March 27, 2024

Lolo National Forest
Attn: Amanda Milburn, Revision Team Leader
24 Fort Missoula Road
Missoula MT 59804

Re: Comments on the Wild and Scenic Rivers Eligibility Report, Proposed Action, and Need for Change for the Lolo National Forest

Dear Ms. Milburn,

American Rivers appreciates the opportunity to submit the following comments on the Wild and Scenic Rivers Eligibility Report, Proposed Action, and Need for Change for the Lolo National Forest.

Since 1973, American Rivers has protected wild rivers, restored damaged rivers, and conserved clean water for people and nature. With headquarters in Washington, D.C. and 355,000 members, supporters, and volunteers across the country, we are the most trusted and influential river conservation organization in the United States, delivering solutions to reduce pollution in rivers, improve clean water access, and safeguard public drinking water supplies. We have offices in every region of the country, including in Montana, where many of our members live, work, and recreate in the Lolo National Forest.

Summary of Recommendations

- The Lolo National Forest must undertake a climate-specific secondary review of the Wild and Scenic Rivers Eligibility Study that: 1) deliberately and systematically integrates and documents elements of climate refuge within fish ORV descriptions for eligible rivers; and 2) re-analyzes the fish ORV for non-eligible rivers, ensuring that elements of predicted cold water persistence, climate significant fish populations, and connectivity between headwaters and downstream habitat constitute eligibility.
- The Lolo National Forest must better operationalize climate change and climate refuge within water- and river-related plan components, consult language found in other forest plans, and crosswalk plan components with the Forest Service Climate Adaptation Plan.
- American Rivers supports eligibility findings from the Wild and Scenic Rivers Eligibility Study for 21 streams including the Blackfoot River, North Fork Blackfoot River, Clark Fork River (St. Regis to Quinns), Clearwater River, Colt Creek, Morrell Creek, Monture Creek, Middle Fork Monture Creek, Lodgepole Creek, North Fork Fish Creek, West Fork Fish Creek, Straight Creek, Cache Creek, Deer Creek, Cromie Creek, Up Up Creek, Lolo Creek, South Fork Lolo Creek, Rattlesnake Creek, Rock Creek, and the West Fork Thompson River.
- The Lolo National Forest must also find the following streams to be Wild and Scenic eligible:
    - Thompson River for both recreation and fish ORVs that acknowledge whitewater boating, angling, and climate refuge connectivity between the West Fork Thompson River and the Clark

Fork River.
    - Fish Creek and South Fork Fish Creek for both recreation and fish ORVs, that acknowledge whitewater boating, angling, and climate refuge connectivity between North Fork Fish Creek, West Fork Fish Creek, Straight Creek, Cache Creek and the Clark Fork River. We support eligibility for Fish Creek for a botany ORV for Big Pine.
    - The St. Regis River for both recreation and fish ORVs, that acknowledge angling and climate refuge connectivity to the Clark Fork River.
    - Alder Creek, Ranch Creek, and Welcome Creek for a fish ORV, that acknowledge the climate refuge habitat they protect within the Rock Creek watershed.
- The Lolo National Forest must retain longstanding fish and wildlife ORVs for Rattlesnake Creek, Rock Creek, Cache Creek, and West Fork Fish Creek.
- The Lolo National Forest must add westslope cutthroat trout to the Species of Conservation Concern list due to lack of distribution of high genetic integrity and the potential for increased distribution resulting from restoration.

Please find more details on each of these items in the following pages.

Warm regards,

Lisa A.K. Ronald

Lisa Ronald
Western Montana Associate Conservation Director
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Absence of Climate Change/Climate Refugia Specific to Rivers

Fish ORV must consider climate refugia information

In American Rivers' comments from May 2023, we recommended adopting a climate refuge Outstandingly Remarkable Value (ORV) and integrating Forest Service Climate Shield science[1] into the ORV framework for the Wild and Scenic Rivers Eligibility Study. The Lolo National Forest declined to adopt these recommendations, but committed to address climate change and climate refugia as part of the fish ORV:

> "Various elements of climate refugia will be considered under the existing criteria for Fish and Wildlife categories, such as cold-water habitat persistence, connectivity, other important habitat considerations. While this topic is emerging in broader agency discussions, there is no clear national direction on what specific criteria should be considered to substantiate the presence of an ORV and further guidance is needed. The aquatic and riparian conservation strategy and associated conservation watershed network analyses to support plan development will identify and consider areas across the forest anticipated to provide for climate refugia more broadly than this Wild and Scenic River Eligibility Study."[2]

Included in the fish ORV definition, the Forest states: "In addition to rare and unique habitats within the corridor, the evaluation will consider the connectivity needs, security, crucial habitat, and habitat quality for these species."[3]

In contrast with these prefacing statements, the Lolo National Forest neglected to adequately consider climate refugia in its evaluation of the fish ORV throughout the Wild and Scenic Rivers Eligibility Study. For example, language consistent with elements of climate change and climate refugia are absent within the river evaluations:

- The terms climate refuge/climate refugia are not included anywhere in the Eligibility Study.
- Cold water, mentioned above in the prefacing statements, is referenced only for the Clearwater River and Graves Creek, which was found to be ineligible despite reference to cold water persistence through the year 2040.
- Springs, which are often sources of cold water, are mentioned only twice, and neither river for which these are identified was deemed worthy of eligibility for climate related reasons within the fish ORV (Fish Creek, Petty Creek).
- Connectivity is mentioned only in reference to grizzly bears (Rock Creek). In contrast to multiple references above to the importance of connectivity and conversations with Forest leadership and planning staff around the desire to better manage for connectivity, it is not mentioned anywhere in the Eligibility Study related to fish habitat, migration patterns, or connection corridors to cold water areas.

In the limited circumstances where the Forest appears to have noted climate refuge values, these streams were found to be ineligible for fish ORVs for unclear and inconsistent reasons:

- Genetically pure fish populations are documented for:
    - Morrell Creek – found eligible, but only the new segments (trailhead to Seeley Lake and uppermost headwaters) were found to have a fish ORV, which is inconsistent with the fish values described in the evaluation as extending throughout the mainstem.
    - Cedar Log Creek – fish ORV was removed without clearly documented evidence or rationale. See

[1] See the Forest Service's Climate Shield Cold-Water Refuge Streams for Native Trout website and Isaak, Daniel J.; Young, Michael K.; Nagel, David E.; Horan, Dona L.; Groce, Matthew C. 2015. The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st century. Global Change Biology. 21: 2540-2553.

[2] Appendix 7, p. 10.

[3] Appendix 7, p. 7.

the below section for additional information regarding removed ORVs.

See the section below for broader critiques of the lack of acknowledgment of fish habitat connectivity for several streams on the Lolo National Forest including the Thompson River, Fish Creek, South Fork Fish Creek, the St. Regis River, and tributaries to Rock Creek.

The Lolo National Forest must undertake a climate-specific secondary review of the Wild and Scenic Rivers Eligibility Study that: 1) deliberately and systematically integrates and documents elements of climate refuge within fish ORV descriptions for eligible rivers; and 2) re-analyzes the fish ORV for non-eligible rivers, ensuring that elements of predicted cold water persistence, climate significant fish populations, and connectivity between headwaters and downstream habitat constitute eligibility.

Climate Refuge Absent from Water and River Related Plan Components

In addition to the absence of climate change and climate refuge elements from the Wild and Scenic Rivers Eligibility Study, these are also absent more broadly from watershed, riparian management zone, and conservation watershed network plan components.

Overall, American Rivers suggests the following ideas for how to better operationalize climate change and climate refuge within water- and river-related plan components:

- Combining HUC-12 polygons, High Ecological Values Assessment (HEVA)[4], and Forest Service Climate Shield data[5] to predict maintained/persistent cold water (refugia) and/or restoration opportunities for enhancing cold water storage.
    - Creating a special designation or category within the plan for these areas.
    - Creating goals around protecting/restoring stream miles within these areas.
- Highlighting species sensitive to climate change within the Species of Conservation Concern list.
- Enhancing goals around increasing/maintaining beaver on the landscape to support climate resiliency.
    - Creating goals around number of beaver family groups per watershed.
- Establishing goals around using Low-Tech Process-Based methods for restoration projects.[6]
- Connecting climate change implications to infrastructure and municipal water supplies,
- and emphasize ecosystem services for facility and human safety, water storage, and to provide clean water downstream for people/communities.

Specific to plan components, we recommend drawing from other forest plans such as the Flathead, Custer-Gallatin, Helena-Lewis and Clark, and Grand Mesa Uncompahgre and Gunnison (GMUG) to craft plan components within watershed, riparian management zone, and conservation watershed network sections of the plan that use climate change language to identify and protect:

- Riverside shade cover
- Cold water seeps and springs
- Areas of persistent snowpack (location and duration)

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[4] The Pew Charitable Trusts May 2023 comments.

[5] See the Forest Service's Climate Shield Cold-Water Refuge Streams for Native Trout website and Isaak, Daniel J.; Young, Michael K.; Nagel, David E.; Horan, Dona L.; Groce, Matthew C. 2015. The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st century. Global Change Biology. 21: 2540-2553.

[6] Corday, J. January 2020. Restoring Western Headwater Streams with Low-Tech Process-Based Methods: A Review of the Science and Case Study Results, Challenges, and Opportunities. American Rivers. Version 2.0.

- Microclimates
- Genetically pure fish populations
- Riverine connectivity between cold water persistent headwaters and mainstem river segments

In Appendix A below, American Rivers has listed select plan components by forest and highlighted language that speaks to climate change and climate refuge elements. We offer these as resources for the Lolo National Forest. Additionally, we recommend replicating the GMUG Appendix 13, Table 68[7], which is a crosswalk between the Forest Service's Climate Adaptation Plan[8] and GMUG plan components. We recognize that climate refuge and connectivity concepts are new within the forest planning process and that there is no tried-and-true roadmap to draw from to guide the Lolo National Forest's path forward. We supply these examples from other forests not as a recommendation to copy-and-paste, but instead to challenge the Lolo National Forest to draw from work to date as a starting point for further innovation.

Wild and Scenic River Eligibility – Specific Rivers

Support for Eligibility Determinations

American Rivers supports the following eligibility findings from the Wild and Scenic Rivers Eligibility Study[9], pending re-analysis for climate refuge values within the fish ORV (see above recommendations). We thank the Forest Service for continuing to protect the nine streams found eligible in 1991, and for recognizing numerous ORVs found on an additional 12 streams:

- Blackfoot River, North Fork Blackfoot River
- Clark Fork River (St. Regis to Quinns)
- Clearwater River, Colt Creek
- Morrell Creek
- Monture Creek, Middle Fork Monture Creek
- Lodgepole Creek
- North Fork Fish Creek, West Fork Fish Creek, Straight Creek, Cache Creek
- Deer Creek, Cromie Creek, Up Up Creek
- Lolo Creek, South Fork Lolo Creek
- Rattlesnake Creek
- Rock Creek
- West Fork Thompson River

Further, we support a balanced management approach to activities conducted within Wild and Scenic eligible river corridors. While we agree with plan components prohibiting commercial timber harvest within Wild and Scenic eligible river corridors, we do not oppose forest management, vegetation management, and fire mitigation activities as long as ORVs are protected. The express allowance of these activities and an agency culture that recognizes them provides the Lolo National Forest with latitude and discretion to protect communities from wildfire, manage conditions to meet Endangered Species Act requirements for threatened and endangered species, and ensure safe recreation that boosts Montana's tourism economy all while also protecting river values.

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[7] Grand Mesa, Uncompahgre, and Gunnison National Forests Revised Land Management Plan, Pre-Objections Version, August 2023, p. Appendix 13.
[8] USDA Forest Service. July 2022. Climate Adaptation Plan. FS-1196.
[9] Appendix 7.

Incorrect Ineligibility Determinations

American Rivers believes that the following seven streams were incorrectly found to be ineligible in the Wild and Scenic Rivers Eligibility Study. These streams should be deemed eligible based on the presence of ORVs, which were either unacknowledged, minimized, or misrepresented by the Lolo National Forest.

Thompson River

The Forest Service admits this river provides "recreation opportunities related to day-use recreation including boating and world class fishing"[10] yet mistakenly dismisses the significance of these values within the region of comparison. The Thompson River is a well-known angling destination, is listed on numerous fishing websites, and is the only Class I-III whitewater river proximate to the Thompson Falls area[11]. Paddlers travel from Missoula to paddle the Thompson River. Clearly, this river warrants a recreation ORV for whitewater boating and angling.

The Thompson River also plays an important role in connecting migratory fish to climate refuge headwaters—a value that should be documented and acknowledged within the fish ORV consistent with the Forest's definition of this ORV. Studies underscore the importance of the mainstem as a migration corridor for fish going through the Thompson Falls Dam fish ladder to the West Fork Thompson River—a headwaters stream providing critical coldwater habitat for bull trout and westslope cutthroat trout through the year 2040. Montana Fish, Wildlife and Parks estimated that "Since a PIT array was installed [at Thompson Falls Dam] in 2015, approximately 40% of ladder-tagged trout have been documented to enter the Thompson River."[12] In NorthWestern Energy's 2022 report required by FERC for operation and licensing of the Thompson Falls Dam, it reported that "Approximately 70 percent of the Bull Trout ascending the ladder were genetically assigned to the Thompson River drainage (Fishtrap Creek or West Fork Thompson River) and many were subsequently detected in the Thompson River drainage via remote PIT tag array systems located in the mainstem and tributaries."[13] Forest Service Climate Shield data[14] identified the West Fork Thompson River as an important climate refuge headwater tributary for westslope cutthroat trout and bull trout, making the Thompson River worthy of a fish ORV due to its unique relationship as a prominent and proximate coldwater refuge connectivity corridor between the Clark Fork River and Thompson Falls Dam and the West Fork Thompson River.

The Lolo National Forest must find the Thompson River to be Wild and Scenic eligible for both recreation and fish ORVs that acknowledge whitewater boating, angling, and climate refuge connectivity between the West Fork Thompson River and the Clark Fork River.

Fish Creek and South Fork Fish Creek

In the Wild and Scenic Rivers Eligibility Study, no clear rationale is provided for finding these streams to be ineligible for designation. These streams provide popular camping destinations within the river corridor for Missoula residents and the most dispersed camping opportunities among those rivers eligible for recreation ORVs. Fish Creek is a well-documented paddling run that includes 16 miles of Class II/IIII and Class IV whitewater[15] proximate to Missoula and well-known among those who frequent Alberton Gorge. Road access within the river corridor makes this an "excellent bikerafting stream and the lower main stem is close enough to

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[10] Appendix 7, p. 13.
[11] American Whitewater website.
[12] Kreiner, R. and Terrazas, M. (2018) Thompson River Fisheries Investigations: A Compilation Through 2017. Montana Fish, Wildlife, and Parks. p. 29.
[13] Bose, K.D. (2023). 2022 Annual Report, Fish Passage Project. NEW-THF-4238.
[14] Climate Shield Cold-Water Refuge Streams for Native Trout website.
[15] American Whitewater website.

Missoula for after-work runs."[16] These rivers warrant a recreation ORV for whitewater boating, angling, and camping.

The waters of Fish Creek feed "Big Pine," the largest ponderosa pine in Montana and third largest in the nation with a circumference of over 20 feet. Big Pine, clearly unique enough to warrant a botany ORV, is over 350 years old and is one of two Montana trees listed on the National Register of Historic Places. Collaborative management already exists between the Forest Service and Montana Fish, Wildlife and Parks, meaning that eligibility status for Fish Creek as it flows across both federal and state public lands is both warranted and authorized under the Wild and Scenic Rivers Act.

Like the Thompson River, Fish Creek and South Fork Fish Creek provide climate refuge connectivity and warrant a fish ORV. These streams provide critical connectivity between headwater tributaries within the Great Burn and Cache Creek to Fish Creek State Park (the largest park in Montana and a stronghold for native trout[17]) and the Clark Fork River. Fish Creek and South Fork Fish Creek are the Middle Clark Fork River's primary drainage for bull trout spawning and rearing, and therefore are considered critical habitat for these species. The previous Eligibility Study description of Cache Creek includes this statement: "Existence of large bull trout (28 to 30-inch maximum size) indicates that these species migrate to Cache Creek from the Clark Fork River."[18]

The Lolo National Forest must find Fish Creek and South Fork Fish Creek to be Wild and Scenic eligible for both recreation and fish ORVs that acknowledge whitewater boating, angling, and climate refuge connectivity between North Fork Fish Creek, West Fork Fish Creek, Straight Creek, Cache Creek and the Clark Fork River. We support eligibility for Fish Creek for a botany ORV for Big Pine.

St. Regis River

The Lolo National Forest neglected to evaluate the mainstem, but American Rivers' own Wild and Scenic Rivers eligibility report recommends eligibility from the headwaters to the town of Borax. This river provides reliable late season angling as well as significant spawning grounds for bull trout and westslope cutthroat trout. Forest Service Climate Shield data[19] identifies this reach as providing critical coldwater refuge for cutthroat trout through the year 2040.

The Lolo National Forest must find the St. Regis River to be Wild and Scenic eligible for both recreation and fish ORVs, that acknowledge angling and climate refuge connectivity to the Clark Fork River.

Alder Creek, Ranch Creek, Welcome Creek

For the Thompson River, Fish Creek, and South Fork Fish Creek, suggestions above encourage the Forest Service to protect mainstem rivers that connect the basin to climate refuge headwaters. In contrast, the mainstem of Rock Creek was found eligible for its recreational fishing values, yet its climate refuge tributaries that sustain this fishery were found to be ineligible. While we thank the Lolo National Forest for continuing to recognize the importance of Rock Creek as a blue-ribbon fishery providing unique and high-quality angling opportunities, protecting coldwater refuge headwaters are critical to sustaining this popular fishery and the angling it provides. Alder Creek sustains a significant spawning population of fluvial bull trout in the Rock Creek drainage and is also

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[16] American Packrafting Association forum.

[17] Montana Fish, Wildlife and Parks website.

[18] Wild and Scenic Rivers Eligibility Study, p. 20.

[19] See the Forest Service's Climate Shield Cold-Water Refuge Streams for Native Trout website and Isaak, Daniel J.; Young, Michael K.; Nagel, David E.; Horan, Dona L.; Groce, Matthew C. 2015. The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st century. Global Change Biology. 21: 2540-2553.

home to a genetically pure westslope cutthroat trout population, an important element of climate refugia. Ranch Creek is a nursery tributary for fluvial bull trout and hosts a population of native westslope cutthroat trout that is believed to be genetically pure. It also flows through one of 26 High Ecological Value Areas (HEVA)[20] that the Pew Charitable Trusts has identified on the Lolo National Forest. HEVAs are areas that score in the top 10% of Pew's composite ecological value index but that are outside of existing protected areas (i.e., GAP 1 or 2). Indicators in the composite index are total carbon, climate resilience, vertebrate species richness, ecological intactness, ecological connectivity, vegetation diversity, and imperiled species richness, which includes bull trout and westslope cutthroat trout. Welcome Creek is home to a resident population of bull trout and naturalized populations of rainbow and brown trout, providing uniquely accessible, high-quality, wilderness angling opportunities. Of all the tributaries to, Rock Creek, Ranch Creek, and Welcome Creek are predicted to make the largest contributions of cold water refugia habitat through the year 2040.

The Lolo National Forest must find Alder Creek, Ranch Creek, and Welcome Creek to be Wild and Scenic eligible for fish ORVs, that acknowledge the climate refuge habitat they protect within the Rock Creek watershed.

Removal of Longstanding ORVs

The Wild and Scenic Rivers Eligibility Study removed five ORVs from rivers that have been eligible since 1991.

River	ORV	Rationale Given
Rattlesnake Creek	Fish	"The fish ORV is no longer present. Previous populations of westslope cutthroat trout and bull trout have been impacted by warming stream temperatures and expansion of non-native fish species such that current populations do not support the presence of a fish ORV within the context of the region of comparison."[21]
Rock Creek	Fish	"However, the Fish ORV is no longer present. Current population data does not support the presence of a fish ORV."[22]
Cache Creek	Fish	"During the review for fish ORVs, these streams were not noted to currently possess this value."[23]
West Fork Fish Creek	Fish	"This eligibility study identified Fish ORVs only for Middle Fork Indian Creek due to changes along the mainstem of West Fork Fish Creek and Cedar Log Creek."[24]
West Fork Fish Creek	Wildlife	"Wildlife ORVs are no longer considered present although many of the values previously identified have persisted."[25]

All of these rivers, except Rock Creek, underwent a suitability study in 1996. The 1996 suitability study expanded the ORV lists for Cache Creek and West Fork Fisk Creek to include the fish ORV. For Rattlesnake Creek, the 1996 suitability study confirmed the fish ORV that was identified in 1991. For Rattlesnake Creek, Cache Creek, and West Fork Fish Creek, the 1996 suitability study recommended that Congress designate these streams for their ORVs, including the fish ORV that the Forest is now removing.

In all cases, insufficient information is presented to justify the Forest Service's finding that changed conditions

[20] Conservation Science Partners. 2021. Ecological value of lands In the Lolo National Forest. Final Report. Truckee, CA.
[21] Wild and Scenic Rivers Eligibility Study, p. 24.
[22] Ibid. p. 32.
[23] Ibid. p. 21.
[24] Ibid. p. 22.
[25] Ibid.

warrant removal of these ORVs. Further, removal of the fish ORV, in particular, removes any consideration of climate refuge potential for these streams, since it is within this ORV that the Forest Service has chosen to evaluate climate change elements including predicted coldwater persistence and connectivity. Connectivity between headwaters and mainstem habitat is particularly important for Rock Creek, Cache Creek, and West Fork Fish Creek. Removal of these ORVs suggests that: 1) ORV definitions have changed since 1991 and significantly more information, including scientific studies of fish populations, is required to explain how and when ORVs are no longer applicable; or 2) the Forest Service has not upheld its legal obligation to protect ORVs defined in 1991. Degraded stream conditions, as the rationale for Rattlesnake Creek alludes to, suggest that additional protection measures, not fewer, are warranted.

The Lolo National Forest must retain longstanding ORVs. American Rivers strongly opposes removal of fish and wildlife ORVs from Rattlesnake Creek, Rock Creek, Cache Creek, and West Fork Fish Creek without compelling evidence and clearly detailed rationales for changed conditions that do not result from neglected legal obligations for ORV protections under the Wild and Scenic Rivers Act.

Species of Conservation Concern

Westslope cutthroat trout should be added to the Species of Conservation Concern list due to lack of distribution of high genetic integrity and the potential for increased distribution resulting from restoration. We refer you to Trout Unlimited's proposed action comments for more information about the need to add this species to the Species of Conservation Concern list.

Appendix A: Select Climate Refuge Plan Component Language

Flathead National Forest

FW-DC-WTR-13 Peatlands, including fens, have the necessary soil, hydrologic, water chemistry, and vegetative conditions to provide for continued fen development and **resilience to changes in climate** and other stressors. Peatlands support unique plant and animal species that are characteristic of historical conditions. Trees exist on drier hummocks within and on the edge of peatlands but do not retard development.

FW-DC-WTR-14 Beavers play an important ecological role benefiting groundwater, surface water, stream aquatic habitat complexity, and adaptation to **changing climate conditions**.

FW-DC-CWN-01 The conservation watershed network has high-quality habitat and functionally intact ecosystems that are contributing to and enhancing the conservation and recovery of specific threatened or endangered fish species or aquatic species of conservation concern and providing high water quality and quantity. The watersheds contribute to the conservation and recovery of native fish and other aquatic species and help **make habitat conditions more resilient to climate change**.

FW-DC-RMZ-02 Riparian management zones provide key conditions, including slope stability and associated vegetative root strength, wood delivery to streams and streambanks, input of leaf and organic matter to aquatic and terrestrial systems, **solar shading, microclimate,** and water quality, operating consistently with local disturbance regimes.

Custer-Gallatin National Forest

FW-DC-WTR-01 Watershed features, including natural disturbance regimes and aquatic or riparian habitats, are well distributed, diverse, and complex. **Watersheds and associated aquatic ecosystems retain their inherent resilience to respond and adjust to disturbances, including climate change**, without long-term, adverse changes to their physical or biological integrity.

FW-DC-WTR-09 Beavers play an important ecological role within suitable habitat by increasing water residence time, spatial extent of water on the landscape, aquatic and riparian habitat complexity, and **adaptation to changing climate conditions**. Due to these benefits, beaver habitation is encouraged and present across the Custer Gallatin National Forest in suitable areas.

FW-DC-RMZ-01 Riparian management zones are, at a minimum, in a properly functioning condition to provide energy dissipation, **in-stream thermal buffering**, sediment capture and routing, **groundwater recharge**, and have an intact normative flow regime.

Helena-Lewis and Clark National Forest

FW-WTR-DC-11 Groundwater dependent ecosystems, including peatlands, fens, wetlands, wet meadows, seeps, springs, riparian areas, groundwater-fed streams and lakes, and groundwater aquifers persist in size, seasonal and annual timing, and water table elevation within the natural range of variation in order to maintain biodiversity of flora and fauna. **Wetland and groundwater dependent ecosystem vegetation communities are resilient to drought, climate change, and other stressors**. Also see Threatened, Endangered, Proposed, and Candidate and Plant Species of Conservation Concern (PLANT).

FW-WTR-DC-02 **Spatial connectivity exists within or between watersheds**. Lateral, longitudinal, and drainage network connections include floodplains, groundwater, wetlands, upslope areas, headwater tributaries, and **intact habitat refugia**. These network connections provide chemically and physically unobstructed routes to areas critical for fulfilling the requirements of aquatic and riparian-associated plants and animals.

FW-RMZ-DC-02 RMZs feature key riparian processes and conditions that function consistent with local

disturbance regimes, including slope stability and associated vegetative root strength, wood delivery to streams and within the RMZs, input of leaf and organic matter to aquatic and terrestrial systems, **solar shading, microclimate**, and water quality. RMZs also provide an opportunity for **riparian and terrestrial connectivity**.

Grand Mesa Uncompahgre and Gunnison National Forests

FW-DC-AQTC-02 Water flows are sufficient to create and maintain riparian, aquatic, and wetland habitats; retain patters of sediment, nutrient, and wood routing and transport while maintaining reference dimensions (e.g., bank full width, depth, entrenchment ratio, **sufficient pool depth to provide summer refugia and winter habitat**, slope, and sinuosity), ensure floodplain inundation occurs, allowing floodplain development, and ensure that the timing, magnitude, duration, and spatial distribution of peak, high, and low flows are retained. Flows may also support water-related recreation including boating.

FW-DC-FMGD-02 Within the riparian management zones, the biological composition of native flora (e.g., willows, cottonwoods, sedges) and fauna (i.e., beaver) support the associated ecosystem services (e.g., filtering of sediment, modulation of floods, drought resiliency, carbon uptake and storage), providing a dynamic equilibrium of natural structure (i.e., channel morphology, floodplain development, large wood) and connectivity (e.g., periodic flooding, aquatic organism passage. **Shade is maintained**. The species composition provides the ecosystem services of water and carbon storage (particularly in fens—which are among the most carbon-dens ecosystems on the planet—and other wetlands).

FW-STND-WTR_05 Management activities shall **maintain or restore the connectivity**, composition, function, and structure of watersheds in the long-term, as consistent with the Watershed Conservation Practices Handbook and its exceptions (FSH 2509.25) and National Core Best Management Practices (FS 990a) or equivalent direction.

FW-GLD-RMGD-17 To maintain beaver populations and the ecological functions that beavers provide, **management actions should use techniques that sustain beavers (i.e., flow devices to protect infrastructure, using pipes to reduce water levels, and beaver dam analogues)**, while also mitigating undesired effects of beaver dams.

FW-MA-RMGD-21 For climate change adaptations, Rondeau et al. (2020) contains a description of a planning framework and a catalog of additional **climate adaptation strategies specifically for seeps, springs, and wetlands**, but which are applicable to all riparian and aquatic ecosystems. Revised plan direction supports the following strategies.

- **Enhance resiliency of riparian and aquatic ecosystems to climate change by maintaining hydrological connections and processes**, and restoring or improving the condition of these ecosystems to support a variety of wildlife species and ecosystem service including livestock grazing and recreation.

FW-MA-ECO-04…

- Alpine Ecosystems: Consider management actions that **maintain snowpack location and duration**, given the impacts of reduced snowpack and warmer temperatures to distribution and abundance of plant species, changes in amount and timing of seasonal runoff, recreational access and use, and wildlife populations.

FW-DC-SPEC-58 Subalpine forests and alpine habitats characterized by persistent snow cover and cooler temperatures provide high-quality reproductive habitat, denning and foraging opportunities for wolverines. High-elevation habitat and associated **microclimates provide refugia and habitat connectivity** for wolverines in the face of changing climates and emerging threats.