CENTER for LARGE LANDSCAPE CONSERVATION

July 20, 2020

Objection filed online

Objection Reviewing Officer
USDA Forest Service: Northern Region
26 Fort Missoula Road
Missoula, MT 59804

Re: Objection related to inclusion of management for **wildlife habitat connectivity** in the Final Forest Plan for the *Helena – Lewis and Clark National Forest Plan Revision* under the 2012 Planning Rule

Dear Objection Reviewing Officer,

In objection to the Helena-Lewis and Clark National Forest's (HLCNF) DROD for the final Forest Plan (Plan) the Center for Large Landscape Conservation (CLLC) provides the following comments to support further inclusion of ***wildlife habitat connectivity*** (connectivity) into the final Plan. The Forest Service's 2012 Planning Rule and its directives for implementation identify connectivity as key to maintaining and restoring ecosystem integrity and facilitating climate adaptation for plants and wildlife. **Given the acknowledgement in the Plan of the intent to put forward a plan in accordance with the 2012 Planning Rule, per 36 CFR Part 219, we believe that the Helena-Lewis and Clark National Forest must update the Plan to include the following elements:**

1. Determine where vital connectivity corridors (areas of connectivity conservation) exist throughout the Forest and along its borders. There is *no way* to adequately manage for connectivity if it is not known where on the Forest to enforce those Plan components.

2. Incorporate additional actionable connectivity-related Plan components that adequately address this element of ecosystem integrity.

CLLC provided comments on the importance of including connectivity management in USFS plans during the development of the 2012 Forest Planning Rule. We are pleased that our request was

heard, and that formal consideration of connectivity is now a requirement in revised forest plans. CLLC believes that in this generation of Forest Service plans, management for connectivity must be foundational. Our review of the HLCNF Plan has determined that while there is some consideration of connectivity in the Plan, there remain many more opportunities for including substantive Plan components for connectivity (i.e. Standards, Objectives, Guidelines and the designation of spatially explicit areas for connectivity conservation/linkage areas) in the Final Plan.

Our comments are organized as follows:

1. Existing considerations of connectivity in the current HLCNF Plan
2. Examples of other National Forest plan revision approaches to connectivity
3. Proposed elements to strengthen the revised Plan

- Recognize that providing for connectivity is the best strategy to allow wildlife to adapt in the face of climate change.
- Identify and map wildlife movement corridors. Designate areas on the forest that emerge as vital landscapes for wildlife movement and migration as "areas of connectivity conservation" specifically managed to protect and/or enhance connectivity.
- Formally define linear infrastructure as a stressor and develop mitigation measures to reduce the adverse impacts to wildlife habitat connectivity of roads, railways, transmission lines, pipelines, and other linear features.
- Increase and formalize collaboration with Montana Department of Transportation (MDT), Montana Department of Fish, Wildlife, and Parks (FWP), U.S. Fish & Wildlife Service (USFWS), and Federal Highway Administration (FHWA) where there is not already robust collaboration in order to take advantage of these agencies' data and expertise.
- Develop and incorporate more actionable Plan components related to connectivity conservation.
- Assess current conditions for native pollinators and establish Standards and Guidelines that promote connectivity for these species.

EXISTING CONNECTIVITY CONSIDERATIONS IN THE PLAN

There are more than 50 references of ***connectivity*** in the Plan. Eight of these are included in specific, numbered, and actionable Objectives, Standards, and Guidelines. While rationale for including connectivity management actions is elemental, CLLC believes that the Plan would benefit from including more specific Objectives, Standards and Guidelines related to connectivity in order to adequately protect and promote it on the Forest. Examples of concrete Plan components are illustrated by the following direct quote passages:

- (FW-RMZ-GDL) 12 To reduce the likelihood of sediment input to streams and reduce adverse effects to stream channels and riparian areas, all management activities in RMZs should protect key riparian features and processes, including maintenance of stream bank stability, input of organic matter, temperature regimes, water quality, and aquatic and terrestrial habitat connectivity. (p. 21)
- (FW-FAH-GO) 04 The Forest Service works with federal, state, tribal, and private land managers towards an all-lands approach to management and cooperation, including efforts to mitigate threats or stressors, provide for wildlife and fish habitat connectivity, and to provide social, economic and ecological conditions that contribute to mutual objectives. (p. 22)
- (PCAZ1-NCDE-GDL) 04 Within the NCDE primary conservation area and zone 1, along motorized routes, seismic corridors, and pipelines constructed for leasable energy activities, wildlife cover should be maintained at regular intervals where present (this varies on a site-specific basis) in order to provide habitat connectivity for grizzly bears. NCDE-GDL-MIN-03 (p. 56)
- (PCAZ1-NCDE-GDL) 05 Step 2: If step 1 is not attainable, operators should either acquire a perpetual conservation easement (or easements) or purchase comparable or better replacement grizzly bear habitat within the primary conservation area. Acquisition of habitat within connectivity corridors could also be considered for mitigation, when appropriate. Habitat acquired for mitigation may require a purchase rate of > 1:1 on an acreage basis, depending on the quality of habitat degraded and habitat available for acquisition. (p. 56)
- (FW-BRDG-GDL) 01 Bridge removal or reconstruction should be timed to minimize impact to native wildlife nesting or roosting on structures, or aquatic connectivity. (p. 105)
- (DI-WL-GO) 01 Acquire ownership of or easements on non-NFS lands that are intermingled with or immediately adjacent to NFS lands, for the purpose of ensuring connectivity and security for wildlife species. (p. 151)
- (DI-WL-GDL) 01 In order to maintain or improve wildlife security and connectivity, resource management activities in the central portion of the GA, adjacent to Highway 12, and where

private ownerships are intermingled with NFS lands, should maintain or enhance high quality wildlife habitat, wildlife movement areas, and connectivity. In order to improve wildlife security and connectivity in these areas:

  - Vegetation management activities should provide for wildlife hiding cover needs.
  - Motorized access should not be increased.
  - New trails should be constructed only where minimal impacts will occur to wildlife habitats and movement corridors. (p. 151)

- (UB-WL-GDL) 01 Resource management activities in the west-central and east-central portions of the GA, where NFS lands narrow and approach the area of private lands surrounding Highway 200, should maintain or enhance high quality wildlife habitat, wildlife movement areas, and connectivity. In order to improve wildlife security and connectivity in these areas:
  - Vegetation management activities should provide for wildlife hiding cover needs
  - Motorized access should not be increased
  - New trails should be constructed only where minimal impacts will occur to wildlife habitats and movement corridors (p. 201)

CLLC commends the Forest for integrating connectivity components into the Plan. However, we believe more specific direction for connectivity conservation is needed. CLLC made the following suggestions to the Plan that were not integrated into the Final Plan.

We suggest that (DI-WL-GDL) 01 and (UB-WL-GDL) 01 not only state that motorized access should not be increased, but that motorized use may be decreased in areas where connectivity and/or habitat security is unacceptably reduced, disrupted, or expunged.

We suggest that (UB-WL-GDL) 01 includes a mandate to promote safe wildlife passage (underpasses, overpasses, other forms of technology) across Highway 200 in areas deemed important for wildlife habitat connectivity and where forest land is located on both sides of the highway

Specific actionable language increases the ability to implement and achieve connectivity goals and measure success. The above language exemplifies the need to provide more detailed language in the development of Plan components.

As you will see in the following sections, designating certain areas as “areas of connectivity conservation” (See the Flathead National Forest map and examples below), establishing corresponding Plan components, including the incorporation of more Objectives, Standards, Guidelines, and monitoring protocols based on the elements laid out in the “Proposed Elements to Strengthen the Plan” section, is warranted.

EXAMPLES OF OTHER FOREST'S MANAGEMENT APPROACHES TO CONNECTIVITY

Other national forests have incorporated various components related to connectivity in their Plan revisions. Examples from the Custer-Gallatin and Flathead National Forests help inform what connectivity-specific Plan components the HLCNF Plan could include.

CUSTER-GALLATIN NATIONAL FOREST

The Custer-Gallatin National Forest's Final Plan and DROD published in 2020 identifies and maps "Key Linkage Areas" (See figures 1 and 2 below) and includes species-specific provisions as well as other Desired Conditions, Objectives, Guidelines, and Standards. The maps of "Key Linkage Areas" (Figures 1&2) can be seen below. The following list is a sampling of connectivity-related provisions found in the Custer-Gallatin National Forest Final Plan:

1. Defined a forestwide watersheds and aquatics Desired Condition (DC) as, "Riparian vegetation provides breeding, feeding and sheltering opportunities, as well as habitat connectivity and movement corridors for a wide range of terrestrial, semi-aquatic and avian wildlife species" (CHLCNF Plan at 23).
2. Defined a forestwide forested vegetation DC as, "Landscape-scale patch configuration and composition is conducive to ecological processes operating within their natural range of variation including the extent, intensity and frequency of disturbance events, to provide for habitat connectivity, wildlife movement and gene flow…" (*id*. at 38).
3. Defined a forestwide forested vegetation Guideline (GL) as, "To maintain habitat connectivity and minimize disturbance of old-growth associated wildlife, road construction (permanent or temporary) or other developments should be avoided in old growth unless access is needed to implement vegetation management activities and purposes as outlined in FW-GDL-VEGF-01" (*id.* at 41).
4. Defined a forestwide wildlife DC as, "Landscape patterns throughout the Custer Gallatin provide habitat connectivity for wildlife, particularly wide-ranging species such as medium to large carnivores and wild ungulates. Resulting habitat connectivity facilitates daily and seasonal movement, as well as long-range dispersal of wildlife to support genetic diversity, allowing animals to adapt to changing conditions over time" (*id*. at 56).
5. Defined two forestwide wildlife Goals (GO) as
    a. "The Forest Service coordinates management actions with other federal, state and local agencies, Tribes, and adjacent landowners. Opportunities to manage wildlife habitat and provide for connectivity are expanded through coordination and collaboration along and across administrative boundaries" (*id.* at 56).
    b. "Through cooperation with willing landowners and other entities, non-federal lands within the national forest boundary are acquired, or managed under

conservation easements where needed to maintain or restore wildlife habitat structure, function, or connectivity" (*id*. at 56).

c. "The Forest Service works with partners to develop and disseminate information designed to increase public awareness of the high value of wildlife resources such as biodiversity, habitat connectivity, recreation opportunities, cultural or spiritual connections, safety issues and co-existence" (*id*. at 57).

6. Defined a forestwide wildlife GL as, "To maintain or restore habitat connectivity for wildlife, management actions should not create movement barriers to wide-ranging species such as medium to large carnivores and wild ungulates, except where necessary to provide for human or wildlife safety" (*id.* at 57).

Proposed provisions specifically related to "Key Linkage Areas"

*****See figures 1 and 2 below to refer to where on the forest these management elements would be applied

7. Defined a forestwide wildlife GL as, "Vegetation management activities in a key linkage area should include design features to restore, maintain or enhance habitat connectivity for long distance range shifts of wide ranging wildlife species (*id.* at 57).
8. Defined a forestwide wildlife GL as, "New permanent facilities or structures for administrative or public use should not be constructed within key linkage areas unless needed to address on-going or imminent resource concerns within the key linkage area, including but not limited to, degradation of wildlife habitat connectivity. Any new permanent facilities or structures and relocation of existing facilities within key linkage areas should be designed and located so that wildlife movement patterns are not permanently disrupted" (*id.* at 57).
9. Defined a forestwide wildlife GL as, "To maintain habitat quality and limit disturbance effects on wildlife movement patterns, a key linkage area should be free of sustained substantial disturbance for at least four years out of every 10-year period, including at least two consecutive years of no sustained substantial disturbance. Sustained substantial disturbance is the use of heavy equipment or low-level helicopter flights for vegetation management actions for a total of more than 30 days throughout an entire key linkage area in a calendar year" (*id.* at 58).
10. Defined a permitted livestock grazing Goal (GO) as, "When evaluating vacant livestock allotments, the Forest Service may emphasize allotment closure for accelerated ecological enhancement in areas of greatest conservation concern. This includes, but not limited to proposed or established research natural areas or special areas, at-risk species habitat, under-represented reference areas, native species restoration areas, key linkage areas, conservation watershed networks, areas with opportunities for reduced risk of disease transmission between domestic and wild animals, or retention for forage reserves

(grassbanks) or opportunities to enhance management or improve resources through combination with adjacent allotment(s). The Forest Service may de-emphasize use demand as a consideration in these types of conservation areas" (*id*. at 76).

11. Defined a wildlife monitoring question as, "What management actions have contributed to changes in natural movement patterns in wildlife key linkage areas? As well as defined an implementation indicator related to this question as, "Wildlife key linkage areas management actions: #, types, and locations of new structures and sustained substantial disturbances in key linkage areas" (*id*. at 198).
12. Defined "linkage areas" in the Plan's glossary as, "Support seasonal, exploratory, or dispersal movements of animals beyond the home range to facilitate demographic and genetic connectivity between geographically separate patches of habitat; key linkage areas are typically located near the Custer Gallatin National Forest boundary, where wildlife movement is desirable for genetic exchange between blocks of public lands, but may be restricted by permanent development such as highways, railroads, agricultural lands and residential areas" (*id*. at 224).
13. Defined "sustained substantial disturbance" in the Plan's glossary as, "The use of heavy equipment or low-level helicopter flights for vegetation management actions for a total of more than 30 days throughout an entire key linkage area in a calendar year (*id* at 242).

The above examples illustrate that the Custer-Gallatin National Forest provides some Plan components that should also be adopted by the HLCNF. The "key linkage area"-specific management actions, as well as the visual representation of those areas (Figures 1 and 2 below) serve as excellent examples of how the HLCNF should designate "key linkage areas" or "areas of connectivity conservation" on the forest as well as include corresponding management provisions.

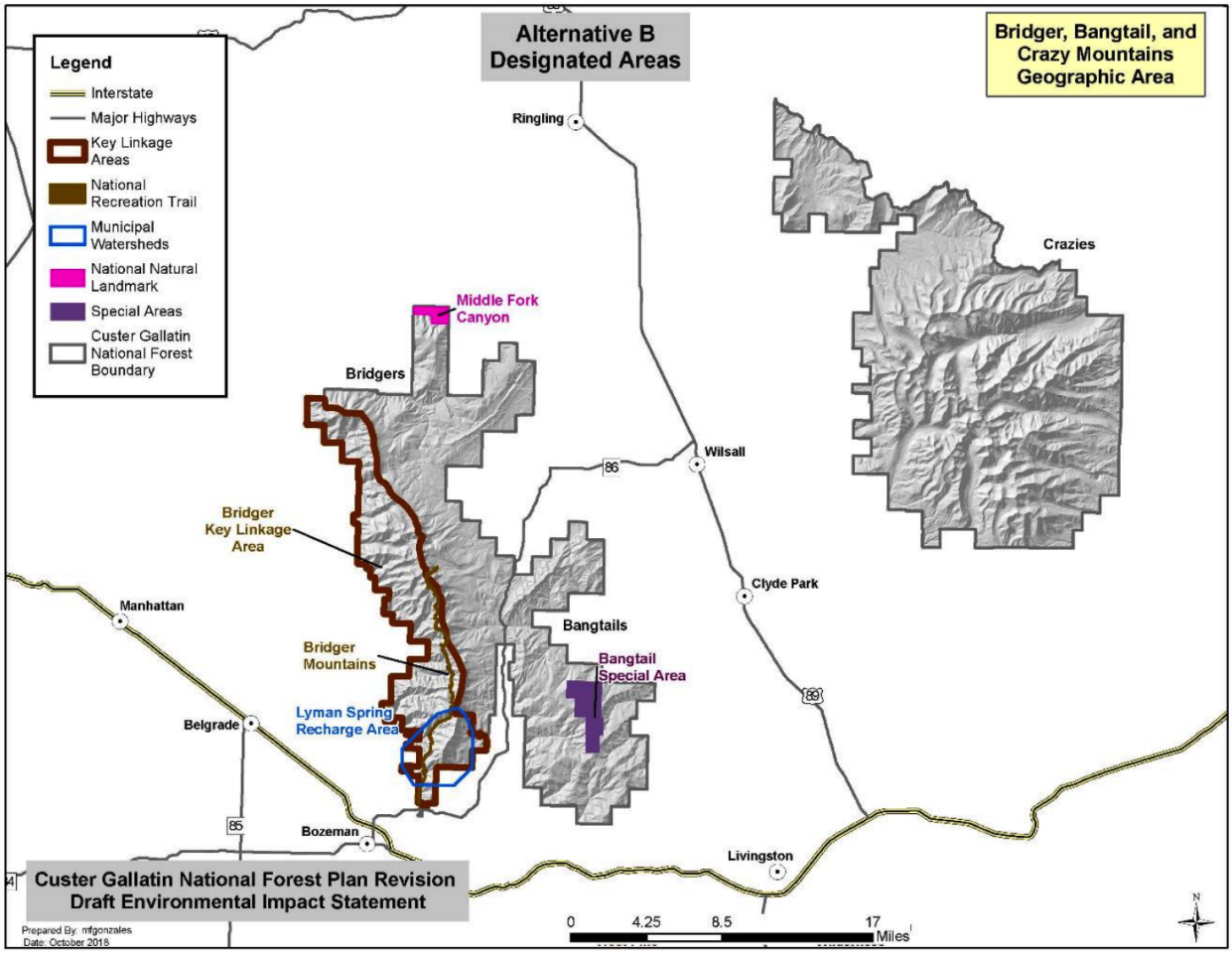

Figure 1. This "Alternative B Designated Areas" map for the Bridger, Bangtail, and Crazy Mountains Geographic Area includes "Key Linkage Areas" outlined in brown. (Appendix A, Page 66, CGNF 2020).

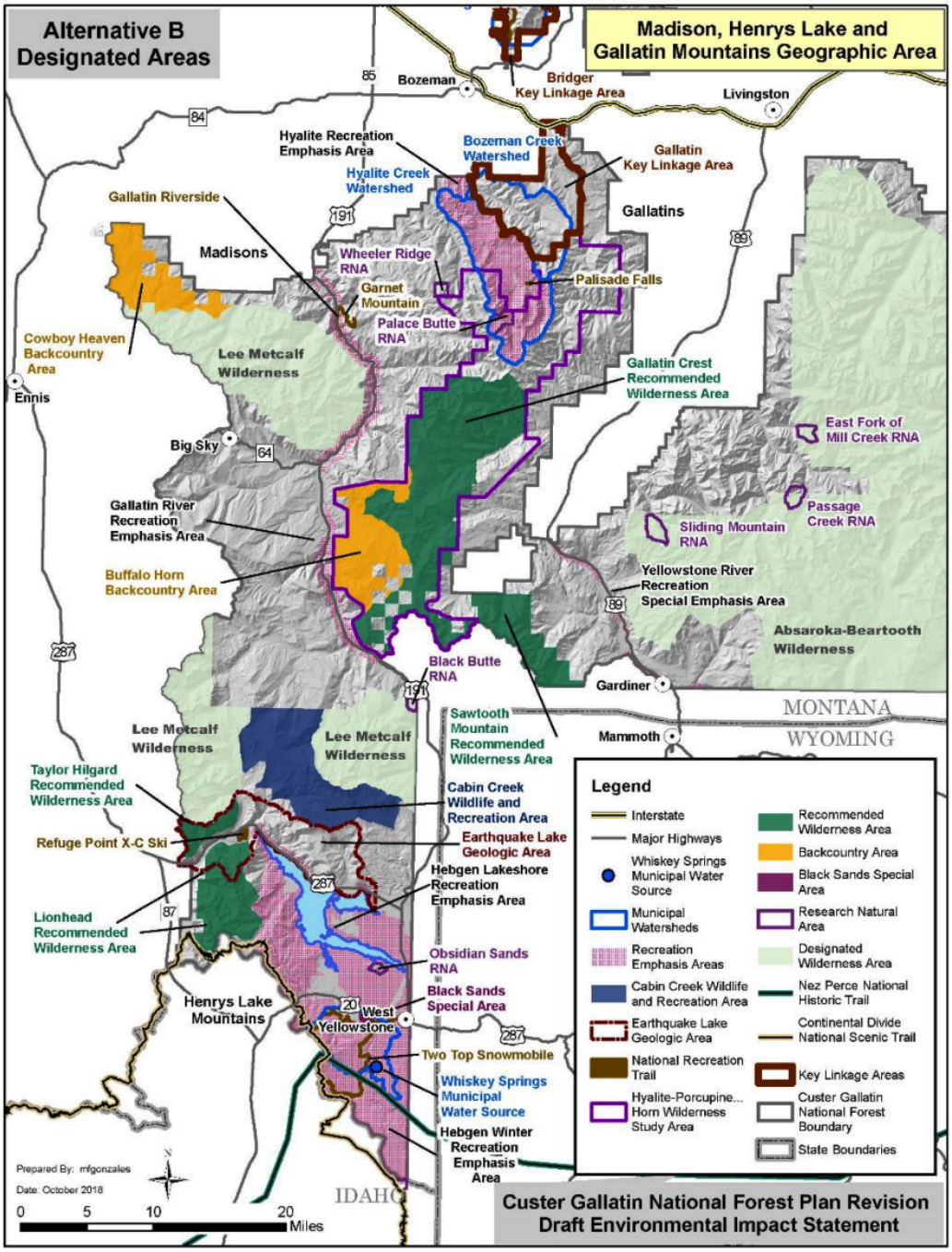

Figure 2. This "Alternative B Designated Areas" map for the Madison, Henry's Lake and Gallatin Mountains Geographic Area includes "Key Linkage Areas" outlined in brown. (Appendix A, Page 85, CGNF 2020).

FLATHEAD NATIONAL FOREST

The Flathead National Forest's Final Plan published in 2017 is one of the Nation's most progressive in terms of management for connectivity. The Plan includes species-specific components, has designated and mapped "connectivity areas for geographic area plan components", and includes many connectivity-related Plan components. The map of "connectivity areas for geographic area plan components" (Figure 3) can be seen below. The following list is a sampling of connectivity-related components found in the Flathead National Forest Final Plan:

1. Defined a riparian management zone Desired Condition (DC) as, "If new openings are created in riparian management zones through even-aged regeneration harvest (see glossary) or fuel reduction activities, each created opening's distance to cover (see glossary) should not exceed 350 feet to provide wildlife habitat structural diversity, connectivity, and cover" (FNF Plan at 23).

2. Defined a terrestrial ecosystems and vegetation Guideline (GL) as, "To maintain connectivity and avoid adverse impacts to old-growth forest, new road construction or reconstruction should not be located within old-growth forest. Exceptions may occur, such as when there are no feasible alternative road locations" (*id*. at 44).

3. Defined a wildlife habitat diversity DC as, "Ecological conditions provide for wildlife diversity (including species of conservation concern) and wildlife habitat connectivity (including seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long-distance range shifts of species) (*id*. at 47).

4. Defined a northern bog lemming habitat DC as, "Areas in and within 300 feet of peatlands have low groundcover and downed woody material that contribute to northern bog lemming habitat and connectivity between clusters of individual sites" (*id*. at 47).

5. Defined an infrastructure GL as, "Within areas specifically identified as being important for wildlife connectivity across highways, the Forest should cooperate with highway managers and other landowners to design approaches and crossings that contribute to wildlife and public safety" (*id.* at 69).

6. Defined a lands and special uses DC as, "Land ownership adjustments, through purchase, donation, exchange, or other authority, improve national forest management by consolidating ownership, reducing wildlife-human conflicts, providing for wildlife habitat connectivity, improving public access to public lands, and retaining or acquiring key lands for wildlife and fish and within wild and scenic river corridors" (*id.* at 70).

7. Defined two partnerships and coordination DCs as, 1) "The Forest works towards an all-lands approach to management, cooperating with other land managers; this includes efforts to mitigate threats or stressors, provide for wildlife and fish habitat connectivity, and provide social, economic, and ecological conditions that contribute to mutual objectives", and 2) "The Forest works towards an all-lands approach to management of species of conservation concern, cooperating with other land managers across the range of a species and including efforts to provide for habitat connectivity, mitigate threats or stressors, and provide other ecological conditions that support the species" (*id*. at 83-84).

8. Defined a Hungry Horse Geographic Area DC as, "The Coram connectivity area (see figure [1]) provides habitat connectivity for a north-south movement corridor for wide-ranging species (e.g., grizzly bear, Canada lynx, wolverine) moving between the southern and northern watersheds on the Forest" (*id*. at 118).

9. Defined a Middle Fork Geographic Area DC as, "The Nyack Pinnacle, Essex, and South Glacier connectivity areas (see figure [1]) provide habitat connectivity for wide-ranging species (e.g., grizzly bear, Canada lynx, wolverine) moving north- south between Glacier National Park and the Bob Marshall Wilderness and east-west within the Middle Fork watershed" (*id.* at 123).

10. Defined a Middle Fork Geographic Area objective as, "Acquire one or more parcels and/or provide one or more easements for wildlife crossings along Highway 2 and the Burlington Northern Santa Fe Railway corridor in the Nyack Pinnacle and Essex connectivity areas (see figure [1])" (*id*. at 124).

11. Defined a North Fork Geographic Area DC as, "The Haskill Basin connectivity area (see figure [1]) provides habitat connectivity for wide- ranging wildlife species (e.g., grizzly bear, Canada lynx, wolverine) moving north-south between the Swan Range and the Whitefish Range.

12. Defined a Swan Valley Geographic Area DC as, "The portion of the Seeley Clearwater connectivity area from Condon south to the boundary of the Swan Valley geographic area and from the south end of Swan Lake to Lost and Porcupine Creeks (see figure [1]) provide habitat connectivity for wide-ranging wildlife species (e.g., grizzly bear, Canada lynx, and wolverine) moving between the Swan and Mission Mountain Ranges" (*id*. at 148).

13. Defined a Plan monitoring question and indicators as, "What is the status of forest conditions that support wildlife habitat connectivity? And indicators are defined as follows: 1) In riparian management zones: acres with trees with an average d.b.h. of 5 inches or greater and canopy cover greater than 40%, 2) In riparian management zones: distribution

of trees with an average tree d.b.h. of 5 inches or greater and canopy cover greater than 40%, 3) In connectivity areas identified for the geographic areas: mapped distribution of forest cover with an average tree d.b.h. of 5 inches or greater and canopy cover greater than 40%" (*id*. at 164).

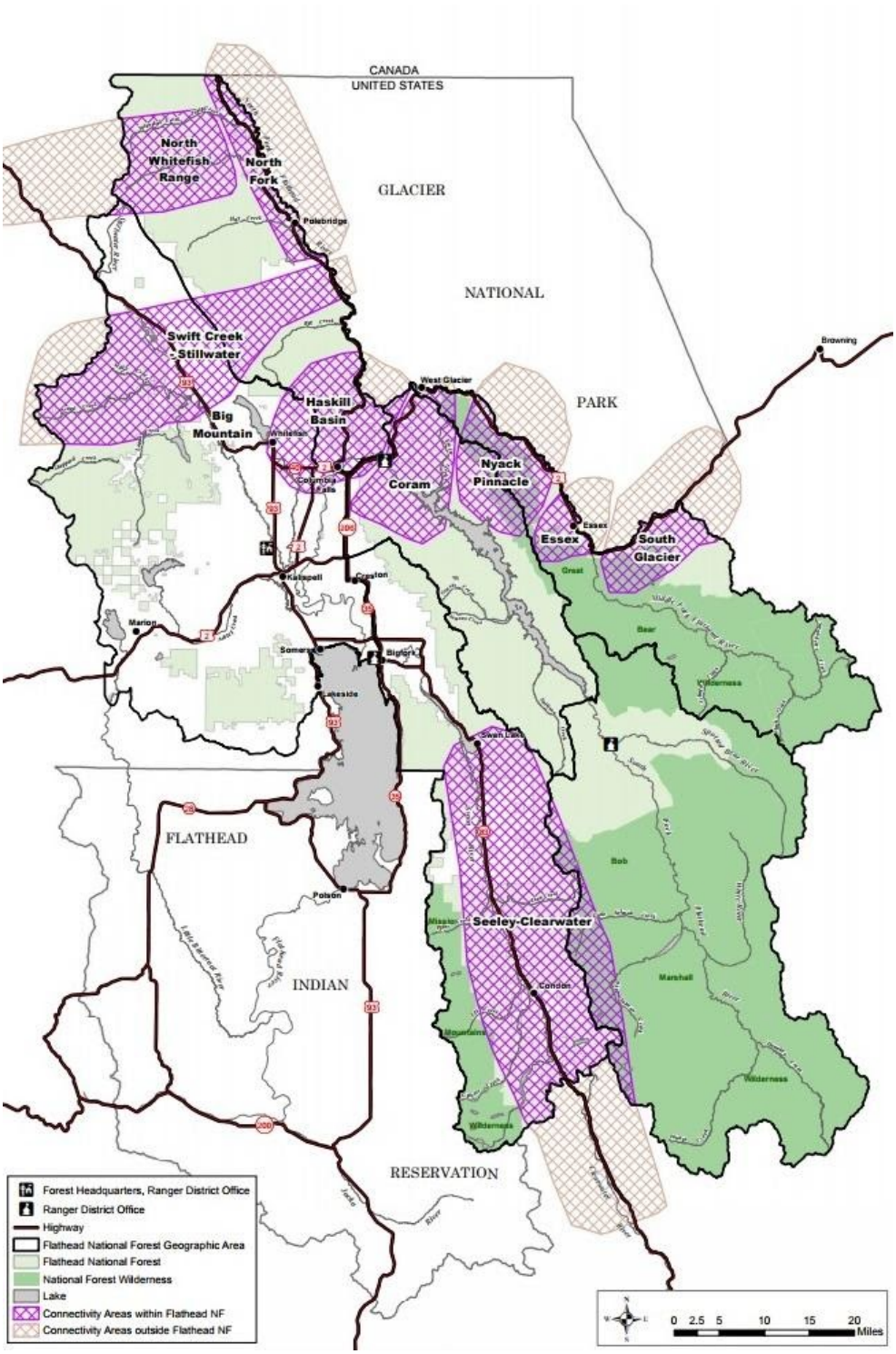

Figure 3. Connectivity areas for geographic area plan components (Appears as Map B-30, Appendix B, FNF 2017).

The Flathead National Forest's management for connectivity, while not perfect, includes many good provisions to ensure the future of connectivity on the Forest. The most significant element to take away from this Plan is the designation and mapping of "Connectivity Areas for Geographic Area Plan Components". The HLCNF Plan must include "areas of connectivity conservation" and have corresponding management provisions.

PROPOSED ELEMENTS TO STRENGTHEN THE PLAN

CLLC encourages the HLCNF to consider the following recommendations for increasing consideration of connectivity in its Plan:

Recognize that providing for connectivity is the best strategy to allow wildlife to adapt in the face of climate change.

While there are some connectivity-related provisions that mention climate change in the plan, there is not adequate acknowledgement of, or corresponding Plan components that address, the importance of connectivity as plants and wildlife adapt to climate change. Maintaining permeability throughout and beyond forests such as the HLCNF in the form of protected wildlife corridors is of paramount importance in facilitating wildlife and plant adaptation to climate change. Climate change affects natural systems and wildlife populations by exacerbating the negative effects of habitat loss, degradation, and fragmentation. Local climate disruptions are changing seasonal patterns of precipitation and temperature resulting in changes in long-term fire patterns and drought and flood cycles. To adapt and survive wildlife are already and will continue to adjust their home ranges and movement patterns (Chen et al. 2011). Scientific reviews of the most effective strategies to protect biodiversity highlight the importance of maintaining landscape connectivity. Facilitating wildlife movement will be crucial for preventing biodiversity losses (Mawdsley et al. 2009, McGuire et al. 2016). In fact, a review of 25 years of peer-reviewed articles found that the most common recommendation for protecting biodiversity in the face of climate change was to increase connectivity (Heller & Zavelata 2009). To bolster this argument, Gilbert-Norton et al. (2010), in their review of empirical studies of corridors, found that corridors increase movement between habitat patches by approximately 50% compared to patches that are not connected by corridors. Further, McGuire et al. (2016) found that introducing corridors to facilitate movement increases the percentage of climatically connected natural area from 41% to 65%. Therefore, increasing connectivity is critical as it allows species to move to find suitable climates in response to rapidly changing climates.

Thus, conserving corridors is not only strategic and climate-smart, but a proven method of allowing wildlife to move in response to environmental change. The HLCNF Plan should explicitly recognize the need of wildlife and plants to adapt to the current and anticipated

effects of climate change, and then identify and protect connectivity on the landscape through actionable substantive Plan components that are spatially explicit.

Identify and map wildlife movement corridors. Designate areas on the forest that emerge as vital landscapes for wildlife movement and migration as "areas of connectivity conservation" specifically managed to protect and/or enhance connectivity.

Using the connectivity data and modeling information above, as well as other relevant connectivity data available, the Plan should model and map connectivity in order to designate specific geographic areas prioritized for connectivity (See Flathead National Forest example above). These efforts should designate and map wildlife movement corridors within HLCNF lands as well as points on the HLCNF border where important movement corridors intersect surrounding lands. Identifying spatially explicit linkage areas and corridors is essential for operationalizing substantive plan components for connectivity conservation.

Formally define manmade infrastructure as a stressor and develop related mitigation measures to reduce the adverse impacts to wildlife habitat connectivity of roads, railways, transmission lines, pipelines, and other linear features.

Roads on forestlands fall into two general categories, Forest Service managed roads (lower density, usually unpaved), and highways and other larger roads managed by MDT and counties (higher density, usually paved). The Plan should include components that address wildlife mitigation plans and measures for each type of road. While in the past national forests often did not establish restrictions on larger roads managed by other entities, in order to protect natural resource integrity on the Forest, they must. Along Interstate 90 on Snoqualmie Pass in Washington State, multiple wildlife crossing structures are already completed or are in the final stages of construction including an overpass and multiple underpasses. These wildlife crossing structures were incorporated into a larger highway project as a direct result of the Okanogan-Wenatchee National Forest's Plan standards that mandate the protection of connectivity on forestlands, including where roads influence that land.

Road density is one of several stressors modeled in the U.S. Forest Service National Terrestrial Condition Assessment (TCA;(Cleland and others 2017). Figure 10 models habitat quality for wildlife based on road density across all National Forests including the HLC.

Large animals, like elk, are thought to be more vulnerable to roads than small animals. They are more mobile and more likely to encounter roads and suffer their ill effects. Large animals also have inherently lower reproductive rates and recover from population declines relatively slowly (Carr and Fahrig 2001 and Gibbs and Shriver 2002 in Fahrig and Rytwinski 2009).

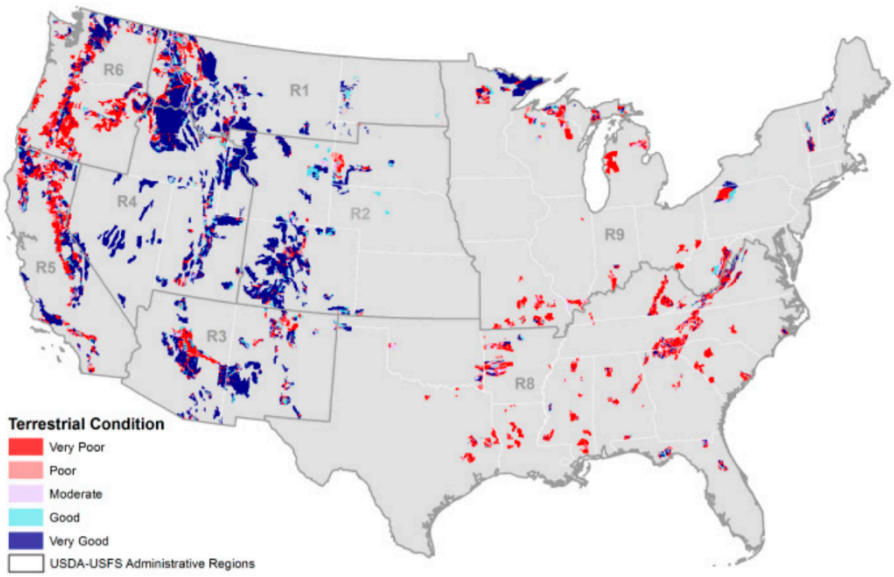

Figure 10. Ratings of the total road density metric of the land-type associations (LTAs) from the
Terrestrial Condition Assessment on USDA Forest Service lands (Cleland et al. 2017).

The scale of this study is not to provide data fine enough to be incorporated directly into the Plan, but rather exemplifies that roads are a stressor on the health of ecosystems. This study indicates that and serves as rationale for developing more substantive Plan components related to transportation corridors. Specifically, the HLCNF should commit to:

- Design and build linear infrastructure (e.g., fences, roads, and transmission lines) in a manner that does not create unreasonable or unnecessary movement barriers or hazards for terrestrial and aquatic wildlife.
- Design new, replacement, and reconstructed stream crossing sites (i.e. bottomless culverts, bridges) to provide and maintain passage for fish and other aquatic species, as well as riparian-associated terrestrial species (although constructed barriers may need to be maintained in instances where native species benefit from physical isolation).
- Implement a pilot project to develop a standardized methodology for reporting and collecting data on wildlife-vehicle collisions and wildlife carcasses along roads within forest boundaries. An application known as ROaDS has been developed by Western Transportation Institute, National Park Service, and US Fish and Wildlife Service that could serve as a useful resource in meeting this commitment. This application serves as a wildlife- vehicle collision (WVC) data collection system for federal land

management agencies and their partners. The app collects information on large animal-vehicle crashes to address motorist safety concerns on federally managed roads, as well as carcass data for medium and small fauna relevant to conservation missions.

- Define minimum wildlife-vehicle collision (mortality) and traffic volume (connectivity) thresholds that determine when the HLCNF must consider wildlife mitigation measures.
- Decommission or reduce access to HLCNF-managed roads that bisect seasonal migration corridors for big game species and/or see traffic densities that already or may in the future negatively affect wildlife movement.

Increase and formalize collaboration with Montana Department of Transportation (MDT), Montana Department of Fish, Wildlife, and Parks (FWP), U.S. Fish & Wildlife Service (USFWS), Federal Highway Administration (FHWA), regional tribes, and other relevant stakeholder groups where there is not already robust collaboration in order to take advantage of these entities' data and expertise as it relates to connectivity.

The HLCNF should increase collaboration with Federal, state, tribal, and local partners to share wildlife data, identify and prioritize areas of ecological significance, and establish appropriate management actions during project planning, design, review, and construction. Where appropriate (e.g., for projects involving HLCNF and state or federally managed roads), the Forest should ensure that wildlife and their habitats are considered early and often during transportation planning and other infrastructure and development projects.

Like wildfire, wildlife does not recognize political boundaries. In wildfire management, regular interagency collaboration is the norm, as it is the only manner in which to adequately carry out comprehensive wildfire management. This is exemplified through institutions such as the National Interagency Fire Center which works across agencies and geographies to coordinate wildfire management. This serves as an example for wildlife management; interagency and broad stakeholder engagement is key to the effective management of wildlife.

Develop and incorporate more actionable Plan components related to conserving connectivity

As the Planning Team knows, some types of connectivity modeling products and Plan components can be adopted at a Forest-wide scale (i.e., requiring that livestock fencing constructed on the Forest must be wildlife-friendly). There is also a need for more species-specific components in this Plan that have direct, positive impacts on particular TES/SPCC

species identified by the Montana State Wildlife Action Plan and/or the Regional Forester. For example, the Forest should develop specific and actionable plan components to mitigate impacts to specific species disproportionately negatively affected by roads. Transportation agency staff (Federal, state, county) and HLCNF's own engineers that manage Forest roads should consider using thresholds (e.g. open road densities, traffic volumes, type of road, number of lanes) to determine when mitigation measures are needed to maintain connectivity). Because wildlife movement is unique to each species, the needs of particular species of concern will require specific protocols (fine-scale) while Forest-wide Standards & Guidelines can have an immensely positive impact on connectivity across the Forest (coarse-scale).

Assess current conditions for native pollinators and establish Standards and Guidelines that promote connectivity for these species.

The decline of native pollinator populations is an emerging issue of concern, and the scientific and management information regarding their decline and ways to reverse this trend through conservation action is rapidly increasing. According to Rotchés-Ribalta et al. (2018), increasing abundance, species, and functional richness of host plants for native pollinators will amend pollinator diversity. Management actions should consider the spatial configuration of the landscape to improve its outcome. Thus, one important priority for protecting native pollinator populations is to facilitate their ability to move through a diversity of habitats including through habitats fragmented by road corridors. The latest Federal transportation act (FAST Act of 2015, Public Law No. 114-94) includes direction for roadsides to provide pollinator habitat that provides food and serves as a movement corridor. Given the extent of the road network on the Forest, we suggest that a pollinator section be added to the Plan, that includes Standards and Guidelines that provide for connected pollinator habitat along roadways and beyond.

IN CONCLUSION

Wildlife corridors identified by the management actions proposed and described above provide the strongest scientific basis for setting priorities for connectivity management in the HLCNF Forest Plan. After repeated recommendations, we are disappointed to see that the HLCNF did not designate specific "areas of connectivity conservation" within the Forest to manage primarily for connectivity, as exemplified by the Flathead National Forest Plan example above.

We ask that the HLCNF Plan Revision Team acknowledge the recommendations included here and that they be incorporated into the future revisions of the Plan to bolster the Forest's connectivity management.

Thank you for the opportunity to provide comments on the Final Revised Plan related to wildlife habitat connectivity. If you have any questions regarding our comments or the information we have provided, please be in touch.

Regards

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