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Comments:
Dear Custer Gallatin Forest Planning Team and Supervisor Erickson,

I began my first visits to the Gallatin National Forest when I was 6. My family camped in Yellowstone and the surrounding environs two weeks a year for a decade. I attended MSU and have spent my adult life in Montana. My three children have all grown up hiking and camping in the greater Yellowstone ecosystem. I took great joy in introducing my son-in-law from Spain to the area last summer. He was astounded at the expanse, the scenic beauty, the sparkling rivers and the resident herds of elk, bighorn sheep, pronghorn and deer grazing unaware. My daughter, who grew up here, has spent considerable time in the backcountry and had yet to see a wolf, was chagrined that on his first visit, he saw a pack trailing elk in the park. I have two grandsons and I look forward to hiking in the Gallatin Range with them when they are older. I want to take them up above Tom Miner and show them where their dad came up with his first tick.

I have just finished reading the 2017 Montana Climate Assessment and I am exceptionally concerned about connectivity and migration corridors in the Custer Gallatin Forest Plan revision. Based on the information from the climate assessment, I heartily support Alternative D as the best (and only realistic) choice for preserving the amazing and varied wildlife found in the greater Yellowstone ecosystem. I urge you to support Alternative D and an additional 230,000 acres of wilderness for the Gallatin Range.

Connectivity is integral for maintaining the broad selection of fauna Yellowstone enjoys. Wildlife migration corridors become even more important as these animals will need to adapt to changing conditions in their areas of traditional habitat. A map of the migration corridors can be viewed at this link.
http://www.wildthingsultd.org/research-program/yellowstone-to-yukon/
Habitat changes that are to accompany climate change in the summary include projections based on regions of MT. The Custer Gallatin National Forest falls in three Montana climate divisions, the Southwest, the South Central and the Southeast, a subset of divisions defined by NOAA. For purposes of migration corridors I will be focusing on the Southwest and South Central climate divisions as they encompass the Madison and Gallatin Ranges and the headwaters of the Missouri and the Yellowstone Rivers.

Simply using major findings the following will impact habitat. Average annual temperatures, including daily highs, lows, and averages have risen across the state between the 1950s and 2015. Increases range between 2 degrees F and 3 degrees F. Average winter precipitation has decreased. Montana is projected to keep warming in all locations, seasons and under all emission scenarios throughout this century. Changes in Montana are predicted to be larger than the average changes projected globally and nationally. Precipitation is expected to increase in winter, spring and fall, decreasing in summer. Extreme heat days are projected to increase (an additional 5-35 days) with greatest increases in southern Montana.

Regarding watersheds, rising temperatures will reduce snowpack, shifting late summer and fall historical patterns of stream flow. With higher temperatures, snowpack will be reduced at mid and low elevations. April 1 snow water equivalent in Montana has dropped roughly 20% over the last 80 years, the decline being most pronounced at lower elevations. Peak spring runoff will occur earlier, reducing late summer water availability. Groundwater demand is predicted to increase with higher temperatures forcing water users to seek alternatives. Groundwater in the headwaters area is found in intermontane basins which are shallow alluvial

aquifers along with deep-confined and semi-confined basin-fill aquifers, both containing large amounts of water. Climate change is expected to reduce recharge, increase water demand, and with precipitation changing from snow to rain, may produce runoff rather than a slow replenishment of the aquifer.

Drought, multi-year and decadal scale, is predicted to continue and increase with temperature rise. The report describes different kinds of drought (meteorological, hydrological, ecological and agricultural). Ecological has been described as "a prolonged and widespread deficit in naturally available water supplies that creates multiple stresses across ecosystems". Increased temperatures lead to increased evaporation and plant transpiration, both of which are referred together as evapotranspiration. This will be singularly important on drought caused by higher temperatures. Evapotranspiration and its increased moisture transport into the atmosphere can result in decreases in soil moisture, streamflow and groundwater recharge. The report states that while this is seen as a global trend, it is a complex process and prediction is difficult. However, this is expected to increase.

Forest impact is predicted to be varied. An increase in fire risk, including size, frequency and severity, is expected due to a longer fire season, higher temperatures, and past fire suppression. Other impacts are viewed as uncertain and dependent on local sites and stand conditions, however increased instances of extreme heat are viewed as negative. Net impact of shifts in temperature and precipitation are described as negative, especially in areas short on water. Drought and beetle-induced mortality will negatively impact forest ranges. CO2 storage in forests may be reduced. Long term forest resilience is determined by genetic diversity of forests and individual species. Some research has shown that tree ranges are already shifting to colder locations in the Pacific Northwest. What may be happening is with fewer climatically suitable places, alpine vegetation may be unable to find space in higher altitudes. Adding to the complexity, the best elevations for some plant species are shifting lower tracking the availability of water, rather than seeking cooler temperatures uphill. Feedback mechanisms are complex and will play a large role in forest health.

Habitat (temperature, water sources, snowpack, plant life) is changing. While wildlife is inherently adaptable, these changes are stressors. Human presence is also a stressor. Large contiguous areas of land support wildlife better than small segmented areas. Wildlife will likely need to move from historic ranges to find more habitable ranges during the coming years. Wilderness is the gold standard of habitat. Wildlife will need connectivity to areas that will support their needs. We have this now in abundance. With predicted dramatic population growth in the area, bringing competing interests for land use and development, the timing of this forest plan revision is important. Adding a 230,000-acre parcel of Wilderness to the northern border of Yellowstone will enhance future survival of the species that define the greater Yellowstone ecosystem.

I would like you to strongly encourage the CGNF team to consider a wildlife bridge over I-90 to allow for safe crossing over (or under) the Interstate. Montanans for Safe Wildlife Passage have been working on this. I realize this would be a multi-agency project but it would further assure passage for wildlife to access other regional habitat.

I urge you to support Alternative D and an additional 230,000 acres of wilderness in the Gallatin Range. The time to do this is now. The Hyalite Porcupine Buffalo Horn WSA has long been recognized as integral habitat for Yellowstone National Park's wildlife. Any plan that demotes protection of this Wilderness Study Area is short-sighted at best, economically and environmentally damaging for the Yellowstone area, and will not contain the desires of mechanized or motorized recreation. Within a decade or so the population will require more - newer, trendier areas to develop, leaving behind a sad remnant of what was once magnificent habitat. We can do better. We must.

Thank you for your consideration of my input.