considered three of these species—burrowing owl, mountain plover, and ferruginous hawk—as SCCs but justified not carrying them forth on the draft SCC list due to the rationale, "[n]ot documented on the Rio Grande National Forest" (Assessment 5: 33). These species are at-risk across their range; their ranges overlap with the RGNF. The Forest Service also included in its justification for not carrying forward these species, "[v]ery little suitable habitat on the Rio Grande National Forest" (Assessment 5: 33).

Questions: How much suitable habitat occurs on the Forest? Of this suitable habitat, how much is occupied by prairie dogs?

Question: How much potential exists for prairie dog populations and colony numbers and sizes to increase?

5. Complex early seral forest

Assessment 1 and 3 (Terrestrial) use "late successional habitats" as a key characteristics to help evaluate ecosystem conditions. Assessment 5 lists "late seral forests" as an ecological condition or feature essential to several species, including boreal owl, Northern goshawk, and Western bumblebee.

Significantly disturbed areas, such as areas that have experienced high-severity fire, resulting in complex early seral forest habitat should be managed as opportunities to contribute to achieving

ecological integrity, habitat diversity, and species persistence requirements, especially snag dependent and shrub-dependent species, over a long timeframe measured in decades. The Assessment should acknowledge the importance of fire-burned areas as wildlife habitat, early successional vegetation resulting from mixed and high-severity fire, and structural complexity resulting from disturbance to ecological integrity and forest resilience. Complex early seral conditions that result from canopy-opening disturbances (see Swanson et al. 2011; Donato et al. 2012; DellaSala et al. 2014; Swanson et al. 2014) should be identified in the forest plan as a desired and critical stage of biodiversity establishment and forest development, and a foundation for supporting ecological integrity and affirming the Forest Service's guidance on ecological integrity in the planning rule.

Disturbed areas require sensitive management to protect these fragile habitat from activities such as road-building, livestock grazing, recreation, and logging. The planning rule requires the maintenance and restoration of ecological integrity at the ecosystem scale, as well as the maintenance and restoration of the diversity of habitat types throughout the plan area. We are concerned about potential negative impacts of post-disturbance salvage harvest to ecosystem integrity and habitat-type diversity for burned habitats, particularly on complex early seral forest conditions. Swanson et al. (2011: 10) sum up the management issues by finding that,

> Natural disturbance events will provide major opportunities for these ecosystems, and managers can build on those opportunities by avoiding actions that (1) eliminate biological legacies, (2) shorten the duration of the ESFEs [early-successional forest ecosystems], and (3) interfere with stand-development processes. Such activities include intensive post-disturbance logging, aggressive reforestation, and elimination of native plants with herbicides.

Some wildlife species that prefer early-successional communities include mountain bluebird, three-toed woodpecker, Lewis's woodpecker, and lazuli bunting (Swanson et al. 2011).

IX. Assessment of drivers and stressors

a. Bark beetle disturbance

The recent spruce beetle outbreak in the Forest and the Southern Rockies region is one of (if not the) most significant issues and changed conditions on the Forest since the 1996 LRMP was adopted. Despite the large-scale tree die-off, published science and the vegetation model disagree as to whether and how much current conditions are departed from historic conditions. Assessment 1 and 3 (Terrestrial) (p. 18) recognizes the discrepancy. To summarize some points from above, we urge the Responsible Official to make a determination regarding which information constitutes the BASI for this topic and otherwise adhere to the planning rule requirements under 36 C.F.R 219.3, to more fully utilize available peer reviewed scientific literature, and to tap experts (many of whom work in Colorado universities and other institutions) to provide opinions on scientific disagreements and uncertainties.

b. Livestock grazing

Assessments 1 and 3 for both terrestrial and aquatic ecosystems and Assessment 5 identify and describe livestock grazing as a stressor for most terrestrial and aquatic ecosystems and a risk factor for at least 28 at-risk species. In several cases, the assessments note several cases where livestock

grazing is likely contributing to departure from NRV. Below are a few examples of statements in the assessment that indicate livestock grazing is contributing to degraded conditions.

> … a few wetlands are ranked C due to stressors including grazing, hydrologic modifications, and surrounding land use activities. (Assessments 1 and 3 Aquatic: 14)

> Low-elevation seeps and springs frequently used for livestock and/or wildlife troughs were not included in the Colorado Natural Heritage Program assessment. Although condition data is lacking for these types of systems, we consider their ecosystem integrity low due to water diversions, trampling, and other impacts. (Assessments 1 and 3 Aquatic: 4)

> Pugging in saturated soil areas is readily observable in some montane springs and meadow areas where livestock and native ungulates congregate. Heavy cattle use in palustrine systems can alter the hydrology by damaging soils. Soil compaction and pugging of the peat layer will change surface water flow. Heavy cattle use can also alter the successional processes within the sedge- dominated area of a fen. Cattle hoof action can lead to pugging and hummocking, creating microsites where shrubs can become established, changing the sedge-dominated meadow to carr shrubland. (Assessments 1 and 3 Aquatic: 4-5)

> Gage and Cooper (2013) suggest that a variety of factors have caused many high-to middle-elevation riparian shrublands to be outside the natural range of variation, due to exotic species invasion, herbivory and trampling by livestock and native ungulates, and changing hydrologic regimes and beaver populations. (Assessments 1 and 3, Terrestrial: 21).

> Threats listed in the final listing rule and the recovery plan include trampling of the Uncompahgre fritillary butterfly and its habitat by humans and livestock, collecting, lack of regulatory mechanisms, adverse climatic changes, small population size, and low genetic variability (USDI Fish and Wildlife Service 2009). While most known populations are in remote areas, potential threats to the species' persistence still exist. Increasing recreational traffic, including extensive off-trail use, domestic livestock grazing, grazing by wild ungulates, and the potential for global climate change all pose problems to habitat necessary for the species' recovery. (Assessment 5: 7)

> Potential habitat includes riparian that does not currently provide the characteristics of suitable habitat but has the potential of attaining them in the foreseeable future. Potential sites may include habitat such as a stand of young willow that currently lacks the density or size needed for suitable habitat. Potential habitat can be previously suitable habitat rendered unsuitable by events such as a severe flood, or human activities such as unmanaged livestock grazing. (Assessment 5: 26-27)

Given this situation, we would expect plan components governing livestock grazing on the forest need to change. Assessments 1 and 3 (Terrestrial) (p. 2) indicates that plan components related to livestock grazing may need to be revised:

> To ensure it is responsibly done, we have standards and guidelines in the current Forest Plan regarding the timing, amount, and regulation of livestock grazing. We need to evaluate and potentially adjust these standards and guidelines based on monitoring data. This is

particularly true for low elevation riparian areas, which are especially vulnerable to climate change impacts.

The next draft of the assessment should include an appraisal of such monitoring data in order to help determine and help the public to understand why or why not plan standards and guidelines related to grazing should or should not change.

c. Climate change

We strongly recommend that the Planning Team utilize available scientific literature to conduct a more comprehensive appraisal of current and predicted climate change impacts on the Forest's ecosystems and plant and animal communities to incorporate into the Assessment. Some available resources include: Isaak et al. (2012); Johnson (2013); Fischman et al. (2014); Schmitz et al. (2015).

d. Highly interactive species, ecosystem engineers

Plan components should provide for the integrity of aquatic ecosystems, based on sustainable hydrologic regimes and connected aquatic habitat. In that spirit, BASI supports the identification of beaver (*Castor canadensis*), in the planning process as a system driver, a key compositional characteristic of the integrity of riparian ecosystems, as providing habitat necessary for the recovery of at-risk species, and as a focal species. Key characteristics of riparian ecosystems have been disrupted due to the absence of beaver and the absence of beavers has impaired the ecological integrity of aquatic and riparian ecosystems and watersheds. The assessment does identify beaver as an important keystone species, and identifies subwatersheds within the Forest where beaver habitat suitability exists. But the assessment and need for change fail to actually recommend beaver reintroduction. This is an example where the need for change does not match up well with the forest assessment. The Forest needs to project future sustainability/integrity conditions for beaver (including incorporating available information on likely future climate conditions), and promote the ecological conditions provided by beaver populations as it pertains to the sustainability and diversity requirements of the planning rule.

X. Comments on specific draft NFC statements and priorities

We are making the assumption that components in the 1996 LRMP will not change unless specifically identified in a NFC statement. Please correct us if this assumption is inaccurate. Please also see comments that we have offered with our partners (Smith, San Luis Valley Ecosystem Council et al. 2016). Below are a few additional recommendations regarding these statements.

a. Watershed direction

C3. Revise the previous plan to identify priority watersheds to reflect the current best management practices including the Watershed Conservation Practices Handbook, National Best Management Practices program, and Watershed Condition Framework (Draft NFC 2016: 3, Table C)

The planning rule provides strong direction for the management, protection, and restoration of water resources and quality. In addition, the Forest Service in 2010 launched the Watershed Condition Framework in an effort to create a consistent approach to evaluating, restoring, and monitoring watersheds across the National Forest System. We recommend that the Forest Service adopt a management strategy that "protects the best and restores the rest" by assuring that activities

within a network of watersheds maintain existing conditions or lead to improved watershed conditions; such a framework would include the following elements for proactively protecting watersheds and water quality:

- Protect Riparian Management Areas.
- Protect Key Watersheds. Key watersheds are a *network* of watersheds distributed through the region that are crucial to at-risk fish species and stocks and for high-quality water.
- Conduct watershed Analysis: Watershed analysis provides a basis for development of watershed-scale restoration strategies and is a key basis for defining desired conditions, management objectives and monitoring.
- Restore watersheds: Watershed restoration is a comprehensive, long-term program to restore watershed health, riparian ecosystems, and fish habitats consisting of active and passive management actions.
- Monitor.

We commend the Rio Grande staff for recognizing a need to incorporate the new direction into the revised plan and including C3. However, we would recommend that you revise the wording to C3 in order to better reflect the direction in the new authorities and current scientific thinking regarding watershed management. We recommend articulating the needs in two statements,

- Revise the previous plan to identify, protect, restore, and monitor a network of priority watersheds to enable highly functioning aquatic processes and improve vitality and persistence of imperiled aquatic species including the cutthroat trout.

- Revise the previous plan to reflect the current best management practices including the Watershed Conservation Practices Handbook, National Best Management Practices program, and Watershed Condition Framework.

b. Old growth forest

D1. Update the definition and management direction for late successional/ old growth forest and woodland communities (Draft NFC 2016: 3, Table C)

It is not yet clear how the "diversity of vegetation" and "late successional habitats" analyses presented in Assessment 1 and 3 (Terrestrial) will provide guidance to develop management direction. As stated above, the Assessment is confusing regarding what scientific information the Responsible Official has determined to be the BASI. The data related to this topic are equivocal. Modeling results indicate that spruce-fir forest and wet mixed conifer are "substantially departed" from NRV while pinyon-juniper woodland is highly departed and dry mixed conifer is slightly departed (Assessment 1 and 3 (Terrestrial): 17). Assessment 1 and 3 (Terrestrial) (p. 35) states the following regarding its findings on late-successional habitats,

> In order to assess the presence and change in late successional habitats through time, the state and transition modelling done by Oregon State University was used. This work modelled the presence of various habitat structural stages under current conditions and into the future. Late successional here is defined as habitat structural stages 4B and 4C for any of the cover types (except pinyon-juniper where there is no 4C) and is discussed below. Habitat structural stage class 4B corresponds to areas with mature trees (9 inches and larger) with 40

> to 70 percent canopy cover. Habitat structural stage class 4C corresponds to areas with mature trees (9 inches and larger) with more than 70 percent canopy cover.
>
> Based on these criteria, currently, only about 13 percent of the forest is late-successional (figure 5, table 10). This is projected to increase under current plan direction to 19-27 percent in the next 20-50 years. Even so, this is less than the amount (35 percent) thought to be in late successional habitat under historic conditions. If, as predicted, disturbances such as large fires and insect outbreaks increase in frequency due to climate change (Vose et al. 2012), the forest may have even less late successional habitat than model predictions suggest. In general, most forest types have less late successional habitat than under historic conditions (table 10).

These passages raise questions for us that do not seem to be answered in the Assessment.

Questions: How will managing under current plan direction increase late-successional habitat to "19-27 percent"? What is the scientific basis for this assertion?

Question: How has management under the current plan direction contributed to the current conditions?

Question: What does the Assessment say about how management direction should change in the revised plan?

Question: Given the significant modifications to the model described in Appendix B of Assessment 1 and 3 (Terrestrial) (pp. 63-64), to what extent can these data be relied up for decision making?

We recommend these questions be answered in the Assessment to provide the public a better understanding of how management direction needs to change. We recommend the NFC statement be revised to reflect how the Responsible Official believes management direction should change based on the revised Assessment.

c. NFC statements without corresponding information in the Assessment

As stated in our earlier comment letter (Smith, San Luis Valley Ecosystem Council et al. 2016), we agree that management direction captured in the following statements should change,

> *D8. Consider additional management direction for recreational climbing in relation to sensitive heritage resources and habitat like peregrine falcon nests (Draft NFC 2016: 6, Table D)*
>
> *D9. Update management direction to maintain separation between bighorn and domestic sheep (Draft NFC 2016: 6, Table D)*
>
> *D10. Additional management direction regarding recreational pack goats on the Rio Grande National Forest (Draft NFC 2016: 6, Table D)*
>
> *D13. Revisit the off-road game retrieval policy on the Rio Grande National Forest (Draft NFC 2016: 7, Table D)*

These are all needs for change that internal Forest Service staff have made. Currently, these statements do not indicate if the Responsible Official believes plan direction should be more or less restrictive regarding NFC statements D8, D10, and D13. We recommend that the Responsible Office include in the next revision of the Assessment and explanation of the problems regarding these issues and how current direction is affecting at-risk wildlife so that the public can understand how management direction needs to change.

XI. Additional needs for change

a. Desired condition statements

Under the planning rule, "[d]esired conditions must be described in terms specific enough to allow progress toward their achievement to be determined …" (36 C.F.R. 219.7(e)(1)(i)). The planning directives state that desired conditions, "[m]ust be written with enough detail so the condition of on-the-ground achievement is clear and progress toward their achievement can be measured or evaluated" (FSH 1909.12, ch. 20, 22.11(2)). Additionally, the "Responsible Officials should include sufficiently detailed descriptions of desired conditions so they are useful to determine the purpose and need for many projects such as restoration projects and activities." (FSH 1909.12, ch. 20, 22.11).

Some existing desired conditions in the 1996 LRMP may not be meeting the planning rule requirements and will likely need to change. For example, the following "Soils" desired condition may be too vague to allow progress to be measured: "[e]cosystem management activities are harmonious with soil capabilities, potentials, and limitations."

b. Monitoring program and adaptive management

It is helpful that the Forest Service outlined a set of specific tasks that the planning rule requires be undertaken as part of plan revision, including timber suitability evaluation, wilderness evaluation, and wild and scenic river identification and evaluation. We recommend that developing a monitoring program as a key task be captured in identified needs for change as the planning process moves forward. The Assessment revealed where information gaps are hindering a more comprehensive evaluation of forest conditions. These identified gaps should provide a starting point for developing monitoring questions that address information needs for the Forest.

We are also concerned that the assessment does not adequately lay the groundwork for an effective monitoring and adaptive management program. According to the planning rule, the assessment should be used to inform the development of the monitoring program (219.5(a)(3)). The monitoring report must in turn be used to "inform adaptive management of the plan area" (219.12(d)(2)). Adaptive management must therefore be built into the design of the assessment by using existing information to establish hypotheses for testing. Further, the draft directives explicitly direct assessments to advance adaptive management. We believe that the assessment could have a more robust discussion of underlying assumptions and areas of uncertainty, including a discussion of how effectiveness monitoring of plan components could verify assumptions and reduce uncertainty. For example, uncertainty should be documented and flagged as an adaptive management question that pertains to plan components associated with vegetation diversity and species condition/persistence. Generally, uncertainty and assumptions regarding the relationship between ecosystem level plan components and species persistence need to be flagged for attention to facilitate future viability determinations and effectiveness monitoring strategies.

c. Focal species

The planning rule addresses focal species only in conjunction with the plan monitoring program developed by the responsible official (36 C.F.R. § 219.12(a)(5)(iii)). However, the purposes of a focal species are to permit "inference to the integrity of the larger ecological system to which it belongs" and to provide "meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area" (36 C.F.R. 219.19). We strongly recommend that Responsible Official consider focal species as part of the overall strategy for identifying at-risk species and key ecosystem characteristics, and recommend that the regional forester play a role in identifying focal species as well as SCC. It is also important to note that effective monitoring may require that some SCCs be selected as focal species.

d. Indications of additional needs to change management direction governing forest uses

The following statement in the Assessment caught our attention,

> Assessment 2 notes that in general most watershed and stream health concerns on the Rio Grande National Forest are associated with existing system roads and trails, uncontrolled motorized use on unauthorized roads and trails, and livestock grazing in riparian areas. These concerns relate to accelerated soil erosion and compaction, sediment delivered to streams and wetlands, stream channel aggradation and degradation, and the direct, indirect, and cumulative effects on the water cycle and water quality. These concerns are primarily related to proper implementation and/or administration of existing forest plan direction rather than a significant need to change existing direction. (Assessment 1 and 3 (Aquatic): 31-32)

We believe the Assessment should include additional detail and clarification regarding this assertion to help the public understand why plan components related to roads and trails, motorized used, and livestock grazing in riparian areas do not need to change. The statement has raised a few questions for us:

Question: What information provides the basis for this conclusion?

Question: Which plan components are not being properly implemented and administered?

Question: Why are these plan components not being properly implemented and administered?

Question: Should the public expect plan components related to these uses be retained in the revised plan?

a. Opportunities for collaboration with neighboring land owners

We urge the Forest Service to describe in the Assessment opportunities for collaboration with adjacent landowners to "support a landscape approach for sustainable management…" in accordance with the planning directives (FSH 1909, ch. 20, 23.23m(1)(d)).

Question: In what ways is the RGNF already collaborating with other land-owning entities to contribute to the recovery and conservation of federally protected and other at-risk species?

There are likely significant opportunities to work with other entities on such efforts as Canada lynx habitat protection and movement corridor protection, Gunnison sage-grouse recovery, and improve the integrity of bighorn sheep migration corridors, for example.

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