

Wilderness, Wildlife, and Ecological Values of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area



Executive Summary

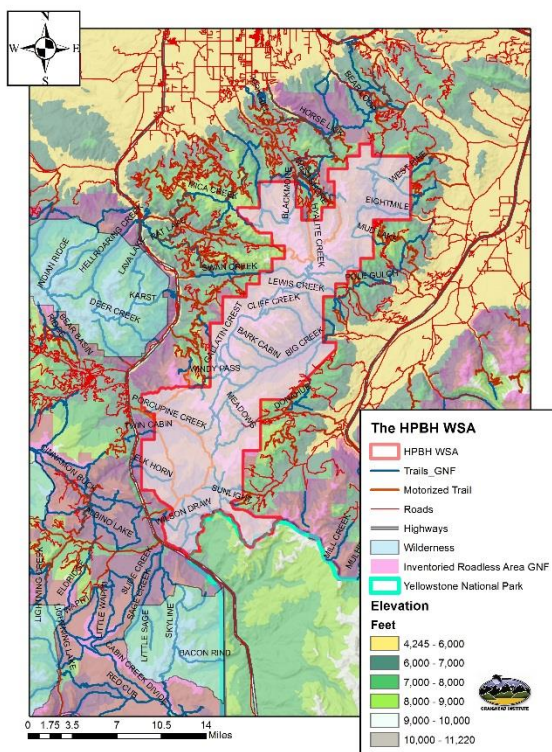
This 155-page report is a review of existing data and literature that were available in 2015 pertaining to the Hyalite Porcupine Buffalo Horn Wilderness Study Area (HPBH WSA) which is located in the Gallatin National Forest in the Gallatin Mountains of southcentral Montana. It was

commissioned by trustees of the Lee and Donna Metcalf Foundation to address a perceived need to gather all the relevant science and data into one document, to facilitate planning, as the fate of the HPBH WSA is decided.

Wilderness Study Areas are areas that were set aside by the U.S. Congress so that they could be studied in more detail to determine their “*suitability for preservation as wilderness*”. At the time the Wilderness Act was passed in 1964 the goals of wilderness preservation were to retain “...*its primeval character and influence, without permanent improvements or human habitation*” and to “*preserve its natural conditions*”, primarily to provide “*outstanding opportunities for solitude or a primitive and unconfined type of recreation*”. Other attributes of wilderness were listed as: “...*ecological, geological, or other features of scientific, education, scenic,*

or historical value.” In 1977 The Montana Wilderness Study Act was passed: about 155,000 acres of land on the Gallatin National Forest, formally known as the Hyalite Porcupine Buffalo Horn (HPBH) Wilderness Study Area (WSA) are included in the Act, which requires Congress to evaluate and decide whether the area merits inclusion in the national Wilderness system.

Although solitude and primitive types of recreation are still important wilderness values, we have learned much more about the ecological importance of wilderness areas in the decades since the



Wilderness Act, and the Montana Wilderness Study Act, were passed. We now know that intact, roadless areas of secure habitat are critical for maintaining healthy ecosystems, particularly in the face of our rapidly changing climate. Intact, functioning ecosystems are our best hope for removing carbon dioxide from the atmosphere and sequestering it, and for buffering the impacts of climate change. Intact areas with wilderness characteristics are essential for maintaining the fish and wildlife populations that provide Montanans with a quality of life that has disappeared from most other states.

This report summarizes the current state of knowledge of the ecology of the HPBH WSA in an effort to provide a solid scientific foundation to determine its “*suitability for preservation as wilderness*” as mandated by the Montana Wilderness Study Act. This report also discusses other possible actions that can be taken by the U.S. Forest Service, the U.S. Congress, and the Executive Branch of government to manage these lands without fulfilling the requirements of the Montana Wilderness Study Act.



This report examines the ecology of seven key ‘focal species’: Bighorn Sheep, Mountain Goat, Cutthroat Trout, Elk, Grizzly Bear, Wolverine, and Pika. Other species mentioned in the report include: Columbia Spotted Frog, Boreal Toad, Bison, Wolf, Lynx, Moose, Beaver, and Fisher. These species were chosen because of their documented value as focal species in nearby landscapes, their sensitivity to climate change and land use change, and the existence of sufficient data to evaluate their status in the HPBH WSA. These focal species are used as an index to represent the total biodiversity of the area. More rigorous approaches to choosing focal species are outlined in the report that could be taken by the Forest Service to assess current conditions for the Custer-Gallatin National Forest Plan Revision which begins in 2016.



The Gallatin Elk Herd represents the heart and soul of the HPBH WSA. One of the last elk herds in Montana in 1910 survived in parts of the HPBH WSA and has since recovered; there are now 5,000-6,000 elk that summer in the high country of the HPBH WSA and winter in lower elevations. A critical component of habitat, particularly during hunting seasons and winter, is adequate security. Elk habitat has been managed generally to provide security from predators and humans so that they can survive and reproduce under conditions that are natural and are free of the stress provided by human disturbance. The elk herd is currently healthy and well-managed by the Montana

Department of Fish, Wildlife, and Parks. Some winter ranges have been steadily decreasing in size, particularly near Bozeman, as more and more development removes habitat.

Bighorn sheep have also persisted in the HPBH WSA during the late 1900's when market hunting and other factors decimated wildlife populations in Montana; there are now about 219 sheep comprising 4 herds living in the HPBH WSA. Their habitat is increasingly shared by mountain goats but the degree of competition between them remains unclear.



Mountain goats are not native to the HPBH WSA but have migrated in from neighboring ranges where they were introduced. About 179 mountain goats now reside along the Gallatin Crest within the HPBH WSA.



Grizzly bears were probably extirpated from the HPBH WSA by 1975 when they were listed as Threatened under the Endangered Species Act. They have since increased in numbers and expanded in distribution so that grizzlies are considered to occupy almost all of the HPBH WSA which is considered primary grizzly bear habitat by the Interagency Grizzly Bear Study Team. Ongoing studies should provide more information on how many grizzlies are currently using the HPBH WSA.

Wolverines have probably used the HPBH WSA continuously. Because they travel so extensively they could have been extirpated briefly but then recolonized the area. Wolverines that were radio-collared in the Madison Range were found to often visit the HPBH WSA and at least one den site has been recorded there. All of the HPBH WSA is considered either primary or maternal wolverine habitat and it is critical for connectivity.

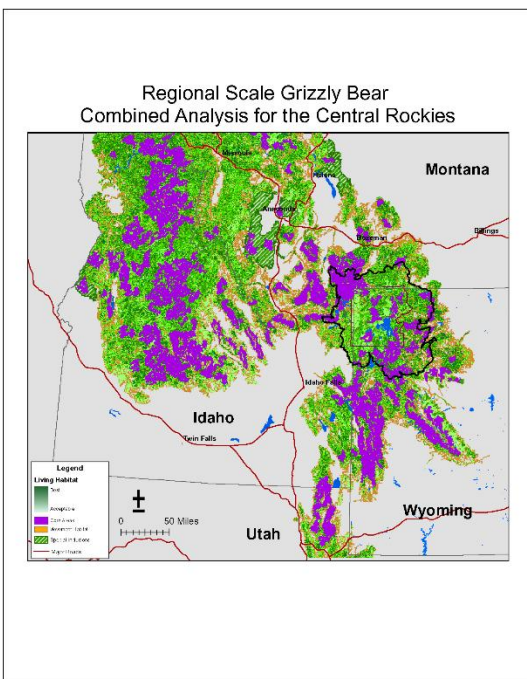


Pikas are found throughout the HPBH WSA, primarily at higher elevations (above 8,500 feet) but extending to lower areas wherever there is suitable habitat. Pika populations have probably remained stable throughout the HPBH WSA since 1992 when studies were initiated, but will likely decline as the climate warms. Pika populations can be monitored to assess the effects of climate change.

Two subspecies of cutthroat trout inhabit streams in the HPBH WSA; Yellowstone Cutthroat Trout, which are found east of the Gallatin Crest in the Yellowstone River drainage, and Westslope Cutthroat Trout, which are found west of the Gallatin Crest in the Gallatin River drainage. Cutthroat trout require cold water source streams that will become even more important in the future for refugia as the climate changes and downstream waters become increasingly warmer.



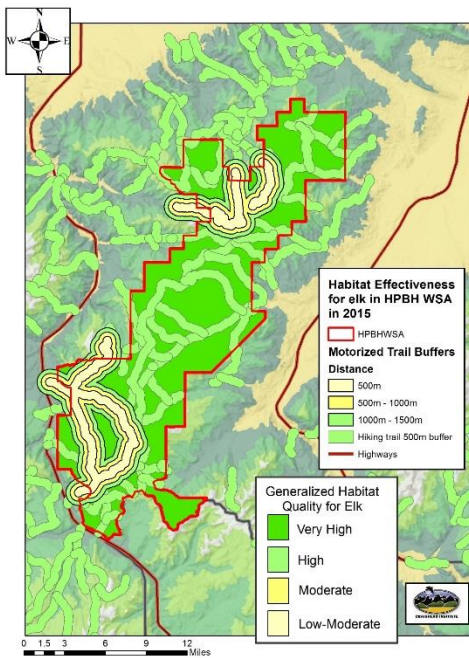
Recent Climate Change Assessments have concluded that the GYE and Gallatin NF will experience continued warming temperatures, decreasing springtime snowpack, and decreasing late season soil moisture. The climate will probably become hotter and drier at lower elevations and hotter with similar precipitation at higher elevations. This dryness at lower elevations will probably be due to changes in water balance, and is an average across the entire GYE; since precipitation is predicted to slightly increase at least in Gallatin County. Headwater streams in the HPBH WSA are predicted to maintain cold water conditions under most scenarios. Compared to other areas in Montana and the Gallatin NF, the HPBH WSA will become critically important as a refuge from climate change in the future.



The existing information on the seven focal species indicates clearly that the HPBH WSA is an ecologically intact landscape that still contains about 99% or more of the vertebrate species that historically used the area (bison are still missing but could recolonize the area if they were not prevented from doing so by state agencies). For many species the HPBH WSA can be considered a complete 'ecosystem' that meets all requirements for sustainable populations; for other more wide-ranging species such as elk, grizzly bear, and wolverine the HPBH WSA is a critical component of the Greater Yellowstone Ecosystem (GYE) which supports sustainable populations of those species and comprises a key part of the larger metapopulation of wolverines. The GYE may eventually comprise part of a larger grizzly bear metapopulation if connectivity is maintained or restored and animals are allowed to move freely.

The HPBH WSA, along with the NW corner of Yellowstone National Park, to which it is connected physically and ecologically, has long been a refuge

for beleaguered wildlife populations. At the turn of the last century (1900) this region was one of the few places in the northern Rocky Mountains that still supported elk, bighorn sheep, grizzly bears, and other species that had been decimated by market hunting, fur trapping, and an expanding human population. Hunting restrictions and other regulations have allowed wildlife populations to recover until they are near carrying capacity in the HPBH WSA. Today however, these populations are again threatened by developments and activities of the increasing human population as well as the warming climate which it has created. As in the past, the key to maintaining the wildlife and the ecosystem is to maintain a low human footprint and restrict activities which are damaging to the environment.



Most wildlife species, particularly those prized for hunting, viewing, and photographing, are sensitive to human-caused disturbance and habitat alteration. A review of the relevant scientific literature in this report documents the vulnerability of the seven focal species. Currently, the only human activities occurring on the WSA occur on the trail network and off-trail hiking and climbing. The amount of disturbance to wildlife caused by trail users is greatest from all-terrain vehicles (ATVs) or off-road vehicles (ORVs) followed by mountain bikes, horseback riders, and hikers according to most existing studies. Motorized use of trails in the HPBH WSA is limited to seasonal use on some trails by motorcycles and snowmobiles. Bicycle use is also limited to the same trails as motorcycles. Disturbance due to human activities reduces the amount of habitat available for use by wildlife, increases stress, and depletes energy reserves, thus

reducing the carrying capacity of the habitat: the best habitat for wildlife is found in areas with the least human disturbance. Habitat effectiveness models can predict the value of habitat for individual species under different disturbance scenarios and can be used by the Forest Service and other parties to assess the effects of recreation use on the trails in the HPBH WSA.

Intact ecosystems which are not fragmented by human developments or degraded by human activities are important for many reasons. These include the provision of ecosystems services such as clean air and clean water, climate regulation, soil formation, nutrient cycling, and harvesting of food, fuel, fibers, and pharmaceuticals. Ecosystems also provide spiritual and psychological benefits whose values are not yet well understood. These benefits, like many others derived from wild places, cannot be exactly measured in traditional economic terms. Based on the data and information contained in this report, the HPBH WSA can be considered an intact 'ecosystem' or critical component of a larger ecosystem, the GYE, and as such should be protected from further human alteration and disturbance. This protection should be as restrictive of human uses as possible and should be as permanent as possible.



To ensure that wildlife have sufficient habitat for population persistence into the future, and to confer resilience in the face of climate change and land use change, there must be an adequate amount of protected habitat available among the spectrum of lands that are accessible to those wildlife. The more permanent that protected habitat is, and the larger the area is, the more certainty there is that wildlife populations can persist. Fragmenting the HPBH WSA into smaller pieces of protected habitat

would greatly diminish its value for wildlife habitat and the provision of ecosystems services, and could nullify its ability to function as a refuge from climate change.



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