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Comments on East Paradise Range Allotment Management Plan and Environmental Assessment

Submitted by: David J. Mattson, Ph.D.

I appreciate having the opportunity to comment on the East Paradise Range Allotment Management Plan Environmental Assessment (EA). My purpose here is to communicate my many concerns about both adequacy of the EA itself as well as comparative benefits of the three alternatives considered in the EA. I do not intend to provide an exhaustive list of substantiating scientific literature, evidence, and anecdote. I anticipate having the opportunity to provide this type of information along with a more replete description of my remaining concerns during the objection process. As the entity with primary responsibility for carrying out adequate technical analyses, the Forest Service—not the public—clearly bears the burden of obtaining and consulting key scientific publications relevant to issues flagged during this comment period.

My comments are not frivolous. They are informed by not only 50 plus years of relevant practical experience and professional training, but also by intimate familiarity with the areas and issues covered by the EA. I am especially familiar with the Suce Creek area where I have closely observed changes in vegetation, human use, and wildlife activity during the last 15 years.

I was, moreover, raised on a small ranch in the Black Hills of South Dakota where our pastures closely resemble those in more mesic areas of the East Paradise allotments. I had the opportunity to observe how abundance of common timothy, smooth brome, and Kentucky bluegrass varied during a number of years as a function of weather, stocking rates, and whether grazed or cut as hay. I subsequently obtained undergraduate degrees in forest management and range science—the latter of which acquainted me with the culture and prejudices of range managers. My Master's Degree in plant ecology was based on investigations of wetland vegetation in Yellowstone National Park. My Doctoral Degree was based on 15-years investigating grizzly bears in the Greater Yellowstone Ecosystem. My subsequent research included investigations of mountain lion ecology in Arizona, Utah, and Nevada.

The point of all this is that I have insight into the ecology of large predators and the dynamics of grazed rangelands informed by decades of region-specific practical experience, close observation, and scientific studies. I am also well-acquainted with the relevant scientific literature.

My comments organize around several thematic concerns:

- The Forest Service consistently overstates the benefits of cattle grazing.
- The Forest Service consistently understates the harm caused by grazing.
- The Forest Service too often substitutes assertion or a superficial reading of relevant science for a more deliberative assessment of applicable evidence.
- The Forest Service uses rubrics that obfuscate rather than clarify prescriptive intent—for example in the invocation of "adaptive management."
- The Forest Service trivializes key issues—specifically related to depredation.
- The Forest Service fails to consider some issues altogether—notably related to burgeoning human recreation.

- The Forest Service failed to develop and consider important alternatives.
- On a related note, the Forest Service failed in its obligations to the public during the scoping process.

Overall, the pattern of and bias and selective neglect of issues evident throughout the EA conveys the impression of an agency that decided on a decisional outcome well before it conducted any meaningful assessment—or even scoping—of environmental consequences and well before offering the public opportunity to provide comments. As important, the EA evinces an imbedded pattern of bias that is deferential to the interests of a handful of livestock producers and dismissive of interests held by everyone else. All of this is corrosive to what little trust the public likely still has in Forest Service decision-makers.

A. The Forest Service Failed in its Scoping Duties

The scoping for this EA occurred during mid-2013, more than 7-1/2 years ago. For unclear reasons, the EA was put on hold and then resurrected without updating the scoping process. Needless to say, much has changed between 2013 and 2020 of direct relevance to managing the East Paradise allotments.

My personal experience is germane. I was aware that an EA for the allotments had been initiated and was listed as being on hold on the Custer-Gallatin National Forest's SOPA list. Because of this ambiguity, I sent an email dated 4 September 2020 to Chauntelle Rock, Rangeland Management Specialist for the Yellowstone Ranger District, stating: "Could you please send me any public materials pertaining to the East Paradise Range Recession EA? According to the SOPA, this EA appears to be "on hold." Is that right? If so, could you notify me whenever this EA gets rolling again. I am keen to see what the analysis finds."

I heard nothing back in response and was not notified by anyone in the District Office when the EA was released. I only heard about its existence from a friend. Nor was I or anyone else given the opportunity to provide additional information for timely scoping of issues to be addressed in an EA released over 7 years after what was clearly an antiquated antecedent process.

Recommendation: The Forest Service needs to reinitiate the scoping process for this EA as a prelude to undertaking a revised assessment that adequately addresses current issues and public concerns.

B. Alternative 3 is Not an Adaptive Management Alternative

Alternative 3 of the EA claims to employ "adaptive management." However, what's described is not adaptive management. Adaptive management entails a rigorous systematic approach to eliciting and closely monitoring responses from complex ecosystems through deployment of practices that embody provisional hypotheses or schema. This approach rests on a disciplined and timely process of gathering intelligence, developing hypotheses, implementing these hypotheses as management actions, monitoring outcomes, and appraising and recrafting provisional hypotheses (see Carl Walter's 1986 classic text for a more complete description of adaptive management).

None of this is evident in descriptions of Alternative 3. A better rubric for what's described would be "discretionary management," which is indeed implied by the emphasis placed on "flexibility."

Discretion and flexibility are often desirable, but they do not constitute adaptive management. More importantly, neither discretion nor flexibility are appropriate in this case—for several key reasons.

First, deference to managers through the affordance of "discretion" and "flexibility" rests on trust—trust that managers will faithfully fulfill their responsibilities as trustees for the public. This means that there will not be bias in favor of certain special interests and that legal mandates will be faithfully and scrupulously fulfilled. Unfortunately, there is minimal basis for trust in Forest Service managers given a history of politicized decision-making and patterns of bias already evident in the EA.

Second, fungible boundaries for agency accountability—as implied by discretion and flexibility—increase the odds of on-going conflict among stakeholders organized around a lack of stable expectations and attempts to influence how the Forest Service exercises its discretion. Of particular relevance here, there is no lack of stakeholders or conflicts of interest attached to management of the East Paradise allotments, which is a recipe for on-going conflict centered on how the Forest Service exercises its "flexibility."

Recommendation: Given these considerations, the Forest Service needs to: first, drop the term "adaptive management," unless the EA is substantially revised to include an alternative that does, in fact, embody the principles and practices of this approach; and, second, establish clear, unambiguous, and measurable standards by which the Forest Service will implement management of grazing on the East Paradise allotments. This precludes current provisions for "flexibility" under Alternative 3 that leave the public wondering how that flexibility will manifest from one month or year to the next, and whose special interests those vagaries will serve.

C. Forest Service Use of "Succession" is Ill-defined and Vagarious

"Succession," as applied to vegetation, is an ill-defined and contested concept under the best of circumstances. Even so, there is somewhat greater consensus when applied to forest vegetation compared to when applied to rangeland vegetation. Regardless of the application, the Forest Service's deployment of this concept in the EA leads me to conclude that either the author(s) had a very poor understanding of this concept or that they were using the concept in politically expedient ways. Neither conclusion is trust-engendering.

C.1. Connections Made by the Forest Service Between Grazing and Succession in Conifer Forests is Not Warranted

Succession in forests encompassed by the East Paradise allotments has largely been—and continues to be—driven by wildfire and outbreaks of insects. There is no evidence that succession in conifer-dominated portions of these forests is affected one way or another by grazing. Which is to say, the invocation of some sort of an effect by grazing on conifer forests, retrogressive or not, is unwarranted if not nonsensical. Yet the Forest Service invokes such an effect when extolling the virtues of Alternative 3, and even Alternative 2, over Alternative 1; that grazing will somehow have "beneficial" effects on forest succession(?); and that "plant vigor and litter accumulation in upland vegetation has increased…the long-term trend is toward late seral stages" because cattle grazing has not occurred (as per the Suce Creek allotment).

Another peculiarity of this contrast is the implicit assumption that succession will irrevocably progress in the absence of grazing. This tacit if not explicit claim is likewise nonsensical. The history of wildfires and outbreaks of insects and disease in this region during the last 30 years clearly shows that natural

disturbances will continue, probably with increasing frequency and extent. Fire, insects, and disease will axiomatically take care of the "succession problem," to the extent that any such problem exists.

Apropos, there is a somewhat mystifying subtext in the EA characterizing "succession" as intrinsically problematic. I am unclear why. For one, forest succession does not progress indefinitely, simply because of the predictable perturbations caused by fire, insects, and disease. For another, forest succession provides transient benefits for a host of animal, plant, and fungal species. Some are winners and some are losers at any point in time. This is not intrinsically problematic, especially given the guaranteed intervention of natural disturbance.

Recommendation: Unless the Forest Service can provide unambiguous evidence for a connection between cattle grazing and successional dynamics in conifer forests of the East Paradise allotments, all implication of a such a connection needs to be removed from the EA.

C.2. The Forest Service Neglects the Impacts of Cattle Grazing on Plants and Animals in Aspen and Shrub-Dominated Communities

Declines of shrubby vegetation dominated by species such as aspen, serviceberry, chokecherry, and hawthorn are often attributable, not only to lack of fire, but also to browsing and grazing—although without any clear conceptual relationship to succession, as such. Disease and insects also play a role. Of the native herbivores, moose are the most prominent browse-dependent species in the East Paradise area and thrive in areas with abundant browse-worthy species such as serviceberry and aspen—along with a host of birds and insects that benefit from associated structural diversity.

The only evidence-based connection between cattle and "succession" in shrub-dominated vegetation that I know of is highly problematic. There is ample research and other evidence showing that even modest levels of cattle grazing retard recruitment of sprouts in aspen clones—to the detriment of all the birds and mammals that depend upon healthy aspen forests. Localized heavy trampling and browsing by cattle also typically reduces the cover of shrubs such as willow, serviceberry, and hawthorn—again to the detriment of all the animals dependent on browse, cover, or other food provided by vigorous shrub communities. I saw all of this first-hand on our ranch while growing up and have seen the same everywhere I've observed the impacts of cattle grazing in the Yellowstone region.

Given these clear evidentiary patterns, I find it mystifying that the Forest Service did not take a hard and meaningful look at the likely impacts of grazing under Alternatives 2 and 3 on aspen forests and shrub fields and the many species dependent on these communities. Neglect of these impacts is, in fact, even more mystifying given investments made by the Custer-Gallatin National Forests in "restoring" aspen forests.

Recommendation: The Forest Service needs to provide a meaningful assessment of the likely impacts of grazing under Alternatives 2 and 3 on aspen forests and mesic shrub-fields, along with associated impacts on all of the plant and animal species that either depend on or are closely associated with these communities. Moreover, the Forest Service needs to drop the rhetoric of "succession" in application to such an analysis given that it obfuscates more than clarifies such an assessment.

C.3. The Forest Service Analysis of How Cattle Grazing Affects Spread of Weeds and Restoration of Native Species in Inadequate and Obfuscated by Invocations of "Succession"

I have a life-time's experience observing rangelands and the dynamics that affect such herbaceous communities, yet I am completely mystified by the Forest Service's argument espousing the beneficial effects of grazing under Alternatives 2 and 3 on rangeland vegetation, including presumed successional benefits.

There is little doubt that changes in upland and mesic rangelands of Paradise Valley have been dominated by the introduction and spread of non-native plant species—not "succession," as such. Common timothy, smooth brome, Kentucky bluegrass, and yellow sweet-clover are among the palatable non-native species. Cheatgrass and other annual bromes are prominent along the less palatable species. The worst of the weeds include Canada thistle, hounds-tongue, spotted knapweed, leafy spurge, and Dalmatium toadflax, with localized infestations of hoary alyssum, poison hemlock (*Conium maculatum*), and stickseed (*Lappula squarrosa*).

Importantly, ALL of these are non-native species; ALL of the introductions were directly or indirectly tied to the introduction of non-native herbivores, notably cattle; and ALL of these species have proliferated in large part due to historic and on-going cattle grazing. As problematic, and as acknowledged by the Forest Service, once established it is quite difficult to reduce the abundance of these non-native species, much less restore native rangelands.

That having been said, I am not aware of any reliable evidence suggesting that perpetuation of cattle grazing is beneficial when it comes to controlling the weeds and other non-native species that have become so abundant on rangelands in Paradise Valley—or of evidence suggesting that grazing significantly promotes the restoration of native grasses such as bluebunch wheatgrass and Idaho fescue. More certainly, the weight of available evidence supports the benefits of eliminating or reducing rather than perpetuating cattle grazing if the objective is control of weeds and restoration of native vegetation.

Of particular relevance here, none of these dynamics or considerations related to effects of cattle grazing is usefully construed through the lens of "succession." Because of this, I am again mystified by the Forest Service's invocation of cattle grazing as a means of effecting beneficial successional change on rangelands, first, because "succession" doesn't capture the major dynamics and challenges confronting rangeland managers and, second, because the weight of evidence suggests that cattle grazing is more often harmful than beneficial when it comes to limiting the spread of weeds and restoring native grass species. And, to the extent that certain kinds of grazing produce benefits, most goals could likely be achieved by increasing the numbers of native predators such as mountain lions as well as native grazers or mixed-feeders such as elk.

Recommendation: The Forest Service needs to drop the unhelpful and obfuscating rubric of "succession" in its assessment of effects attributable to cattle grazing on rangelands and instead focus on more concrete outcomes such as control of weeds and other non-natives, along with restoration and propagation of native plant and animal species. As important, rather than relying on assertion and the biased and selective invocation of science, the Forest Service instead needs to take a hard look at the weight of available evidence regarding impacts of cattle grazing on rangelands such as those encompassed by the East Paradise allotments.

D. Earlier Stocking of Allotments Poses Big Problems

I remain unclear about the justification for stocking the East Paradise allotments at an earlier date—as early as June 1st. The Forest Service's current presumed justification is that earlier stocking will allow better utilization of palatable non-native grasses, as well as greater "flexibility." Beyond this, the Forest Service also seems to imply that greater utilization will somehow reduce the abundance of common timothy and Kentucky bluegrass, or at least cause substantial structural changes in affected herbaceous communities. There is little said about the potential problems associated with an earlier stocking date, which comes across as a peculiar blind spot. Yet there are substantial potential problems. Moreover, the presumed justification is suspect.

D.1. Earlier Stocking with Cow-Calves Virtually Guarantees Increased Depredation

Calves account for almost all victims of grizzly bear and mountain lion depredation on cattle. And, the younger the calf, the greater the odds of falling victim to these predators—with peak vulnerability of calves lasting up to 5 months of age. Odds of depredation increase yet more if young calves are released into areas where topographic and vegetation cover facilitates ambush predation. Depredation is virtually guaranteed if livestock are then left unattended for weeks on end.

I have seen ample evidence of this perfect storm while researching mountain lions and bears in the Southwest and the Yellowstone region, as well as in my immediate environs along Suce Creek. I came across the remains of two cow calves killed by mountain lions during the last two years alone. There were no indications that these kills had been detected by the livestock owners, who were very little in evidence during the time their cattle grazed the rugged partially forested rangelands in which the depredations occurred.

All of this is relevant to the East Paradise grazing allotments given the extent of ambush cover, the typical husbandry practices of permittees, and the demonstrable presence of mountain lions and, increasingly, grizzly bears. In other words, stocking the East Paradise allotments with cow-calves in June virtually guarantees a depredation problem, even in allotments that have historically not had one.

Even more problematic, the typical resolution of a depredation "problem" entails calling in a houndsman or someone from Wildlife Services to kill predators—often without strategic targeting of perpetrators, especially when dealing with lions. By contrast, I have rarely seen solutions to depredation that involve changing stocking dates or reconfiguring allotment boundaries—much less requiring that permittees exercise better husbandry. The upshot will almost certainly be more dead mountain lions and, prospectively, more dead black and grizzly bears.

Recommendation: The Forest Service needs to drop provisions in Alternatives 2 and 3 for earlier stocking of allotments. Any Alternative that includes grazing also needs to include provisions for strategic fencing to keep cattle away from ambush terrain as well as requirements for closer monitoring of cattle by permittees. I elaborate on some preventative practices in the attached Declaration I wrote as part of litigation contesting Forest Service management of cattle allotments in the Upper Green River area of Wyoming.

D.2. Earlier Grazing Will Likely Harm Native Bunchgrasses and Increase Soil Compaction

The Forest Service seems to imply that cattle released on allotments during June will primarily—if not exclusively—graze non-native grasses such as common timothy. This will clearly not be the case. In addition to grazing palatable non-natives, cattle will also graze any accessible native bunchgrasses, with predictable harm to Idaho fescue and bluebunch wheatgrass given that the vigor of both species is markedly reduced by grazing before seed set, which typically occurs during July-August.

The consequences of early season grazing on retention of native bunchgrasses are evident even in Paradise Valley rangelands subject to comparatively light stocking. Non-native perennial and annual bromes and other grasses tend to flourish in less rugged terrain and in areas nearer water where cattle more often congregate, whereas healthy native grasslands are relegated to steeper terrain. Even in areas where grazing is currently limited to mid- late-summer, the proliferation of non-natives caused by historic early-season grazing persists. This is evident to anyone with training who spends time in upland ranges on either side of Paradise Valley.

Of further relevance, peak spring and early-summer precipitation typifies foothills of Paradise Valley. Soils are more consistently wet during this period and, in turn, more vulnerable to compaction and erosion. As a consequence, any increase in early-season grazing by cattle will likely cause damage to soils, especially in swales, other gentler topography, and loafing areas. The Forest Service acknowledges this impact by suggesting it will "Restrict access to livestock grazing on all allotments when soils are wet," yet fails to clarify how this provision reconciles with an earlier prospective start to the grazing season.

In other words, the weight of evidence suggests that cattle grazing on East Paradise allotments any time prior to July will harm native rangeland vegetation and degrade rangeland soils. Yet the Forest Service fails to provide a coherent analysis of this prospective harm in the two Alternatives that allow for grazing.

Recommendation: The Forest Service needs provide the public with an unbiased and comprehensive analysis of impacts on soils and native vegetation likely to be caused by grazing cattle during June, as well as clear coherent linkage between these impacts and preferred practices. There is little evidence of such an analysis in the current EA. Ideally, all provisions for initiating grazing prior to July would to be dropped from Alternatives 2 and 3.

D.3. The Forest Service Needs to Provide A More Rigorous Analysis of How Early Season Grazing Will or Will Not Affect Non-native Grasses.

The East Paradise EA left me confused about goals related to non-native grasses and the presumed relation between an earlier grazing season and abundance of these species. Common timothy, smooth brome, and Kentucky bluegrass are all invasive non-native species that also happen to be palatable to cattle. But common timothy and smooth brome pose a particular threat to native herbaceous vegetation; both tend to increase with disturbance; and, as the Forest Service acknowledges, both are difficult to control once established.

The East Paradise EA claims that cattle will make greater use of common timothy and Kentucky bluegrass during June compared to later in the year, and that timothy becomes essentially unavailable to cattle after setting seed and curing. This purported pattern seems to be the main reason why the

Forest Service advocates an earlier grazing season, although the EA seems to also suggest that the Forest Service envisages this earlier grazing as a means of reducing the dominance of especially common timothy, stating that "Timothy is particularly sensitive to overgrazing." This purpose is implied by the stated intent under Alternative 3 "…to focus utilization on introduced invasive grasses and provide for maintenance of native perennial grass species."

The Forest Service's claims and preferred management direction are highly suspect, only weakly supported by evidence, and at odds with more compelling evidence for the likely harm that early-season grazing will cause to native plants and animals. Although cattle will more heavily graze timothy prior to entering the joint stage, utilization of this species by cows can occur throughout the summer. There is, moreover, little or no evidence that in the absence of intensive growing-season-long grazing, early-season utilization will reduce the abundance of timothy, smooth brome, or Kentucky bluegrass—or that any of these species are "…particularly sensitive to overgrazing." If anything, the opposite is likely to be true. It is conceivable that some reduction in cover might be achieved by creating a heavy grazing regime through confinement of cattle to select areas dominated by non-native perennial grasses, but with benefits likely accrued only through integration with an intensive restoration program entailing aggressive weed control and reseeding of native species (see my point E, below).

Recommendation: The Forest Service needs to clarify its objectives regarding both utilization and/or control of common timothy and other invasive grass species. More importantly, whatever the objectives, the recommended means of achieving these ends must be evidence-based and plausible. As is, the EA provides none of this. Perhaps more importantly, the Forest Service needs to make unambiguously clear that common timothy, along with species such as smooth brome and Kentucky bluegrass, are non-native invasive species that pose a threat to native species, and that effective control of these non-native species should be made a priority.

E. Reclamation of Disturbed Areas and Restoration of Native Vegetation Should Be A Priority Management Goal for East Paradise Allotments

The East Paradise Allotment plan should, indeed, elevate the goal of controlling weeds and invasive non-natives and restoring native rangelands to top priority. As important, any adopted management alternative should include methods and actions commensurate with achieving this goal.

The EA does claim to make control of weeds a priority as prelude to then describing a weed control program based largely on use of herbicides. This program is de facto represented as being effective. I know for a fact that it is not, despite well-intentioned efforts on the part of the Forest Service. Of particular relevance to the Suce Creek allotment, Canada thistle, houndstongue, poison hemlock, and hoary alyssum have continued to proliferate 18 years after the cessation of grazing despite periodic scatter-shot spraying and even hand-pulling. The point here is that weed control efforts need to be dramatically increased and improved if meaningful progress is to be made—even in the absence of grazing.

The only other measure offered by the EA for controlling non-native invasives is an earlier start to the grazing season, with the presumed effect of reducing coverage through greater utilization. I address the implausibility, likely ineffectiveness, and probable collateral damage of this approach above. In other

words, the problems posed by non-native invasive grasses will likely persist unabated with prescriptions entailed by Alternative 3.

Clearly, control of weeds and non-native grasses and related restoration of native pastures poses a major challenge that will require substantial investments in remediation—far in excess of anything being proposed under any alternative in the EA. Moreover, perpetuating, much less propagating, cattle grazing on the East Paradise allotments almost certainly works against the goal of restoration.

Recommendation: The management plan adopted for East Paradise allotments needs to include measures that will lead to meaningful restoration of native pastures and rangelands. At a minimum, these should include an augmented program that includes the strategic deployment of biocontrol agents, chemicals, and mechanical treatments, coupled with aggressive propagation of native species in effectively-treated areas without viable seed sources. Continued cattle grazing should, moreover, not be allowed.

F. The Forest Service Fails to Assess Impacts of Cattle on Recreationists and Recreationists on Cattle

The Forest Service's treatment of potential conflicts between recreationist and cattle is a curious cypher, and amounts to little more than "The area provides many recreation opportunities, and some areas have high visitation. Some individuals may react negatively to the presence or interactions with cattle on the landscape. However, these are not new conditions or experiences. The proposal does not change any recreation opportunities." At which point the entire issue is dismissed out of hand.

This treatment constitutes breath-taking indifference to a potentially major issue and, moreover, evinces an almost willful disregard for trends in recreational activity that have been evident for over a decade, with dramatic acceleration during the last 5 years. There is certainly no evidentiary basis for dismissively claiming that only "Some individuals may react negatively to the presence or interactions with cattle on the landscape. However, these are not new conditions or experiences." How does the Forest Service know this? Where is its evidence? Have recreationists using the East Paradise allotments been surveyed? Did the EA author(s) even bother to consult the Forest Service's own analyses of trends in recreation, most notably the report recently prepared in support of the Revised Custer-Gallatin National Forests Land Management Plan? As important, the Forest Service altogether fails to acknowledge or address the potential impacts of recreationists on free-ranging cattle.

These concerns are set against the backdrop of dramatic increases in numbers of recreationists using the Custer-Gallatin National Forests, as well as equally dramatic changes in the nature of this use—all of which applies to the East Paradise grazing allotments. The increasing numbers of backcountry recreationists are typified by a greater proportion engaging in activists that are guaranteed to increase conflicts with and over cattle.

For one, there are a lot more people mountain biking, whether reckoned proportionately or in shear numbers. Mountain bikers travel silently and at high speed, which will almost certainly lead to increasing numbers of surprise encounters with cattle, with attendant predictable increases in hazards for the involved people as well as disturbance of the involved cows.

For another, an increasing proportion of users are not only participating in day hikes, but also accompanied by dogs. This greater presence of dogs is likewise guaranteed to result in increased

conflicts marked by greater disturbance of cattle. And I'm sure that most of the involved day-hikers, many comparative new-comers to the region, will, in fact, "react negatively," protestations of the Forest Service notwithstanding.

These are not trivial issues, which makes the Forest Service's dismissive treatment in the East Paradise EA all the more striking as well as puzzling.

Recommendation: The Forest Services needs to undertake a good-faith assessment of potential conflicts between recreationists and cattle set against critical scrutiny of trends in levels as well types of backcountry use. The presence of dogs and mountain bikers deserves particular attention.

G. The Forest Service Needs to Clarify Its Approach to Managing the Suce Creek Allotment

The Forest Service describes the Suce Creek allotment as a "temporary forage reserve" that will be utilized at the discretion of managers, but in particular when cattle are displaced from other allotments by drought—among other factors. Even so, I remain unclear about the impacts of this practice, as well as the constraints and policies governing its implementation.

As the Forest Service acknowledges, the Suce Creek allotment consists largely of rugged terrain and dense native forests, much of which is included in the Absaroka-Beartooth Wilderness Area. Rangeland and pastures are limited to a small area of bottomland and steeper south-facing slopes. The bottomland was used as a loafing area by cattle prior to 2012 and heavily impacted by this past grazing. Native vegetation has still not recovered from the effects 18 years after grazing ended. These pastures remain dominated largely by non-native invasive grasses and plagued by infestations of weeds. To date, Forest Service treatments have resulted in few lasting gains. The south-facing slopes are in much better condition, support diverse and vigorous native vegetation, but are typified by carbonate-derived finer-grained soils that are vulnerable to the impacts of trampling.

The point of all this is pretty straight-forward. There are limited grazing resources in this allotment, largely confined either to sites that are vulnerable to the impacts of grazing cattle or to bottomland pastures that are in need of more aggressive restoration efforts—not additional grazing.

Which brings me to my concerns and questions regarding how the Suce Creek allotment will be managed as a "temporary forage reserve."

First of all, I assume that even under emergency situations created by fire, drought, or administrative exigencies that stocking levels for the Suce Creek allotment under Alternative 3 will be limited to 177 AUMs, with an end date of no later than October 15th. Is this correct? If so, this basic fact needs to be made clear. And, if so, does this mean that >38 cattle will be stocked if dumped there during an abbreviated grazing season elsewhere caused by drought?

If so, how will these AUMs be allocated to permittees of other allotments under emergency conditions, especially if the Sixmile North allotment is impacted? What does this adjudication/prioritization process look like, in particular when drought conditions are affecting all of the routinely stocked allotments? This needs to be clarified.

Finally, the Forest Service needs to address the likely impacts of placing the maximum permissible number of cows on the Suce Creek allotment under circumstances where this allotment is also being affected by drought. Aside from wildfire burning a routinely stocked allotment, regional drought is the

most likely reason why cattle would be relocated from other allotments to the Suce Creek "forage reserve." Yet under these conditions the Suce Creek allotment would be most vulnerable to grazing impacts. How does this get reconciled?

Recommendation: The Forest Service needs to clarify how it will allocate access by permittees to the Suce Creek "forage reserve" under emergency conditions. It furthermore needs to adequately assess the likely effects of placing cattle on the Suce Creek allotment during a drought, with likely impacts to sensitive sites and pastures with persisting impacts from past grazing.

H. The Forest Service Needs to Clarify How Utilization Standards Address Likely Impacts of Grazing

Under Alternative 3, the Forest Service proposes to seasonally regulate grazing by monitoring utilization of upland and riparian pastures, with allowance for 35-40% use of upland vegetation and 20,30-50% use of riparian vegetation. But, as described in the EA, these provisions raise several questions.

As the EA's author(s) have stated, the East Paradise grazing allotments are rugged, and most are forested. As a consequence, even on the Sixmile North grazing allotment, cattle will tend to be concentrated on lower slopes and bottomlands, with impacts disproportionately incurred on these sites. Loafing areas will be predictably hardest hit.

Which brings me to some questions:

1. Is utilization averaged over an entire allotment, albeit with uplands differentiated from riparian areas?
2. Is there any provision for detecting and limiting grazing impacts on areas subject to disproportionately heavy use by cattle, such as swales, low-slopes, and non-riparian bottomlands?
3. What is or is not considered to be forage, and thus subject to monitoring?
4. Does this include understory herbaceous vegetation in more open upland forests that are less likely to be used by cattle?
5. Aside from strategically locating salt blocks, what is required of permittees to insure a more uniform distribution of grazing—assuming this would be desirable?
6. Are there any provisions for lower levels of use on sites that still support healthy stands of native grasses such as Idaho fescue and bluebunch wheatgrass?

It would be helpful if the Forest Service could provide information in the East Paradise EA that addresses these questions.

Recommendation: The Forest Service needs to provide more information in the East Paradise EA on how it will implement monitoring of forage utilization on East Paradise grazing allotments, including provisions for protecting vulnerable sites and vegetation. The interested public should not be burdened with seeking out, understanding, and applying protocols and practices buried in ancillary Forest Service handbooks that guide how the agency monitors vegetation utilization in mountain and foothill rangelands.

I. The Forest Service's Assessment of Potential Impacts on Grizzly Bears is Inadequate

The Forest Service's assessment of how Alternatives 2 and 3 will likely impact grizzly bears in patently inadequate. The EA's relevant conclusions are based almost exclusively on the fact that the East Paradise grazing allotments have not experienced any depredation in the past; the blithe assumption that relevant environmental conditions have remained unchanged; the equally blithe assumption that grizzly bear numbers, distributions, and food habits have also remained unchanged; and complete disregard for the larger geospatial context of grizzly bear recovery. None of this is warranted.

Most of the cone-producing whitebark pine in the Gallatin Range and in the Absaroka Mountains adjacent to the East Paradise grazing allotments were killed by an outbreak of mountain pine beetles between 2000 and 2010. Losses of mature whitebark pine ecosystem-wide have probably amounted to around 70%. By all indications, loss of this critically important food source for bears resulted in increasing reliance by grizzlies on meat from large ungulates, coincident with declines in regional elk populations, and rapid expansion of grizzly bears into peripheral areas, including the Absaroka Mountains.

This increased reliance on meat coincident with expansion into grazing allotments on public lands has resulted in an exponential increase in conflicts resulting from grizzly bear depredation on cattle wherever the two phenomena have gone hand-in-hand. The first areas to be affected were the Upper Green River allotments in Wyoming, followed by allotments in the Owl Creek Mountains, and, locally, private lands in Tom Miner Basin. More recently conflicts have escalated on allotments in the Gravelly Mountains of Montana.

The main point here is that the past offered no clues regarding what the future might hold in all of these areas, at least insofar as grizzly bear depredation on cattle was concerned. And once depredations started to occur, the trend was exponential, leaving managers and permittees scrambling to find solutions, all in an arena typified by intense conflict among stakeholders. In all these instances, managers failed to exercise foresight or anticipatory prudence—largely because the past held few lessons.

But this excuse does not apply to Forest Service managers responsible for East Paradise grazing allotments. At this point in time there is ample past experience and evidence to be drawn on for assessing likely future levels of cattle depredation by grizzly bears on the East Paradise grazing allotments. Given the increasing number of grizzly bears observed in this area and the experiences of livestock producers in Tom Miner Basin, there is every reason to anticipate that grizzly bears will predate on cattle in the East Paradise area, especially if the Forest Service adopts an earlier grazing season under Alternative 3 that entails the release of cattle with calves <5 months old (see my point D, above).

The unfortunate consequence of such dynamics is, not only that cattle die from depredation, but also that grizzly bears die. In fact, the ratio of grizzly bear to cattle deaths as a result of depredation in the Yellowstone region is not that different from 1:2. And, increasingly, adult female bears are among the toll, which is relevant to the East Paradise allotments given that females with cubs have been documented in nearby areas. The upshot of this is that Alternative 3 will almost certainly negatively affect grizzly bears—with the same likely to hold for Alternative 2 as well.

The location of the Absaroka Mountains lends even greater weight to the significance of any grizzly bear losses from depredation-related conflicts on East Paradise grazing allotments. The Absarokas have repeatedly been identified as a key part of connective habitat potentially linking grizzly bears in the Greater Yellowstone Ecosystem to grizzly bears in the Northern Continental Divide Ecosystem through the Crazy, Castle, and Little Belt Mountains. Which is to say that the costs to long-term recovery entailed by grizzly bears deaths in the Absaroka Mountains are proportionately greater than costs entailed by deaths closer to the center of the ecosystem. This alone should give Forest Service managers pause.

All of the dynamics that I describe here are more fully explicated in the attached declaration I submitted in support of litigation contesting current management plans for the Upper Green River allotments on the Bridger-Teton National Forest in Wyoming.

Recommendation: The Forest Service needs to take a hard evidence-based look at impacts to grizzly bears likely to result from adopting Alternatives 3 and 2, together with a realistic appraisal of benefits for grizzly bear conservation likely to arise from adopting Alternative 1.

J. The EA Does Not Adequately Account for the Harm Likely to Be Caused to Native Wildlife by Implementing Alternatives 2 and 3

As written, the East Paradise EA provides a pro forma assessment of how cattle grazing under Alternatives 2 and 3 will impact native wildlife. And, indeed, this assessment is only pro forma at best.

Importantly, the EA altogether fails to consider how prospective grazing will impact native amphibians, insects, and birds, especially through effects on shrub communities, aspen stands, riparian vegetation, ground stubble, and localized heavy impacts to vegetation and soils on lower slopes and in swales. These animals are all important elements of biodiversity.

The EA is also unduly dismissive of how grazing likely affects elk and native predators such as mountain lions. Indeed, the weight of available evidence suggests that the impacts of cattle grazing in environments such as those typifying the East Paradise allotments are significant, both by reducing forage for over-wintering elk, by displacing elk during the calving and grazing seasons, and, under Alternative 3, by intermixing vulnerable cow-calves with predating mountain lions.

The mere presence of elk, especially on and near the Sixmile North allotment, introduces a dynamic of relevance to mountain lions. Elk often calve near winter ranges, usually between mid-May and mid-June. Elk calves are a favored prey of lions during this period. After calving season, lions typically do not decamp from calving areas and winter ranges to follow elk as they migrate to summer ranges, but rather locally switch to other prey, often deer—but inclusive of whatever vulnerable prey may be locally available.

There are significant implications of all this for grazing proposed under Alternative 3. An early June stocking date would impose impacts on calving elk, at a time when cow elk are already experiencing multiple stresses. An early stocking date would, moreover, place vulnerable cow-calves in habitats being actively used by lions to hunt elk calves, with probable spill-over risks for the cow-calves. Cow-calves would also be candidate alternate prey for lions during late June and early July after the majority of elk vacate winter ranges and calving areas.

Recommendation: The Forest Service needs to provide a good-faith, evidence-based, adequately comprehensive analysis of impacts to the full spectrum of wildlife likely to arise from grazing, especially as proposed under Alternative 3. There is little of this evident in the current EA.

K. Of the Current Alternatives, Alternative 1 Best Serves the Broader Public Interest

Alternatives 2 and 3 primarily serve the purpose of providing a handful of permittees the opportunity to graze public lands under provisions that entail heavy subsidies from American taxpayers. The weight of evidence also conclusively shows (as per my points above) that this grazing will likely lead to continued diminishment of native vegetation; adversely impact a wide variety of wildlife; play little or no role in controlling non-native invasive grasses; contribute to impaired experiences of wildlands by a large number of recreationists; and be typified by conflicts organized around depredation and people on mountain bikes or accompanied by dogs. There are few public benefits from these Alternatives, whereas the prospective costs are high.

By contrast, Alternative 1 clearly better serves the broader public interest and better fulfills the public trust held by the Forest Service. The Forest Service describes presumed problems associated with adopting Alternative 1, including the deadly progression of "succession" and the inevitable persistence of non-native invasive grasses. Yet this characterization is implausible. Grazing will not appreciably change any aspects of forest and shrubland succession, which will continue to be driven primarily by natural disturbances such as wildfire, disease, and insects. There is similarly little reason to think that grazing will reduce the abundance of weeds or non-native grasses, and ample reason to think that grazing will do the opposite. Elk and other native wildlife will continue to introduce ground level disturbances that will likely enhance biodiversity better than patterns of use and disturbance that typify cattle grazing.

Moreover, despite the fact that the East Paradise allotments were preserved when the Absaroka-Beartooth Wilderness Area was designated, it is almost certainly the case that Alternative 1 will serve the interests of a large number of people by preserving and enhancing the wilderness character of existing allotments, compared to the interests of a trivially small number of permittees served by grazing allowed under Alternatives 2 and 3.

Recommendation: At a minimum, the Forest Service needs to adopt Alternative 1 for future management of the East Paradise grazing allotments (but see my following point L).

L. The Forest Service Needs to Develop and Seriously Consider an Additional Alternative That Retires All Allotments and Features an Aggressive Program for Restoring Native Vegetation

Of the existing Alternatives, Alternative 1 is clearly the most desirable for a large number of reasons. However, the EA fails to offer an Alternative that probably best serves the broader public interest: one that not only permanently retires all of the East Paradise grazing allotments, but also features an aggressive well-resourced program for controlling weeds, reducing the dominance of non-native invasive grasses, and promoting the restoration of native vegetation.

The Forest Service clearly has ample funds to support building and maintaining roads and subsidizing below-cost timber sales and grazing. The funding required to make substantial progress restoring native vegetation in the East Paradise allotments would be comparatively trivial, even if such a program included a diversity of control and propagation efforts. Ideally, a restoration program would use

biocontrol agents in additional to mechanical and chemical treatments. But reseeding and other revegetation designed to promote native species would also be critical features.

Recommendation: The Forest Service needs to substantially revise the EA by developing and seriously considering an alternative that best serves the public interest through not only the permanent retirement of all East Paradise grazing allotments, but also through featuring an aggressive well-resourced program for restoring native vegetation and controlling weeds as well as invasive non-native grasses.

If you have any questions about the issues I raise here, please feel free to contact me through the information I provide in my covering email.

Sincerely

David J. Mattson, Ph.D.