18 December 2020

VIA EMAIL

Bureau of Land Management
Boise District Office
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Re: Tri-State Fuel Breaks Project

Dear Bureau of Land Management:

As scientists focused on the sustainability and restoration of semiarid (shrub steppe) ecosystems of the western United States, we wish to provide a scientific review of the Tri-State Fuel Breaks Project, including the Bureau of Land Management's ("BLM") project environmental review.[1]

Our analysis is based on decades of experience, published research, field study, management and conservation of the flora and fauna of sagebrush landscapes. We include recommendations for enhancing the resilience and resistance of semiarid landscapes to fire and other natural and anthropogenic disturbances. It is imperative to take unprecedented steps now that will sustain and restore sagebrush steppe ecosystems threatened by the establishment and spread of invasive species and destructive wildfire. Unfortunately, the alternatives presented in the FEIS fail to support this goal. If implemented as proposed (and as already approved in the Idaho-side Record of Decision), the project will likely degrade the biological diversity and ecosystem services provided by these landscapes. We hope our comments will be useful to BLM for improving efforts towards maintaining or restoring the diversity of the shrub-steppe landscapes in the American West.

The project area is ecologically and topographically complex, includes parts of three states, and has a diversity of communities dominated by big sagebrush (three subspecies), early sage, low sage, western juniper, riparian zones, bunchgrass prairies, and many others. The main methods of fuel break construction in the FEIS include mowing, mowing and seeding, and seeding within the fuel treatment zone, and blading, hand cutting, or herbicide application to remove vegetation within the existing roadbed. We are concerned that the probability of successfully achieving the purpose of the project is far outweighed by the highly probable negative outcomes to these habitats. This is because the FEIS lacks an ecosystem perspective with respect to causes of ecosystem degradation. Fuel breaks alone will not restore ecosystem resilience, and their efficacy for increasing resistance (*i.e.*, fewer fires on the landscape) is doubtful. It is certain that the large fuel breaks outlined in the FEIS will: (1) fragment large areas of intact sagebrush ecosystems; (2) facilitate the invasion of exotics due to the disturbance created by the breaks; (3) supplant native

[1] The Final Environmental Impact Statement ("FEIS") and other project documents are available on the agency's website at: https://eplanning.blm.gov/eplanning-ui/project/42341/510.

communities with exotic dominants; and (4) destroy or degrade biological soil crusts and any native species in the sites. Further, these breaks are unlikely to be effective against fires that occur under the most severe fire/fuels conditions of high winds, high temperatures, and low fuel moisture. Fires under these conditions are those that result in the majority of burned areas in the country. Finally, the EIS does not address the ultimate and only controllable cause of the degradation of the biodiversity of the Sagebrush steppe –livestock grazing. This is especially true for the restoration and recovery of riparian zones that are critical habitats for >80% of the wildlife of this large ecoregion.

The FEIS also does not adequately address the cumulative effects of climate change on the efficacy of the proposed treatments, nor how this approach contributes to climate change. We thus urge reconsideration of the proposed managerial approaches because they inadequately meet agency requirements for maintaining the public resources.

We briefly address these issues below:

- Negative impacts of the fuel breaks
- Fire behavior analyses
- Climate change
- The role of domestic livestock grazing

This is by no means a comprehensive list but, rather, a few of the most salient points that must be addressed in order to assess whether the project, as proposed, can meet its purpose of sustaining and restoring sagebrush steppe ecosystems.

(1) Negative Effects of Fuel Breaks

Fuel breaks are designed to reduce the spread of wildfire across landscapes by creating a strip or area of altered vegetation where fire spread cannot be maintained. Shinneman *et al*. (2019) reported that there is little scientific information available regarding their ecological effects. They report that fuel breaks can: (1) directly alter ecosystems; (2) create edges and edge effects; (3) serve as vectors for wildlife movement and plant invasions; and (4) preemptively fragment otherwise contiguous sagebrush landscapes.

It is well established in the scientific literature that roads, trails, and rights-of-way are particularly effective vectors in spreading invasive plants. Cheatgrass and medusa head establishment has been associated with roads and travel routes, where regular disturbance from travel and maintenance activities (*e.g.*, mowing) confer a competitive advantage over native species (Banks & Baker 2011; Bromberg *et al*. 2011; Gelbard & Belnap 2003; Gelbard & Harrison 2003). Fuel break treatments typically result in ecosystem type conversions or major modifications of existing vegetation biomass and structure that facilitate exotic species establishment. Actions that create the fuel breaks (*e.g.*, mowing, herbiclde treatments, seeding using rangeland drills, etc.) greatly disrupt soil stability and ecosystem composition. Fuel breaks also require regular maintenance (*e.g.*, blading, mowing, herbicides) to avoid undesirable shifts in their effectiveness due to increases in exotic vegetation and fuels. Adding fuel breaks to a landscape also increases the probability of soil erosion and loss of site productivity for the treated landscapes.

Research indicates that fuel breaks may facilitate the proliferation, immigration, and emigration of non-native plants in some landscapes (Keeley 2006). Within fuel breaks, soil disturbance, reduced competition, and loss of symbiotic mycorrhizal fungi after treatments can create opportunities for dominance of exotic/invasive species that prefer disturbed habitats. Plowing up the soil during the fuel break construction process will destroy residual native species (such as Sandberg's bluegrass), native forbs, and biological soil crusts, while creating an ideal seed bed for cheatgrass and other exotic species (Serpe *et al*. 2006). Biological soil crusts (*i.e.*, cryptogamic crusts, microbiotic crusts) and other aggregated soil surface conditions provide several important ecological functions including soil stabilization, nitrogen fixation, serving as natural fire breaks, and inhibiting cheatgrass germination (Ravi *et al*. 2011, Rosentreter 1986, Serpe *et al*. 2006).

Fragmentation of wildlife habitat as a result of fuel -break construction also is a significant concern. Up to 1,539 miles of fuel breaks would be created by this project. Such fuel breaks will fragment large areas of contiguous habitat (much of which is recognized as Wilderness Study Areas and Lands with Wilderness Character), potentially resulting in functional habitat loss to wildlife.

Seeding of non-native species that are known to be invasive can only reduce native biological diversity. We now know that forage kochia and crested wheatgrass can be invasive (Gray & Muir 2013, Connelly *et al*. 2016, Henderson *et al*. 2005, Fink & Wilson 2011). Proof of non-invasiveness should be required before these species are used. If they spread, the ecological consequences would not likely be positive. It is ecologically naïve to assume without strong proof that a non-native species can be seeded successfully but not spread over time from the area where it was seeded.

Crested wheatgrass is far less palatable than native bunchgrasses such as bluebunch wheatgeass and western needle grass. Reducing fire intensity within the fuelbreak would require substantial reduction in the mass of the fuels composed of native grasses, exotic grasses, and shrubs, and BLM states this can be achieved through "targeted grazing." But to accomplish this would result in extreme soil trampling and overuse of the native grasses and forbs before cattle would begin to graze the less palatable exotic grasses and shrubs. This overuse/overgrazing of the native species would be deleterious to other resource values such as Greater sage-grouse habitat.

Several firebreaks in Ada, Owyhee and Elmore Counties were created in the 1980s as part of the "greenstrip" program. Now neglected, these long, plowed strips in the landscape are merely weed corridors that off-highway vehicles drive on, exacerbating the spread of cheatgrass. These firebreaks are not maintained. The long-term implications of fuel break construction suggest that the ultimate effects of fuel breaks will not serve to decrease fire spread but, rather, to serve as corridors for the establishment and spread of exotic plant species. The access provided by these routes also increases the probability of arson/ human-caused ignitions occurring on the landscape.

(2) Fire Behavior Analyses

Most of the area burned in the Great Basin is from large fires (10,000 to ≥200,000 ha) (Brooks *et al*. 2015) that are often driven by extreme fire weather conditions under which fuel breaks are not intended to function. Extreme fire weather conditions—characterized by low fuel moisture, low

relative humidity, high temperatures, and high wind speeds—affect wildland fires more than fuel characteristics and loadings (Strand *et al*. 2014), thus suggesting strongly that fuel breaks will be of limited value for the control of large fires.

The FEIS assumes throughout that fuel breaks will be effective; but this assumption is unsupported in the scientific literature and directly contradicted by statements within the FEIS. The FEIS acknowledges, for example, that fuel breaks are not effective in stopping or slowing large fires (*see, e.g.*, FEIS at 34) and that "some of the only known peer-reviewed literature on empirical fuel break success rates" shows they are successful less than half (46%) of the time. FEIS Appx. S at 10.

(3) Climate Change

Climate change affects public lands ecosystem services throughout the American West, and these effects are projected to intensify (Mote *et al*. 2019, USGCRP 2018, Beschta *et al*. 2013). The climate is changing, and southeastern Oregon is among the areas of the United States most affected by rising temperatures. The changes include increases in exotic grass invasions, warmer stream temperatures affecting native fishes, and increased wildfires across the landscape.

Future climate change could lengthen the annual duration of extreme fire-weather conditions (Abatzoglou & Kolden 2011). Fire seasons are now, on average, 78 days longer than in 1970 (Abatzoglou & Williams 2016, USFS 2015). Coupled with increases in the extent and productivity of invasive annual species, we expect changes in the climate to potentially result in more fire-prone landscapes in coming decades. In other words, the proposed fuel breaks may become even less effective in the future due to climate change-mediated changes in fire weather and behavior.

Seeding of crested wheatgrass may actually exacerbate the effects of climate change. Stands of crested wheatgrass are associated with reduced soil quality—higher bulk density, fewer water-stable aggregates, and lower levels of organic matter and nitrogen compared to native grass (Dormaar *et al*. 1995). Crested wheatgrass also results in lower water holding capacity, and lower nutrient and carbon storage, than the native communities they replaced (Lesicu & DeLuca 1996). Crested wheatgrass stands sequester less carbon than native landscapes, thus contributing to climate change.

An elevated wildfire occurrence in concert with the "business as usual" approach to livestock grazing in the preferred alternative likely will facilitate an increase in the degradation of sagebrush and other native shrub-perennial grass communities and their conversion to plant communities dominated by alien grasses (D'Antonio & Vitousek 1992, Brooks 2008). This will have positive feedbacks to climate change through increasing greenhouse gas emissions and decreasing the ecosystem service of carbon storage by ecosystems within the project area.

There are synergistic effects of climate and land-use change on animal population dynamics, suggesting accelerated loss of biodiversity in areas under pressure from both (Northrup *et al*. 2018). Seeding exotic species and continuing livestock grazing at current levels exacerbates the effects of climate change, as well as providing a significant source of greenhouse gas emissions.

(4) The Role of Livestock Grazing

The FEIS overlooks another major factor promoting annual grass invasion—livestock grazing. The FEIS repeatedly states that grazing "is managed to meet" land health standards and "projected to maintain or improve upland vegetation." *See, e.g.*, FEIS at 41, 73, 113; Appx. S at 13. However, this fails to acknowledge, for example, that 75% of allotments in the Southeastern Oregon Resource Management Plan planning area (which governs the Oregon side of the project) are currently failing to meet those standards. If ecologically harmful grazing practices persist, conversion of native sagebrush steppe to exotic annual-dominated plant communities will likely continue throughout the project area. Fuel breaks simply will exacerbate this phenomenon.

Studies have consistently found that cattle grazing facilitates exotic annual establishment and compromises invasion resistance by decreasing bunchgrass abundance, thereby increasing connectivity of gaps between perennial plants. Trampling reduces biological soil crusts (Root *et al*. 2019), which also provides important resistance to annual grass invasions. Williamson *et al*. (2019) report that grazing corresponds with increased cheatgrass occurrence and prevalence regardless of variation in climate, topography, or community composition, and their analysis provides no support for the notion that contemporary grazing regimes or livestock grazing in conjunction with fire can suppress cheatgrass. In other words, the most effective means of reducing cheatgrass (and other exotics), and therefore the degradation of biological diversity, is to remove livestock grazing from public lands.

Summary

If the goal of the Tri-State Fuel Breaks Project is to conserve and restore the resistance and resilience of sagebrush steppe landscapes, managers should consider maintaining or restoring: (i) native bunchgrass cover and a spatial structure characterized by small gaps between the bunchgrasses; (ii) a diverse assemblage of native bunchgrass, forb, and shrub species to maximize competitive interactions with cheatgrass in time and space; and (iii) biological soil crusts to limit cheatgrass establishment (Root *et al*. 2019). Further, the restoration of riparian zones and the resulting recapture of lost floodplain widths will create expanded areas with higher water tables that could function as fire breaks as well as provide many other valuable ecosystem services (Kauffman 2001, Dwire *et al*. 2003). Passive restoration, achieved by reducing cumulative cattle grazing impacts is the most effective means of achieving these goals (Kauffman *et al*. 1997, Dobkin *et al*. 1998, Batchelor *et al*. 2015, Reisner *et al*. 2013).

We wish the BLM the utmost success in meeting its responsibility to protect and maintain the quality of the environment and the structure, function, and biological diversity of public lands, particularly in the presence of the challenges associated with a changing climate. To prevent unnecessary or undue degradation of the natural resources and other values of the project area, the BLM must take an ecosystems/ecological approach to land management. Sadly, the alternatives examined in the FEIS, including the proposed/adopted decision, will not achieve success and may in fact exacerbate degradation of the native flora and fauna of the region.

We thank the BLM for the agency's careful consideration of these concerns.

Sincerely,

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