Data Submitted (UTC 11): 3/23/2022 6:00:00 AM
First name: Carin
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Comments: Dear Mr. Underhill,

The stated objectives of the Spruce Vegetation Management Project are to increase overall forest resiliency by reducing acres of spruce (Picea glauca) and increasing acres of pine (Pinus ponderosa) and aspen (Populus tremuloides) forests and to reduce undesirable fire behavior across the Black Hills National Forest (BHNF) landscape (Tomac 2022, USDA FS 2022). The Forest Service Project will proceed using the Environmental Assessment (EA) method without current knowledge of the abundance or distribution of unique habitats, rare (target) plants or sensitive animals within the treatment-slated spruce habitat that currently exist. The Project proposal fails to meet many United States Forest Service (USFS) objectives and should be cancelled or greatly reduced and must include reduced wildlife and livestock grazing following spruce treatment otherwise aspen forest regeneration will fail and treatment acres will be replaced by pine.

Spruce habitat on the BHNF comprises a range of unique conditions, which includes springs and seeps that generally erupt near the toe slope of many of the north-facing slopes. Often, the valley bottoms of these high elevation forests are relatively flat and are considered to be wetland habitat. Another frequent characteristic of spruce habitat is its soil surface; it is often covered with a layer of abundant mosses and lichen species. Over twice as many moss species have been found in BHNF spruce habitat compared to BHNF pine habitat. Unique forbs are also often found among the moist moss covered rocks, litter and soil in spruce habitat. Spruce habitat is considered by the USFS to be high probability target plant habitat while pine habitat is considered to be low probability habitat. Target plants include sensitive or rare plants, plants with unique habitat requirements, or plants BHNF managers lack enough information about as to adequately address management concerns of the species. Over 40% of target plant species known on the BHNF occur within habitat that contain spruce as a dominant or codominant tree species. The largest remaining old-growth pine trees also reside within the proposed treatment habitat. The majority of the BHNF spruce habitat is found within Lawrence County and western Pennington County and is why Lawrence County has about 1,400 plant species within its borders, making it the most plant-diverse county within the state.

The Spruce Vegetation Management Project Scoping Package (USDA FS 2022) only considers tree diversity and resiliency, not overall plant and animal diversity and resiliency. Relative to ponderosa pine, spruce is patchily distributed and in low abundance (USDA FS 2005). Spruce is estimated to comprise only about 4-5% of the forested habitat found on the BHNF (DeBlander 2002, Walters et al. 2013). Reducing these relatively small, unique spruce habitats will further increase the most common tree species (pine) and habitat of ponderosa pine. Since pine already represents 76, 85, or 95% (Walters et al. 2013, De Blander 2002, Brown and Cook 2006, respectively), the overall forest diversity and resiliency will decrease with the proposed Project.

Brown and Cook (2006) report the BHNF has a strong moisture gradient from 740 mm in the northern high elevations of the Black Hills to 480 mm in the southern Black Hills that results with spruce and aspen to be occasional co-dominants at the higher and wetter areas of the forests in the northern and central Hills (Lawrence and western Pennington Counties), but ponderosa pine is generally the only tree species present in the southern Hills and much of Wyoming[rsquo]s BHNF. Pine is currently over-represented in the BHNF and it represents habitats from low to high elevation over the entire forest while spruce is only found in abundance at high elevation and confined to the northern and central Black Hills. If treated, this moist habitat will be subjected to increased solar radiation and increased wind speed (both drying factors), which will reduce resiliency of its unique understory habitat which is where over 40% and possibly more of the rare plant species known within the Black Hills National Forest lives. The retention of this habitat and the viability of all rare plant species is also a USFS management objective; an objective lacking in the proposed Scoping Package.

Encouraging ponderosa pine (possible pine plantings) to encroach into spruce habitat and to increase its overall abundance in the higher elevation, greater soil moisture habitats will actually reduce the overall forest resiliency and degrade many ecological services on the forest overall. As seen over the last 1-2 decades, ponderosa pine has been devastated by a pine beetle infestation. Increasing pine habitat may actually make the overall Black Hills forest less resilient when the next pine beetle infestation occurs. The dry understory of pine forests are also at greater risk of undesirable fire behavior compared to moist soils and vegetation (mosses) found in spruce habitat. I fail to comprehend how increasing pine forest in a forest that already contains 76-95% of all forested lands will increase forest resiliency.

The proposed management plan will also fail to recruit any additional aspen forests. Walters et al. (2013) reported that quaking aspen has a relatively high mortality rate that actually resulted in a negative net average annual growth, the average annual mortality rate was greater than white spruce, and the abundance of aspen to the overall tree species diversity in the Black Hills was predicted to decline. The proposed treatments will more than likely increase the rate of aspen decline.

Aspen research in the western United States and particularly within habitat on the BHNF indicate many unsuccessful aspen regeneration events are due to excessive ungulate browsing of the regeneration, direct and indirect herbivore impacts that include grazing by wildlife and livestock, and fire suppression (Kranz and Linder 1973, Bartos et al. 1994; Heady and Child 1994, Keyser et al. 2005, Shepperd et al. 2006; Kota and Bartos 2010, among others). Specifically, Keyser et al. (2005) observed 58% of all live aspen sprouts were browsed within four years after the Jasper Fire and 78-79% of aspen suckers were browsed during another aspen study (Kota and Bartos 2010). None or very few aspen trees have been reported to have established by seed on the BHNF. Aspen regeneration is primarily by sucker growth following fire or man-made treatment when protection of suckers is included. Aspen suckers are at greatest risk of being browsed until they exceed 1.5 m height from domestic animals (Sampson 1919; Smith et al. 1972) and 2-4 m from wild ungulates (DeByle 1985; Kimble et al. 2011). Unless wildlife and livestock grazing is reduced significantly and are excluded (especially elk) from treated habitats for a period of up to 20 years to allow aspen to reach heights greater than 2-4 meters, aspen regeneration in treated habitats will more than likely fail and result in an increase of ponderosa pine.

There are other USFS objectives (not stated in the proposed Project) that need to be considered, some specific to sensitive species while others to habitat considerations for sensitive species. Some USFS management objectives specify to conserve or enhance habitat for Region 2 sensitive species and species of local concern (SOLC). Results of monitoring sensitive species indicate many are dependent upon spruce habitat, either the tree canopy or the cool, moist understory habitat associated with spruce forests.

Forest resiliency is implied to be an easy concept to understand when tree species is the only driving factor, but is difficult to understand when other plant species and ecological services provided by spruce habitat are considered. An ecological service is a process that would be provided by (in this case) spruce habitat on the BHNF and would benefit man; aesthetics is an example of an ecological service. Another ecological service provided by spruce forests includes a disproportional amount of target plant habitat (over 40%) comparing overall acreage and considering that at most 5% of the forested landscape on the BHNF contains spruce. Rare plants will certainly be adversely impacted by spruce removal, especially creation of clear-cuts and machine piling of timber when as much as 50% of the spruce habitat is proposed to be logged.

Many plant species unique and more abundant in spruce habitat compared to the more common pine habitat, will more than likely be severely damaged or have their habitat destroyed by machine piling of spruce. When fallen spruce are dragged across the moist, mossy, relatively steep north-facing slopes or along the toe slopes with abundant soil moisture, occasional seeps, springs, or wetland habitat, the dragged trees will remove the shallow soils, moss layer, and high organic content hummocks often found in spruce habitat. Removing this soil, unique plants and moss and organic matter covering will expose the bare soil to greater solar radiation. The thinned or

clear-cut spruce forested patches will allow greater air flow and wind velocity through the forest. Thus, logging the spruce communities will likely dry these habitats, creating conditions similar to adjacent pine forests since the protective soil cover will be severely disturbed.

Results of having tree canopy removed from moist understory habitats has been seen recently in Florida. In Florida, the overhead canopy was removed by hurricanes, the soils and vegetation under the removed canopy dried out, the area retained less moisture content (became dryer) which resulted in increased fire risk (the opposite of the desired fire behavior objective). Area desiccation may also result in less soil infiltration, an increase of rainfall runoff and greater sediment yield being transported to the headwaters of many streams within the Black Hills. Drought and climate change alone may greatly impact these spruce habitats, but timber removal that includes clear cutting would accelerate and exacerbate the drying of the habitat even more.

One main wildlife issue that has been ignored for decades in the Black Hills has been the decrease in the number of whitetail deer (Griffin et al. 1992, Griffin 1994). A reason for the decline in deer density in the central Black Hills is the regeneration of ponderosa pine partially due to lack of fire which has substantial increase the amount of pine which in turn has decreased habitat diversity (Sieg and Severson 1996, Richardson and Peterson 1974). Rice (1984) concluded that the reproductive potential of white-tailed deer was lowest in the Black Hills compared to other areas of South Dakota due to low quality and available forage. Additional management actions like this Project will fail to produce diverse habitat and improve forage quality for species like whitetail deer.

Pine martins preferred habitat is highly associated with spruce forest. The Forest Service has stated it is conserving habitat for the American pine marten (USDA FS 2005, USDA FS 2007). Leopard frogs are rarely found in riparian habitat, but their habitat is often associated with spruce forests and partially shaded moist to saturated soils. The northern flying squirrel preferred habitat includes spruce and pine of very large tree size (USDA FS 2007). Other animals, possibly shrews, mollusks, or gastropods found in moist soils would be reduced if spruce habitat is converted to pine forest which are generally dryer and contain greater amounts of forage. Just like some very uncommon sensitive or rare plants, some pollinating insect species that are restricted to certain plant species and confined to moist soil conditions in spruce habitats may be decreased or extirpated since such a small percentage of spruce forests overall is found on the BHNF. Specifically, several orchid species are most abundant within the spruce habitats compared to pine or other BHNF habitats and some are supposedly only pollinated by nocturnal sphinx moths (unknown on the BHNF).

Bird watchers in the United States spent about $700.00 per person based on values reported by Panjabi (2005) in 2004. That same year there were 271,000 bird watchers reported in South Dakota. In addition, there are many more sustainable economic interests and supports that could be provided to local communities associated with a diverse forest ecosystem that includes spruce. Improving habitat that would benefit whitetail deer could greatly increase economic activity within the Black Hills, far exceeding timber only interests, if whitetail deer habitat improvement was prioritized. Also listed in Panjabi (2005) were at least three bird species that were reported to be tied to spruce or high elevation spruce habitat. The American three-toed woodpecker is restricted to mature stands of spruce. The brown creeper is found in old-growth and spruce and much of the only old-growth pine are found adjacent or within these remaining spruce habitats.

Swainson[rsquo]s thrushes were reported to be found wherever high elevation spruce were growing (Panjabi 2005). A comment was also presented to maintain habitat for golden-crowned kinglets, as outlined in specific direction pertaining to spruce habitat (USDA FS 2007).

SUMMARY

Contrary to the stated Project objectives, increasing the amount of pine forest in a forest dominated by pine forests will decrease the overall Black Hills National Forest resiliency of many resources. Replacing moist spruce

forests with greater amounts of dry pine forest in a forest already dominated by dry pine forests will increase fire risk and undesirable fire behavior in the higher elevation of the Black Hills National Forest landscape. Using the Environmental Assessment method to proceed with the Project will fail to identify current sensitive plants and animals in these habitats and where unique habitat within spruce treatments should be avoided. Unless additional forest treatments such as significant decreases in wildlife and livestock grazing are also implemented, there will be no measurable increase in aspen habitat in any of the proposed treated forests; these habitats will be replaced with ponderosa pine. Spruce habitat occurs on only a small percentage of the overall BHNF (4-5%) and is considered to be a high probability rare plant habitat compared to low probability pine habitat. Forest resiliency, species viability of all native plants and animals found within spruce habitat, and many ecological services provided with spruce habitat within the Black Hills National Forest will be decreased. Many unique plant species will decline, possibly to levels that some will become extirpated along with their unidentified pollinators. Therefore it would be much better if areas of spruce habitat were conserved and managed as is, rather than treating them to increase additional pine forest habitat. I oppose the Spruce Vegetation Management Project.

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