August 05, 2019

David Whittekiend
Uinta-Wasatch-Cache Forest Supervisor
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South Jordan, UT 84095

Re: Comments on the High Uintas Domestic Sheep Analysis Project

Dear David,

The undersigned conservation organizations are providing these comments in response to the June 25, 2019 Notice of Release of the Draft Environmental Impact Statement (DEIS) for the High Uintas Wilderness Domestic Sheep Analysis Project. These parties have previously submitted scoping comments in response to the May 2014, December, 2015 and February 2016 Scoping Notices. A relevant subset of these scoping comments are included as an attachment to these comments, since we have come to the conclusion that our scoping comments were more-or-less ignored by the USFS in this NEPA process. As such, we are noting this and including them here again to make sure this problem is noted in the project record.

Below we detail some concerns we have with the analysis of the proposed action. Our chief comments are organized into the following categories:

I. The USFS has generally failed to address domestic sheep grazing in the Hugh Uintas wilderness in the context of pending climate change

II. Issues relating to Bighorn sheep and risk of contact with domestic sheep

III. Issues relating to wilderness qualities and values

IV. Appropriateness of sheep grazing within important lynx habitat

V. Overgrazing of domestic sheep in the wilderness

I. The USFS has generally failed to address domestic sheep grazing in the Hugh Uintas wilderness in the context of pending climate change

The DEIS makes only a single mention of climate change and this is in relation to conifer encroachment in willow communities (DEIS p71). Thus acknowledging that climate change is real, the DEIS never mentions it again or in connection with Forest Management, in this case grazing of domestic livestock in the Ashley and Uinta Wasatch Cache National Forests and in the allotments in question along with the other allowed or permitted activities cumulatively

affect wildlife, habitats, watersheds, soils and carbon sequestration. Domestic sheep grazing in these and other allotments in these Forests remove vegetation and its associated stored carbon, generate greenhouse gases, accelerate soil erosion and thereby the accelerated loss of carbon from the soils.

The livestock industry's contribution to greenhouse gases also includes CO_2 released by conversion of forests to grasslands for the purpose of grazing.[1] Worldwide, livestock production accounts for about 37 percent of global anthropogenic methane emissions and 65 percent of anthropogenic nitrous oxide emissions with as much as 18% of current global greenhouse gas emissions (CO_2 equivalent) generated from the livestock industry.[2] Nitrous oxide, 300 times more potent than methane in trapping greenhouse gases, is also produced and released with livestock production.[3] It is estimated that livestock production, byproducts, and other externalities account for 29.5 billion metric tons of CO_2 per year or 51 percent of annual worldwide greenhouse gas emissions from agriculture.[4] Gerber, et al., 2013 state, "Livestock producers, which include meat and dairy farming, account for about 15 percent of greenhouse gas emissions around the world. That's more than all the world's exhaust-belching cars, buses, boats, and trains combined."[5] Saunois et al. (2016a) note "the recent rapid rise in global methane concentrations is predominantly biogenic—most likely from agriculture—with smaller contributions from fossil fuel use and possibly wetlands. …Methane mitigation offers rapid climate benefits and economic, health and agricultural co-benefits that are highly complementary to CO_2 mitigation."[6]

It is estimated that three times as much carbon resides in soil organic matter as in the atmosphere[7], while grasslands and shrublands have been estimated to store 30 percent of the world's soil carbon with additional amounts stored in the associated vegetation.[8] Long term intensive agriculture can significantly deplete soil organic carbon[9] and past livestock grazing in the United States has led to such losses[10, 11]. Livestock grazing was also found to significantly

[1] R. Goodland and J. Anhang. 2009. Livestock and climate change. World Watch, vol. 22, no. 6, pp. 10–19.
[2] H. Steinfeld, P. Gerber, T. Wassentaar, V. Castel, M. Rosales, and C. de Haan. 2006. Livestock's Long Shadow, Food and Agriculture Organization of the United Nations. Rome, Italy, 2006.
[3] Environmental Protection Agency, "Climate change overview of nitrous oxide," 2013, http://epa.gov/climatechange/ghgemissions/gases/n2o.html.
[4] L. Reynolds. 2013. Agriculture and livestock remain major sources of greenhouse gas emissions. http://www.worldwatch.org/agriculture-and-livestock-remain-major-sources-greenhousegas-emissions-1.
[5] Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. 2013. Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome.
[6] Saunois M., R. B. Jackson, P. Bousquet, B. Poulter and J. G. Canadell; 2016a. The growing role of methane in anthropogenic climate change. EDITORIAL Environ. Res. Lett. v11 (2016) 120207.
[7] R. R. Allmaras, H. H. Schomberg, J. Douglas C.L., and T. H. Dao. 2000. Soil organic carbon sequestration potential of adopting conservation tillage in U.S. croplands. Journal of Soil and Water Conservation, vol. 55, no. 3, pp. 365–373, 2000.
[8] J. Grace, J. S. Jose, P. Meir, H. S. Miranda, and R. A. Montes. 2006. Productivity and carbon fluxes of tropical savannas. Journal of Biogeography, vol. 33, no. 3, pp. 387–400.
[9] D. K. Benbi and J. S. Brar. 2009. A 25-year record of carbon sequestration and soil properties in intensive agriculture. Agronomy for Sustainable Development, vol. 29, no. 2, pp. 257–265.
[10] R. F. Follett, J. M. Kimble, and R. Lal, Eds. 2001. The Potential of US Grazing Lands to Sequester Carbon and Mitigate the Greenhouse Effect. Lewis Publishers, Boca Raton, Fla, USA.

reduce carbon storage on Australian grazed lands while destocking currently grazed shrublands resulted in net carbon storage.[12] Livestock-grazed sites in Canyonlands National Park, Utah, had 20% less plant cover and 100% less soil carbon and nitrogen than areas grazed only by native herbivores.[13] Declines in soil carbon and nitrogen were found in grazed areas compared to ungrazed areas in sage steppe habitats in northeastern Utah. As grazing intensity increased, mycorrhizal fungi at the litter/soil interface were destroyed by trampling, while ground cover, plant litter, and soil organic carbon and nitrogen decreased. [14] A review by Beschta et al. determined that livestock grazing and trampling in the western USA led to a reduction in the ability of vegetation and soils to sequester carbon and also led to losses in stored carbon.[15]

A landmark report from the United Nations' scientific panel on climate change paints a much darker picture of the immediate consequences of climate change than previously thought and says that avoiding the damage requires transforming the world economy at a speed and scale that has "no documented historic precedent." [16] The report, issued late last year by the Intergovernmental Panel on Climate Change, a group of scientists convened by the United Nations to guide world leaders, describes a world of worsening food shortages and wildfires, and a mass die-off of coral reefs as soon as 2040—a period well within the lifetime of much of the global population.

The report "is quite a shock, and quite concerning," said Bill Hare, an author of previous I.P.C.C. reports and a physicist with Climate Analytics, a nonprofit organization. "We were not aware of this just a few years ago." The report was the first to be commissioned by world leaders under the Paris agreement, the 2015 pact by nations to fight global warming. The authors found that if greenhouse gas emissions continue at the current rate, the atmosphere will warm by as much as 2.7 degrees Fahrenheit (1.5 degrees Celsius) above preindustrial levels by 2040, inundating coastlines and intensifying droughts and poverty. Previous work had focused on estimating the damage if average temperatures were to rise by a larger number, 3.6 degrees Fahrenheit (2 degrees Celsius), because that was the threshold scientists previously considered for the most severe effects of climate change. The new report, however, shows that many of those effects will come much sooner, at the 2.7- degree mark.

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[11] C. Neely, S. Bunning, and A. Wilkes. 2009. Review of evidence on drylands pastoral systems and climate change: implications and opportunities for mitigation and adaptation. Land and Water Discussion Paper 8, Food and Agriculture Organization of the United Nations, Rome, Italy.

[12] S.Daryanto, D. J. Eldridge, andH. L.Throop. 2013. Managing semiarid woodlands for carbon storage: grazing and shrub effects on above and belowground carbon. Agriculture, Ecosystems and Environment, vol. 169, pp. 1–11.

[13] D. P. Fernandez, J. C.Neff, and R. L. Reynolds. 2008. Biogeochemical and ecological impacts of livestock grazing in semi-arid southeastern Utah, USA. Journal of Arid Environments, vol. 72, no. 5, pp. 777–791.

[14] J. Carter, B. Chard, and J. Chard. 2010. Moderating livestock grazing effects on plant productivity, carbon and nitrogen storage. in Proceedings of the 17th Wildland Shrub Symposium, T. A. Monaco et al., Ed., pp. 191–205, Logan, Utah, USA.

[15] R. L. Beschta, D. L. Donahue, A. DellaSala et al. 2012. Adapting to climate change on western public lands: addressing the ecological effects of domestic, wild, and feral ungulates. Environmental Management, vol. 51, no. 2, pp. 474–491.

[16] Kala, J., Hoegh-Guldberg, O., Tschakert, P., Newman, P. 2018 Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emissions pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/sr15/ . Accessed July 29, 2019.

In its DEIS, the Forest Service totally ignores the potential impacts of this change, including but not limited to, the effects and consequences of permitting livestock grazing. Timber harvests, road density and off-road vehicle use being allowed in the Forests and other management actions such as oil and gas, pipelines and so on also are integral to this problem.

The USDA, in its Committee of Scientists Report recognize the importance of forests for their contribution to sustainability and contributing to global carbon cycles and that preservation of plants, animals and habitats should be the first priority in managing Forest Service natural resources.[17] The 2011 draft NFMA regulations recognize that forests provide "Benefits… including… Regulating services, such as long term storage of carbon; climate regulation…"

How can this national forest be considered "suitable" for activities that contribute to—rather than reduce—the greatest threat to the Earth's biosphere? The present level of CO_2 in Earth's atmosphere is already dangerous and not sustainable under any definition of the word. Typical of FS NEPA documents, the DEIS has no analysis of the project's carbon budget. It is clear that the management of the planet's forests is a nexus for addressing this huge crisis of our times. Yet the DEIS fails to even disclose the amount of CO_2 emissions created by Forest Plan or project implementation, or consider the best available science on the topic. This is immensely unethical.

The FS has never analyzed and disclosed the cumulative effects of overall agency management contributions to the reduction in stored carbon and thus, to climate change. The DEIS fails to provide comprehensive estimates of the total amount of CO_2 or other greenhouse gas emissions caused by FS management actions and policies—forestwide, regionally, or nationally. The DEIS fails to quantify CO_2 and other greenhouse gas emissions from several other common human activities related to forest management and recreational uses. These include emissions associated with machines used for logging and associated activities, removal of carbon stored in trees and vegetation by logging and so-called "vegetation treatments", vehicle use for administrative actions, recreational motor vehicles, and most emissions associated with livestock grazing, including loss of carbon stored in vegetation as it is consumed, and soils as they erode. The Forest Service is simply ignoring the impacts of these management and other authorized activities.

An analysis[18] of the carbon footprint of off-road vehicles in California determined that:

- Off-road vehicles in California currently emit more than 230,000 metric tons — or 5000 million pounds — of carbon dioxide into the atmosphere each year. This is equivalent to the emissions created by burning 500,000 barrels of oil. The 26 million gallons of gasoline consumed by off-road vehicles each year in California is equivalent to the amount of gasoline used by 1.5 million car trips from San Francisco to Los Angeles.
- Off-road vehicles emit considerably more pollution than automobiles. According to the

[17] USDA. 1999. Sustaining the People's Lands. Recommendations for Stewardship of the National Forests and Grasslands into the Next Century. Committee of Scientists March 15, 1999. Accessed on July 28, 2019. https://www.fs.fed.us/emc/nfma/includes/cosreport/Committee%20of%20Scientists%20Report.htm

[18] Kassar, Chris and Paul Spitler, 2008. Fuel to Burn: The Climate and Public Health Implications of Off-road Vehicle Pollution in California. A Center for Biological Diversity report, May 2008.

California Air Resources Board, off-road motorcycles and all-terrain vehicles produce 118 times as much smog-forming pollutants as do modern automobiles on a per-mile basis.

- Emissions from current off-road vehicle use statewide are equivalent to the carbon dioxide emissions from 42,000 passenger vehicles driven for an entire year or the electricity used to power 30,500 homes for one year.

Another study[19] provides data on the amount of fossil fuel being consumed by snowmobiles in Montana, from which one can calculate the carbon footprint. The study finds that resident snowmobilers burn 3.3 million gallons of gas in their snowmobiles each year and a similar amount of fuel to transport themselves and their snowmobiles to and from their destination. Non-residents annually burn one million gallons of gas in snowmobiles and about twice that in related transportation. So that adds up to 9.6 million gallons of fuel consumed in the pursuit of snowmobiling each year in Montana alone. Multiply that by 20 pounds of carbon dioxide per gallon of gas (diesel pickups emit 22 pounds per gallon) and snowmobiling releases 192 million pounds (96 thousand tons) of climate-warming CO_2 per year into the atmosphere.

Kutsch et al., 2010[20] provide an integrated view of the current and emerging methods and concepts applied in soil carbon research. They use a standardized protocol for measuring soil CO_2 efflux, designed to improve future assessments of regional and global patterns of soil carbon dynamics. The authors state:

> *Excluding carbonate rocks, soils represent the largest terrestrial stock of carbon, holding approximately 1,500 Pg C in the top metre. This is approximately twice the amount held in the atmosphere and thrice the amount held in terrestrial vegetation. Soils, and soil organic carbon in particular, currently receive much attention in terms of the role they can play in mitigating the effects of elevated atmospheric carbon dioxide (CO_2) and associated global warming. Protecting soil carbon stocks and the process of soil carbon sequestration, or flux of carbon into the soil, have become integral parts of managing the global carbon balance. This has been mainly because many of the factors affecting the flow of carbon into and out of the soil are affected directly by* ***land-management practices****. (Emphasis added.)*

Rather than allow continued grazing by up to 40,000 domestic sheep in the sensitive watersheds and soils of the Uinta Wilderness, the Forest Service should be engaged in reversing soil erosion, restoring plant productivity to potential and restoring damaged watershed function. This can best be accomplished by terminating grazing these domestic sheep in these and adjacent allotments such as West Fork Blacks Fork.

A further, and normally overlooked aspect has to do with the Forest Services' obligation to consider other factors such as connectivity of habitats. Grazing of domestic sheep and other

[19] Sylvester, James T., 2014. Montana Recreational Off-Highway Vehicles Fuel-Use and Spending Patterns 2013. Prepared for Montana State Parks by Bureau of Business and Economic Research, University of Montana. July 2014.

[20] Kutsch, Werner L. Michael Bahn and Andreas Heinemeyer, Editors, 2010. Soil Carbon Dynamics: An Integrated Methodology. Cambridge University Press.

Forest management actions described above fragment already fragmented habitats and corridors for lynx, wolverine, deer, elk, grizzly bears and other wildlife. It is necessary to provide analysis, standards, mitigations and other on-ground measures such as road crossings, overpasses, road closures, closure of areas to ohvs/snowmobiles, livestock grazing, trapping and limiting noise levels to enable these and other animals that rely on migration, habitat security and capability to be allowed to do so. For example, since climate change is such a central part of these species fate as evidenced in the cited court ruling and papers in another section of these comments related to wolverine, the Forest Service should address its own Roadmap to address climate change. Recognizing the current and coming changes to climate with longer, drier periods and drought, the Forest Service has implemented a Roadmap to address climate change[21]. This roadmap provides guidance to the agency, including, but not limited to:

- Assess vulnerability of species and ecosystems to climate change
- Restore resilience
- Promote carbon sequestration
- Connect habitats, restore important corridors for fish and wildlife, decrease fragmentation and remove impediments to species migration.

To date, in project after project, we have not seen the Forest Service cite or adhere to these principles in any project EA or EIS. This project is no exception.

In addition, the National Fish, Wildlife and Plants Climate Adaptation Strategy proposed by the Fish and Wildlife Service, NOAA Fisheries and the American Fish and Wildlife Association describes climate change effects and emphasizes conservation of habitats and reduction of non-climate stressors to help fish and wildlife adapt.[22] The Forest Service must address conservation of habitats and reduction of non-climate stressors such as the habitat degradation from livestock grazing, including soil loss, plant communities shifting to increasers or weeds to help fish and wildlife adapt in accordance with the National Fish, Wildlife and Plants Climate Adaptation Strategy. Instead, the Forest Service announces and approves project after project that further destroys habitat and connectivity with no complete analysis of cumulative effects and no actions to recover lost habitats and connectivity.

II. Issues relating to Bighorn sheep and risk of contact with domestic sheep

The Forest Service May Not Abdicate its Responsibility to Comply With Agency Policy

The Forest Service acknowledges that the proposed alternative would include the authorization of grazing on allotments that pose a significant risk to bighorn sheep, a Region 4 Sensitive Species, but the Forest Service contends that authorized grazing on BLM lands and domestic sheep grazed on private lands likewise puts bighorn sheep at risk, so the additional risk posed by

[21] USDA. 2010. National Roadmap for Responding to Climate Change. 30p. www.fs.fed.us/climatechange/pdf/roadmap.pdf
[22] https://www.wildlifeadaptationstrategy.gov/

grazing on Forest Service lands is inconsequential. This argument is logically inconsistent, and inconsistent with Forest Service policy, Forest Plan direction, and the National Forest Management Act. Further, this argument was thoroughly addressed during litigation relating to the Payette National Forest's Bighorn Sheep Viability Plan Amendment.

The Forest Service is required to coordinate the conservation of Sensitive Species with other agencies (FSM 2670.22). The Forest Service is not authorized to coordinate the destruction of populations of native species where commercial interests would benefit from such destruction, and the Forest Service cannot abdicate the agency's responsibilities to other federal or state agencies, or to private landowners, even in the event that coordination done with the goal of Sensitive Species conservation fails to mitigate risks from other sources. As such, instead of dismissing the risks posed to bighorn sheep by Forest Service allotments due to those posed by BLM allotments and private lands, the Forest Service should be coordinating with BLM and with state wildlife agencies in Utah and Wyoming to address risks posed by domestic sheep outside of the Forests. In the absence of such coordination, the Forest Service must nevertheless comply with NFMA, NEPA, and Forest Service policy.

The Forest Service's flawed argument that it need not mitigate risks on Forest Service lands because risks occur on BLM lands would enable BLM to adopt a similar position, where BLM officials could dismiss their own obligations to protect bighorn sheep, contrary to BLM policy, and authorize high risk grazing due to the risks posed by Forest Service grazing and private lands. The circular logic presented by the Forest Service, wherein federal agencies may collude to avoid following agency policies requiring the conservation of species on their respective lands, is unreasonable.

The Forest Service's dismissal of the risks posed to bighorn sheep populations from Forest Service authorized activities due to the presence of domestic sheep on private lands incentivizes the decimation of native species by livestock producers, timber companies, and others. Following this logic to its natural conclusion, anywhere domestic livestock allotments would be subject to scrutiny and potential mitigation actions due to the presence of species listed as Sensitive, a domestic livestock producer need only create a high risk situation on private lands to ensure the availability of public lands grazing. This would also mean that the Forest Service would never act to protect Sensitive wildlife populations where any other source of risk exists for that species, or where the presence of risks is unknown but cannot be decisively asserted to be zero. Taken together, these factors would lead to the rapid decline and local extirpation of species the Forest Service is mandated to protect, precisely because the Forest Service has identified their viability as of concern. This is likewise unreasonable.

The argument regarding the presence of risk from other sources was settled within the Payette National Forest Plan Amendment for Bighorn Sheep Viability NEPA assessment and subsequent litigation. Because bighorn sheep already exposed to domestic sheep pathogens respond to new strains of those pathogens just as naive sheep would, and because the pathogen strains rapidly evolve, risk from each pathogen source compounds the overall risk to bighorn sheep populations. Mitigation of one source of risk, even where others remain, nevertheless reduces overall risk to a population. The Forest Service is required to mitigate known risks originating from Forest Service activities, regardless of other potential sources of risk.

From the Payette National Forest Plan Amendment for Bighorn Sheep Viability FSEIS at 3-14:

> *"Additional arguments state that since disease pathogens have already been transferred to domestic sheep, separation at this point is moot, or that private lands provide risks to bighorn sheep that cannot be offset, regardless of actions taken on Federal lands. These contentions claim that management on Federal lands to provide separation will not be effective due to changed conditions that cannot be offset. The uncertainty in these contentions poses all of the risk to be borne by bighorn sheep. They do not consider that pathogens likely evolve as they move within and between species, or existing or new diseases that are virulent to bighorn sheep (e.g., mycoplasms) may still be transferred between domestic and bighorn sheep. Recent serological research (Dassanayake et al. 2009) demonstrates that pathogens, in this case Mannheimia haemolytica serotype A1, which are not lethal to domestic sheep, are transferrable to bighorn sheep and highly lethal to them. In another recent experiment, pathogens were tagged and followed as they passed from domestic to bighorn sheep and resulted in bighorn sheep mortality (Lawrence et al. Forthcoming)."*

The Forest Supervisor further explained the rationale in the ROD:

> *"In making my decision, I considered cumulative effects. During the public comment period, I received letters that stated, "Given the probabilities of contact from off-forest private lands sources, excluding domestic sheep on Federal lands is futile." Activities that occur on private lands are outside my control. By implementing Alternative 70 modified, I believe we can successfully manage the low level of foray contact risk with this alternative. The Forest Plan Standards and Guidelines will allow the Forest Service to manage the risk of Alternative 70 modified so it will not add to the greater risks left on the landscape that are outside the control of the Payette National Forest. I have the responsibility to analyze cumulative effects on Forest Service administered lands, and disclose them to the public. The analysis conducted recognizes these uncertainties but clearly focuses on the Forest Service's responsibility to provide adequate habitat to support viable populations of bighorn sheep, particularly given the risks that the species currently faces relative to potential impacts from disease. I believe that given the cumulative effects, Alternative 70 modified meets the needs of bighorn sheep as a sensitive species by not further contributing to a downward trend in the population numbers. The regulations implementing NFMA require that I select an alternative that provides habitat to support at least a minimum number of reproductive bighorn sheep and the habitat is well distributed so that those bighorns can interact with others in the planning area. For this document, the definition of planning area is lands administered by the Payette National Forest."*

Plaintiffs in a case challenging the Payette decision asserted this argument was flawed. The courts, however, upheld the rationale, summarizing:

> *"[The Forest Service] responded, in effect, that one risk (endemic disease cycling) does not take away from other risks (transmission from domestic sheep). FS006134. So "[e]ven though other events may lead to die-offs of bighorn sheep, the Forest Service still ha[d] a responsibility to address the risk of disease posed by its management decisions relating to domestic sheep grazing." Id.; see also FS006137*

(noting the need to manage the risk of disease from domestic sheep even if some bighorn populations carry disease endemically); FS006225 (same); FS006234 (same). Defendants further concluded that there was insufficient information on endemic disease transmission to model the possibility accurately. FS005447. And they cited research showing that "pathogens evolve as they move within and between species" and that certain domestic sheep carry pathogens that are lethal to bighorn sheep but not domestic sheep – suggesting that there are still pathogen strains capable of transfer, even if domestic sheep have already transferred one lethal strain. FS005095 [FSEIS at 3-14]

Defendants' response is reasoned and reasonable. NEPA does not require that agencies eliminate all risks contributing to a problem before they can address one of those risks. Cf. Lands Council, 537 F.3d at 1001 (explaining that agencies need not even "present every uncertainty in its EIS" because "such a requirement might inadvertently prevent [agencies] from acting due to the burden it would impose" (emphasis added)).

Whatever the risks from endemic disease transmission, there is still a risk from domestic sheep that is within Defendants' control, even if domestic sheep have already transmitted one lethal pathogen strain. Plaintiffs' studies also show the possibility of endemic disease transmission, but they do not show the fact of it or the irrelevance of taking any other protective action. Cf. id. (Idaho Wool Growers Association et al v. Vilsack et al, No. 1:2012cv00469 (D. Idaho 2013))

The Forest Service May Not Rely on Other Agencies and Hypothetical Future Actions To Meet Agency Requirements

The Biological Evaluation for bighorn sheep repeatedly refers to the 'cyclic nature' of the High Uintas bighorn herds, as though this is the natural condition of bighorn sheep occurring in the area. This is misleading. Repeated declines followed by slight recovery over time is the signature of repeated exposure to pathogens originating in domestic livestock. The assertion that bighorn sheep herds in the area are resilient to disease is likewise misleading, and is contradicted by Best available science and by the herd histories of the Forestwide population. Bighorn sheep have been previously extirpated from the High Uintas, and were only restored through artificial restocking. Die-offs have occurred multiple times since then, and the current population has only been sustained through extensive management intervention. Bighorn sheep remain below the landscape carrying capacity, and large segments of the total population have been eliminated for the protection of the remainder of the population. Any significant recovery followed artificial supplementation from other populations. The populations have been restricted from interacting with others in the planning area for their own protection, and the populations are not self-sustaining. All of these conditions originate from the domestic sheep grazing analyzed under the proposed action. There is nothing natural about the population history of the High Uintas bighorn sheep, and nothing to indicate the population is unusually resilient.

The loss of more than one third of the Forestwide population of bighorn sheep in 2009 following an outbreak of respiratory disease in the supplemented Goslin herd illustrates the potential consequences of pathogen exposure: In order to protect the animals that were not yet exposed to disease, UDWR enlisted Wildlife Services to kill a large portion of the Forestwide population. Had they not, a greater proportion of the population may have been lost. It is clear from the Goslin herd history that supplementation of existing herds and reintroduction of new herds into

the habitat of extirpated populations has not led to viable and self sustaining populations over the last few decades, and may not be relied upon for attainment of goals and adherence to policies regarding Sensitive Species. The failed augmentation and subsequent removal of the Goslin herd is a stark example of why bighorn sheep researchers, state wildlife agencies across the West, and WAFWA strongly discourage transplants to new habitat or augmentations of existing bighorn sheep herds where pathogens or the risk of pathogen exposure remains on the landscape.

Here, the Forest Service proposes to continue to authorize grazing despite agency policies because the state of Utah has committed to augmenting bighorn sheep herds in the High Uintas. However, the Forest Service cannot create an obligation for a state agency to mitigate harm caused by Forest Service authorized activities to protected resources, and the Forest Service cannot waive its own obligations by relying on the hypothetical future actions of another agency. The Forest Service cannot diminish a population of a Sensitive Species through avoidable actions, and cannot allow the total extirpation of a subset of the forestwide population, regardless of any promise by UDWR to undertake future augmentations.

The Forest Service's argument here was dismissed by the courts in the order granting a TRO enjoining sheep grazing on the Caribou-Targhee National Forest:

> *"[The Forest Service] argues that, because the South Beaverhead population is not viable, it does not matter, under the Forest Plan, if it is extirpated—i.e. the risk of extirpation does not violate the Forest Plan. In other words, the Forest Service asks the court to the measure the Forest Plan's maintenance requirement not herd-by-herd, but by considering the sum of all of the individual bighorn populations Forest-wide. The sum would necessarily include the South Bighorn population—unless or until they are extirpated. This circular logic is untenable.*
>
> *The meaning of "maintain" underscores the Court's point. The Oxford English Dictionary contains numerous definitions for maintain, including: "to sustain (life) by nourishment," "to keep up, preserve, cause to continue in being (a state of things, a condition, an activity, etc.); to keep vigorous, effective, or unimpaired; to guard from loss or deterioration."22 Thus, in no way do the common definitions and understandings support neglect or deterioration of a population of animals (taken as a whole, or in part) that the Forest Service is mandated to maintain.*
>
> *Layered on top of the mandate of maintaining viable populations of all desired native or non-native wildlife, are the requirements related to sensitive species. Bighorn sheep are currently designated as a sensitive species in National Forests in the Intermountain region, including the Caribou-Targhee National Forest. (Dkt. 19-5 at 3.) With regard to sensitive species, the Forest Plan directs the Forest Service to "develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions." (Forest plan, Sensitive Species, 2670.22, Dkt. 19-8.)*
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> *By authorizing domestic sheep grazing on the allotments, the Forest Service risks extirpation of a herd, albeit small, of sensitive species. This is an action that threatens the herd, and to the Forest Service's point, potentially will diminish the overall population of bighorn sheep throughout the Forest."* [Case No. 1:17-CV-434-CWD]

Forest Service Sensitive Species policy states that the Forest Service must "avoid or minimize impacts to species whose viability has been identified as a concern," and that the Forest Service must "analyze the significance of impacts that cannot be avoided on the population and on the species as a whole. Impacts may not result in a loss of viability or create a significant trend toward federal listing as T&E" (FSM 2670.32). The Forest Service cannot reasonably assert that avoidable exposure of bighorn sheep to domestic sheep pathogens complies with Sensitive Species policy, and that such exposure, which is occurring on Forest Service lands throughout the West, will not contribute to a trend toward ESA listing for the species.

The Proposed Action Does Not Comply with Forest Plan Direction

Forest Plans implementing NFMA provide guidance for meeting the viability and distribution requirements for native species. Ashley National Forest Plan direction includes "Ecosystems on the Forest provide and maintain viable and well-distributed populations of flora and fauna. New listings of threatened, endangered, and sensitive species as a result of Forest Service management activities are avoided. Population objectives developed cooperatively with the Utah Division of Wildlife Resources and U.S. Fish and Wildlife Service are achieved. To contribute to species stabilization and full recovery, habitats across all levels or scales for endangered, threatened, and proposed flora and fauna species listed in accordance with the Endangered Species Act are protected and recovered, and sensitive species appearing on the Forest Service Intermountain Region's Sensitive Species list are protected. Newly-developed management direction from recovery plans and conservation strategies to which the Forest Service is a signatory is incorporated as applicable to facilitate protection and/or recovery of threatened, endangered, or sensitive species." The Forest Service acknowledges that bighorn sheep will be neither maintained nor enhanced by the proposed action. The proposed action should therefore be disallowed on the Ashley National Forest.

The Uinta Forest Plan includes the goal: "sensitive species appearing on the Forest Service Intermountain Region's Sensitive Species list are protected" and stipulates that "[n]ewly-developed management direction from recovery plans and conservation strategies to which the Forest Service is a signatory is incorporated as applicable to facilitate protection and/or recovery of threatened, endangered, or sensitive species." Management direction from states and counties, even where the Forest Service is a signatory, should not be integrated into projects where it will fail to facilitate the protection and recovery of Sensitive Species, and management actions which would fail to protect sensitive species should not be permitted on the Uinta National Forest. The Uinta Plan further states "If consistent with ecosystem health and integrity, and threatened, endangered, and sensitive species management, forage for livestock grazing on lands identified as suited for this use is provided to support social and economic community stability." Forage shall not be provided where it is inconsistent with the needs of Sensitive Species. The proposed action does not comply with Forest Plan direction on either Forest, and does not comply with NFMA.

The Forest Service's Biological Evaluation is Flawed

The 2013 Utah Bighorn Management Plan is not a peer reviewed document, and does not constitute Best available science. The state's definition of a Minimum Viable Population is

therefore not only inaccurate, it is not applicable to the current project. The MVP estimate of 125 has been perpetuated for decades despite being unsupported by the literature, and despite fundamental flaws resulting from the lack of any consideration of bighorn sheep exposure to domestic sheep pathogens in the single study upon which it was originally based.

Region 4 Forest Service officials have presented conflicting numbers for a Minimum Viable Population, with John Shivik, Region 4 Wildlife Program leader, asserting the number is 188. The total population distributed across both forests has recently risen from below 150 to 192, or from below a number considered viable for a single planning unit to a number that just meets Region 4's minimum threshold for viability. The cause of the most recent drop below the viability threshold was pneumonia, which likely originated as a result of the domestic sheep authorizations proposed here. Past pneumonia events have resulted in declines that, if they occurred in equal proportion today, would leave the total population below 125. It is clear that the proposed action can, has, and will lead to a loss of viability, and will not facilitate the continued existence of self sustaining populations of bighorn sheep well distributed across the forests. The risk to bighorn sheep from the proposed action is replicated on public lands Westwide, where many bighorn herds remain at risk from Forest Service authorized domestic sheep grazing a decade or more after being added to Regional Forest Service Sensitive Species lists. The Forest Service's determination that the proposed action "may impact individuals, but would not cause a trend toward the federal listing or cause a loss of viability" is inaccurate and unjustifiable.

The spatial and temporal bounds of the cumulative effects analysis described in the Biological Evaluation are too limited, and thus do not capture either the total area described in the risk assessment or the time period over which direct and reasonably foreseeable effects will occur. It likewise fails to describe in detail the reasonably foreseeable future condition of bighorn sheep populations under all possible alternatives.

The project risk assessment considers risks from private and BLM lands, outside of the Biological Evaluation's stated range. Past impacts to bighorn sheep in the High Uintas date back more than a century, and this is acknowledged throughout the evaluation, yet the BE sets the prior impact date at just 3 years. Several bighorn populations carry pathogens contracted greater than 3 years ago, and several demonstrate the population-wide impacts of that pathogen exposure. There is therefore no basis for a 3-year baseline for historic impacts. Bighorn sheep exposure to pathogens is likely to result in population impacts lasting greater than ten years, and bighorn sheep exposed near the end of the ten year period of the permit will certainly be affected at the time the permit expires and beyond. Further, the Forest Service's poor record of NEPA completion on permits means the permit is not guaranteed to undergo a thorough NEPA assessment at the end of a 10 year period, and is instead likely to be renewed without changes to the permit Terms and Conditions. The minimum timeline for determining reasonably foreseeable future effects should be the average period bighorn sheep populations are affected by pathogens added to the average number of years between NEPA assessment completion for allotments.

The Forest Service Should Not Have Dismissed a Reduced Grazing Alternative, and Should Have Analyzed an Alternative Wherein BLM Grazing was Discontinued

The effect of exposure to multiple strains of domestic sheep pathogens from multiple sources is not redundant, but additive. As such, the Forest Service has unreasonably dismissed an alternative wherein reduced grazing on Forest Service lands would be analyzed in detail and given fair consideration throughout the process. Further, the Forest Service has failed to analyze an alternative in which BLM grazing is likewise discontinued (40 C.F.R. §1502.14(c)).

NEPA's alternatives requirement serves to inform the public of "reasonable alternatives that would avoid or minimize impacts," (40 C.F.R. § 1502.1). Here the Forest Service's preferred alternative would offer no solution to the problem of disease transmission, so its rejection of a reduced or no grazing alternative for not fully alleviating risk to bighorn sheep is irrational.

The Forest Service has Failed to Prepare an Updated Capability and Suitability Assessment

Guidance on the completion of Suitability assessments is contained in the Forest Service's *Rangeland Suitability For Livestock Grazing At the Forest Plan Level and Standards for NEPA Display*, including:

- Subtract areas where decisions have been made that specific TES habitats, including habitat for Forest Service sensitive species, need to be excluded from livestock grazing due to an established incompatibility.
- Have IDT specialists on the planning team identify any additional areas where conflicts occur between livestock grazing and other resources to the extent that the conflicts cannot be resolved or satisfactorily mitigated, and where the other resource values are proposed in the alternative to take precedence over livestock use. If the planning recommendation is that livestock use in these areas is incompatible, or the conflicts are incapable of being resolved in a satisfactory manner, these lands will be designated as other than suitable for the specific alternative for this planning cycle. Clearly document the reason for the other than suitable determination.

Bighorn sheep were designated as a Forest Service Sensitive Species in 2009. There is a clear, established incompatibility with bighorn sheep in the allotments proposed for domestic sheep grazing, and these conflicts cannot be mitigated or resolved through allotment management practices alone. The suitability analysis is therefore outdated, not based on Best available science or agency direction, and is not an appropriate document on which to make wildlife management decisions. An accurate suitability analysis must produced prior to the release of the FEIS.

III. Issues relating to wilderness qualities and values

According to Forest Service data[23] obtained recently, the High Uintas Wilderness is the most

[23] This is from a FOIA response to Wilderness Watch from Region IV of the Forest Service. This DEIS includes some new information that corrects the earlier FOIA data but does not change the general conclusions therein.

heavily grazed Wilderness in the entire National Wilderness Preservation System (NWPS). This fact alone suggests why the Uintas, perhaps the best habitat for Rocky Mountain Bighorn Sheep in the entire NWPS, has struggling populations of that species, which were mainly if not entirely reintroduced.

Nowhere in the DEIS does it explicitly state that domestic livestock grazing in Wilderness is a nonconforming use that detracts and denigrates wilderness character. For example, we provided citations in our scoping comments detailing agency guidance on wilderness character monitoring, which explicitly states the negative impacts of livestock grazing on wilderness character. Rather than look at impacts or honestly compare the non-grazed areas with those which are grazed, the agency dissembles the public through statements like, "The proposed action in this analysis does not change this and does not create new, additional, or amplified impacts to the wilderness resource." DEIS at 192. If the Fall Creek allotment is grazed as per the proposed action, it would create new, additional and amplified impacts to the wilderness resource. Again, the failure to recognize grazing as a nonconforming use that harms wilderness character severely biases the NEPA analysis.[24]

In 1964, Congress passed the Wilderness Act "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness."[25] The law provided statutory protections for wilderness areas and established the National Wilderness Preservation System. The Act, among other things, mandated that wilderness areas be administered in a manner that will leave them "unimpaired for future use and enjoyment as wilderness" and provide for "the protection of these areas" and "the preservation of their wilderness character."[26]

The Wilderness Act defines wilderness: "A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are *untrammeled by man*, where man himself is a visitor who does not remain."[27] Wilderness is "land retaining its *primeval character and influence*, without permanent improvements or human habitation, which is protected and managed so as to *preserve its natural conditions*...."[28] In addition, wilderness should be "*affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable*."[29]

The provision allowing grazing in the Wilderness Act is an exception to the general premise of the Act, which directs agencies to manage wilderness areas to preserve their wilderness character and natural conditions. The language concerning livestock grazing in wilderness is a mere forty words long: "Within wilderness areas in the national forests designated by this Act...the grazing of livestock, where established prior to September 3, 1964, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture." Thus,

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[24] Our earlier comments raised the issue of the monitoring protocol. Since that time, *Keeping It Wild 2, An Updated Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System* (Landres et al, 201has come out. GTR-217. Regardless of the many shortcomings with this document, it does recognize the impacts of livestock grazing on Wilderness.

[25] 16 U.S.C. § 1131(a).

[26] *Id*.

[27] 16 U.S.C. § 1131(c) (emphasis added).

[28] *Id*. (emphasis added).

[29] *Id*. (emphasis added).

grazing which existed in wilderness areas when the Wilderness Act was enacted may continue. In other words, grazing is an exception to normal wilderness protections. It is a use that, by definition and practice, degrades Wilderness.

By leading the reader to conclude the proposed action would not harm Wilderness, the DEIS also fails to recognize existing agency policy regarding Wilderness:

> *Each designated wilderness is affected by a variety of human influences that vary in intensity. In one area, human influence may be very limited; in another area, major disturbances occur. The number and intensity of these influences cause a gap between the attainable legislative wilderness and the conditions that exist on a wilderness ("X"). The goal of wilderness management is to identify these influences, define their causes,* ***remedy them, and close the gap ("A") between the attainable level of purity and the level that exists on each wilderness ("X").***

Forest Service Manual (FSM) at 2320.6, emphasis added. See also FSM 2310.6 – Exhibit01. The impacts on wildlife, recreation, soils, fisheries and watersheds, all independent of wilderness analysis, are reason enough to end grazing in the High Uintas Wilderness. By primarily addressing grazing impacts on these other important aspects, the agency would also improve wilderness character as per manual direction.

The DEIS premises much of its analysis on the condition classes established in the 1997 wilderness management plan for the High Uintas Wilderness. However, as the DEIS explains regarding the wildest condition class, "Generally, Class I areas are defined outside permitted livestock allotments." DEIS at 192. Thus, the agency has biased the NEPA analysis by premising the analysis on the described condition classes established in an earlier plan. In essence, the agency is telling the public there is no real need to objectively analyze the no-grazing alternative. The DEIS as a whole bears out this bias as demonstrated elsewhere in these comments.[30]

The DEIS also refers to documents (specialists reports) which are not available on the web. Allegations are made without the public being able to review the source material. For example:

> *The majority of wilderness visitors stay on Forest system trails and visit and camp at popular destination sites such as lakes (containing fish), and scenic meadows with meandering streams. Wilderness visitors typically utilize approximately 35,251 acres (Appendix E-Table D of the Wilderness/Recreation Resource Report [project record]) within the analysis area or about 24 percent of the analysis area.*

DEIS at 194. Indeed, the entire analysis on primitive recreation refers to the project record on pages 195 to 197 of the DEIS. What the DEIS fails to recognize is that those seeking a true primitive recreation experience and avoiding popular sites would likely be most harmed by domestic livestock grazing, assuming the DEIS is accurate regarding location of sheep and the popular recreation sites. The DEIS on pages 201 and 202 makes a similar mistake regarding the percentage of visitors who registered a negative comment.

Furthermore, it would appear that most visitors register at the trailhead, the beginning of the trip, before encountering any sheep in the Wilderness. As such, reliance on these registers is wrong.

[30] The one exception is a tiny portion of the Fall Creek Allotment which has been in a nonuse status since before the Wilderness was designated.

In any case, breaking down the wilderness analysis, citing Landres et al 2008, into the following factors--untrammeled, naturalness, undeveloped, and solitude/primitive/unconfined recreation—misses what is important about wilderness character.

The apparent adoption of the Keeping it Wild 2 (KIW2) in the DEIS is a misuse of that protocol. It is simply a monitoring protocol. Attachment H is a critique by wilderness professional of how KIW2 has downplayed the essence of Wilderness and how KIW2 has been used to justify trammeling actions in Wilderness.

Regardless, even if we were to assume that the analysis of these four factors is either appropriate or sufficient to analyze impacts to Wilderness and wilderness character, the DEIS analysis of these four factors is serious flawed. For example, the DEIS makes some incredible comments regarding so-called naturalness.[31] For example:

> *Wilderness ecological systems are fairly free from the effects of modern civilization. A herd of domestic sheep displaces some of the native wildlife from that site the herd occupies at that moment in time. Once the sheep herd passes, the wildlife will typically move back in within a few days.*

DEIS at 201. In no way is sheep grazing, including the forage consumed, the watershed degradation, potential disease organisms left in feces, and the like natural. Further, there are no site-specific citations that wildlife move in after a few days or that wildlife numbers approximate those of a natural condition. This is particularly true of bighorn sheep, whose numbers are far below what they once were before domestic sheep grazing.

Regarding structures and the undeveloped attribute analyzed in the DEIS, the DEIS states:

> *Permanent structures are limited to trail features (boardwalks, bridges, water bars, and signs) necessary for resource protection and are confined to the prism of the trails. There is one small (5' x 6') log structure in the Henry's Fork Lake vicinity that is used for salt storage, which was there prior to the area being designated Wilderness. There are also 43 temporary structures associated with sheep herder camps. A typical herder camp consists of a skeletal tent frame, fire ring, and one to two horse tie rails; camps are simple and temporary in design. Other than these features, the area is free of human-made structures.*

Ibid. However, the FSM states, "Permanent improvements include such items as trails, toilet buildings, cabins, fences, *tent frames, fire grills,* and instrumentation stations. Emphasis added FSM at 2320.5 5. Additionally, there is no indication that the permanent log structure is necessary for grazing operations (presumably salt storage) rather than temporary structures.[32]

There is no mention of predator control and its impacts on Wilderness. The FSM states, "Predacious mammals and birds play a critical role in maintaining the integrity of natural

[31] This too, is in error. The Wilderness Act refers to natural conditions and never uses the word naturalness.

[32] Oddly, the DEIS at 203 states regarding the log structure under the no grazing alternative, "The one small log structure in the vicinity of Henry's Fork Lake in the Hessie Lake-Henry's Fork Allotment may remain for salt storage." Salt would not be needed if no grazing were taking place. Further, the DEIS inconsistently states on page 208 "no permanent structures" exist except those associated with trails and for visitor use.

ecosystems." FSM at 2323.33c. A wolverine was found in 2014 and the area is within lynx habitat. Also, there is no mention in the DEIS about bears or coyotes. The only mention of mountain lions is in conjunction with bighorn sheep.

We raised the issue of sheep driveways in our scoping comments. These have become sacrifice zones, depauperate of plant diversity and severely eroded. This affects the Wilderness as well as surrounding lands, roadless and roaded. Similarly, the analysis evades the history of the Fall Creek allotment. The following statement is misleading:

> *The reissuance of grazing permits is a continuance of practices already in place prior to and since wilderness designation and would not change the quality of the wilderness character found at that time since no changes in general operations are being proposed. The implementation of this alternative, therefore, would not change the existing wilderness character.*

DEIS at 208. The DEIS itself admits that there ahs been no grazing since 1977 on the Fall Creek Allotment. The High Uintas Wilderness was designated in 1984. Thus, at the time of designation, there had not been any use on the allotment for seven years. The DEIS does not detail any impacts from grazing this allotment in terms of establishing a sheep driveway.

Given the impacts addressed elsewhere in this comment and the errors found in the wilderness analysis, it is wrong to suggest the gain in quality of wilderness characteristics would only be "slight" for Alternative 1. See DEIS at 208.

The High Uintas could be one of the most outstanding Wildernesses in the entire NWPS. The grazing of domestic sheep severely hampers the recovery of native wildlife, native predators, and watersheds.

IV. Issues relating to Canada Lynx in the High Uintas

The Canada lynx (*Lynx canadensis*) is listed as a threatened species under the Endangered Species Act. However, the U.S. Fish and Wildlife Service has determined that Utah does not contain critical lynx habitat, i.e., habitat essential to the survival of the species. While there does not appear to be a resident population of lynxes in Utah today, Utah nevertheless contains vast expanses of lynx habitat where lynxes were historically present.

Having been previously extirpated from Colorado, the Canada lynx was reintroduced into the San Juan Mountains beginning in 1999. Lynxes have since proliferated and spread out over the landscape. Several lynxes have made forays into Utah, with the Uinta Mountains and surrounding forestlands being most visited.[33] In addition, the greater Yellowstone ecoregion, including the Salt River and Wyoming ranges, which are located just to the north of the Uintas, supports a naturally occurring Canada lynx population and is classified as critical habitat for the Canada lynx.[34]

[33] Colorado Department of Wildlife Report, 2006-7, page 29.
[34] https://www.fws.gov/mountain-prairie/es/species/mammals/lynx/criticalhabitat_files/20081016_noa_yellowstone_map.pdf

The Uinta Mountains are recognized as a regionally significant wildlife corridor.[35] This corridor connects to the greater Yellowstone ecoregion through the Bear River Mountains of northern Utah and southern Idaho, and through the Crawford Mountains of southwest Wyoming.

Given that there are resident lynx populations in Colorado and Wyoming today, and given that the Uinta Mountains are recognized as a regionally significant wildlife corridor, it is no surprise that lynxes still use the Uintas. Indeed, telemetry records confirm that there is a "hot spot" of lynx occurrences at the western end of the Uinta Mountains, where collared lynxes from Colorado remain for a time before moving on, presumably unable to find mates. As of 2009, at least 22 individuals had made at least 27 visits to the state of Utah, recorded by air telemetry and satellite.[36] The highest concentration of lynx locations in Utah, as identified by telemetry, is in the Uinta Mountains. "The use-density surface for lynx use in Utah indicates the primary area of use being located in the Uinta Mountains."[37]

The Uinta Mountains are core lynx habitat

Sophisticated, peer-reviewed modeling identifies the Uintas as core lynx habitat. Here is an excerpt from the study[38].

"Using 90m-cell resolution, we used ArcGIS to conduct a habitat suitability analysis to identify best core areas for lynx in the study area. Inputs were vegetation community types (National Land Cover Database 2001), and weighted road density (Census 2000 TIGER/Line data). Each cell was attributed a score based on the dominant vegetation community type from the reclass values in table 1. Vegetation types (Figure 2) were assigned scores from 1 to 10 based on known lynx affinities for various land cover types, and re-classified in a binary raster where scores of 8 to 10 were considered to contain suitable vegetation types for lynx. Suitable vegetation types for lynx were defined by the current literature (Ruediger et al. 2000, Singleton et al. 2001, Singleton et al. 2002, USFS 2002, Bunnell et al. 2005, Wasatch-Cache National Forest 2005, Southwest ReGAP model, 2006, Shenk 2008). Suitable road density (Figure 3) for lynx was similarly calculated in ArcGIS using a kernel line density function, and assessed in a binary manner, with values below a 6.4-km/0.9-km radius circle (or <4-mi/mi^2) threshold considered acceptable as core (Singleton et al. 2001). After all cells that surpassed both the vegetation suitability and road density suitability thresholds were identified, habitat patches were formed using ArcGIS REGIONGROUP, 8-neighbor. For the purposes of this model, we considered large enough core patches for lynx to be those that are at least 1,600 km^2, the approximate area of eight average home range sizes for male lynx in the American Rockies (Ruggiero et al. 1999, Squires 2005, Shenk 2006, personal communication John Squires, personal communication Tanya Shenk). This generated nine individual core habitat areas within the study area (Figure 4).

We assumed that areas identified as core patches in our model would: (1) be of sufficient area to support more than two mated-pairs of lynx to reside year round, for multiple years; (2)

[35] Wasatch-Cache National Forest March 2003 Revised Forest Plan 4-21.
[36] Colorado Department of Wildlife (CDOW) Report, 2006-7, Tables 4 and 6, pages 23 and 24.
[37] Ibid. page 10; see also Figure 2, page 29.
[38] Jones, A.L. and W. Bates. 2007. Least-Cost Corridor Analysis for Evaluation of Lynx Habitat Connectivity in the Middle Rockies.

provide necessary land cover types for denning and hunting; (3) contain necessary prey to support lynx year-round; and (4) sufficient safety from human persecution.
Our model indicated that there are nine clusters of relatively well-connected blocks of suitable landscapes of sufficient size to be considered core lynx habitat (Figure 4). These habitat concentration areas include the High Uintas Wilderness (plus adjacent forested lands), a core patch in the Bear River Range, and many core patches in close proximity to one another in both the west slope of the Colorado Rockies and the greater Yellowstone region."

Given that the Uinta Mountains are core lynx habitat and a regionally significant wildlife corridor, it is perhaps surprising that there does not appear to be a resident population of lynxes in the Uintas today.[39] No doubt this is true, but why? Have researchers simply failed to detect them? Not likely. Lack of evidence of lynxes in this case is evidence of lack of lynxes. The most obvious and most probable explanation is that, following an initial extirpation due to trapping, hunting, poisoning, logging and livestock grazing, natural recolonization of the Uintas by Canada lynx is prevented by ongoing anthropogenic disturbances. One major continuous disturbance to consider is the domestic sheep trailing and grazing in the Uintas that has gone on every year for over 100 years.

Why is there not a resident lynx population in the Uintas?

The Forest Service relies on two dubious hypotheses to explain the absence of a resident lynx population in the Uintas today. Unsurprisingly, neither one involves sheep grazing.

> H1: There was never a resident population of lynxes in the Uintas to begin with—the occasional visiting lynx has always been a disperser, or at best a temporary resident.[40]

> H2: The intersection of vegetation cover types used by sheep and delineated by lynx habitat is of insignificant size and is discountable when compared to the acres of the entire lynx analysis unit (LAU); and the percentage of overlap would not likely result in lynx/hare habitat/food loss.[41]

Neither hypothesis is plausible. In both cases the underlying premises are much too weak to support the hypothesis even when their truth is granted. Consequently, they provide no support for the conclusion that Alternative 2 "is not likely to adversely affect the Canada lynx."[42] Let's examine these two hypotheses and their underlying premises.

H1. Based on a number of lynx surveys conducted by state and federal agencies between 1999 and 2017, which found no solid evidence of lynx presence, the FS concludes that there is not a resident lynx population in the Uinta Mountains today. The FS further concludes that there never was a resident lynx population in the Uintas—only occasional transients. According to this

[39] Draft Environmental Impact Statement High Uintas Wilderness Domestic Sheep Analysis (DEIS), June 2019, page 27.
[40] Ibid. page 129.
[41] Ibid. page 132.
[42] Ibid. page 133.

hypothesis, the Uintas are not good lynx habitat, which explains why lynxes have not been detected and leads to the conclusion that the Uintas will probably never host a resident lynx population regardless of the livestock grazing. Here is what the FS states in an earlier document: "We conclude that lynx that occur in Utah are dispersers rather than residents."[43]

Additionally, the Forest Service states that there were only 10 verified records of lynx in Utah in the 20th century, most of them in or near the Uintas, and that four of the 10 verified lynx occurrences in the Uintas correlate to the cyclic [lynx] highs of the 1960s and 1970s.[44]

To conclude from these premises that there has never been a resident population of lynxes in the Uintas commits the fallacy of "begging the question" by presupposing what is to be proved. (For simplicity, we'll narrow "never" to "since 1800".) Obviously, the explanation for why there is not a resident population of lynxes in the Uintas today, and no detectable reproduction, could just as easily be that human uses of the forest—for example, ongoing domestic sheep grazing—have resulted in the extirpation of lynxes from the Uintas and are preventing their natural recovery. What does the evidence actually show? Let's examine each premise carefully.

A: lynx sightings. There may have only been 10 verified records of lynx occurrence in the Uintas in the 20th century, but there have been an additional 17 reliable reports of lynx in Utah in the 20th century, based on physical remains (including photographs), visual sightings and track identifications, plus another 10 of unknown reliability. [45] The total number of records is 37. Most of these lynx occurrences were on the north slope of the Uintas, in or near the West Fork of Blacks Fork. Even if we discount the 10 reports of unknown reliability, we still have 17 reliable reports and 10 verified records of lynx, for a total of 27, most of which located the lynx in the Uintas! In other words, the historical evidence indicates a minimum of 10-37 lynxes in the Uinta Mountains over the last 103 years (not counting dispersers from Colorado). Thus, there can be little doubt that the actual number "sightings" was greater than 10. 30 would be much more probable.

Why arbitrarily exclude the "reliable" sightings? What does "reliable" mean if you can't rely on what is reliable? Yet the FS chooses not to rely on them for the purpose of the DEIS—a decision that would seem to be based not so much on a desire for accuracy as a desire to minimize the presence of lynx in Utah in order to make room for Alternative 2.

At this point we should ask ourselves how many records—verified records, if you like—it would take to establish that there was a resident population of lynxes in the Uintas during some part of the 20th century. Does anyone have even the slightest clue? Of course not. And the reason is that there are no empirical data for establishing a baseline on which to base a prediction. Surely all we can reliably say is that the more records (verified + reliable), the higher the probability. Thus, this premise commits the fallacy of begging the question, by presupposing what is to be proved.

[43] West Fork Blacks Fork Grazing FEIS (WFBF FEIS), 2006, page 48.
[44] DEIS page 129.
[45] Ruggiero, et al., Ecology and Conservation of Lynx in the United States, University Press of Colorado, (1999.) p. 210

B: lynx cyclic highs. The fact that four of the verified records of lynx occurrence correlate with cyclic highs in the lynx metapopulation does nothing to support the hypothesis that lynx in the Uintas were transient dispersers rather than members of a resident population. This premise also begs the question.

First, the cyclic high explanation is inconsistent with the predominant snowshoe hare story: "The predominant snowshoe hare story in this century has been that snowshoe hares are strongly cyclic in the north but show reduced or no cycles in their southern distribution."[46]

Second, the Uinta lynx population, assuming there was one, would most likely have also been undergoing a cyclic high, since cyclic highs occur throughout the metapopulation.[47]

Third, the fact that only four of 27-37 lynx occurrences—one in seven—correlated with a lynx population cyclic high is statistically irrelevant to the question of where those four lynxes came from. The conclusion insinuated by the FS is that they probably immigrated to the Uintas from a distant population when the habitat for that distant population became saturated—but, significantly, no evidence is given for this conclusion. It is to be expected that some of the records and reports would correlate with a lynx population cyclic high, since cyclic highs, which occur one or two years out of 10 or 11,[48] exhibit about the same frequency as the proportion of lynx records during the purported cyclic highs to the proportion of lynx records plus reliable reports (= 1 in 7).

C: no evidence of lynx reproduction in Utah. What does this show beyond what no one denies, namely that there may not be a resident population of lynxes in the Uintas now? This has no bearing whatsoever on whether there was ever a resident lynx population in the Uintas or whether one could exist there today if domestic sheep grazing were eliminated. Put another way, this premise again begs the question, for it doesn't tell us why biologists have obtained no evidence of recent lynx reproduction in Utah or the Uintas. And absent this knowledge, all we are entitled to conclude is that there is probably not a resident lynx population in the Uintas today.

Conclusion: Premises A, B & C carry no water. Each begs the question and so does nothing to move the evidence needle in either direction with respect to whether the Uinta Mountains and surrounding forests ever hosted a resident lynx population. From an evidentiary point of view, they are each a 0. And 3x0 = 0. So much for H1.

H2. Since the principal prey species of the Canada lynx throughout its range is the snowshoe hare, a dearth of snowshoe hare habitat in the Uintas would be evidence for a low or nonexistent population of hares, and hence a low or nonexistent population of lynxes. Furthermore, if it can be shown that sheep grazing will impact only a very small amount of lynx habitat—e.g., hare food resources—and that the impact will be insignificant and non-cumulative, then we may conclude that sheep grazing will probably not be detrimental to any lynxes there might actually be.

[46] Ruggiero, et al. p. 191.
[47] Ruggiero, et al. p. 438.
[48] Ruggiero, et al. p. 271,2.

The West Fork Blacks Fork watershed (WFBF) is exemplary of lynx habitat in the Uintas. The WFBF grazing allotment lies within a lynx analysis unit (LAU 34). In stark contrast to what the Forest Service claims in the DEIS, in the West Fork Blacks Fork Grazing Allotment FEIS, 2006, the Forest Service estimates the allotment to include 7,625 acres of primary lynx habitat and 27 acres of secondary lynx habitat on the national forest system land, for a total of 7,652 acres, or 42% of the allotment acreage).[49] The allotment as a whole is estimated to contain 36,640 acres of lynx habitat on Forest Service lands, and roughly another 10,000 acres of lynx habitat on private lands.[50]

According to the FS's own analysis, the quantity of lynx habitat within the grazing allotment in LAU 34, as stated in the 2006 WFBF Grazing FEIS, is enough to accommodate at least one male lynx home range and one or more female lynx home ranges. ("Home ranges of lynx are generally 6-8 square miles...")[51] These estimates would be five times higher for LAU 34 as a whole = ~ 5 male home ranges and ~ 10 female home ranges. When you consider the entire Uinta Mountain range and associated forest lands, this would obviously allow for many breeding pairs and thus for a persistent resident population. So, why isn't there a resident lynx population in the Uintas today? Is it because the stated amount of lynx habitat is incorrect?

In contrast to what the FS states in the 2006 WFBF Grazing FEIS, the DEIS revises the earlier estimate by stating that there are only 574 acres of primary lynx habitat in LAU 34![52] The DEIS similarly reduces the amount of primary lynx habitat throughout the Project Area by identifying it with vegetation types that provide food for snowshoe hares, namely "aspen, mixed aspen, sagebrush, and willow vegetation cover types"[53]

The DEIS states:

> *The total acres of intersection between vegetation cover types (likely used by sheep) and delineated lynx habitat are insignificant (size of impact is minute and would never reach the scale that take would occur) and discountable (based on a person's best judgement effects would not be able to be meaningfully measured, detected, or evaluated) when compared to the acres of the entire LAU (Table 24 and Table 25 above). The acres of lynx habitat that could possibly be affected by sheep grazing in this project area is 0.60 percent on the UWCNF and 0.09 percent on the ANF. This percentage of overlap would unlikely result in lynx/hare habitat loss. It is also unlikely that sheep grazing would significantly impact the overall hare food resources to the point of decreasing the hare population because grazing would not cause the vegetation cover types to change and the allotments are currently in satisfactory condition (Cameron 2017 and Huber 2016). A significant impact would be where a person could show that sheep grazing results in an adverse effect and take of an individual lynx. The take for*

[49] West Fork Blacks Fork Grazing FEIS, 2006.
[50] Ibid.
[51] Ibid.
[52] DEIS p. 126-133.
[53] Ibid.

this project would result from an indirect effect to lynx where snowshoe hare populations were decreased resulting in prey reduction.[54]

To summarize: In the DEIS, the FS claims that the Uinta sheep grazing allotments contain less than .1% of primary lynx habitat. This bit of legerdemain was accomplished by adopting an "indicator" as a proxy: "In order to compare and contrast effects to Canada lynx, an indicator was chosen to evaluate."[55] This indicator is the number of acres of aspen, mixed aspen, sagebrush, and willow vegetation cover types within the (PA): "The domestic sheep diet consists of forbs, grasses, and some woody vegetation such as young aspen sprouts (DeByle 1985 and Jensen et al. 1972). Sheep primarily consume forbs, grasses to a lesser extent, and incidentally use willows and aspens as forage (Cameron and Huber 2017). Snowshoe hare, lynx's main prey item, may compete with sheep for these food items in certain habitats such as aspen, mixed aspen, sagebrush, and willow vegetation types within the Project Area."[56]

This is quite a revelation. The FS must have made a tremendous error in the 2006 WFBF Grazing FEIS! The "correction" presented in the DEIS identifies a mere 1,995 acres of primary lynx habitat in all the Uinta LAUs combined, which isn't enough to support a single lynx home range! Secondary lynx habitat isn't even quantified. No wonder sheep trailing and grazing can't have a negative impact on lynxes. As an indicator of lynx abundance and of impacts to the Canada lynx and its habitats from annual sheep trailing and grazing for more than a century, this is simply ludicrous—as if there is no other possible way in which the grazing activities can affect lynxes or a lynx population. Nothing else is even considered.

What about the abundance of lynx prey species in the Uintas? The primary prey species of the lynx throughout its range is snowshoe hare, secondarily red squirrel.[57] Is it the case that there just aren't very many of these animals in the Uintas?

To the contrary, research indicates that the Uintas support a fairly robust hare population with densities comparable to those in other western states and Canadian provinces where Canada lynx are present.[58] Snowshoe hare surveys were conducted in the forest on the north slope of the Uintas, in the same general area that many historic lynx sightings were made, and they have shown "…an average of 0.34 hares per hectare over the three year period within mature vegetation types."[59]

This density also compares favorably with what similar studies have shown in Colorado and Washington—states that have resident lynx populations. For example, a Colorado study

[54] Ibid.
[55] Ibid.
[56] Ibid.
[57] Bunnell, Kevin D., Doctoral Dissertation: Factors Potentially Limiting Canada Lynx Conservation in the Uinta Mountains and the Intermountain West, 2005.
[58] WFBF Grazing FEIS, p. 3-42; Ruggiero, et al. *Ecology and Conservation of Lynx in the United States*, University of Colorado Press (2000), Chapter 7, p. 185)
[59] Bunnell, Kevin D., Doctoral Dissertation: Factors Potentially Limiting Canada Lynx Conservation in the Uinta Mountains and the Intermountain West, 2005.

conducted in 1998 indicated an average of 0.29 hares per hectare.[60] Thus, the evidence indicates that the principal prey species of Canada lynx is fairly abundant in the Uintas. The researchers also surveyed for red squirrels with similar results.

Using WFBF as an example once again, in a previous publication the FS estimated that "Potential habitat for snowshoe hare within the WFBF Allotment based on cover types is approximately 7,354 acres"—approximately equal to the quantity of lynx habitat on the allotment.[61] Apparently snowshoe hare and hare habitat are both moderately abundant on grazing allotments in the Uintas, as well as within the LAUs.

Conclusion: The FS is able to conclude that there is less than .1% primary lynx habitat within the PA by equating primary lynx habitat with aspen, mixed aspen, sagebrush, and willow vegetation. This despite the fact that throughout North America lynx prefer boreal forest consisting primarily of spruce and fir! In addition, the proxy was only measured within the PA, which excludes most of the national forest. If this proxy is adequate for identifying primary lynx habitat, then surely it is adequate for identifying snowshoe hare habitat within the forest as well. And from this one would be warranted in concluding that there are very few snowshoe hares in the Uinta Mountains and surrounding forests. Yet, of course, this is not true, as is shown by the work of Bunnell et al. There is no reason to suppose that snowshoe hare abundance in the Uinta Mountains and surrounding forests is too low to support a residence lynx population. Quite the opposite in fact! So much for H2.

The DEIS fails to consider likely negative impacts to lynxes from sheep grazing

There are many thousands of acres of snowshoe hare habitat and Canada lynx habitat in the PA. H1 and H2 were apparently designed to spare the FS from having to analyze the probable impacts of annual domestic sheep trailing and grazing on Canada lynxes within the PA. The analysis provided by the FS not only minimizes the amount of primary lynx habitat within the PA to a ridiculously low percentage of the total area, it doesn't address probable impacts to the totality of lynx habitat—primary and secondary—within the PA, and hence doesn't adequately address the probable negative effects on the Canada lynx. If the DEIS is correct, the only possible negative impact to lynxes in the Uintas from sheep grazing, albeit an indirect impact, would be restricted to less than 2,000 acres total and would be minimal at worst. This is so obviously untenable as to verge on absurdity. Lynxes rely on a variety of vegetation types. Primary lynx habitat is habitat that provides for a number of needs, not just food for snowshoe hares. The FS acknowledges as much in the DEIS:

> *"Primary habitat consists of Engelmann spruce, subalpine fir, and lodgepole pine on spruce-fir habitat types that supports foraging, denning, and rearing of young. Secondary habitat includes other vegetation types (cool/moist Douglas-fir) when interspersed within subalpine forests and immediately adjacent to primary habitat. Non-habitat are dry forest types such as ponderosa pine and climax lodgepole pine (Ruediger et al. 2000)."*[62]

[60] Species Status Assessment for the CANADA LYNX *(Lynx canadensis)* Contiguous United States Distinct Population Segment, October 2017, page 28.
[61] West Fork Blacks Fork Grazing FEIS, 2006.
[62] DEIS page 129, emphasis added.

It is not incumbent upon citizen reviewers to show that, or how, sheep trailing and grazing, ongoing every year for more than a century, might negatively affect the Canada lynx. It is incumbent on the Forest Service to demonstrate convincingly that the activity will not have a significant negative effect on the Canada lynx. In this regard, the FS is in default and has failed utterly to make a case for its preferred alternative, Alternative 2, so far as Canada lynx conservation is concerned.

Applicable Law.

Marble Mountain Audubon v. Rice[63] interprets NEPA to require the Forest Service to consider biological corridors and to ensure their functionality. The standard for such a review is the same "hard look" NEPA requires of other environmental effects. This means those corridors within the analysis area and linkages with areas adjacent to the analysis area need to be examined, plus the value of the entire analysis area, as part of a larger corridor within or between ecosystems. Friends of the Bitterroot, Inc. v. USFS[64], and Oregon Natural Resources Council v. John Lowe[65] also highlight the importance of including corridors as an element of consideration for an agency decision. Therefore, the Forest is required to address how the grazing and other management activities in the Uinta Mountains affect the Uinta corridor—a corridor that would normally function to promote genetic diversity and population stability 0f lynxes among far flung populations in the Rocky Mountains.

(G18) In Lynx Analysis Units design all management activities to maintain, restore, or protect desired lynx and lynx prey habitats including foraging, denning and movement.[66]

V. Grazing Impacts on the Uinta Wilderness Ecosystem

This section of comments on the Uinta Domestic Sheep DEIS was written by Dr. John Carter, Yellowstone to Uintas Connection. Emanuel Vasquez with the Wild Utah Project conducted mapping and GIS analysis. Darlene Voerner, Ashley NF Soil Scientist - Retired, provided photographs and comments on the sensitivity and characteristics of alpine soils in relation to domestic sheep grazing. Jonathan Ratner of Western Watersheds Project determined ground cover using Sample Point software.

Other than a section of trail here, or a spot there, the DEIS is devoid of any admittance of impacts on soils, vegetation, streams or watersheds by grazing tens of thousands of domestic sheep in this sensitive, steep and erodible landscape. It conflates gophers with areas with low ground cover and claims that areas with high ground cover lack gophers, stating, *"Where sheep graze in the absence of pocket gophers, ground cover is often greater than 85 percent. Where pocket gophers are more abundant, ground cover is reduced."* The DEIS and Forest Specialists avoid the obvious. That is tens of thousands of sheep are grazing these sensitive areas and avoiding the adjacent wet meadows. They graze them before the plants have begun growth as

[63] No. 90-15389, D.C. No. CV89-170-EJG, Sept. 13, 1990
[64] 900 F. Supp. 1368, 1372 (D. Mont 1994)
[65] 109 F.3d 521, 526 (9th Cir. 1997)
[66] Revised Forest Plan Wasatch-Cache National Forest 2003, page 4-42, emphasis added

snowmelt continues until near the end August in many years. The Forest Service concludes that sheep trampling the wet soils on slopes and eating plants that have barely begun growth don't do damage, but gophers do. The DEIS ignores the ecology of gophers which we have previously summarized along with a study of grazed and ungrazed snow bank and meadow areas showing the soil compaction and forage removal by livestock create a situation wherein gophers, when present, have to forage further, repair and rebuild tunnels that have suffered damage from compaction, thus more visible activity. (See comments dated July 13, 2014).

Then the DEIS (p52) states, *"Other areas with low percent ground cover can be divided into two groups. The first group includes snowbeds, Red Pine Shale barrens, and scoured drainage-ways. Sheep have equal access to these areas that have high percent ground cover as they do to areas that have low percent ground cover."* (DEIS p52). The DEIS (p52) also notes that sheep do not prefer riparian areas and use there is light. This applies to wet meadows as well. In many instances these side by side comparisons of the sensitive areas, i.e. red shale or steep slopes with an adjacent wetland or wet meadow area (avoided by sheep) are used to make this claim that since sheep have equal access to both areas, it cannot be sheep causing the destabilization or bare soil in the shale area. As will be seen below, the Forest Service, by limiting its monitoring to areas less sensitive to damage by sheep grazing also makes the claim that conditions are "satisfactory".

A review of the "studies" provided by the Forest Service on July 10, 2019 in response to our data request shows that the dominant focus of Forest Service monitoring has been in meadows, wetlands and riparian areas, i.e. "climax communities" according to Darlene Voerner a former soil scientist with the Ashley NF. These have higher resistance to sheep grazing impacts, and receive less use by sheep, while little focus has been on areas described above such as the snowbeds, Red Pine Shale barrens and scoured drainage-ways that are not capable and subject to high erosion rates. Steep slopes are rarely monitored. The relationship of sheep grazing in these alpine capable and non-capable areas to watershed dynamics and flood forces is ignored. Scoured streams are "natural", bare soils in these sensitive areas are "natural". But, basic hydrology would acknowledge that sheep grazing removes vegetation and compacts soils, while creating bare ground. These factors as represented in the Universal Soil Loss equation and even in Forest Service research by such notables as Paul Packer in the 1950's, would say that grazing increases runoff and decreases infiltration, and as slope angle increases so do erosion and runoff. The increased flood forces scour streams, and particularly in areas where livestock grazing has removed vegetation or trampled banks.

The entire database of studies provided in our FOIA response dated July 10, 2019 is devoid of reference to the role of domestic sheep in accelerating loss of soil cover and erosion. All bare soil is natural, a result of gophers, snowbeds, talus slope runoff, frost boils and so on. Bedding, salting, watering spots, trailing and camps are claimed to only damage small areas. (DEIS p53). For example, sheep bedding is claimed to be less than 1% of the Project Area. Salt grounds are moved around, and account for less than 1% of the Project Area. Trail damage is acknowledged as less than 1% of the Project Area (160,000) acres. For bedding, this amounts to 1,600 acres in a single year, but sheep have grazed these allotments for decades, nearly a century. In ten years, the damage would be 10% or 16,000 acres. In a century, the entire project area has been subjected to bedding, salting, and trailing with the associated damage to soils and plant

communities. Trailing is not limited to a narrow band, as high passes and slopes on both sides are grazed and denuded.

A huge problem is present in this DEIS and the monitoring studies conducted by the Forest Service. This is to deflect around damage by domestic sheep. This appears in the record after Mont Lewis, who worked in these areas in the 1960's, applied ecological principles driven by the R4 Range Analysis Handbook. It was a logical, science-based document, but has been abandoned as have the basic principles of Range Science. Such things as setting stocking rates based on desirable forage present in capable areas, these are areas that are not on steep slopes, are not moderately to highly erodible, are not in dense forest and do not risk accelerated erosion. Stocking rates were to be based on the amount of forage consumed[67] by the permitted livestock in those capable acres, which the Forest Service states now must produce more than 200 lbs/acre of forage, but doesn't account for that and these other factors in its own capability and suitability determinations. Utilization rates supported by science are currently 30%, not the 50 - 60% allowed on most public lands. In addition, grazing periods should be adjusted to allow sensitive native plants to maintain vigor, i.e. productive and producing seed or propagules, and not be grazed during early growth. Destocking during drought[68] is vital, and rest is vital for recovery of plant vigor following grazing.[69] None of these principles were observed in the DEIS or the "studies" provided by the Forest Service. The DEIS is devoid of Range or Ecological Science.

We are not surprised at this obfuscation around conditions on the ground or the abandonment of science. During meetings with various Forest Service staff we have been told these allotments are "hammered", that they fear the wrath of the permittees and their political allies and that if they do anything to change the status quo, the Region comes down on them. Recent books and articles that provide interviews with retired agency employees paint a picture of failed management, lying and then relying on environmental groups to sue so the agencies can claim to their permittees and associated political allies within and without the agencies that they had no choice in the matter. See Daily Beast Article by Christopher Ketcham[70], "Western Turf Wars" by Mike Hudak[71] and most recently the "This Land: How Cowboys, Corruption and Capitalism are Ruining the American West"[72]. The Forest Service is entrusted with managing these lands as part of its public trust duty and represents the public, not extractive interests.

We note that in his 2018 State of the Union on January 30, President Trump invoked the public trust responsibilities of the agencies.

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[67] Carter, J. 2016. Updating the Animal Unit Month. Yellowstone to Uintas Connection. https://app.box.com/s/zx4xjekrfuht2aq12soruw0qfil8hogk

[68] Holechek et al. 2004. Range Management Principles and Practices. 5th Ed. Prentice-Hall, NJ.

[69] Carter, J. 2013. Utilization, Rest and Grazing Systems - A Review. Yellowstone to Uintas Connection. https://app.box.com/s/ngw6723dx52quxw2rd8u

[70] Ketcham, C. 2017. Help Wanted: Biologists to Save the West From Trump. https://www.thedailybeast.com/help-wanted-biologists-to-save-the-west-from-trump

[71] Hudak, M. 2007. Western Turf Wars: The Politics of Public Lands Ranching. http://westernturfwars.com/

[72] Ketcham, C. 2019. This Land: How Cowboys, Capitalism, and Corruption are Ruining the American West. https://www.kingsenglish.com/event/christopher-ketcham-land-how-cowboys-capitalism-and-corruption-are-ruining-american-west

All Americans deserve accountability and respect -- and that is what we are giving them. So tonight, I call on the Congress to empower every Cabinet Secretary with the authority to reward good workers -- and to remove Federal employees who undermine the public trust or fail the American people.

The "Standards of Conduct for Employees of the Executive Branch" states principles such as:

- *Public service is a public trust, requiring employees to place loyalty to the Constitution, the laws and ethical principles above private gain.*
- *Employees shall put forth honest effort in the performance of their duties.*
- *Employees shall act impartially and not give preferential treatment to any private organization or individual.*

This indicates that the public trust is elevated above politics or turning a blind eye (willful blindness) to the damage. Making decisions without full disclosure of the facts and best available science is an abdication of the public trust.

In his 1970 Report, *"Alpine Rangelands of the Uinta Mountains - Ashley and Wasatch National Forests"*, Mont Lewis addresses the sensitive nature of these alpine areas and applies these principles to management.[73] He identifies the areas that should not be grazed due to erosion susceptibility, he identifies the mechanisms of sheep damage to soils and plant communities. He explains that potential ground cover in most areas is near 100%. Mont was apparently the last objective Range Professional on these Forests.

Summary of Mont Lewis report

- Soil development
    - Glacial moraines - shallow and rocky, less than a foot of soil, 50% rock
    - Fellfields - very shallow, poorly developed
    - Boulder fields and talus - soil becomes deep, up to 30", eventually covering most of the boulders
    - Alluvial outwash - terraces and fans found at the foot of boulder fields and talus, soils formed from fines flushed out by snowmelt and storms, soils up to 30" deep
    - Slopes below seeps and snowdrifts - on steep slopes where moisture present, plants occupy most of the soil strip, similar to boulder field and meadow
    - Meadows and bottomlands - sediment deposited, well developed and deep, soils with high organic content

Photographs in the report depict vegetation cover is high when sites are in good to excellent condition.

- Alpine soils are sandy to silt loams with surface aggregates that are "rather weak and poorly defined" while a high percentage of rocks and gravel counteract this and result in medium erosion hazard. Shale derived soils are unstable with moderately high to high erosion hazard and rapid erosion occurs wherever ground

[73] Lewis, M. 1970. Alpine Rangelands of the Uinta Mountains, Ashley and Wasatch National Forests. US Forest Service.

cover is lacking. Any grazing use that damages plant cover may have serious consequences.
    - Ground cover on stable sites is nearly complete, on rocky areas very little soil is exposed, most communities have a very tough sod which gives it its stability.
    - Frost action breaks down soil stability in some areas, which is accelerated by grazing animals. "If a site is naturally unstable, it would be folly to add the burden of grazing use to it." (p21) "Trampling by sheep was observed to increase the size of the sod breaks and thus contribute to the instability." (p23) Example of dry meadow in poor condition due to frost and heavy grazing breaking up the sod. (p25). Ashley NF Range studies called this an "interrupted turf community" (covered in a later section). "Sheep walking across solifluction terraces, tend to break the sod and thus weaken its stabilizing power on the face of the terrace. (p27, 29).
    - Concentration of runoff at the base of boulder fields can gouge the turf and create headcuts.[74]
- Plant Communities
    - Cites reference of *Deschampsia caespitosa* sites being classified as snowbed vegetation, with *Geum* turf characterizing exposed sites where wind removes much of the snow. Water accumulation resulted in bog vegetation such as *Carex scopulorum*. Lists dominant species characteristic of wet and dry meadows, drier exposed sites.
    - *Geum rossii* a dominant in boulder fields and dry meadow, deep roots compared to shallower rooted grasses and sedges. Associates with *Deschampsia caespitosa* in dry meadows.
    - Sedge-grass community occurs on the most stable portions of high ridges and slopes with deep soils.
    - Wet meadow and bog communities are too wet for sheep grazing and can include *Carex aquatilus, Carex saxatilis, Deschampsia caespitosa*.
    - Dry meadow or *Deschampsia* and *Geum* community grades from wet and semiwet meadows to dryland comunities and are positioned in the basins and at the foot of slopes. Dry meadows are common on the Uinta Alpine areas and is a favorite of grazing animals, and heavy use and damage to the plant cover have occurred in many areas.
    - Alpine shrub community are the willow, dryad and heath. Hedged and dead willow clumps are common on heavily grazed sheep ranges.
    - Conifer community are characterized by scattered trees and open parks. It extends to the head of drainages, along terraces and benches. The drier sites within this area are generally in poor condition due to heavy grazing. The conifer community is one of the heaviest grazed portions of the high elevation types.
- The report (p50) discusses the rate of change in succession with removal of livestock based on the Kidney Lakes exclosure. After eleven years of exclusion vigor improved, and desirable plants increased in composition, while non-forage species were reduced. The vegetation changes resulted in condition changing from fair to good.

[74] John Carter note - this is counterintuitive as the turf formed in the same position under the same climate/water regime, so an external force such as sheep grazing and trampling has to break the sod. Once the sod is broken, then wind and water erosion can take place.

- Range condition guides were based on results of site analysis on areas that had little or no past grazing use. Most of the areas studied had ground cover approaching 100 percent. Studies on areas that had deteriorated from past grazing use had reduced ground cover and a decline in plant vigor. This results in lowered soil stability.
- Determination of suitability
    - Suitability determined by accessibility, animal preference, soil erodibility, slope and ground cover
    - Wet meadows not preferred by sheep were not considered suitable.
    - Soils with high or moderately high erosion index are very susceptible to erosion. "If a protective ground cover of vegetation and litter cannot be maintained under grazing use, the area should be classed as unsuitable and closed to livestock." (p57). Soil on shale areas are in this classification. Slopes over 20% should be heavily sodded before they are considered as suitable for grazing.
    - Observations show sheep grazing to be a most important factor in sod breaking and reduced ground cover. Serious erosion problems develop when about 30% of the soil becomes bare.
- Grazing capacity
    - Should be based only on suitable range. Suitable and non-suitable areas are intermixed on much of the alpine area and grazing use must consider the damage of the unsuitable areas while suitable areas are grazed. Damage will be based on the stability of the unsuitable range.
    - Unsuitable areas on steeper slopes and shale outcrops must be given full protection from grazing

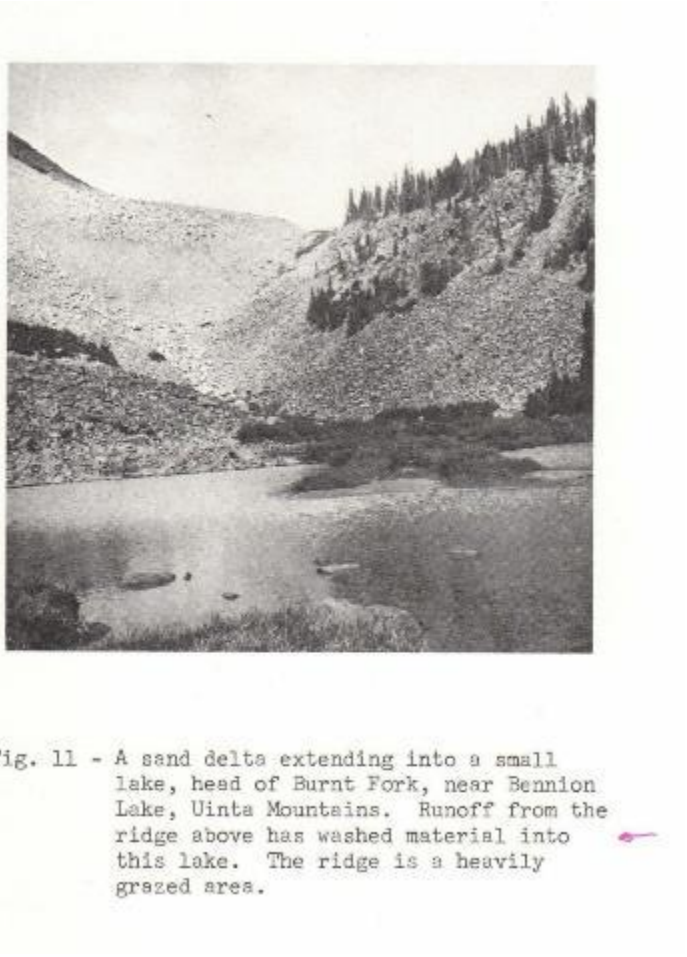


Fig. 11 - A sand delta extending into a small lake, head of Burnt Fork, near Bennion Lake, Uinta Mountains. Runoff from the ridge above has washed material into this lake. The ridge is a heavily grazed area.

Lewis provided photographs typifying communities in good to excellent condition, not recently grazed. He also provided photographs showing typical sheep damage. The DEIS cites Brown (2006)[75] as the authority on these communities. We have protested the use of this document as biased and down-grading potential

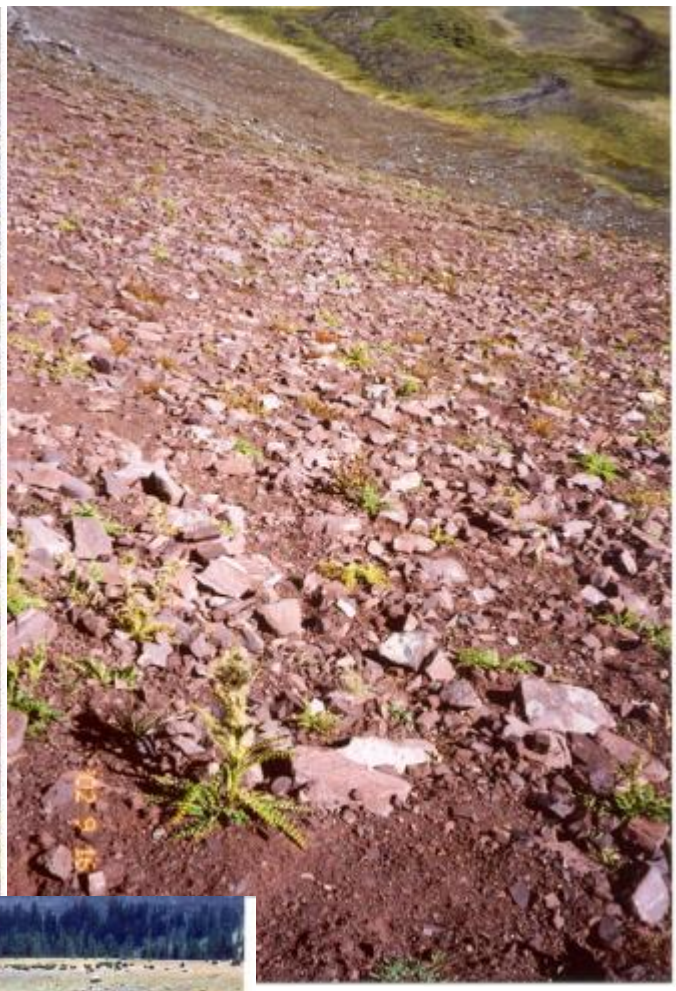
[75] Brown, Garry D. 2006. 2006. An Alpine Plant Community Classification for the Uinta Mountains, Utah. USDA Forest Service Intermountain Region, Ashley and Wasatch-Cache National Forests.

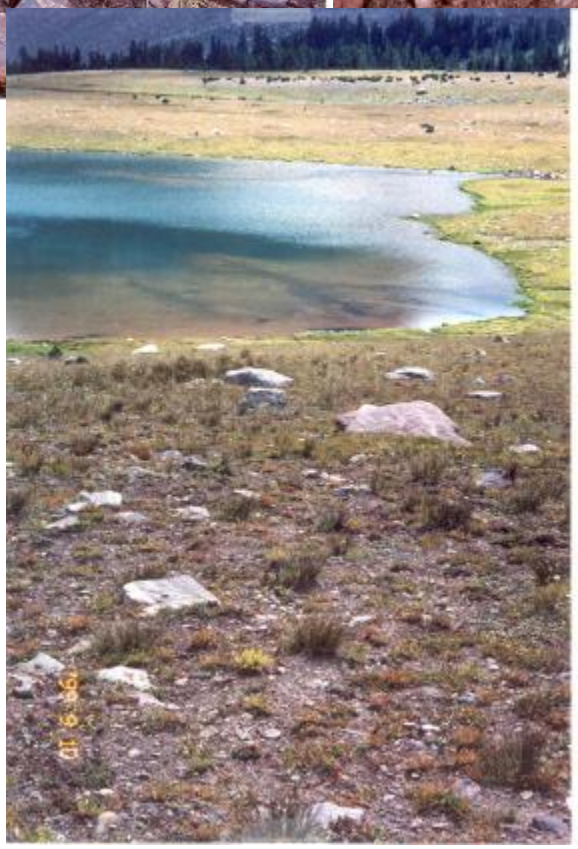
plant and soil communities to claim current degraded conditions are natural, Brown's work was done in heavily grazed sheep allotments. Brown was associated with Sheryl Goodrich, one of the sheep damage deniers that have worked for the Forest Service since the early 1990's. Our letter (attached) requested that this study be withdrawn and a more honest characterization produced that uses ungrazed watersheds as references.

Above is a Figure from Lewis' report showing consequences of sheep grazing on steep slopes and ridges, which due to harsh growing conditions and erosion hazard should not be grazed. In this case the lake is being filled with sediment from the accelerated erosion generated by sheep grazing in this sensitive, steep area. Today, these areas are still grazed by sheep as the photos and ground cover data in the 2006 report (Carter 2006) by Dr. Carter on behalf of WWP demonstrates in numerous photographs. [76] Two examples are provided in the following photos.

The left photo below was taken in East Fork Blacks Fork and shows the steep slope with near 100% bare soil, but with residual thistles that are deep rooted, illustrating that the soil can support a high percent ground cover if not grazed. The right photo shows the slope leading into Lake Fork Basin from Red Knob Pass along the sheep trail, but the entire slope, not just the trail, is denuded by grazing sheep. Lewis also reported that lakes in the Uintas were being filled with sediment from sheep grazing slopes and erodible soils in their watersheds. An example from the West Fork Blacks Fork's Lake EJOD was provided in (Carter 2006) and is shown in the following photo. Note the bare soil in the foreground which is typical of all the uplands surrounding the lake. This occurs throughout the grazed areas of the Uintas and is ignored by the Forest Service.

[76] Carter, J. 2006. Watershed Conditions Uinta Wilderness. Western Watersheds Project. https://app.box.com/s/944957604b8618539585





Another example of an area that should not be grazed is the shale type. Lewis provides the photo below (left) of this type in very poor condition that should not be grazed. The photo at right is from Carter (2006), showing a similar area grazed by sheep in East Fork Black's Fork. It is mostly bare soil, but with trees and plants present showing it has potential for plant occupancy. The Forest Service today claims these conditions are natural and have no relation to domestic sheep grazing. The agency makes this claim by relying on flawed information such as Brown (2006), biased interpretations by Forest Service staff, ignoring that sheep use these areas, and by not using ungrazed reference areas.

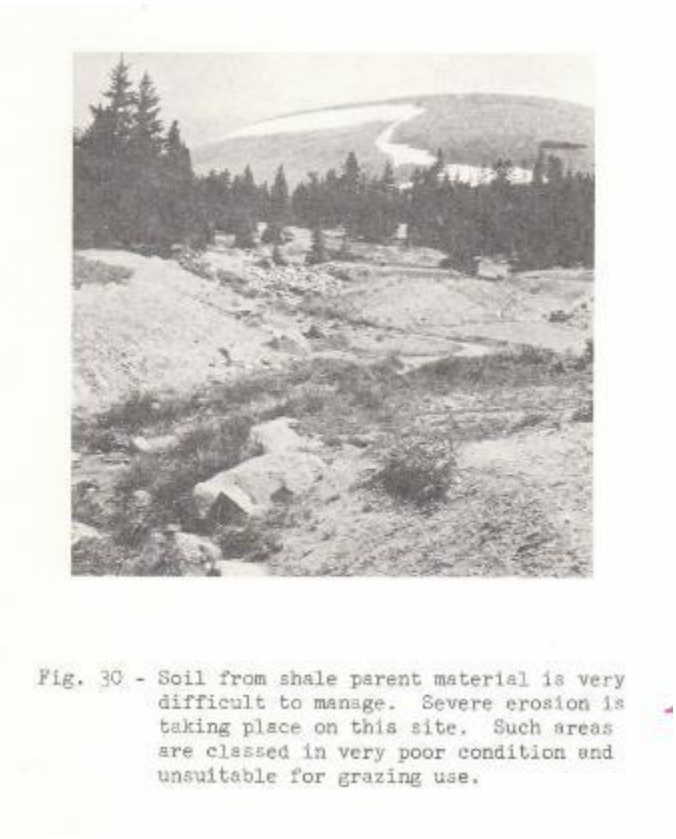
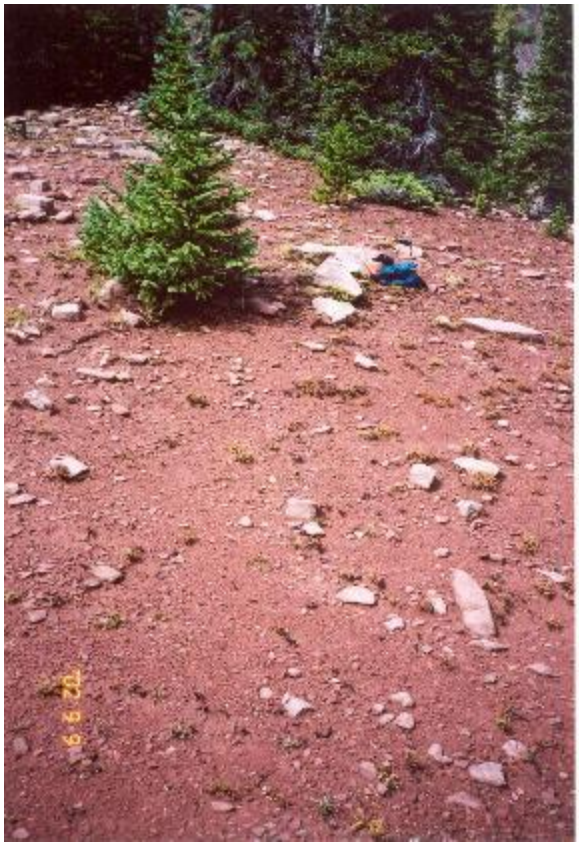


Fig. 30 - Soil from shale parent material is very difficult to manage. Severe erosion is taking place on this site. Such areas are classed in very poor condition and unsuitable for grazing use.



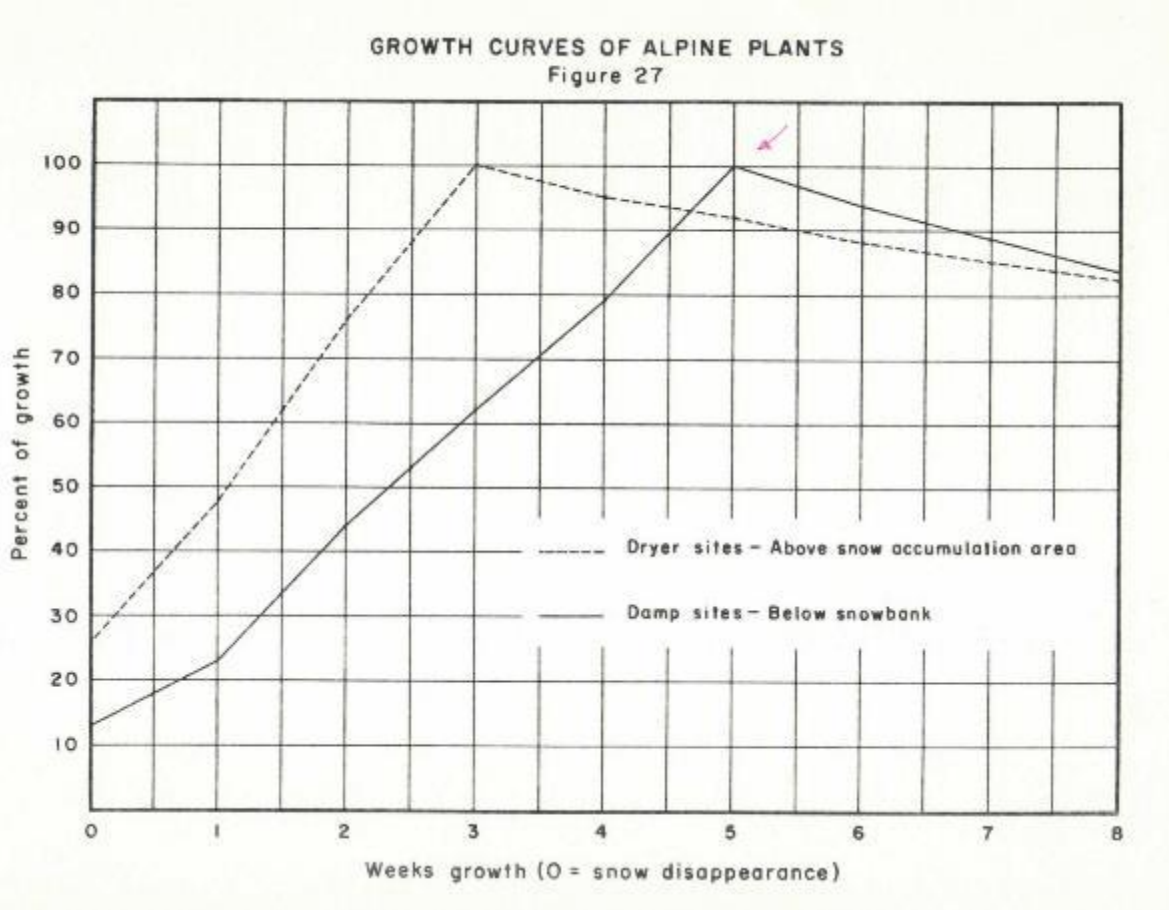
Lewis (1970) provides other examples of sheep damage in photos below. The photo at right is termed alpine turf. It is an area that should have near 100% ground cover but has a large amount of bare soil due to sheep grazing. The left photo is shown in very poor condition reflecting high percent bare soil. Here, Lewis is objectively reporting on sheep damage to areas that have high potential ground cover. Whereas, the current Forest Service would report these conditions as naturally occurring. For example, Sheryl Goodrich, in a photo of a meadow with bare soil and soil pedestals calls it an "interrupted turf community". See later section for photos and comments.

Fig. 29 - Geum-sedge community in very poor condition and unsuitable for livestock grazing. The soils on this 40 percent slope are very unstable.

Fig. 28 - Alpine turf in very poor condition. This site has approximately 35 percent bare soil. It is a concentration area with a long history of heavy use. Lack of soil stability places it in the very poor condition class.

Regarding Range Science principles, Lewis (1970) provides growth curves for alpine plants in two settings. One curve is for well drained locations above snowbanks, the other a less well drained site below snowbanks. Inspection of these curves reveals that after snowmelt, plants in the "above" position reach growth peak in three weeks following snowmelt. Those in the lower position take five weeks to reach peak growth. Sheep grazing in these allotments occurs between late July to early September. Snow melts from the higher elevations and snowbank areas as late as August (see photos in the next section from Forest Service studies). This means that sheep will be grazing and trampling areas such as snowbank or snowbed areas before plants have a chance to grow and while soils are still wet. As Range Science has shown, this is a recipe to eliminate those plants. See Holechek et al (2004)[68]. While ignoring this basic plant physiological fact, the Forest Service allows sheep to graze these areas too early and destroys the plant community, then attributes bare soil to snowbeds or gophers or claim it is in a natural state.

As noted above, we reviewed the ecology of gophers in our comments previously submitted, and while there can be more activity in areas of long-lasting snowbanks, this is due to soil compaction and reduced forage productivity. When sheep are added, more compaction occurs and less production is present. This has the effect of forcing the gopher population to forage more, dig more and eat a larger proportion of the plant roots present. In a normal situation, gophers live in stable tunnel systems and there is little evidence of their presence. Add livestock and, all of a sudden, more gopher activity is evident.



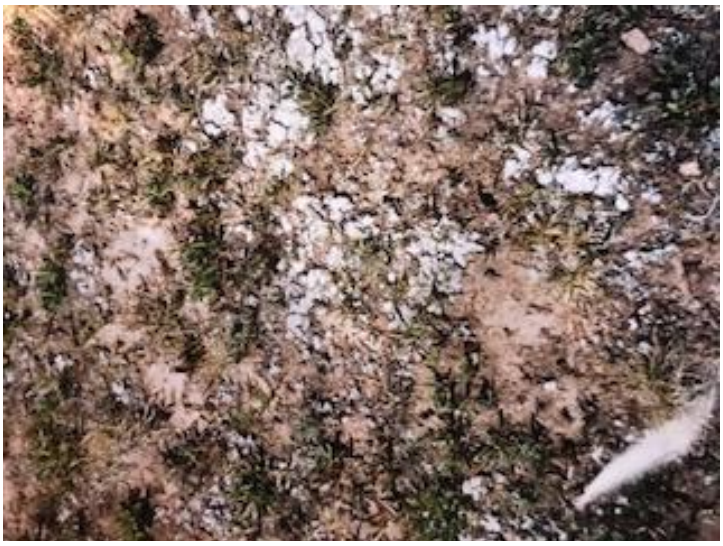
Plant and Soil Interpretations for Alpine Soils by Darlene Voerner, Ashley NF Soil Scientist - Retired

The following writeup and photographs illustrate some of the characteristics and effects of domestic sheep grazing in the Uinta alpine area. We have also requested the report by Christie Oprandy, Soil Scientist-Retired Ashley NF, for the West Fork Black's Fork allotment management plan EIS so that the soil interpretations for that allotment can be applied to this project.

Alpine soils in the cirque basins of the Uintas are formed in till and are generally shallow, sandy and very erosive. Ground moraine has deeper soils but no less erosive. Many components of these systems, whether natural or not, exhibit conditions under which disturbance should be enough to remove them from the suitable grazing designation the Forest has given them. Climate change, gophers, short growing season, shallow erodible soils, lack of lichen in many allotments containing alpine soils should be looked at closer in terms of how much erosion has taken place and continues to erode. It is necessary to know how much eroded phase of soils there is and not just vegetation points that generally are done in climax plant communities. There should be an analysis of the amount of eroded phases of soils in the alpine basins.

Late Snowbanks in alpine areas reduce growing seasons in years where The snowpack lasts into the summer.

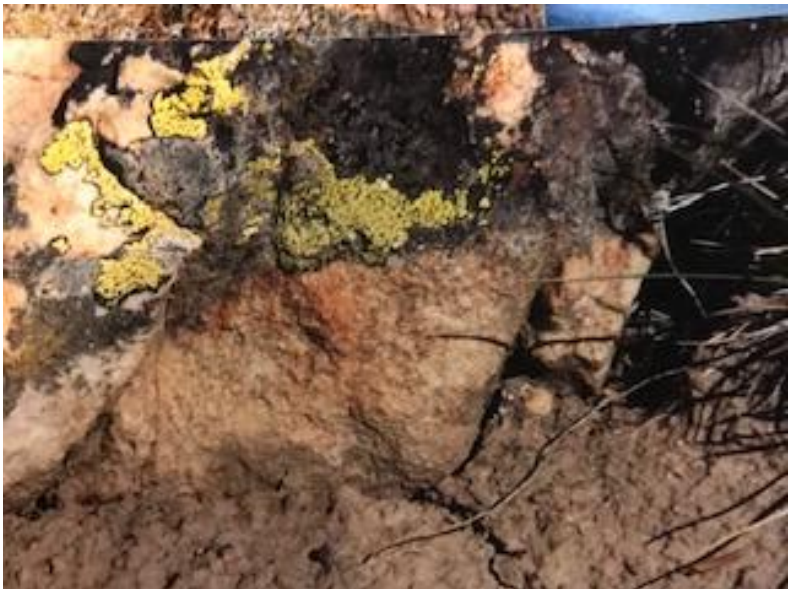
Sheep Allotment with broken turf. Soils are shallow with a 1-2 inch A Horizon. Once the turf breaks and erosion starts, the vegetation continues To peel back reducing productivity and increasing loss of soil.



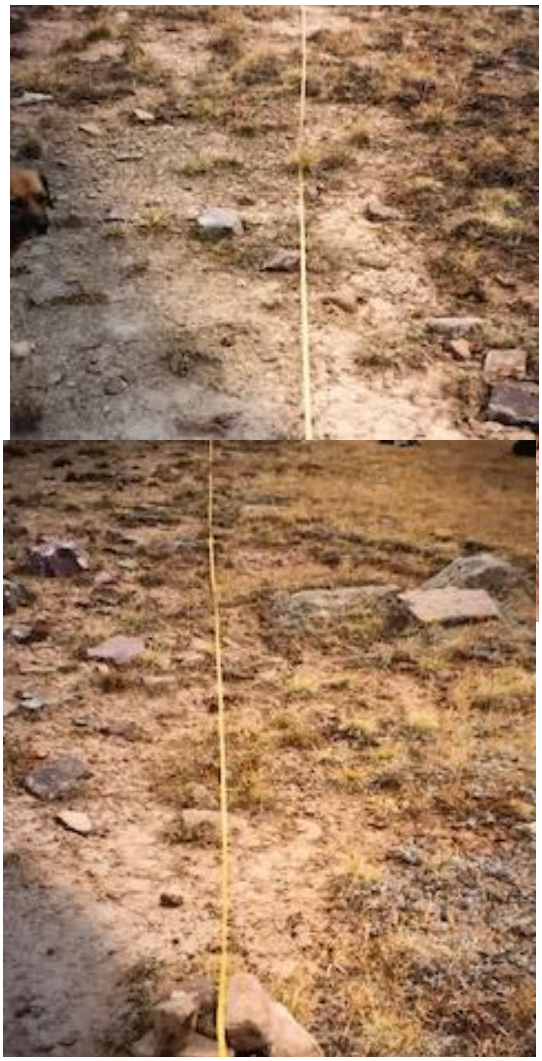
Lichen are an important component of alpine areas. They help stabilize the Soil. Chepeta Lake Area. Grazing has been discontinued and lichens are coming back in to stabilize the soils.

Areas called barren or rock are oftentimes the result of a thin layer of soil that has been eroded exposing what becomes barrens and bedrock. Once these plant communities start breaking and soil erodes it continues to exfoliate and move back.

A lichen line from soil erosion. The lower section of this rock is level with soil and vegetation to the right. The lichen covered area sticks above the past soil line. West Fork Blacks Fork.



A soil/lichen line with erosion of the soil below the lichen. Vey common to see erosion leaving lichens growing to where the soil at one time was. West Fork Blacks Fork.



Eroded phases of soil in alpine showing the breaking of the sod and the continued removal leaving pedestaled vegetation behind. It is not known what percent of the alpine basins are In an eroded phase and a level 2 soil survey should be done to identify the extent of this erosion

Comments on Forest Service "Studies"

In response to our request, we received a file from the Forest Service titled, "03-Studies". In that file, there are field photos and some data sheets for each of the ten allotments in question. Due to lack of time, we have only reviewed the Ashley NF allotment files and cannot do a complete analysis since our request for a 30-day extension was denied stating that *"Forest Service specialists have already summarized this information as part of their analyses…as part of the DEIS."*[77] This is a problem in that the DEIS is general in nature and, for example, while the DEIS mentions utilization standards it applies, there is no data. There was no presentation of actual utilization measurements for each allotment and there was no utilization data provided in the files we obtained. So, utilization standards are meaningless as there is no data and therefore no enforcement. It is all deflection around the situation on the ground. For the Ashley NF allotments we reviewed all the data files and photos. There were 1565 study sites in the Ashley NF spreadsheet titled "**07092019ANFStudyPlotCoordinates**" provided by the Forest Service. Many of these had no location coordinates. But, of 1565 sites listed only 69 reported ground cover data from either line intercept or ocular estimates in the past 20 years, and location data was missing for some of those. In the following pages, we make reference to the page, folder and file in which photographs or data forms are located.

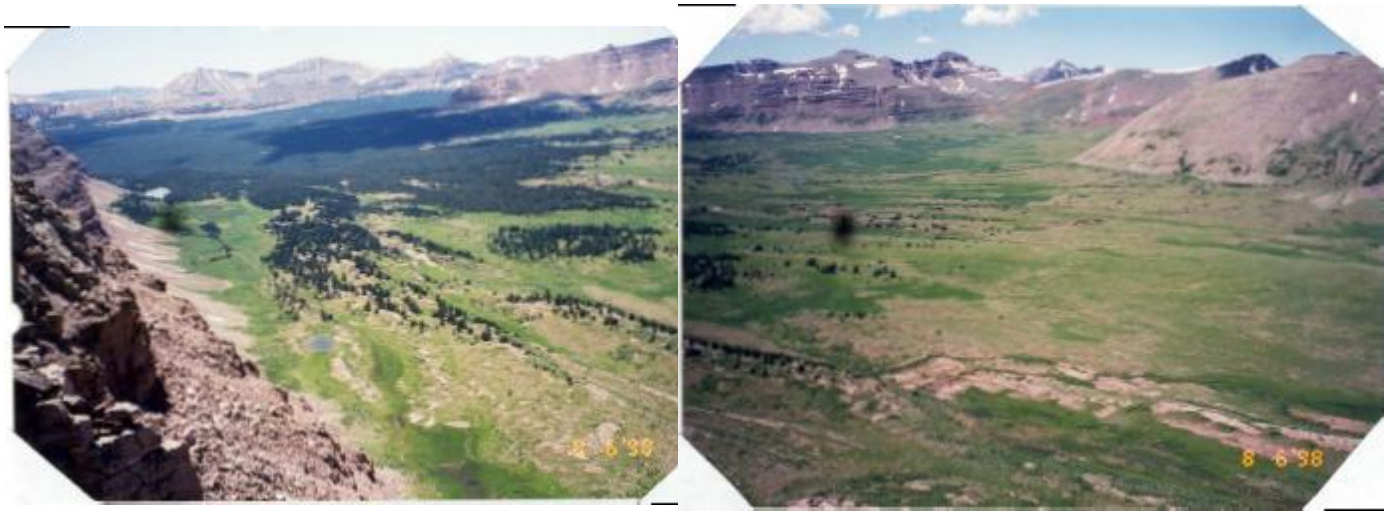
[77] Forest Service response to request for extension of time dated July 30, 2019.

Examples of Topography, Snow Cover Time Period

The head of Yellowstone Drainage M Muir 2009 (P193 Tungsten 24-002 to 24-035) shows basin with wet meadow and willow habitat in the valley floor (habitat avoided by sheep), leaving the knolls, rocky slopes and a few dry sites subjected to sheep grazing scattered around these wet sites that are not preferred.

The head of Yellowstone 29 July 2008 (p163 Tungsten 11-002 to 11-013) showing valley bottom, heavily forested areas, wetland and willow areas, all areas either not capable for sheep grazing or not preferred and avoided in preference to drier upland sites..which in this photo are the ones along the base of ridges and talus slopes, in sensitive soils.

Lower Oweep Basin and head of Lake Fork drainage (p403 Tungsten 11-002 to 11-013). Similar to the Yellowstone photos above, showing non capable, wet, forested areas with capable areas in the drier uplands. Lewis in his report indicates only a small amount of the land in the alpine is "suitable", which in his day meant capable.



Tungsten photo showing snow present 29 July 2008 (p92 Tungsten 11-002 to 11-013). Snow still laying in slopes at the end of July. The allotments in this project are grazed by sheep from mid-July to early September. The growth of plants in these areas will have barely begun when sheep are allowed to graze them, yet it is the snow or gophers that cause bare soil and erosion.

Snow still present Head of Yellowstone August 1967 (p123 Tungsten 11-002 to 11-013). Similar to the photo above, but showing snow still present in these "snowbeds" until sometime in August. Plant growth will not be far along in these areas even at the end of the grazing season. Again, is it any wonder there is low production and high bare soil when a stressed environment such as this is not allowed to complete its growth before thousands of sheep graze and trample it?

Fall Creek allotment ungrazed since the 1970 time period.

Phinney Lake August 2009 (p10 Fall Creek 22-007 to 22-021) showing conifer and dry meadow looking lush and green after decades of rest from grazing by sheep. This site had 100% ground cover.

Phinney Southwest August 2009 (p31, 32 22-007 to 22-021). The next two photos showing old trail with erosion healing after decades of rest from sheep grazing. Adjacent dry meadow fully vegetated head cuts healing

Phinney Southwest August 2009 (p33, 36, 38 22-007 to 22-021). Next three photos show wet meadow and adjacent dry upland moraines appearing fully vegetated after decades of rest from sheep grazing. Evidence of bank scouring from high runoff events appears to be absent and in the third photo an area of bank trampling is healing as sedges stabilize it.

Photos below taken from Carter (2006). Upper shows headcuts in a meadow in the Middle Fork Beaver Creek watershed. They are healing after decades of rest from sheep grazing. The bottom photo is of active headcuts in the East Fork Black's Fork where sheep grazing continues.

Phinney North 2009 (p39 22-007 to 22-021). Dry meadow with Deschampsia and Danthonia common. Ground cover 99% after decades of rest from sheep grazing.

Fall Creek Basin 2009 (p113 22-007 to 22-021). Shows trail barely visible in absence of sheep and herders' horses. This is in the presence of recreation.

Fall Creek Ledge Lake Trail 2004 (p115 22-007 to 22-021). Shows trail with headcuts healing and vegetation returning to bare areas after two or more decades of no sheep trailing.

Fall Creek trail braiding shown 2009 (p137 22-007 to 22-021) note vegetation growing in bare areas as it recovers in the absence of sheep grazing and trailing.

Fall Creek snowbed site 2004 (p232, 233 22-007 to 22-021). This shows cover of plants such as pussytoes, sibbaldia and soil lichens. A note with photos states, *"Close-up of an area with an abundance of a gray lichen that grows on the soil. Abundance of this lichen indicates absence or low presence of pocket gophers. It does not seem to be able to persist in abundance in areas where pocket gophers are highly active."* As pointed out in St. Clair et al (2007) who studied lichens in the Uinta mountains, lichen cover is reduced in the presence of sheep grazing.[78] In these photos, it is the absence of sheep that have allowed lichens to grow. In addition, without sheep, there is no evidence of gophers in the photos.

[78] St. Clair, L, Johansen, J, St. Clair, S, and Knight, K. 2007. The influence of grazing and other environmental factors on lichen community structure along an alpine tundra ridge in the Uinta Mountains, Utah, USA. Arctic, Antarctic, and Alpine Research: 39 p 603-613.

Other photos in the Fall Creek folder show areas of bare soil remain, head cuts and bank scours and bank trampled areas remain, but these appear to be healing after two to three decades of rest as sedges, willows and other plants move in, so recovery is clearly a long-term process. It took a century for the degradation to take place, it likely will take that long or longer for full recovery.

Ottoson Sheep Grazing 2009 (p33 09-001 to 22-013). Here sheep are seen grazing on the dry areas and completely avoiding the wet areas. The removal of vegetation and trampling of these uplands leads to accelerated runoff and flood forces that lead to scouring of stream banks.

Ottoson Severe erosion 2009 (p38 (p33 09-001 to 22-013) as accelerated runoff scours out channels. These do not show signs of healing as the ones in Fall Creek with decades of rest do.

Ottoson Little Basin snowbed (p 42, 43 09-001 to 22-013) shows a snowbed adjacent to willows. Sheep graze these slopes that are described as "barren" and where *"The growing season is so short for plants to colonize much of the site."* Here Goodrich & Co recognize the growing season is short, but say nothing of the contribution of sheep to the loss of plant cover or lichens by grazing these steep slopes as plants have barely begun growth and soils are wet.

Ottoson Little Basin Discontinuous Sod Community 2001 (p97 09-001 to 22-013). Here Goodrich & Co call this broken up meadow a "discontinuous sod community". As Mont Lewis demonstrated in his report (Figure 28), this is alpine turf in very poor condition due to heavy sheep grazing. Goodrich & Co claim it is not sheep because the area with high cover is not broken up. What they don't address is the characteristics of what they call a "turf community" which may be a wetter site with greater resistance to damage. Inset is also a copy from Lewis (1970) showing the same situation but acknowledging the role of sheep.

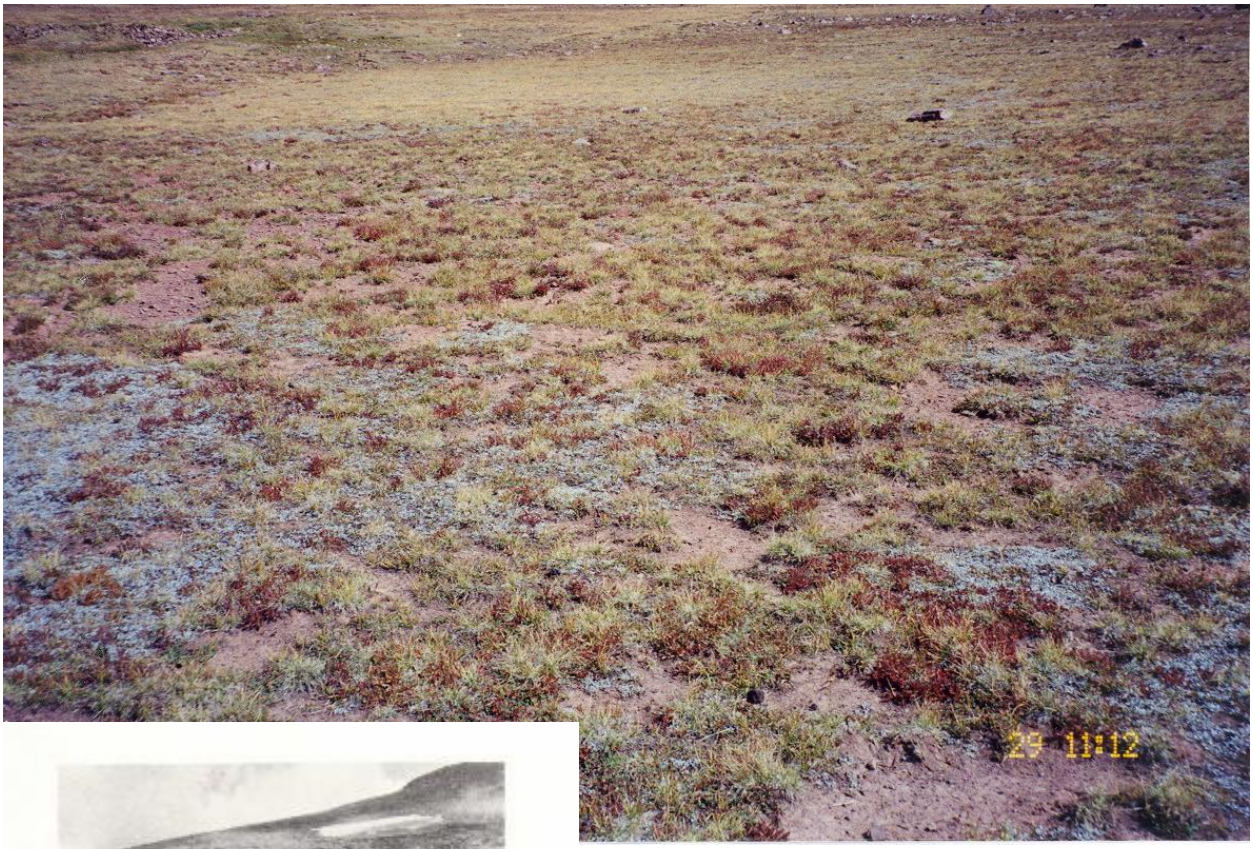


Fig. 28 - Alpine turf in very poor condition. This site has approximately 35 percent bare soil. It is a concentration area with a long history of heavy use. Lack of soil stability places it in the very poor condition class.

Ottoson wet meadow 1994 (p167 09-001 to 22-013). Note with photo by Goodrich states, *"Sheep are very reluctant to use these wet meadows."* He acknowledges this fact, but ignores it when convenient to claim barren areas are natural when they are situated adjacent to these sites.

Ottoson sheep being driven 1982 (p292 22-014 to 23-027). Sheep being driven into dense timber and thru boulders. Non capable areas that are purposefully exposed to sheep.

Rorripa Snowbed 29 August 2001. (p298, 301 22-014 to 23-027). Note with photos states, *"2001 was a relatively light snow-pack year. Snow release date was prior to 29 August this year."* The Forest Service knows these sensitive locations are snow covered until near the end of the permitted grazing season, yet they are grazed and trampled while plants barely begin to grow and soil is wet. No evidence of gophers in these photos, yet high percent bare.

Ottoson Lake Fork gopher activity 1993 (p307 22-014 to 23-027). Note with photos states, *"Pocket gopher eskers indicate a site highly selected by gophers"*. This is also a site selected by sheep if one notes that it is an upland adjacent to an extensive wet meadow or wetland area. This is an example of the Forest Service deflecting around the fact that sheep will concentrate in the area where gopher activity is seen, while avoiding the area across the creek.

Oweep sheep trail 2001. (p60 10-002 to 23-002). Note with photo states, *"A Sheep trailing is evident by the narrow band of vegetation of slightly different color indicated by the blue arrows. This trailing intercepts a headcut shown in the lower photo. At this point the trailing combined with the head cut presents an obvious disturbance. The degree of contribution of sheep trailing to the headcut is unknown. However, it likely contributes to the cutting if not the cause of the cut."* It appears the steeper slope to the left provides surface flow that cuts thru an area where sheep trail, creating this erosion feature. These are common throughout grazed areas in the Uintas and for once the Forest Service admits sheep contribute to the failure of the headcut to heal.

Painter Basin 2003 (p304 12-022 to 12-052. Note with photo states, *"This shows the vivid contrast in vegetation cover on the near side of the stream in quartzitic materials and the relative sparse cover on the far side of the stream where shale materials are abundant. Had livestock grazing been so intense as to cause the conditions on the far side of the stream, similar conditions could be expected on the near side of the stream. Site specific factors and not the more or less ubiquitous factor of livestock grazing are strongly indicated to be the cause of the sharp contrast between the 2 sides of the stream."* Here Goodrich & Co fail to note that wet meadow/willow habitat is on the right side in a more level site. They have admitted sheep avoid these areas, yet here in their zeal to forgive any sheep impacts, they fail to connect the dots to acknowledge the area used by sheep is the less stable shale on the left. Sheep bedding, grazing, trailing, loss of ground cover all are happening on the left. This area should not be grazed, but is.

Ottoson Basin 2001 (p144 22-014 to 23-027) Ground cover data sheet on page 147 reports 2% bare soil at this former exclosure site. This photo was scanned by Sample Point and determined to be 40% bare soil. Forest Service data does not agree with the plot photo.

Bald Mountain Study

St. Clair et al (2007) report on research to determine lichen distribution and other factors in relation to sheep grazing and snow duration in the Uinta Mountains. Their literature review of effects of grazing in alpine areas summarizes by saying, *"These studies and others (Andreev, 1975; Utkin, 1974) show conclusively that when grazing animals are herded extensively, there are significant changes in both the lichen and vascular plant communities; specifically, the total lichen cover was reduced, some sensitive species were completely eliminated, and there was a proliferation of grass species (Olofsson, 2006; Polezhaev, 1980)."* Fruticose and foliose species were more susceptible to grazing impacts while the crustose and squamulose species with lower growth form are not as impacted. (References in quotes not footnoted).

They studied a location at Bald Mountain in the Uintas to determine physical and biological differences as determined by differences in accessibility to sheep and along an elevational gradient. Their results are shown in the chart (Figure 4) extracted from their paper as seen below. The lower elevation sites were in snow longer than the upper sites which were windswept. In the figure 4 from their paper below, sites 1 - 9 are the lower elevation higher snow sites, or meadow location also used as a sheep bedding area. Sites 10 - 18 were higher elevation and more windswept, rocky areas less used by sheep. The Figure shows the sites with more snow and accessible to sheep had total ground cover of about 50%, while the rocky sites with less snow and less sheep access had total ground cover ranging from about 50% to near 100% and an average of about 75%. Bare ground was much higher in the meadow locations than in the more rocky locations. The grazed site had fewer lichen species and was dominated by crustose forms. It also had two vagrant species brought in from lower elevations by the sheep. The conclude by saying, *"Data from this project demonstrated that lichen community distribution and structure are directly influenced by several factors, including domestic sheep grazing, degree of rockiness, nature of the vascular plant community, and snowmelt patterns. Grazing activity had a double impact on lichen community structure at the lower transect sites by 'adding' new species while eliminating species sensitive to trampling."*

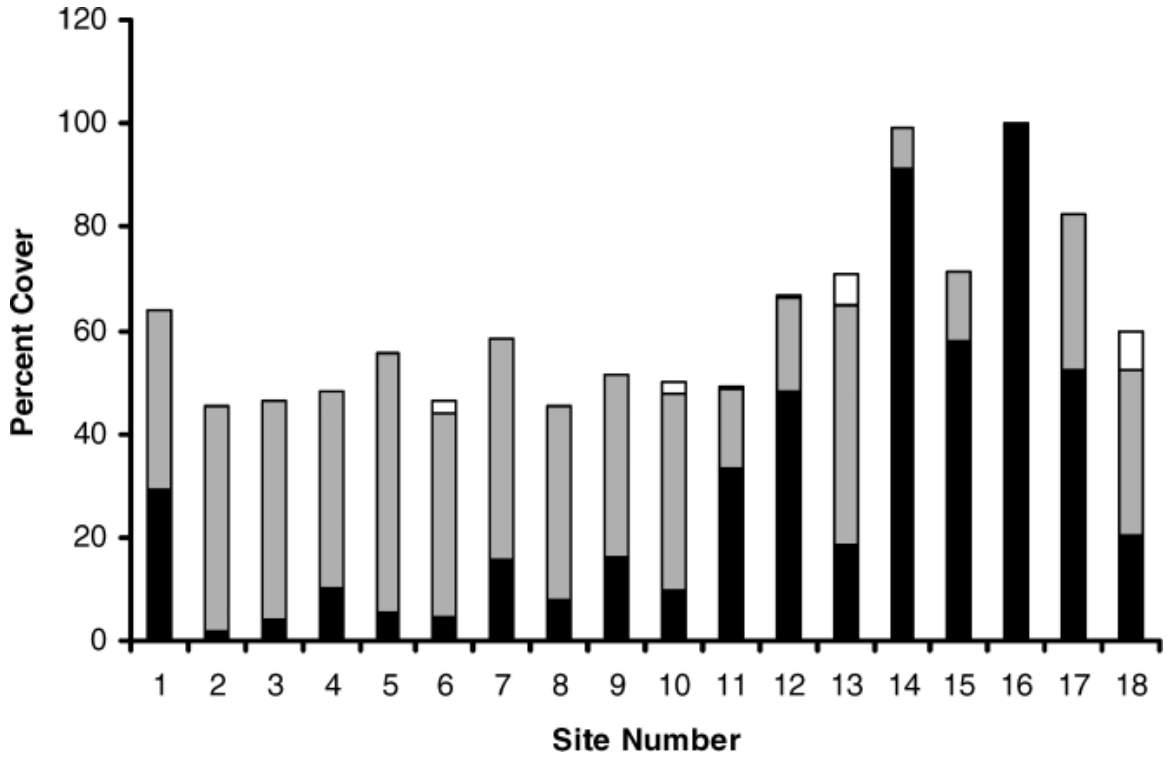


FIGURE 4. Rock cover (black), angiosperm cover (gray), and *Selaginella densa* cover (white) for all 18 sites. Remaining cover was in the categories of bare ground, plant litter, lichens, and mosses. Percent sum cover could exceed 100% in the instances where rocks were overtopped by lichens or angiosperms.

More on Bald Mountain

On July 8, 2019 Dr. Carter received an email with the following photos from a couple who backpacked into the Uintas Wilderness the previous weekend. The email stated, *"I spent the long weekend in the Uintas, my husband and I climbed to the top of Bald Mountain in the Red Castle allotment. There was so much sheep sh.. we couldn't put our packs down. In most places the ground was so saturated the melt was creating overland flow, so the feces was in standing water that was running off into the creeks. We hiked all the way back down without water, because gross. I trust my filter but that was just disgusting."* Many years ago, Dr. Carter and a friend were backpacking in the same area. His friend drank water running off these ridges and contracted giardia. Dr. Carter did not drink the water and did not contract giardia. From a recreation and human health standpoint alone, this water pollution issue should be sufficient to terminate sheep grazing in the Uinta Wilderness.

The photos provided with the email depict Bald Mountain with snowpack melting and melt water running off with sheep manure in the water, polluting everything downstream. The photos show the condition left at the end of the season last year with little residual vegetation in the areas where melt is ongoing. In order for sheep to graze these high elevation ridges, they travel and graze up the steep slopes beneath. Steve Ryberg, former District Ranger of the Evanston Mtn View District told Dr. Carter they were not supposed to graze in these places. But in the years

Dr. Carter backpacked these ridges and valleys, they were laden with sheep manure as evidence they had been grazing and trailing in non-capable areas. Photos follow.

Analysis of Forest Service Monitoring Site Selection

In our FOIA response (July 10, 2019) the Forest Service provided some data. Some of this is difficult to figure out given our request for a 30-day extension was denied by the Forest Service. In the file for study site locations (**07092019ANFStudyPlotCoordinates**) there were 1565 locations listed in the spreadsheet for the Ashley NF, none for the UWCNF. Of those, 517 had no location information, leaving 1048 with location coordinates. This was indicated to be for the Ashley NF allotments. Inspection of the attribute table for the Ashley NF in the GIS data provided (**GISData Folder**), we found 714 records for monitoring locations for the Ashley NF and 284 records for the UWCNF. Of the 714 records for the Ashley NF, 211 had no location information, leaving 503 monitoring points with location data. The UWCNF had 284 points listed in its attribute table with none lacking coordinates. It appears the Ashley NF data has some gaps with the spreadsheet referenced giving 1048 coordinate locations, but the attribute table giving only 503 with location data, so 545 sites appear to be missing. It is also important to remember that the vast majority of these study sites consisted of photographs, not actual data collection.

We did an analysis of some of this. The lack of a vegetation coverage for the UWCNF prevented analysis of that component in the UWCNF. We were attempting to look at the distribution of Forest Service monitoring locations by vegetation, soils and slope attributes. We also went through the Ashley NF data file (**01-Ashley Studies**) for the Fall Creek, Ottoson, Oweep, Painter, and Tungsten folders to locate ground cover data to determine where and in what habitat areas ground cover data was collected either by line-point intercept or other estimates. We found 69 locations with some form of ground cover data for the past two decades. Of these, 54 sites had location coordinates.

Due to lack of time, our review of the "Studies" folder was limited to the Ashley NF. That review generated many of the photographs and observations reported in previous paragraphs of this section. We were unable to review plant species data for any trend comparison in the time allowed, but that should be the Forest Service's job anyway.

GIS analysis to determine the distribution of Forest Service monitoring sites in both Forests determined that 587 of 783 sites (75%) were in capable areas as defined by the Forest Service in generating their Forest Plan map of capability. Capable acres did not include consideration of soil erosion hazard, forested areas, forage production, so this is a very conservative analysis. Omission of these factors shows the Forest Service capability map is inaccurate as it does not reflect the complete set of Forest Service criteria defining capability.

When we looked at the distribution of monitoring sites for both Forests by slope increments, the vast majority (465/789 or 59%) of sites were located in areas of <10% slope, or areas likely to be more stable and less sensitive to impacts of sheep grazing. See **Chart 1** below. We also calculated the number of sites based on area. See **Table 1** below. This points out that the more sensitive erodible and/or steep slope areas were monitored less while the less sensitive sites were monitored more.

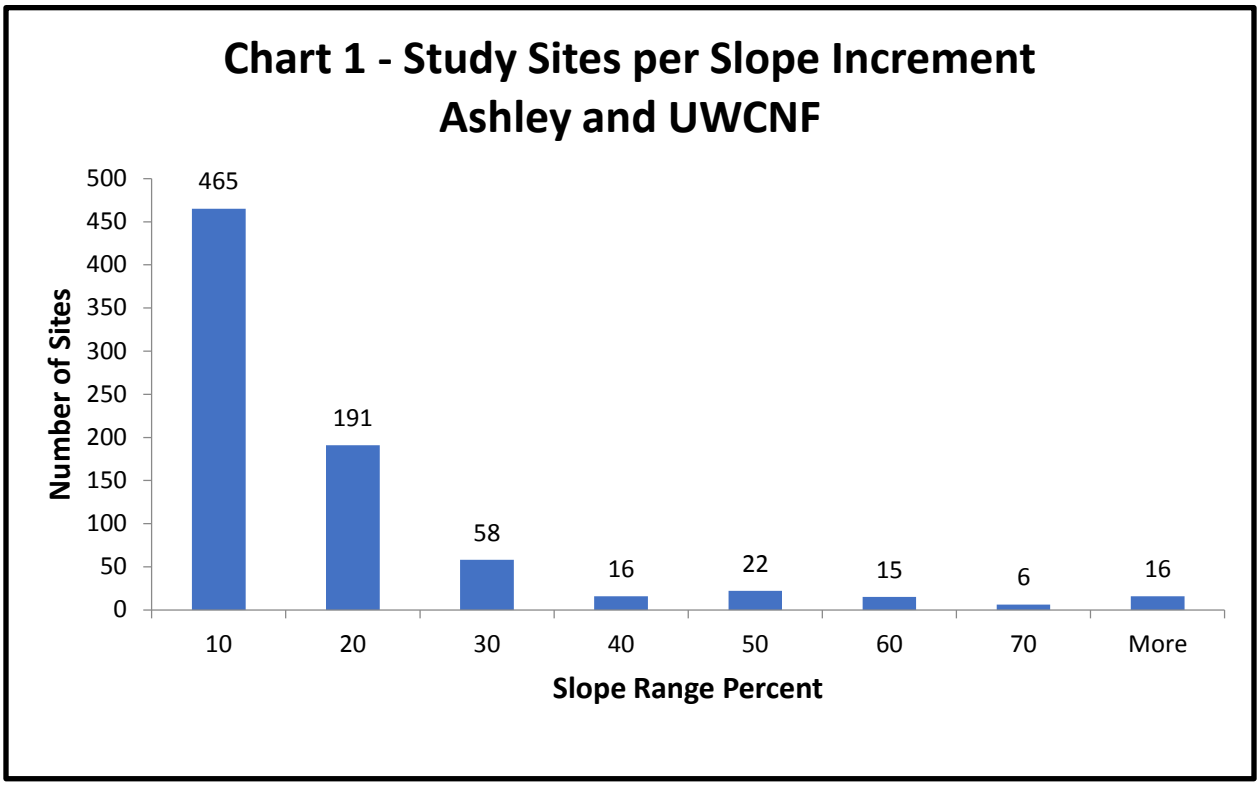
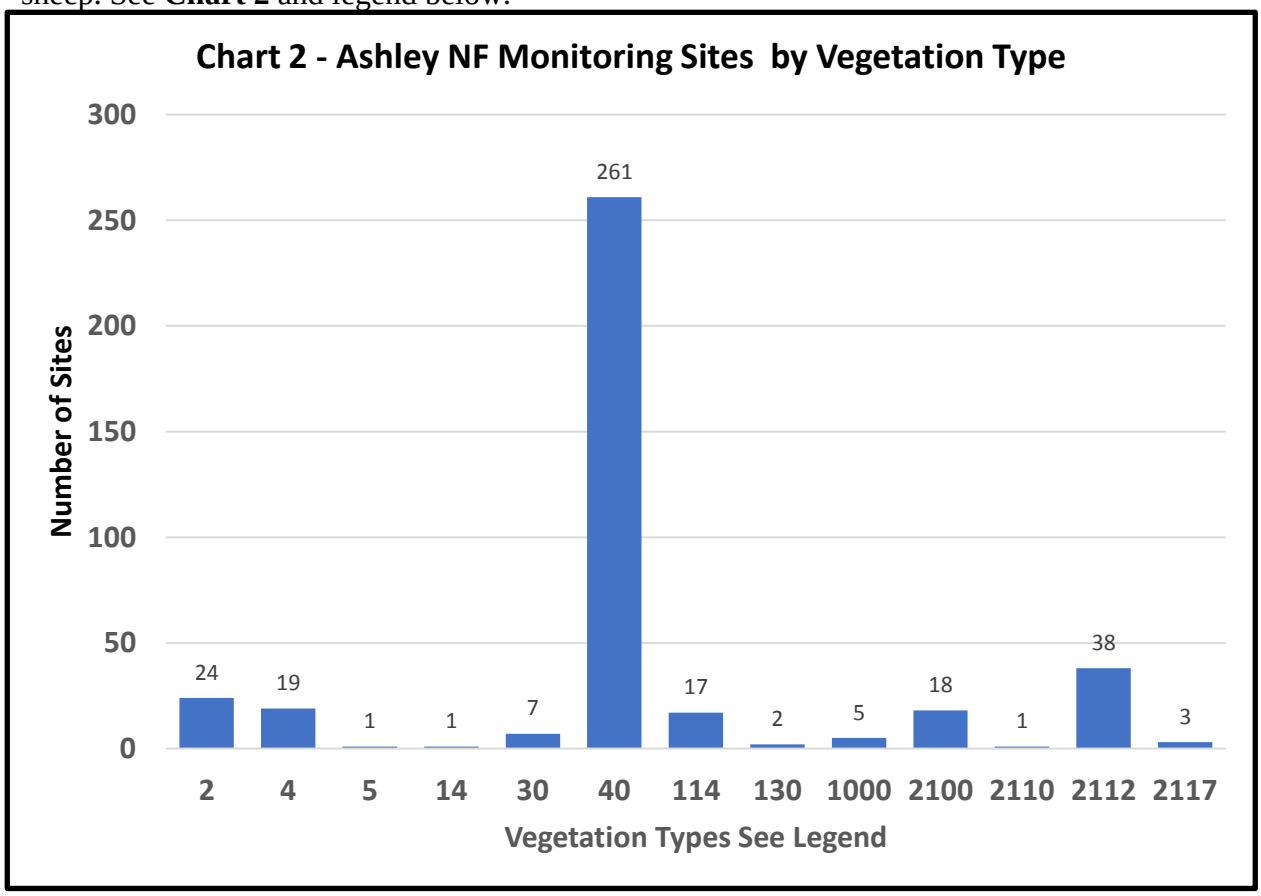


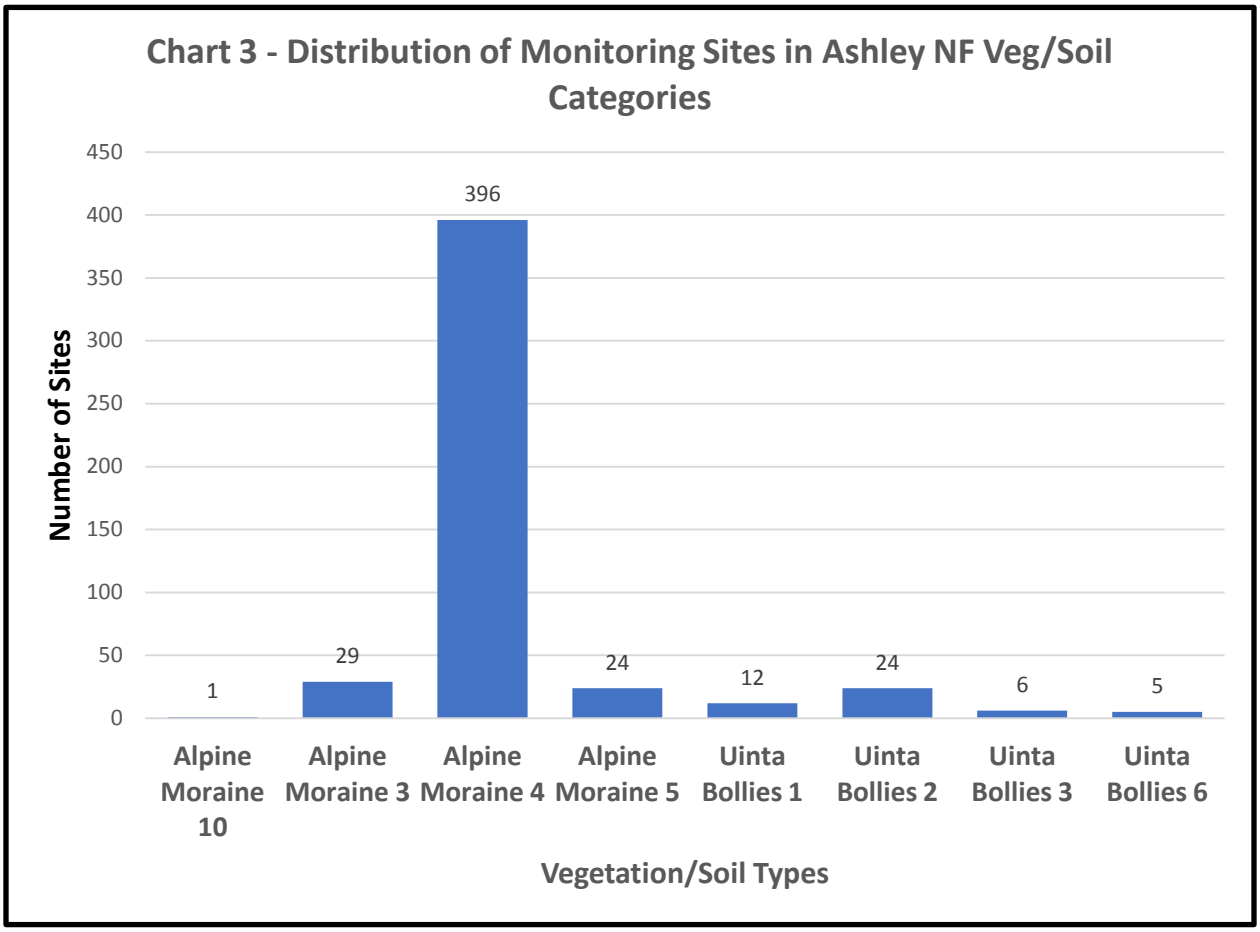
Table 1. Monitoring Sites Per Acre by Slope Class			
Slope Classes Percent	**Acres**	**No of Sites**	**Acres/Site**
0-10	43320	465	93
10-20	42399	191	222
20-30	21501	58	371
30-40	13443	16	840
40-50	9996	22	454
50-60	8576	15	572
60-70	7492	6	1249
Greater than 70	14199	16	887

The analysis of the number of monitoring sites by vegetation type for the Ashley NF (no coverage for UWCNF) determined that 261 of 397 sites (66%) were in Alpine/Wet and dry meadows, willow and graminoid complex, or the less sensitive areas or areas not preferred by sheep. See **Chart 2** and legend below.



VEGTYPE	DESCRIPTION
2	Alpine/Low forb/grass/sedge undifferentiated
4	Alpine/Geum/sedge and sedge/geum
5	Alpine/Kobresia
14	Alpine/Carex nigricans
30	Alpine/Upland willow field undifferentiated
40	Alpine/Wet and dry meadows, willow and graminoid complex
114	Coniferous forest/PIEN/wet and dry meadow complex
130	Coniferous forest/MC/meadow matrix too mixed for delineation
1000	Riparian/RIPARIAN
2100	Riparian/LOW WILLOW
2110	Riparian/Planeleaf willow (Salix planifolia -SAPL2)
2112	Riparian/SAPL2/Carex aquatilis
2117	Riparian/SAPL2/Carex scirpoideae

Analysis of the number of monitoring sites for each Veg/Soil or Landtype Category determined that 396 of 497 sites (80%) were in AM4 moraine category.

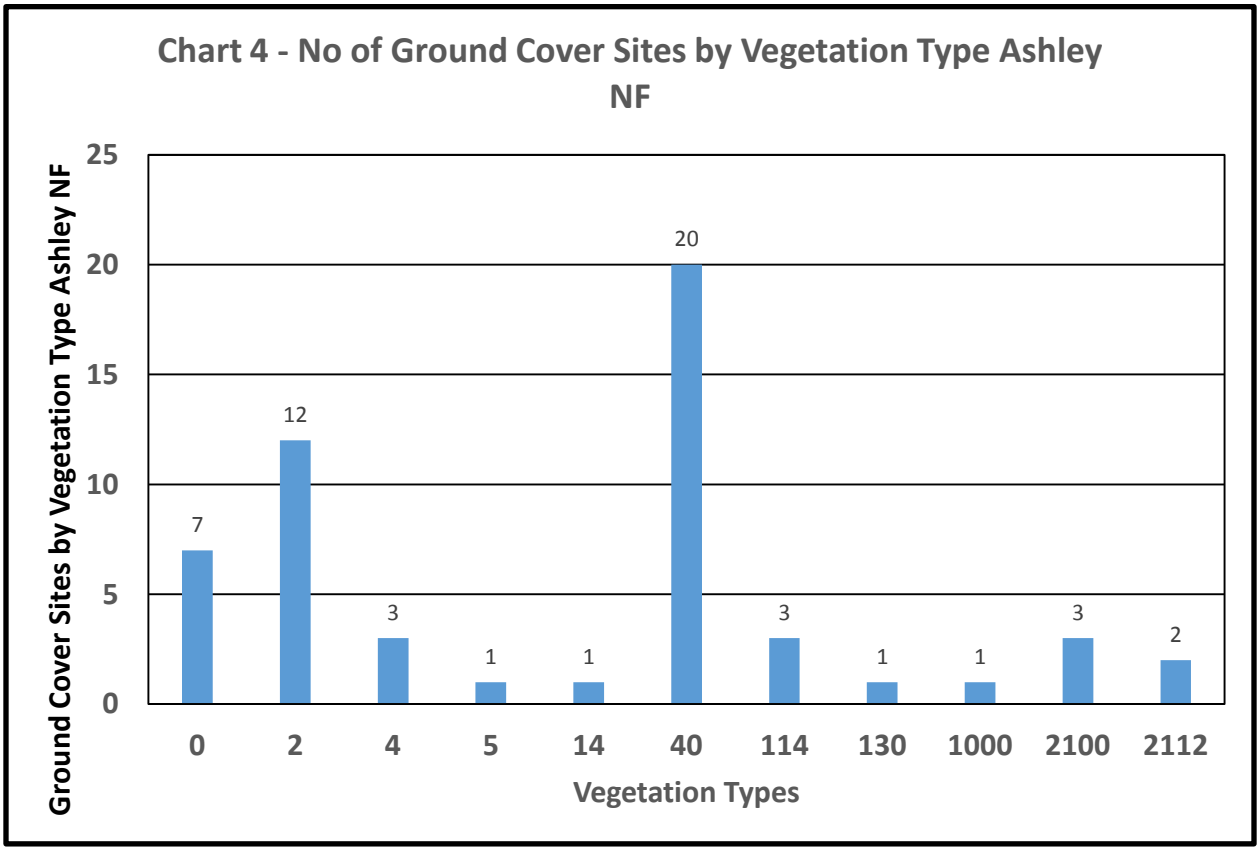


Symbol	Name	Description
AM10	Alpine Moraine 10	Glacial canyon bottoms below AM6 having wet meadows, springs and seeps, and thin hummocky ground moraines and outwash with some inner gorges cut deep in the underlying quartzite bedrock.
AM3	Alpine Moraine 3	Hummocky ground moraine containing lakes, meadows, and streams located in glacial valley bottoms just below the cirques.
AM4	Alpine Moraine 4	Rounded glacially, topography mantled by a thin, veneer of till. Bedrock ledges and areas of scoured bedrock are common.
AM5	Alpine Moraine 5	Lateral morainic lands in cirque basins. Includes a few small lakes and narrow wet meadows.
UB1	Uinta Bollies 1	Lower Bollie side slopes with currently active solifluction feature with an elevation ranging from 11,000 to 12,000 feet and gradients that are typically 5 to 30 percent but range up to 50 percent.

UB2	Uinta Bollies 2	Generally steep to extremely steep mountain side slopes above timberline. Included are cirque headwalls and sides. The elevation is above timberline and ranges from 11,000 to 12,500 feet with gradients of 50 to 80 percent.
UB3	Uinta Bollies 3	Gently to moderate rolling upland surfaces that form the crest of the Uinta Range with an elevation ranging from 11,000 to 13,000 and gradients of 5 to 15 percent.
UB6	Uinta Bollies 6	Flat to gently rounded tree covered surfaces of the bollies at slightly lower elevations that UB3 and UB5. The elevation of this unit ranges from 10,000 to 11,000 feet. Gradients are typically 5 to 30 percent.

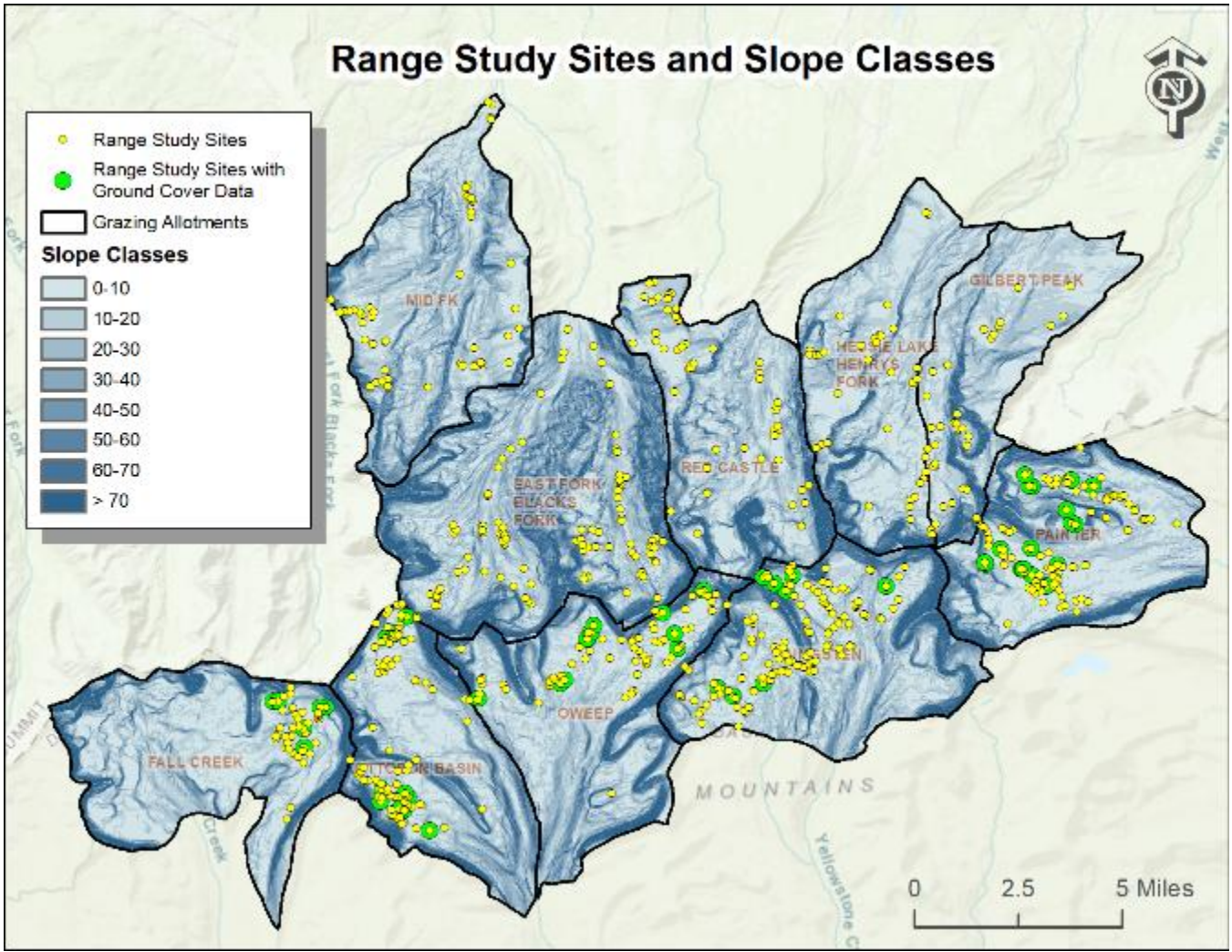
Ground Cover Sites

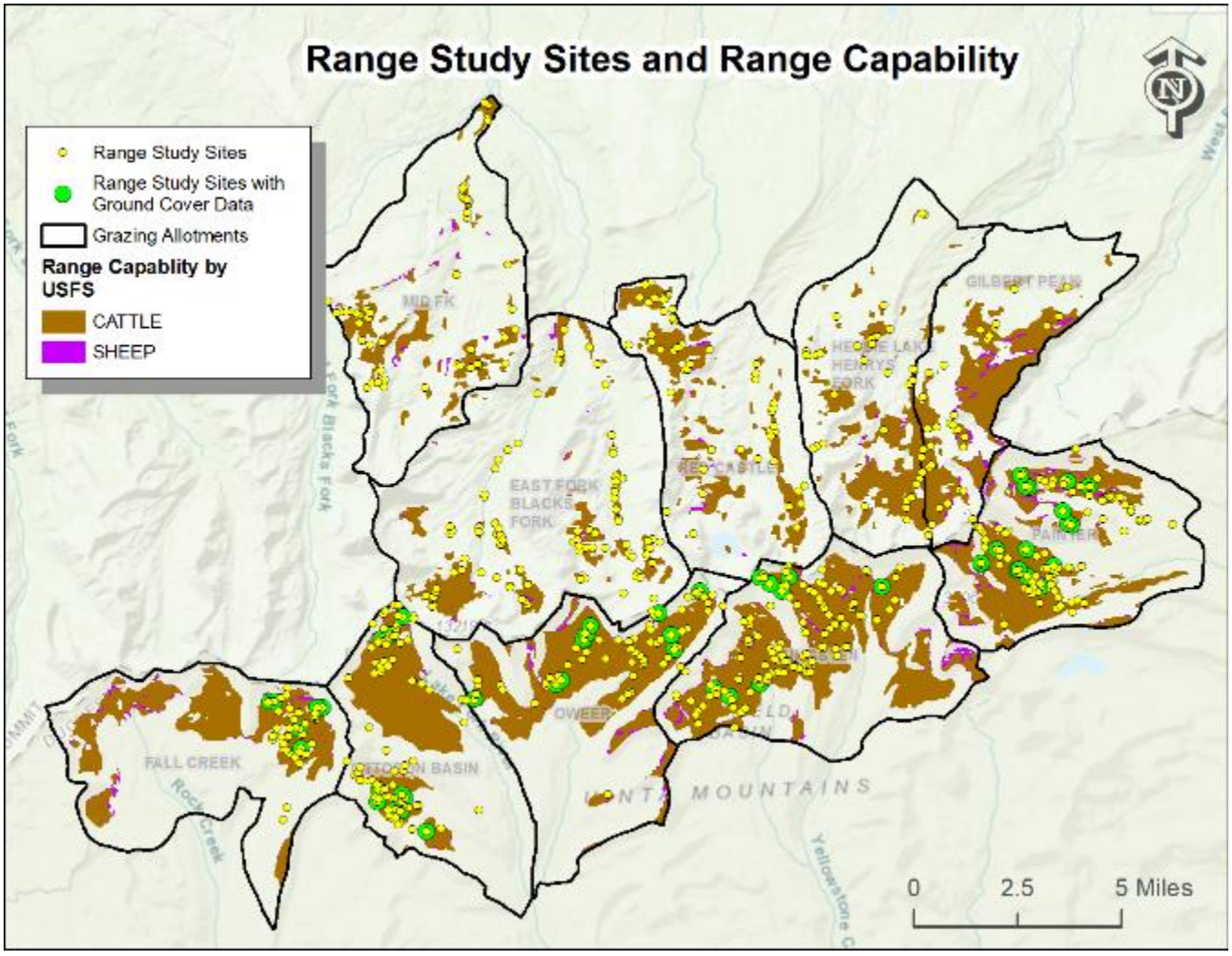
For the sites that had recent ground cover data or observations (Since 2000), 46 of 54, or 85% were in capable areas (as described above). The sites were distributed unevenly with veg/soil or landtype with 47 sites in AM4, 3 each in Uinta Bollies 2 and 3, respectively and 1 in Alpine Moraine 3. No sites with ground cover data were located in AM10, AM3, AM5, UB1, or UB6. The number of ground cover monitoring sites in the Ashley NF by Vegetation Type is shown in **Chart 4** below with its associated legend showing most sites in less sensitive, more stable areas.

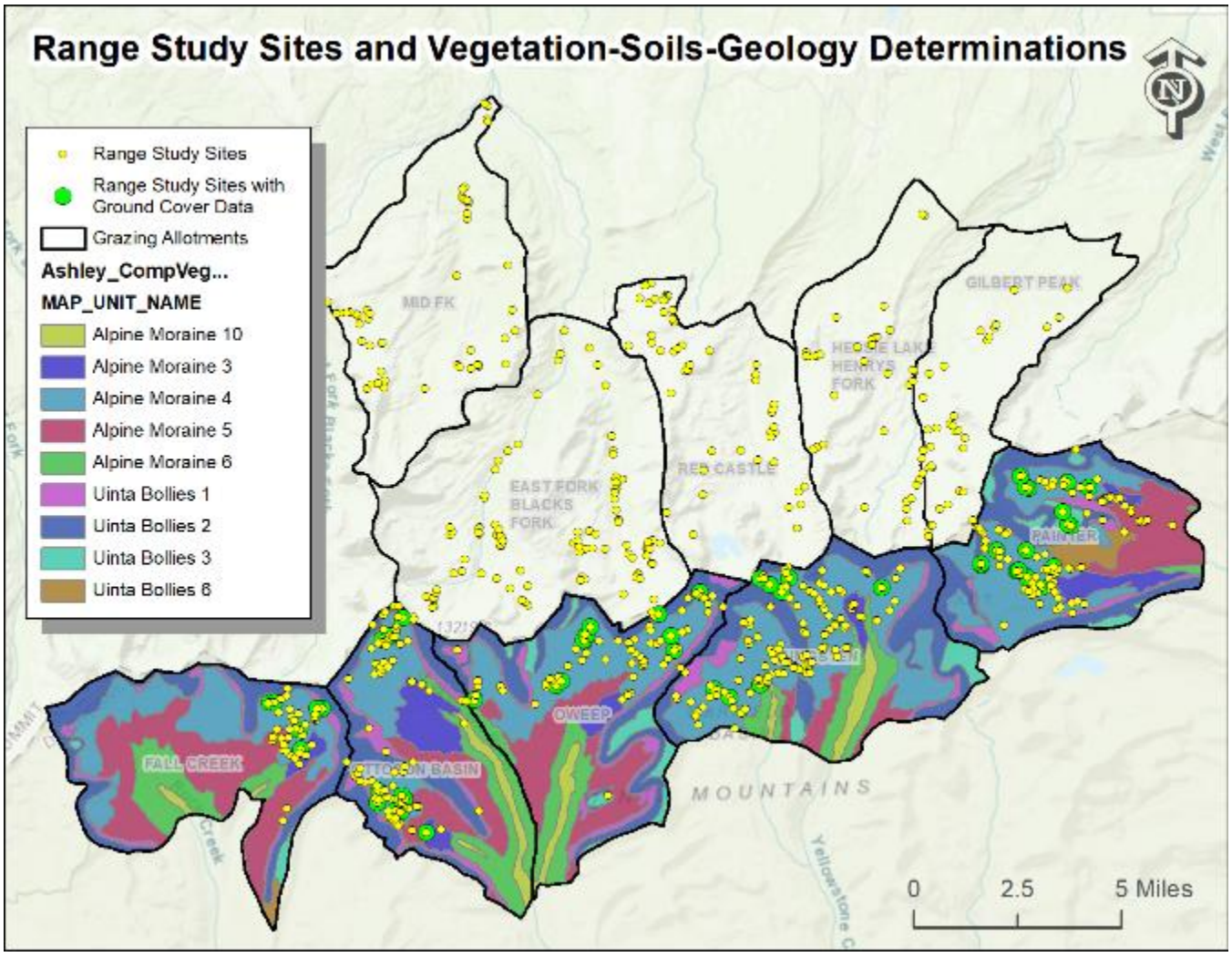


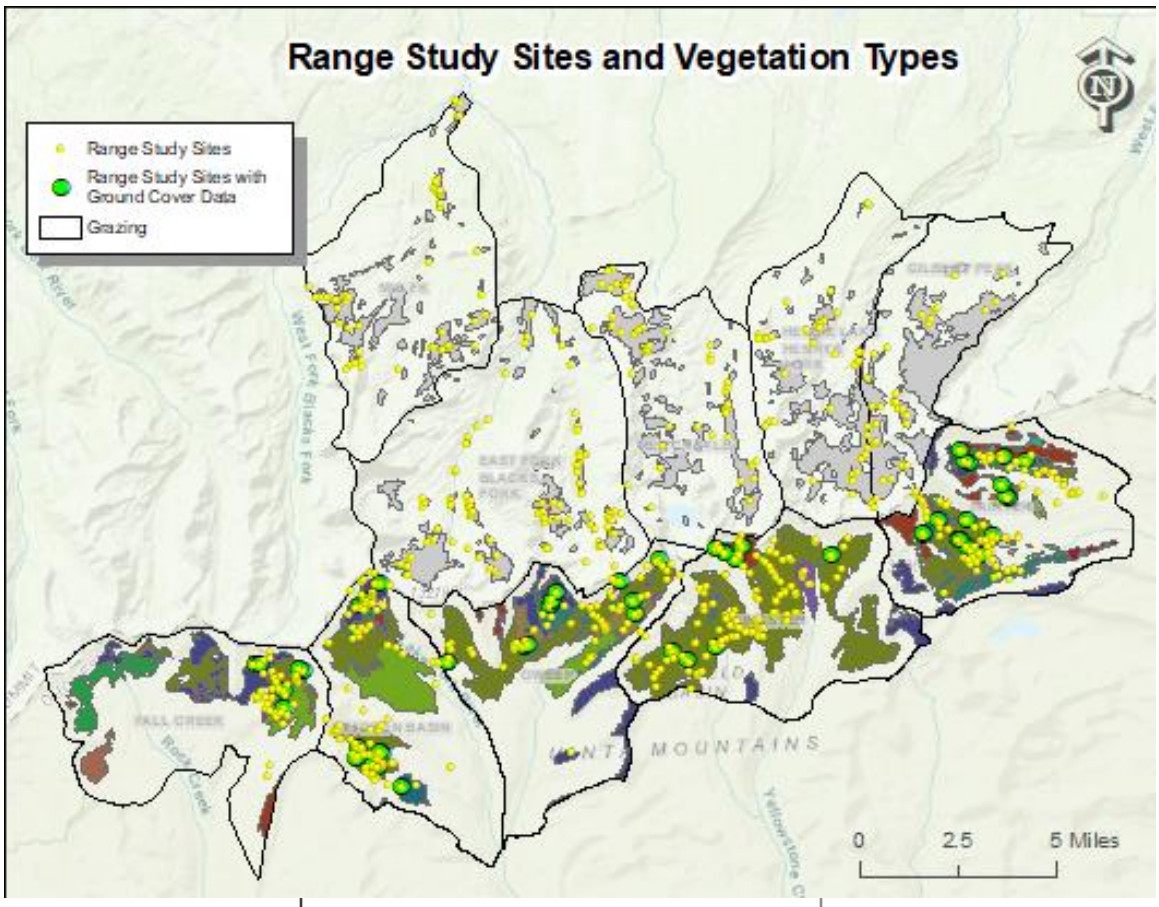
NUMBER OF SITES	VEGTYPE	DESCRIPTION
7	0	Not Determined
12	2	Alpine/Low forb/grass/sedge undifferentiated
3	4	Alpine/Geum/sedge and sedge/geum
1	5	Alpine/Kobresia
1	14	Alpine/Carex nigricans
20	40	Alpine/Wet and dry meadows, willow and graminoid complex
3	114	Coniferous forest/PIEN/wet and dry meadow complex
1	130	Coniferous forest/MC/meadow matrix too mixed for delineation
1	1000	Riparian/RIPARIAN
3	2100	Riparian/LOW WILLOW
2	2112	Riparian/SAPL2/Carex aquatilis

Maps were generated to illustrate the monitoring site distributions. These follow and clearly show the vast amount of land not monitored. These would be the steep slopes and other non-capable areas.




Range Study Sites and Range Capability
Range Study Sites
Range Study Sites with Ground Cover Data
Grazing Allotments
Range Capablity by USFS
CATTLE
SHEEP
MID FK
EAST FORK BLACKS FORK
FALL CREEK
MOUNTAINS
0
2.5
5 Miles


Range Study Sites and Vegetation-Soils-Geology Determinations
Range Study Sites
Range Study Sites with Ground Cover Data
Grazing Allotments
Ashley_CompVeg...
MAP_UNIT_NAME
Alpine Moraine 10
Alpine Moraine 3
Alpine Moraine 4
Alpine Moraine 5
Alpine Moraine 6
Uinta Bollies 1
Uinta Bollies 2
Uinta Bollies 3
Uinta Bollies 6
MID FK
EAST FORK BLACKS FORK
RED CASTLE
HENRYS FORK
GILBERT PEAK
PAINTER
OWEEP
FALL CREEK
MOUNTAINS
0
2.5
5 Miles



Vegetation Types

- Vegetation type data not available
- Alpine/Carex nigricans
- Alpine/Carex rupestris/cushion plant
- Alpine/Danthonia intermedia
- Alpine/Dryas octopetala
- Alpine/Geum/sedge and sedge/geum
- Alpine/Kobresia
- Alpine/Low forb/grass/sedge undifferentiated
- Alpine/Salix glauca
- Alpine/Salix glauca trending to conifer
- Alpine/Upland willow field undifferentiated
- Alpine/Wet and dry meadows, willow and graminoid complex
- Alpine/with conifer displacement
- Coniferous forest/Krummholz PIEN/SAGL/Meadow complex
- Coniferous forest/MC/Wet or moist understory (CALE, CACA)
- Coniferous forest/MC/meadow matrix too mixed for delineation
- Coniferous forest/PIEN/low forb parklands
- Coniferous forest/PIEN/wet and dry meadow complex
- Riparian/Carex aquatilis
- Riparian/LOW WILLOW
- Riparian/Mixed dry and wet meadow complex
- Riparian/Planifolia willow (Salix planifolia -SAPL2)
- Riparian/RIPARIAN
- Riparian/SAPL2/Carex aquatilis
- Riparian/SAPL2/Carex scirpoideae
- Riparian/with conifer displacement

Conclusion – Grazing impacts in the High Uintas

Neither the DEIS nor the Range Studies we received accurately depict the situation on the ground in which sensitive areas are proactively grazed by domestic sheep as they avoid the less sensitive wet locations. Steep, erodible slopes are grazed, and grazed during and immediately after snowmelt before plant growth is at a stage that prevents loss of the plants for basic physiological reasons the Forest Service should know and manage to avoid. This loss of plant and crust cover combined with trampling and displacement by sheep creates accelerated erosion and runoff. Streams are scoured, headcuts are created and these persist in open allotments. Whereas, in closed allotments, these erosion features are recovering along with ground cover. Sheep are bedded, trailed, salted across the entire landscape, even on tops of high ridges and mountains.

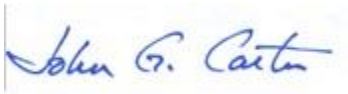
Forest Service monitoring and interpretation is heavily biased in favor of the sheep industry and its permittees. This bias fails to document and explain what is really happening as monitoring is focused on the less sensitive areas of lesser slope, higher soil moisture and a resistant turf. Mont Lewis' 1970 report depicted the effects of domestic sheep grazing on this ecosystem and reinforced the need for not grazing sensitive areas, in today's terms, areas that are not capable. Instead, the Forest Service allows permittees to graze to the tops of mountains, on steep slopes and passes and ignores the effects on these areas. It does not compare these areas in grazed allotments to long term ungrazed allotments and make an honest determination. Instead, it deflects and uses the highly flawed Brown (2006) characterization of alpine plant communities to claim conditions are "satisfactory". There is no explanation of what "satisfactory" means in terms of the potential of these soils/plant communities and what their current condition is.

Alpine soils in the Uintas are a critical component of the watersheds that provide water to a large portion of Utah's population. The loss of integrity of these soils and their plant communities threatens this water supply. The effects of degradation by domestic sheep are visible nearly everywhere and result in accelerated runoff and lowered water storage. This is evident in the eroded uplands, depleted plant communities and scoured streams

The public is left without representation as bias and deflection is used to maintain the status quo. Meanwhile watersheds are degraded, water pollution is created by thousands of domestic sheep that affect downstream users and those who come to the Uintas to see and enjoy this rare place.

In Conclusion…

We are disappointed as to the weaknesses and general failings of multiple aspects of the NEPA anlaysis undertaken in this DEIS. We look forward to working with the Forest Service in fulfilling the intent of NEPA, NFMA and the other statutes and regulations the Forest Service works within, through a complete and accurate analysis of the impacts of the plan, prior to the issuance of a ROD.



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