February 11th, 2022

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355 North Vernal Ave.
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Forest Plan Revision Team Leader
Forest Plan Revision DEIS Comments
Ashley National Forest
355 North Vernal Ave.
Vernal, UT 84078

Re: Comments - Ashley National Forest Plan Revision Draft EIS

Sent VIA USPS Certified Mail/Return Receipt and VIA email to:
www.fs.usda.gov/main/ashley/landmanagement/planning, comments-intermtn-ashley@fs.fed.us, and susan.eickoff@usda.gov,

Dear Supervisor Eickhoff,

Yellowstone to Uinta Connection, Alliance for the Wild Rockies, Native Ecosystems Council, Wildlands Defense and Western Watersheds Project are submitting these comments for the Ashley National Forest Plan Revision Draft Environmental Impact Statement (DEIS).

Yellowstone to Uinta Connection (Y2U) is a 501c3 public interest organization whose staff and members have and will continue to work to protect the integrity of habitat for fish and wildlife as well as recreate in this region. We are concerned about the loss of integrity of the Regionally Significant Wildlife Corridor (Corridor) that connects the Greater Yellowstone Ecosystem and Northern Rockies to the Uinta Wilderness and Southern Rockies. The Yellowstone to Uinta Connection organization was given this name to bring attention to this Corridor and we use this name in reference to both the organization and Corridor as it provides context and public awareness to the location and its importance. Yellowstone to Uinta Connection is headquartered in Paris, Idaho with a satellite office in Bondurant, Wyoming.

Alliance for the Wild Rockies (AWR) is a 501c3 public interest organization whose mission is to secure the ecological integrity of the Wild Rockies Bioregion through citizen empowerment and the application of conservation biology, sustainable economic models, and environmental law. Alliance for the Wild Rockies is headquartered in Helena, Montana.

Native Ecosystems Council (NEC) is a 501c3 public interest organization whose staff reviews Forest Service National Environmental Policy Act (NEPA) assessments of Forest Service impacts on wildlife in the Northern Rockies. NEC is headquartered in Willow Creek, Montana.

Wildlands Defense (WLD) is a 501c3 public interest organization dedicated to protecting and improving the ecological and aesthetic qualities of the wildlands and wildlife communities of the western United States for present and future generations. WLD does so by fostering the natural enjoyment and appreciation for wildlands habitats and wildlife by means of legal and administrative advocacy, wildland and wildlife monitoring and scientific research, and by supporting and empowering active public engagement. WLD has offices in Boise, Idaho and Hailey, Idaho.

Western Watersheds Project (WWP) is a non-profit conservation organization founded in 1993 with the mission of protecting and restoring western watersheds and wildlife through education, public policy initiatives, and legal advocacy. Headquartered in Hailey, Idaho, Western Watersheds Projects has over 11,000 members and supporters, field offices in Idaho, Nevada, Wyoming, and Arizona, as well as additional staff covering Washington, Oregon, California, Montana, Utah, Colorado, and New Mexico.

1. Introduction

The National Forest Management Act of 1976 (Public Law 94-588) requires the preparation of an integrated land management plan by an interdisciplinary team for each unit of the National Forest System. The 2012 Planning Rule1 (36 Code of Federal Regulations [CFR] 219.17(3)(b)(1)) guides the revision of land management plans to promote ecological, social, and economic sustainability of National Forest System lands and communities. The Forest Service has prepared this draft environmental impact statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and state laws and regulations. The DEIS discloses the broad potential effects of a proposed revision of the Ashley National Forest Land and Resource Management Plan (Forest Service 1986). The document describes, in general terms, the expected effects of management during the plan period; it does not predict the site-specific effects of future speculative actions each time the standards and guidelines are implemented at the project level. Those site-specific effects would be disclosed in subsequent NEPA reviews during the implementation of individual projects. Additional documentation, including more detailed analyses of planning area resources, may be found in the planning record located at the Ashley National Forest supervisor's office[1].

The Ashley National Forest encompasses about 1.4 million acres in northeastern Utah and southwestern Wyoming. The national forest is located in three major areas: the northern and southern slopes of the Uinta Mountains, the Wyoming Basin, and the Tavaputs Plateau. Elevations range from 5,500 feet on the Green River below Little Hole near Dutch John, to 13,528 feet at the summit of Kings Peak (the highest point in Utah). About 70 percent of the Ashley National Forest falls within the Uinta Mountains. The Uintas are the largest east-west-trending mountain range in the lower 48 states. Together with the Tavaputs Plateau, the Uinta Mountains provide a unique ecological transition zone, connecting the northern and southern Rocky Mountains. Nationally designated areas include the High Uintas Wilderness, Ashley Karst National Recreation and Geologic Area, and the Flaming Gorge National Recreation Area (DEIS p. 1).

The Ashley National Forest falls predominantly within four counties on the northern border of Utah and southern border of Wyoming: Daggett, Duchesne, and Uintah Counties in Utah, and Sweetwater County in Wyoming. Small portions of the Ashley National Forest also lie within Utah, Wasatch, and Summit Counties in Utah. Portions of the forest are within the original Uintah and Ouray Ute Indian Reservation, and the forest shares many miles of common boundary with the Ute Indian Tribe. In addition, Uinta County, Wyoming, is near the Ashley National Forest (DEIS Figure 1-1). These communities and counties are connected in one way or another to the various ecosystem and economic benefits the Ashley National Forest provides (DEIS p. 2).

[1] https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd492128

The Ashley National Forest is generally considered a rural national forest with many traditional uses. Typical uses and activities include land- and water-based recreation (such as camping, hiking, boating, and all-terrain vehicle [ATV] riding), livestock grazing, commercial timber harvest, oil and gas production, hard rock mining, firewood gathering, hunting, fishing, viewing scenery and wildlife, and visiting historic and prehistoric sites. The Ute Indian Tribe has a unique interest in the Ashley National Forest and values the lands on the Ashley National Forest for many reasons including hunting and gathering, ceremonial and traditional uses, and ancestral connections. Portions of the Forest are within the original Uintah and Ouray Indian Reservation. Local Native American tribes value the lands on the Ashley National Forest for hunting and gathering, ceremonial and traditional uses, and ancestral connections (DEIS p. S-1).

2. Purpose and Need

The purpose and need for revising the forest plan are to: 1) meet the legal requirements of the National Forest Management Act and the 2012 Planning Rule; 2) address the changed economic, social, and ecological conditions in the plan area that have occurred since the current forest plan was approved in 1986, and new focus topics described below; and 3) guide natural resource management activities on the Ashley National Forest for the next 10 to 15 years. The Forest Service developed the Ashley National Forest's needs for change from findings of the Assessment, public comments, and a series of collaborative public workshops (DEIS p. S-1).

The following five focus topics have been identified in the preliminary need to change the existing plan: 1) sustainable recreation, 2) economic resiliency, 3) managing traditional resources, 4) tribal and cultural resources, and 5) managing for resilient ecosystems and watersheds. *The Forest Service planning team identified* ***five main categories of significant issues****, which drove the subsequent development of alternatives:* ***1) sustainable recreation; 2) designated areas; 3) fire and fuels management; 4) vegetation management, timber harvest, and sustainable ecosystems; and 5) social and economic contributions.***

3. Proposed Action

The Forest Service proposes to revise the Ashley National Forest Land and Resource Management Plan (Forest Service 1986), referred to as the "forest plan," to meet the legal requirements of the National Forest Management Act and the provisions of the 2012 Planning Rule. The proposed action is to create one unified forest plan for the Ashley National Forest; address gaps in current plan direction and changes in ecological, social, and economic conditions; and comply with the 2012 Planning Rule and other new laws, policy, regulation, and Forest Service direction adopted since 1986.

The revised forest plan will describe the strategic intent of managing the Ashley National Forest for the next 10 to 15 years and will address the identified need to change the existing forest plan

(DEIS p. 2). ***The area affected by the proposal includes approximately 1.4 million acres of public land in northeastern Utah and southwestern Wyoming.***

4. Alternatives

The Forest Service developed the revised plan alternatives based on the Ashley National Forest assessment (Forest Service 2017); the need for change; desired conditions; implementation and monitoring of the current forest plan; public, agency, and tribal input; and issues derived from comments received during the public scoping period. Four alternatives for the draft forest plan are analyzed in the DEIS: alternative A, the existing forest plan (as amended) and no-action alternative; alternative B, the draft proposed action, which was modified based on public and internal comments; alternative C, which emphasizes preservation of the natural setting and passive management to move toward desired conditions for vegetation and fire management; and alternative D, which focuses on accomplishing desired conditions by shared funding and cooperation with partners. ***The Forest Service has not identified a preferred alternative(s) at this point; it plans to identify a preferred alternative in the final EIS after reviewing and considering the analysis presented in this document and comments received from the public (DEIS p. S-3).***

After reviewing the Alternatives presented in the DEIS the undersigned organizations most support Alternative C which emphasizes preservation of the natural setting and the use of passive management (i.e., reliance on natural processes for changes to vegetation structure) to move toward desired conditions for vegetation and fire management (DEIS p. 18-19). **However, we find that Alternative C still lacks sufficient analysis of many important issues discussed below:**

5. Sustainable Recreation

Under Alternative C, the emphasis for recreation would be on backcountry recreation and recreation classes emphasizing a quiet experience. Motorized recreation would be reduced to restrictions on use in backcountry recreation areas and would increase acres within the backcountry classification. Conflicts from other land uses with recreation would be reduced under this alternative because timber production and livestock grazing would not be permitted in destination recreation areas. Under Alternative C, additional areas would be managed for high or very high scenic integrity objectives (SIOs), with a more natural and natural-appearing scenic character in keeping with the recreation opportunity spectrum (ROS) and management area direction (DEIS p.18-19).

Motorized recreation in the Ashley NF has been and remains largely unpatrolled and unenforced. The USU Institute for Outdoor Recreation and Tourism has conducted studies showing that nearly 40% of riders admit going off legal trails on their last ride[2]. The Forest

[2] http://extension.usu.edu/iort/htm/professional

Service published a Technical Report in 2005 (RWU – 2905) that recognized there is a lack of evidence that educational programs lead to behavioral changes in motorized users. The Ashley NF does not monitor or report this use, its effects nor does it map and control illegal trails.

The science on this issue is presented in the book, *"Thrillcraft"*, by George Wuerthner. It is a comprehensive source that Agencies should consult in evaluating any alternatives that are impacted by motorized recreation.[3]

Quiet environments are becoming extremely rare: In a recent study by a professional sound recorder who visited 15 western and midwestern states, it was found that quiet periods longer than a minute and a half without the sound of motors were difficult to find[4]. Another study pointed out that in 1999, the decibel levels of conversation among Americans had risen to 65 decibels, up 10 decibels from a decade earlier, or a doubling of volume due to elevation of background noise levels[5]. While it is recognized by OSHA and other health officials that exposure to noise of 85 decibels and higher leads to hearing loss, noise at even lower levels can lead to physiological changes in blood pressure, sleep, digestion, and other stress-related disorders. Loud noise, even within established health guidelines, can lead us to feel tense, angry, frustrated, annoyed and prone to violence in addition to contributing to hearing loss. In the period between 1982 and 2000, the incidence of measurable hearing loss increased by 15 to 60%, depending on the age group. In 1999, the U.S. Census Bureau rated noise as the single biggest neighborhood problem among those surveyed. More than one in ten people cited traffic noise as of concern and nearly half of those said they had considered moving as a way of escaping such noise[6]. The EPA has found that 20% of those surveyed are "highly annoyed" when sound levels reach 55 decibels[7]. Federal regulations for highways dictate that if a new or expanded road will yield noise levels of 67 decibels or higher, efforts must be made to bring about a substantial reduction in noise levels. Generally, this involves construction of sound barriers[8].

We also note that the Caribou NF Winschell Dugway DEIS (p. 68) provided an analysis of sound decay with distance, assuming the source sound level of one or two ATVs at 96 – 99 dBA would decay to 69 – 72 dBA at 3200 feet from the source. This is still above the EPA recommended outdoor limit of 55 dBA. (Winschell Dugway DEIS p. 78). Roads and trails, including illegal, user-created routes, must be mapped and sound contours plotted showing the distance and aerial effects on wildlife security areas and "quiet" users. How much of the Ashley NF is protected from these sound levels?

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[3] Wuerthner, G (ed). 2007. Thrillcraft: The Environmental Consequences of Motorized Recreation. Chelsea Green Publishing Company. White River, Vt.
[4] Richard Laliberte, "The Sound of Silence," *Cooking Light*, March 1999
[5] http://interact.uoregon.edu/MediaLit/WFAE/home/index.html
[6] Jim Louderback, "A Sound Solution," *USA Weekend*, October 19, 2003
[7] Environmental Protection Agency, press release, April 2, 1974; see also EPA website, www.epa.gov/history/topics/noise/01.htm.
[8] www.fhwa.dot.gov/environment/htnoise.htm

After Zion National Park banned private vehicles and instituted a low pollution shuttle bus system, visitors commented that the absence of RVs with generators running, buses with clouds of diesel fumes and noise were noticeable and that they could now hear birds calling, streams running, and other low-volume sounds of nature that were previously obliterated by "vehicle noise".[9] Noise is a particularly objectionable aspect of snowmobile (OSVs) use. A Park Service report showed that even "quiet" snowmobiles could be heard more than two miles away, thus affecting a four-mile-wide area adjacent to travel corridors or use areas[10]. This means that a snowmobile traveling 50 miles in one day, which they can easily do, can affect an area of 200 square miles. A visitor survey at Grand Teton National Park found that 96% thought snowmobiles had a negative impact on the park because of noise, air pollution and negative effects on wildlife[11]. Yet they are allowed throughout the Ashley NF with no consideration for impacts on wildlife and quiet user, or residences.

Noise itself has detrimental effects to wildlife, creating stress, loss of hearing, and early emergence from hibernation resulting in death.[12, 13] Scientists studying coyotes have determined that coyote use of packed trails or roads allows them access that would be otherwise difficult or impossible into areas that are habitat for Canada lynx, where they prey on snowshoe hares which are preferred by lynx, a threatened species as well as goshawk, a MIS[14]. **An evaluation of these interrelated effects on these predators, their prey and habitat requirements must be included in any NEPA analysis for the Ashley National Forest Plan Revision**.

<u>Roadless Areas, Motorized Habitat Fragmentation and Ecological Impacts</u>: There have been numerous publications on the effects of roads on noise pollution, wildlife, and the benefits of roadless areas. Roads increasingly provide vehicle access into more and more remote areas, forcing sensitive species to be eliminated or greatly reduced especially when the cumulative impacts from livestock, oil, gas and mineral exploration and development are included. Roads and groomed trails provide increased access to hunters and trappers who can use them in summer and winter to damage environmental resources, loot archaeological sites, and kill predators, birds, or other mammals for sport. Motorized vehicles, ATVs/OHVs, and snowmobiles (OSVs), with their ability to travel large distances cross-country bring these same impacts along whether there is a maintained trail or not. The ecological effects of roads and/or

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[9] Lin Alder, "A Park Rediscovers A Surprising Asset," *High Country News*, September 25, 2000.

[10] U.S. Department of the Interior, National Park Service. Winter Use Plans: Supplemental Draft Environmental Impact Statement. Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr., Memorial Highway. March 29, 2002.

[11] Greater Yellowstone Coordinating Committee. "Greater Yellowstone Winter Visitor Use Management -- Examples of Issues Facing Parks and Forests in the Greater Yellowstone Area." Draft. 1995.

[12] A. Anthony and E. Ackerman, "Biological Effects of Noise in Vertebrate Animals," Technical Report 57-647, Wright Air Development Center, Wright-Patterson Air Force Base, OH, 1957

[13] B, H. Brattstrom and M. C. Bondello, "Effects of Off-Road Vehicle Noise on Desert Vertebrates," in *Environmental Effects of Off -Road Vehicles: Impacts and Management in Arid Regions*, eds. R. H. Webb and H. G. Wilshire (New York: Springer-Verlag, 1983).

[14] Dr. Barrie Gilbert, personal communication

mechanized use include erosion, air, and water pollution, spread of invasive weeds, avoidance of road or machine-affected areas by wildlife and habitat fragmentation[15,16]. When roads and increased human activity and noise fragment habitats, breaking large areas into smaller areas, they no longer retain their original functions and begin losing species, including those that are wide-ranging[17, 18, 19, 20, 21].

Roads have been shown to have thresholds of density above which species begin to decline or be eliminated. This has been reported to generally be 1 mile per square mile, with effects to some large mammals such as bears at a road density of 0.5 miles/square mile.[22, 23] The importance of roadless areas was documented for both small (1,000-5,000 acres) and large (>5,000 acres) scale roadless areas under consideration in the Clinton roadless area environmental impact statement and for three case study regions (Klamath-Siskiyou, Appalachia/Blue Ridge, and Tongass National Forest) recognized by World Wildlife Fund (WWF) for global biodiversity importance[24].

In general roadless areas in these exceptionally diverse regions were found to provide many ecological benefits compared to roaded landscapes, including: relatively high levels of intact late-seral/old-growth forests; essential habitat for many species of conservation concern; buffer areas from exotic species invasions and edge effects; landscape and regional connectivity; areas most likely to have fire regimes operating within natural bounds; essential habitat for species key to the recovery of forests following disturbance such as herbaceous plants, lichens, and mycorrhizal fungi; habitat refugia for threatened species and those with restricted distributions such as

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[15] T. W. Clark, P. C. Paquet, and A. P. Curlee. 1996. Large Carnivore Conservation in the Rocky Mountains of the United States and Canada," Conservation Biology 10: 936–939.

[16] Trombulak, S. C. & C. A. Frissell. 2000. The ecological effects of roads on terrestrial and aquatic communities: a review. Conservation Biology 14:18-30

[17] D. A. Saunders, R. J. Hobbs, and C. R. Margules. 1991."Biological Consequences of Ecosystem Fragmentation: A Review," Conservation Biology 5 (1991): 18-32.

[18] Hitt, N.P. and C.A. Frissell. 1999. Wilderness in a landscape context: a quantitative approach to ranking Aquatic Diversity Areas in western Montana. Presented at the Wilderness Science Conference, Missoula, MT, May 23-27, 1999.

[19] The Importance of Roadless Areas to Idaho's Fish, Widllife, Hunting & Angling. 2004. Trout Unlimited. http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/Roadless_Idaho.pdf

[20] J. R. Strittholt and D. A. DellaSala, Importance of Roadless Areas in Biodiversity Conservation in Forested Ecosystems: A Case Study-Klamath-Siskiyou Ecoregion, U.S.A. 2001. Conservation Biology 15 (6): 1742-1754.

[21] G. E. Heilman, Jr., J. R. Strittholt, N. C. Slosser, and D. A. DellaSala. 2002. Forest Fragmentation of the Conterminous United States: Assessing Forest Intactness Through Road Density and Spatial Characteristics. Bioscience 52 (5): 411-422.

[22] R. P. Thiel. 1985. Relationship Between Road Densities and Wolf Habitat Suitability in Wisconsin. American Midland Naturalist 113: 404-407.

[23] L. D. Mech, S. H. Fritts, G. L. Radde, and W. J. Paul. 1988. Wolf Distribution and Road Density in Minnesota. Wildlife Society Bulletin 16: 85-87.

[24] http://www.worldwildlife.org/wildplaces/kla/pubs/exec_sum.pdf

endemics; aquatic strongholds for salmonids; undisturbed habitats for mollusks and amphibians; remaining pockets of old-growth forests; overwintering habitat for resident birds and ungulates; and dispersal “stepping stones” for wildlife movement across fragmented landscapes.[25, 26]

Extensive literature on the effects of motorized routes on ecosystem processes has also shown many negative consequences, especially in arid environments. These include increased erosion, habitat destruction, soil and water pollution, noise pollution, exotic invasions, and wildlife disturbance, elimination and dispersion (Andrews 1990[27], Brown 1994[28], Dittmer and Johnson 1975[29], Forman and Hersperger 1996[30], Forman and Alexander 1998[31], Gelbard 1999[32], Harris and Gallagher 1989[33], Iverson et al. 1981[34], Langton 1989[35], Miller et al. 1996[36], Montgomery 1994[37], Oxley et al. 1974[38], Schmidt 1989[39]). Vehicle travel within streams, and resulting sedimentation

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[25] R. L. DeVelice and J. R. Martin, "Assessing the Extent to Which Roadless Areas Complement the Conservation of Biological Diversity," Ecological Applications 11, no. 4 (2001): 1008-1018

[26] C. Loucks, N. Brown, A. Loucks, and K. Cesareo, "USDA Forest Service Roadless Areas: Potential Biodiversity Conservation Reserves," Conservation Ecology 7, no. 2 (2003): 5, http://www.consecol.org/vol7/iss2/art5/.

[27] Andrews, A. 1990. Fragmentation of habitat by roads and utility corridors: a review. Aust. J. Zool. 26:130-141

[28] Brown, K.J. 1994. River-bed sedimentation caused by off road vehicles at river fords in the Victorian Highlands, Australia. Water Res. Bull. 30:239-50

[29] Dittmer, M., and A.A. Johnson. 1975. Impacts of high-intensity rainstorms on low-volume roads and adjacent land. Transportation Research Board Special Report, (160) Pp. 82-91

[30] Forman, Richard T.T., Anna M. Hersperger. 1996. Road ecology and road density in different landscapes, with international planning and mitigation solutions. In: Trends in addressing transportation related wildlife mortality. Evink, G.L., P. Garrett, D. Zeigler and J. Berry, eds. Florida Department of Transportation, Tallahassee, Florida. 1996. Pps. 1-22

[31] Forman, Richard T.T., L.E. Alexander. 1998. Roads and Their Major Ecological Effects. Annu. Rev. Ecol. Syst. 29: 207-31

[32] Gelbard, Jonathon L. 1999. Multiple-scale causes of exotic plant invasions in rangelands of the Colorado Plateau and Great Basin, USA. M.S. Thesis, Nichols School of the Environment, Duke University. 71 pp

[33] Harris, L.D., and P.B. Gallagher. 1989. New initiatives for wildlife conservation: the need for movement corridors. In G. Mackintosh, ed. Preserving communities and corridors. Defenders of Wildlife, Washington, D.C. Pp. 11-34

[34] Iverson, R.M., B.S. Hinckley, and R.M. Webb. 1981. Physical Effects of Vehicular Disturbance on Arid Landscapes. Science v.212:915-917

[35] Langton, T.E.S., ed. 1989. Amphibians and roads. ACO Polymer Products, Shefford, Bedfordshire, UK. 202 pp

[36] Miller, J.R., L.A. Joyce, R.L. Knight, R.M. King. 1996 Forest roads and landscape structure in the southern Rocky Mountains. Landscape Ecology 11: 115-127

[37] Montgomery, D. 1994. Road surface drainage, channel initiation, and slope instability. Water Resour. Res. 30:192-193.

[38] Oxley, D.J., M.B. Fenton, G.R. Carmody. 1974. The effects of roads on populations of small mammals. J. Applied Ecology 11:51-59

[39] Schmidt, W. 1989. Plant dispersal by motor cars. Vegetation 80:147-152

and turbidity, may affect macroinvertebrate diversity and abundance (Carothers 2001[40]). Differences in aquatic invertebrate species richness were attributed to the presence of roads within Salt Creek, Canyonlands NPS (Wolz and Shizowa 1995[41], Schelz Salt Creek Report 2001[42]). Additionally riparian cover, volumes and heights of vegetation decreased along roaded segments due to mechanical disturbance and down-cutting of the road which resulted in soil erosion and lowering of the riparian water table (Schelz Salt Creek Report 2001). Vegetative recovery, both in uplands and riparian areas is highly dependent upon the re-stabilization of soil (Iverson et al. 1981[43], Iverson 1979[44]). Trampling, compaction, and shear forces from motorized vehicles resulted in destruction of wetland meadows within Salt Creek, thereby increasing associated stream energies which become confined and channelized, creating deep wide stream channels from erosion and downcutting, further reducing the functioning of the wetland with respect to sediment filtration, groundwater recharge, site stability, and ability to support greater biodiversity (Schelz, Salt Creek Report 2001, Statzner et al. 1988[45]). To the extent that motorized vehicles result in increased accessibility of pedestrian related recreation, increased disturbances to raptor and other birds have been documented (Belanger and Bedard 1989[46], McGarigal et al. 1991[47], Holmes et al. 1993[48], USDI Middle Salt Creek Canyon EA 2002). Schelz (2001)[49] calculated that potential breeding bird density may be reduced due to the reduction in vegetation volume represented by the width of the road corridor. Reptiles are also susceptible to direct vehicle impacts and have been observed crushed in the roadway (Graham 2001)[50].

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[40] Carothers, S.W. 2001. An Evaluation of Off-Road Vehicle Use within the Riparian Corridor of Salt Creek, Needles District, Canyonlands National Park, Utah. Unpublished report to NPS. National Park Service, Monticello, Utah

[41] Wolz, E.R. and D. K. Shiozawa. 1995. Aquatic macroinvertebrates of the Needles District, Canyonlands National Park, Utah (including Lost Canyon, Salt Creek, Big Spring Canyon, and Squaw Canyon). Provo, Utah: Brigham Young University

[42] Schelz, C., M. Moran and D. Silva. 2001. Total vegetation volume and total breeding bird density in Salt Creek, Needles District, Canyonlands National Park. Unpublished NPS report. National Park Service, Monticello, Utah

[43] Iverson, R. M., B. S. Hinckley, R. M. Webb, and B. Hallet. 1981. Physical effects of vehicular disturbances on arid landscapes. *Science* 212:915-916.

[44] Iverson, R. M. 1979. Processes of Accelerated Erosion on Desert Hill-Slopes Modified by Vehicular Traffic. Earth Surface Processess.

[45] Statzner, Bernhard, James A Gore, and Vincent H Resh. 1988. Hydraulic Stream Ecology: Observed Patterns and Potential Applications. The Journal of North American Benthological Society 7(4): 307-360

[46] Belanger, L., and J. Bedard. 1989. Response of staging greater snow geese to disturbance. Journal of Wildlife Management 53:713-719

[47] McGarigal, K., R.G. Anthony, and F.B. Issacs. 1991. Interactions of humans and bald eagles on the Columbia River estuary. Wildlife Monographs 115

[48] Holmes, T.L., R.L. Knight, L. Stegall, and G.R. Craig. 1993. Responses of wintering grassland raptors to human disturbance. Wildlife Society Bulletin 21:461-468

[49] Schelz, C. Long Term Riparian Monitoring in Salt Creek, 2001 Report. Monticello, UT: Canyonlands National Park

[50] Graham, T. 2001. Unpublished preliminary report to NPS. USGS Biological Resources Division. Moab, Utah

Vehicle disturbance within streams can also negatively affect reproduction of amphibians where eggs and growth occur in warm pools which can be fatally crushed or covered with silt as vehicles pass (Schelz, Salt Creek Report 2001).

Other impacts to soils and vegetation include findings that soils under snow compacted by snowmobiles were colder than unpacked snow, leading to a decrease in soil bacteria, which can affect seed vernalization, seed dispersal, spring germination and changes in plant species distribution, density, and productivity[51]. If snow cover is limited, then snowmobiles and other ATVs/OHVs can impact small trees and shrubs causing damage, deformities and a decline in vigor or death[52].

Air and Water Pollution: Public Lands and National Forests should function primarily as the watershed for local communities and for preserving natural stream flows and water quality. The combined effects of sediments from watershed uses such as roads, ATVs/OHVs/OSVs, grazing and logging, have not been addressed in a comprehensive analysis in this DEIS. No evaluation has been done for the contribution of hazardous pollutants to the air and watersheds where motorized vehicles are used.

Atmospheric inversions and canyon environments can trap and hold these hazardous air pollutants and raise exposures to people and wildlife. Those who hike or cross-country ski are exposed to these hazardous fumes in close proximity while they are breathing hard and deep with the exertion of skiing or hiking. At Yellowstone National Park, many of the Rangers there suffered persistent headaches, dizziness, and nausea prior to using gas masks and having oxygen piped into their kiosks[53]. Unfortunately, skiers, hikers and wildlife cannot have oxygen piped to them and must breathe these fumes.

Fuel and lubricants used in these machines spill on the ground and are carried out in exhaust streams and then deposited into the snow and soils wherever they go. They contain benzene, xylene, toluene, polycyclic aromatic hydrocarbons, and other hazardous organic chemicals[54]. As the Montana DEQ states, "*A portion of the air/fuel/lubricant charge escapes directly to the atmosphere with the combustion products, producing poor fuel economy and releasing high levels of hydrocarbons as air pollutants. This phenomenon is known as "short circuiting."* EPA models and emission factors should be used to determine the impacts on the environment and exposures to cross country

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[51] W. J. Wanek, "Snowmobiling Impact on Vegetation, Temperatures and Soil Microbes," in *Snowmobile and Off-Road Vehicle Research Symposium Proceedings*, Technical Report No. 8 (Department of Park and Recreation Resources, Michigan State University, Lansing, MI, 1971), 117–130.

[52] W. J. Wanek and L. H. Schumacher. "A Continuing Study of the Ecological Impact of Snowmobiling in Northern Minnesota," final report (Center for Environmental Studies, Bemidji State College, Bemidji, MN, 1975).

[53] National Park Service, *Winter Use Plan, Final Supplemental Environmental Impact Statement (FEIS) for the Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway, Wyoming and Montana* (Intermountain Station: U.S. Department of the Interior, February 2003).

[54] http://deq.mt.gov/CleanSnowmobile/concerns/tyler2000.pdf

skiers and snowmobile users from these machines. EPA and the Montana Department of Environmental Quality have provided research on this issue. The EPA[55] and Montana DEQ[56] websites provide links to much of this information and EPA has modeling protocols to allow prediction of emissions from these vehicles[57].

Accumulations of motorized hydrocarbon pollutants from rubber tires, fuel and motor oils collect on rocks and within pothole waters within streams and canyons (USDI, 2005 Jeep Safari EA) which can support and adversely affect wildlife, growth of amphibians and invertebrates used for prey bases (Lefcort et al, 1997). The pollutants emitted by these machines are carcinogenic to humans and highly persistent in the environment, adversely affecting terrestrial and aquatic organisms, including reduced plant productivity, tree mortality and making plants susceptible to disease and pests.[58, 59, 60, 61]. A two-stroke snowmobile can emit more pollution in a single hour than a modern car does in a year. Even though four strokes emit lower amounts of pollutants, they emit more than an automobile.[62] Because of inconsistencies in management between National Forests and the effects of ATVs/OHVs/OSVs on the resource and non-OHV users of the Forests, a petition was submitted to the Forest Service on November 2, 2005, by dozens of environmental organizations and individuals calling for better and more consistent management[63]. Some National Forests are banning them altogether as inconsistent with the management imperative of that agency. That petition presents Forest Service case studies and other research pertinent to the issue. The Wildlands Center for Preventing Roads has an extensive bibliography of the research regarding the effects of OHVs and its website provides a discussion, press release and summary of the petition[64].

The Forest Service must review all this information in any NEPA analysis for the Ashley National Forest Plan Revision in order to meet their obligation under NEPA to take a "Hard Look" at the impacts of recreational ATV/OHV/OSV use on the Forest.

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[55] http://www.epa.gov/otaq/recveh.htm
[56] http://deq.mt.gov/CleanSnowmobile/solutions/engine/index.asp
[57] http://www.epa.gov/otaq/ap42.htm
[58] J. P. Giesy, Testimony of John P. Giesy at the Tahoe Regional Planning Hearing on Boating Impacts, February 26, 1997.
[59] J. T. Oris et al., "Toxicity of Ambient Levels of Motorized Watercraft Emissions to Fish and Zooplankton in Lake Tahoe, California/Nevada, USA" Proceedings of the 8th Annual Meeting of the European Society of Environmental Toxicology and Chemistry (SETAC-Europe), April 14–18, 1998 (University of Bordeaux, Bordeaux, France), http://zoology.muohio.edu/oris/TahoePoster.pdf [viewed August 1, 2006].
[60] C. Shaver, D. Morse, and D. O'Leary. 1988. *Air Quality in the National Parks*, report prepared by Energy and Resources Consultants, Inc., NPS Contract No. CX-0001-4-0054 (Washington DC: U.S. Department of the Interior, National Park Service, Air Quality Division, 1998).
[61] M. D. Einarson, "Impacts to South Lake Tahoe Water Supply Wells Resulting from Non-Point Sources of MTBE," prepared for Groundwater Resources Association of California, 2002.
[62] Based on California Air Resources Board Data, January 5, 1999, www.arb.ca.gov.
[63] http://www.alleghenydefense.org/alleghenywild/docs/Attachment_9.pdf
[64] http://www.wildlandscpr.org/

Conservation of Energy and Global Climate Change: Past and current Presidents have called for conservation to save energy as our dependence on foreign oil has become a national security issue. The series of reports from the International Panel of Climate Change shows global warming is almost completely related to human activities, especially consumption of fossil fuels and agriculture with livestock providing some 18% of greenhouse gases. Agencies must address these issues. How many acres of Public Land, its water and wildlife are degraded just to support these "Thrillcraft"? **Where is the analysis of energy savings or costs from activities permitted by Federal Agencies?** Continuing to permit these unmanageable and destructive fuel-consuming uses that were not envisioned in the Multiple Use and Sustained Yield Act is counter to our national interest and is irresponsible in view of the current state of knowledge regarding climate change and its devastating impacts[65].

Road Densities and Big Game Security Areas: **Road densities and effects on wildlife and habitat must be considered when choosing an Alternative to support for the Ashley National Forest Plan Revision**. Researchers, including those with the Forest Service have documented the effects of roads and ATVs/OHVs/OSVs on wildlife and the benefits of roadless areas. For example, Gilbert[66], Noss[67] and Wisdom et al[68] describe the detrimental effects of road density and human activity on large mammals causing large displacements away from roads and mechanized activity. A recent publication by the National Park Service discussed the effects of snowmobiles on wildlife[69]. Agency researchers at UC Davis have suggested an integrated approach for addressing Canada lynx linkage corridors[70]. **An integrated analysis of the effects of roads, human use and habitat fragmentation on lynx and other species that incorporates this information as well as addressing other species of wildlife must be completed in any NEPA analysis for the Ashley National Forest Plan Revision**.

The discussion above describes these effects and provides numerous sources of scientific information that should be considered. In addition, several studies have documented adverse impacts of off-road vehicles on wildlife species. These include displacement from preferred habitats, increased stress, and increased use of scarce energy reserves to flee from approaching vehicles. By compacting snow, snowmobiles create travel routes that can affect species distribution, movement, habitat use patterns and population dynamics. These same routes can

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[65] http://www.eemsonline.co.uk/press_releases/02-02-07?s=wndscl4ow8w4ka2

[66] Gilbert, Barrie K. 2003. Motorized Access on Montana's Rocky Mountain Front. A Synthesis of Scientific Literature and Recommendations for use in Revision of the Travel Plan for the Rocky Mountain Division.

[67] http://www.wildlandscpr.org/resourcelibrary/reports/ecoleffectsroads.html

[68] Wisdom, M. J., H. K. Preisler, N. J. Cimon, B. K. Johnson. 2004. Effects of Off-Road Recreation on Mule Deer and Elk. Transactions of the North American Wildlife and Natural Resource Conference 69: in press.

[69] http://www.nps.gov/yell/publications/pdfs/wildlifewint.pdf

[70] http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1002&context=jmie/roadeco

become barriers to subnivean animals by fragmenting their habitat[71]. Motorized use (by snowmobiles) results in impacts to animals in Yellowstone and other national parks with animals in areas of snowmobile activity exhibiting elevated stress hormones when compared with those in areas where snowmobiles were absent. In a comparison between wolves at Voyageurs National Park in Minnesota, where snowmobiles are allowed, to Isle Royale National Park in Michigan, where they are banned, wolves exhibited higher stress hormones in areas with snowmobile activity. The stress hormone increased as snowmobiling intensity rose, almost doubling in areas with heavy snowmobile use[72]. Noise itself has detrimental effects to wildlife, creating stress, loss of hearing, and early emergence from hibernation. **An evaluation of these interrelated effects on these predators, their prey and habitat requirements must be included in any NEPA analysis for the Ashley National Forest Plan Revision**.

Big Game security areas are defined as an area of cover over 0.5 miles from an open motorized route and over 250 acres. These areas are important for limiting disturbance and hunting vulnerability to big game animals (but provide benefits to other animals as well). Because of the number of roads and trails within the Ashley NF, there are very few security areas within the Forest.

Road density and the status of all roads and OHV/ATV trails (legal, illegal, open, temporary, closed, user-created and other classifications), not just OMRD, should be mapped and the density per square mile determined and compared to the best available science. This analysis should determine additional closures necessary to provide security areas for wildlife such as deer, elk, and moose as well as the migration corridors for Canada lynx, wolverine, and other ESA and Threatened Species.

Y2U has witnessed the difficulty in effectively closing and rehabilitating temporary roads, landings and skid trails after a timber harvest concludes and roads are "decommissioned" and or "closed". **The Ashley National Forest Plan Revision needs to outline how this road decommissioning will be accomplished as well as provide a monitoring and enforcement plan to ensure the integrity of such closures.**

It is also important to monitor, control and prevent the spreading of noxious weeds when constructing temporary roads or resurfacing existing roads. The DEIS does not include any protocol to prevent the spreading of noxious weeds during the implementation of subsequent projects.

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[71] T. Olliff, K. Legg, and B. Kaeding, eds, Effects of Winter Recreation on Wildlife of the Greater Yellowstone Ecosystem: A Literature Review and Assessment. Report to the Greater Yellowstone Coordinating Committee (Yellowstone National Park, WY, 1999).
[72] S. Creel et al., "Snowmobile Activity and Glucocorticoid Stress Responses in Wolves and Elk," *Conservation Biology* 16, no. 3 (2002): 809–814.

Y2U, AWR, NEC, WLD and WWP would like to see a plan included in the EIS for temporary project route closures as well as additional route closure throughout the Forest as mitigation for the cumulative effects of logging, vegetation treatment, grazing and ATV/OHV/OSV use in the region and to create and protect wildlife security areas in the Ashley National Forest. Road densities should decrease over time and should not exceed the recommended number for wildlife security areas within the Ashley National Forest.

For example, the Bridger-Teton National Forest Plan includes the following language, but it varies with the emphasis on a particular DFC or Management emphasis:

Road Management Standard Over the life of the Forest Plan; the average open road density will be 1 mile per square mile of standard or equivalent road with 1-year to 5-year variations of 0.25 to 1.25 miles per square mile. Species-Specific prescriptions for protection of wildlife security should be provided, for example in Lynx Analysis Units, for elk security, to provide security for interior forest species such as goshawk and others.

Choosing Alternative C emphasizes backcountry recreation and recreation classes emphasizing a quiet experience. Motorized recreation would be reduced to restrictions on use in backcountry recreation areas and would increase acres within the backcountry classification. Winter use should be closed or severely limited in the Ashley NF, and the Corridor (See Regionally Significant Wildlife Corridor Section Below) so that lynx, wolverine, and other far-ranging species (elk, deer) have an opportunity to migrate and have security cover during all seasons. The Forest Service can use its Prohibition Authority (36 CFR 261) to regulate noise and other activities detrimental to wildlife such as hunting, trapping or harassing wildlife.

6. Designated Areas

Under Alternative C, the most acres would be managed for wilderness characteristics as recommended wilderness areas (DEIS Appendix A, Figure 2-22). Alternative C includes the inclusion of all areas meeting the requirements for wilderness recommendation under the wilderness review. Approximately 50,200 acres (DEIS p. 26, Table 2-3). Alternative C would also bring forward four additional segments as suitable for including in the National Wild and Scenic Rivers System (DEIS Appendix A, Figure 2-23). Approximately 62 miles of river (DEIS p. 27, Table 2-3). Under Alternative C, an additional research natural area, Gilbert Bench, would also be added bringing the total research natural acres up to 9,100 (DEIS p. 27, Table 2-3).

On November 8th, 2019, Yellowstone to Uintas Connection, The Wilderness Society, Grand Canyon Trust, Defenders of Wildlife, Argyle Wilderness Preservation Alliance, Western Resource Advocates, Utah Native Plants Society, and the Sierra Club submitted scoping comments on the Ashley National Forest's Proposal to Revise the Land Management Plan (Forest Plan) and Evaluation of Potential Wilderness Inventory Areas ("Wilderness Evaluations").

On January 22nd, 2021, the same group of conservation organizations named above submitted supplemental comments on the Ashley National Forest's Proposal to Revise the Land Management Plan (Forest Plan) and Evaluation of Potential Wilderness Inventory Areas ("Wilderness Evaluations").

Both sets of comments are included in this submission as comments for the Ashley National Forest Plan Revision Draft Environmental Impact Statement (DEIS) by way of Attachment 1 and Attachment 2 of this document.

Although by choosing Alternative C the most acres would be managed for wilderness characteristics as recommended wilderness areas, which would include the inclusion of all areas meeting the requirements for wilderness recommendation under the wilderness review, and bring forward four additional segments as suitable for including in the National Wild and Scenic Rivers System, and add an additional research natural area, Y2U, AWR, NEC, WLD and WWP would additionally recommend the following:

Recommending more wilderness designation up to several hundred thousand acres and managing the IRAs in the Ashley NF as wilderness areas. **50,000 acres of recommended wilderness is inadequate.**

7. Fire and Fuels Management

Under Alternative C, fuels management would focus on the use of natural processes, including the use of wildland fire to move toward desired fire regimes. Under Alternative C, the fewest acres are proposed for active vegetation management. Outside of high-value resource areas (HVRAs), suppression would be emphasized to protect human health and safety or property (DEIS p. 19).

The climate, including the intensity and duration of storms, may become increasingly important due to trends from climate change (Forest Service 2017r) (DEIS p. 44).

Climate Change: In 2010, the Forest Service produced a National Roadmap for Responding to Climate Change. The principles expressed therein are applicable to this planning process.[73]

[73] USDA. 2010. National Roadmap for Responding to Climate Change. 30p. www.fs.fed.us/climatechange/pdf/roadmap.pdf

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, we have not seen the Forest Service cite or adhere to these principles in any project Scoping, EA or EIS. **A "Hard Look" would require such an analysis and promote appropriate mitigation actions to include carbon sequestration and offsets as well as habitat restoration and corridor connectivity and habitat integrity.**

For the Ashley National Forest, watershed vulnerability to climate change is considered moderate to high. Increases are anticipated for drought, heat, flooding, greater evaporation, snowpack loss, and earlier snowmelt that would shift runoff timing, reduce streamflow, and increase the severity and intensity of wildfires. Ashley National Forest watersheds are considered highly sensitive to these projected changes (Forest Service 2018a). Vulnerability would be moderate to very high to drought, heat, wildfire, and floods, with decreasing sensitivity as elevation increases (Forest Service 2017c) (DEIS p. 59).

Climate change is considered an additional stressor. Potential changes in the pattern and timing of precipitation and temperature can augment existing stressors. Warming temperatures, prolonged drought, and extreme weather can affect channel, floodplain, and sediment dynamics. This would come about by increasing water stress on riparian and upland vegetation, increasing wildfire intensity and frequency, and increasing peak flow and sediment impacts on area streams (Forest Service 2017d) (DEIS p. 61).

The National Fish, Wildlife and Plants Climate Adaptation Strategy proposed by the US 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.[74] Agencies such as the Forest Service and Bureau of Land Management must address conservation of habitats and reduction of non-climate stressors such as the habitat degradation from livestock grazing, including soil loss, stream dewatering, 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. Regarding connecting habitats, later in these comments we describe the Regionally Significant Wildlife Corridor and its importance to perpetuation of wildlife and their gene pools.

The DEIS states (p. 128), that with or without change in precipitation, temperature increases can decrease snow depth, alter timing and rate of snowmelt, lengthen, or alter the timing of the growing

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[74] https://www.wildlifeadaptationstrategy.gov/

season, and affect soil moisture levels. Climate changes will affect disturbances in the ecosystem, with fire, insects, and disease being the most notable for the Ashley National Forest (Malesky et al. 2018). Increasing air temperatures are expected to change the frequency, severity, and extent of wildfires. Large wildfires that have occurred during a warmer climatic period during the past two decades signify a future in which wildfire is an increasingly dominant feature of western landscapes (Vose et al. 2016). With an increase in temperature over the last several decades, there has been an increase in the number of years of drought. Drought has a clear correlation to the biotic and abiotic (living and dead) conditions within forested and rangeland vegetation types, and drought increases the potential for large fires (Vose et al. 2016). Although some of these interactions are predictable, they can be difficult to quantify. The Forest Service has analyzed the fire danger index energy release component and Palmer drought severity index. It found a correlation of recent drought conditions to an increase in large fires on the Ashley National Forest (Forest Service 2017f).

A Forest Plan NEPA analysis of factors affecting climate change as well as the other topics covered in these comments should include the loss of vegetation and stored carbon by logging, burning, mastication and livestock consumption of vegetation. In addition, use of gas or diesel-powered machines to carry out future project components as directed by the Forest Plan needs to be addressed in terms of the emissions generated. Soil carbon loss due to mechanical disturbance for skid trails, mastication, chainsaws, and other machines needs to be calculated. Recreation occurring on the Forest and the cumulative effects produces GHGs from ATVs/OHVs, snowmobiles and other vehicles used for camping and recreating. Such greenhouse gas sources can be quantified. An analysis[75] 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 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.

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[75] Kassar, C. and P. 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.

Another study[76] provides data on the amount of fossil fuel being consumed by snowmobiles in Montana, from which one can calculate the carbon footprint. The study found 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 spew 22 pounds per gallon) and snowmobiling releases 192 million pounds (96 thousand tons) of climate-warming CO2 per year into the atmosphere.

According to the DEIS (p. 132), forests provide a key ecosystem service in the form of carbon sequestration—the uptake and storage of carbon—which helps regulate climate by modulating greenhouse gas concentrations in the atmosphere (Deal et al. 2017; EPA 2018). Maintaining healthy, productive, native vegetation reduces carbon dioxide, a greenhouse gas that plays a major role in climate change (Forest Service 2016a). Carbon in forests comes from carbon dioxide in the atmosphere. Through the process of photosynthesis, growing plants remove carbon dioxide from the atmosphere and store it in plant stems, branches, foliage, and roots, with much of this organic material eventually stored in forest soils (Dugan et al. 2020). Carbon is also stored in dead plant materials, including coarse woody debris and litter, and in harvested wood products (Forest Service 2015a). These different sources of carbon storage are known as carbon pools, while the amount of carbon stored in each pool is the carbon stock.

Instead, the DEIS proposes that more trees are to be removed and/or burned, the reverse of damping down climate change. Scientists say halting deforestation is just as urgent as reducing emissions to address climate change, given the function forests provide as a carbon sink.[77] Forest thinning reduces this carbon sink function. The IPCC released its special report on climate change in August 2019.[78] That report noted that, "reducing deforestation and forest degradation rates represents one of the most effective and robust options for climate change mitigation, with large mitigation benefits globally."

An analysis of net carbon change in US Forests found that, "Carbon loss in the western US (44 ± 3 Tg C per year) was due predominantly to harvest (66%), fire (15%), and insect damage (13%). Across the US, the various disturbances (harvest, fire, insect, wind and forest

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[76] 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.

[77] Millman, O. 2018. Scientists say halting deforestation "just as urgent" as reducing emissions. The Guardian, October 4, 2018.

[78] IPCC. 2019. Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. https://www.ipcc.ch/report/srccl/. Accessed 11/23/2019.

conversion) reduced the estimate of potential Carbon sink of the US forests by 42%."[79] Life cycle analyses of fuel reduction treatments including removal of woody biomass, combustion of fuel in logging machinery, transport, burning of slash, milling energy use, and other factors lead to the conclusion that over the long term, carbon losses from treatment projects may exceed those from wildfire because most of the carbon mass remains on site unburned during fire. The authors further noted that, "Studies at large spatial and temporal scales suggest that there is a low likelihood of high-severity wildfire events interacting with treated forests, negating any expected benefit from fuels reduction."[80]

As stated in the DEIS (p. 133) the amount of carbon that can be sequestered depends on many factors, including the type of vegetation community, parent materials, soils, and climate. Forested areas can store more carbon than non-forested areas, and meadows and healthy rangelands can store more carbon than arid shrubland and desert plant communities (Reeves et al. 2016). Soil carbon is a significant source of carbon storage, representing over 50 percent of the total carbon stored in forest systems in the U.S. (Forest Service 2020a). Ecosystems are dynamic systems that store and release carbon, with carbon being released back to the atmosphere by respiration and decomposition processes or by disturbances such as land use changes, insect infestation, or fire. An area is called a carbon sink if it accumulates more carbon in plant biomass than the rate of releasing carbon dioxide; conversely, an area is a carbon source if it releases more carbon than the rate of carbon fixation into plant biomass (Forest Service 2015a). Forests store large amounts of carbon in their live and dead wood and soil and are an important carbon sink, removing more carbon from the atmosphere than they are emitting. Thus, forests play an active role in controlling the concentration of carbon dioxide in the atmosphere (Pan et al. 2011).

Both fuel treatments and wildfire remove carbon from forests. A simulation showed that even in mature ponderosa pine forest, protecting one unit of carbon from wildfire combustion came at a cost of removing three units of carbon with treatments. "The reason for this is simple: the efficacy of fuels reduction treatments in reducing future wildfire emissions comes in large part by removing or combusting surface fuels ahead of time. Furthermore, because removing fine canopy fuels (i.e., leaves and twigs) practically necessitates removing the branches and boles to which they are attached, conventional fuel-reduction treatments usually remove more carbon from a forest stand than would a wildfire burning in an untreated stand." The analysis showed that thinning and other fuel treatments to reduce high-severity fire, although considered to keep carbon sequestered, do not do so. High carbon losses came from treatments while only small losses were associated with high-severity fire, and these were similar to the losses with low-severity fire that treatments are meant to encourage.[81] A USDA

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[79] Harris, N.L.; Hagen, S.C.; Saatchi, S.S.; Pearson, T.R.H.; Woodall, C.W.; Domke, G.M.; Braswell, B.H.; Walters, B.F.; Brown, S.; Salas, W.; Fore, A.; and Y. Yu. 2016. Attribution of net carbon change by disturbance type across forest lands of the conterminous United States. Carbon Balance and Management. 11(1): 24. 21 p. http://dx.doi.org/10.1186/s13021-016-0066-5.

[80] Restaino, J.C. and D.L. Peterson. 2013. Wildfire and fuel treatments effects on forest carbon dynamics in the western United States. Forest Ecology and Management 303:46-60.

[81] Campbell, J.L., Harmon, M.E., and S.R. Mitchell. 2012. Can fuel-reduction treatments really increase

study[82] estimated soil organic carbon in relatively undisturbed secondary forests in the Rocky Mountain Region is 71,571 lbs/acre. Estimated carbon in dead organic matter above the mineral soil horizon in lodgepole pine forest in the Rocky Mountain Region is 13,411 lb/acre. Average storage of carbon by Forest ecosystem component for the Rocky Mountain Region is 148,190 lb/acre for Idaho with trees (60,961 lb/acre), soil (64,417 lb/acre), Forest Floor (21,735 lb/acre) and Understory (1,077 lb/acre). Annual average carbon accumulation in live trees for Idaho is 1,112 lb/acre/year. The Proceedings of the American Society of Mining and Reclamation reported that, "Soil organic matter (OM) is drastically reduced by various processes (erosion, leaching, decomposition, dilution through soil horizon mixing etc.) typically associated with topsoil salvage prior to surface mining activities. Of these processes, loss of physical protection of OM through the breaking up of soil aggregation can result in up to 65% of soil carbon (C) reductions."[83] **What impact does the mechanical disturbance of soils to carry out a project such as the Ashley NF Aspen Restoration Project have when masticators and other equipment dig up the soils surface for fire lines, masticating and other actions?**

In past reports such as Livestock's Long Shadow[84], the FAO discussed the contribution of livestock to greenhouse gas emissions. A large factor is also conversion of forests to grasslands for livestock. "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 (CO2 equivalent) generated from the livestock industry." Livestock grazing and trampling in the western US led to a reduction in the ability of vegetation and soils to sequester carbon and led to losses in stored carbon.

The Forest Service and the Bureau of Land Management (BLM) allocate AUMs for livestock that relate to forage consumption by a cow and calf, or five ewes with lambs. In a review of the forage consumption for both cattle and sheep using current weights for these animals, we found that currently, a cow/calf pair consumes 1,504 lbs./month and five ewes with lambs consume 1,976 lbs./month.[85] The cumulative effect of this forage consumption, the gases released by livestock and that lost in timber removal should also be added to the Green House

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forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and Environment 10(2):83-90. doi:10.1890/110057.

[82] Birdsey, R. A. Carbon Storage and Accumulation in United States Forest Ecosystems. USDA Forest Service General Technical Report WO-59.

[83] Wick et al. 2008. Soil aggregate and aggregate associated carbon recovery in short-term stockpiles. Proceedings America Society of Mining and Reclamation, 2008 pp 1389-1412. DOI: 10.21000/JASMR08011389

[84] 7H. Steinfeld, P. Gerber, T. Wassentaar, V. Castel, M. Rosales, and C. de Haan, Livestock's Long Shadow, Food and Agriculture Organization of the United Nations, Rome, Italy, 2006. http://www.fao.org/3/a0701e/a0701e00.htm. Accessed 11/23/2019.

[85] Carter J. 2016. Updating the animal unit month. Report by Yellowstone to Uintas Connection. https://app.box.com/s/zx4xjekrfuht2aq12soruw0qfil8hogk

Gas (GHG) emissions analysis as a contribution to atmospheric GHGs and loss in carbon sequestration. Removing livestock from the project area is a possibility to offset annual GHG emissions.

By choosing Alternative C, the fewest acres are proposed for active vegetation management, recreation impacts are reduced, and livestock grazing is reduced thereby having a positive impact on Climate Change and wildfire on the Ashley National Forest.

8. Vegetation Management, Timber Harvest and Sustainable Ecosystems

Under Alternative C, vegetation management is focused on the use of natural processes and areas suitable for timber harvest and total volume harvested would be reduced. This is due to additional designated areas with limitations on timber harvest, limiting vegetation management in inventoried roadless areas, and fewer vegetation management projects that con contribute to timber yields, compared with the other alternatives (DEIS p. 19).

Vegetation Management and Timber Harvest: **Vegetation management, by whatever name used, whether treatment, fuel reduction, logging, restoration, salvage, mastication cannot be effective in restoring ecosystem function or reducing large wildfires and are inappropriate in most situations.** For example, in a letter to Congress[86], over one hundred scientists stated that in Wilderness and other protected areas (protected from logging etc**.) "fires burned more severely in previously logged areas, while fires burned in natural fire mosaic patterns of low, moderate and high severity, in wilderness, parks, and roadless areas, thereby, maintaining resilient forests."** They concluded their letter by stating, "Public lands were established for the public good and include most of the nation's remaining examples of intact ecosystems that provide clean water for millions of Americans, essential wildlife habitat, recreation and economic benefits to rural communities, as well as sequestering vast quantities of carbon. When a fire burns down a home it is tragic; when fire burns in a forest it is natural and essential to the integrity of the ecosystem, while also providing the most cost-effective means of reducing fuels over large areas. Though it may seem to laypersons that a post-fire landscape is a catastrophe, numerous studies tell us that even in the patches where fires burn most intensely, the resulting wildlife habitats are among the most biologically diverse in the West. **For these reasons, we urge you to reject misplaced logging proposals that will damage our environment, hinder climate mitigation goals and will fail to protect communities from wildfire.**"

Fire hysteria is used to justify more logging and active management when the science shows that climatic factors such as wind and high temperatures drive severe fires and that they burn

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[86] Geos Institute. 2018. Open Letter to Decision Makers Concerning Wildfires in the West. https://app.box.com/s/nemr8uoccub0u8hubomjx4uhn6sfbu83

through treated areas at a higher speed. Beetle infestations are also implicated in these severe fires, which are a direct result of climate change.

In a review[87] of wildland fuel treatments in the interior forests of the US, the following points were made:

- "Treating fuels to reduce fire occurrence, fire size, or amount of burned area is ultimately both futile and counter-productive" because most acreage burned is under extreme conditions which make suppression ineffective. If, due to treatments, moderate intensity fires are suppressed this leads to most acres burning under extreme conditions. Reducing burned area would not be desirable as large fires were common prior to European settlement and many western plant species are adapted to large, severe wildfires. Large fires generally have many areas lightly to moderately burned. Any fire "could offer a unique opportunity to restore fire to historically fire-dominated landscapes and thereby reduce fuels and subsequent effects."
- Reducing fuel hazard is not the same as ecosystem restoration. Treatments such as mastication and thinning may leave stand conditions that do not mimic historical conditions. Mastication breaks, chips, grinds canopy and surface woody material into a "compressed fuel bed" while thinning that removes fire-adapted species and leaves shade tolerant species do not mimic historical conditions. "Fire itself can best establish dynamic landscape mosaics that maintain ecological integrity."
- Thinning for fire hazard reduction should concentrate on the smaller understory trees to "reduce vertical continuity between surface fuels and the forest canopy." Thinning can increase surface fire behavior, for example, it increases surface wind speed and results in solar radiation and drying of the forest floor creating drier surface fuels.
- Fuel treatments are transient. Prescribed fire creates tree mortality with snag fall contributing to fuel loads, tree crowns expand to fill voids, trees continue to drop litter. Trees cut for harvest or killed by fire contribute limbs to the forest floor, increasing fuel loadings. Up to seven treatments may be needed to "return the area to acceptable conditions that mimic some historical range."
- Fire was historically more complex and everchanging than commonly believed and cannot be mimicked by prescribed burning. The low-severity model that is being pushed as "restoration" is no longer widely accepted by scientists. Prescribed fires do not have the variability of past wildfires, and thus can cannot mimic them.
- Commercial Thinning and Prescribed out of season burning have negative ecological impacts. Out of season burning coincides with nesting season for birds. Smoke may drive them from their nest, possibly even kill nestlings, etc. Ground nesters will be most impacted.

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[87]Reinhardt, E.D., Keane, R.E., Calkin, D.E., and J.D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management. 256:1997-2006. https://app.box.com/s/loj3dqgz37akelxs18thq0qpkplmk533

- The probability that a fire will encounter a fuel treatment of any kind is low.

Analysis of fuel treatments and fire occurrence in the western US Forest Service managed lands determined that fuel treatments have a probability of 2.0 - 7.9% of encountering moderate or high-severity fire in a 20-year period of reduced fuels (estimated time frame for return of fuels to prior levels or the "window of effective fuel reduction").[88]

Another review questions current policy and whether it is based on science. Lack of monitoring of post treatment effects leaves questions as to the efficacy of treatments. "While the use of timber harvests is generally accepted as an effective approach to controlling bark beetles during outbreaks, in reality there has been a dearth of monitoring to assess outcomes, and failures are often not reported. Additionally, few studies have focused on how these treatments affect forest structure and function over the long term, or our forests' ability to adapt to climate change. Despite this, there is a widespread belief in the policy arena that timber harvesting is an effective and necessary tool to address beetle infestations. That belief has led to numerous proposals for, and enactment of, significant changes in federal environmental laws to encourage more timber harvests for beetle control."[89]

Analysis of fire severity patterns in western ponderosa pine and mixed conifer forests showed that " that the traditional reference conditions of low-severity fire regimes are inaccurate for most forests of western North America. Instead, most forests appear to have been characterized by mixed-severity fire that included ecologically significant amounts of weather-driven, high-severity fire." "Biota in these forests are also dependent on the resources made available by higher-severity fire. Diverse forests in different stages of succession, with a high proportion in relatively young stages, occurred prior to fire exclusion. Over the past century, successional diversity created by fire decreased. Our findings suggest that ecological management goals that incorporate successional diversity created by fire may support characteristic biodiversity, whereas current attempts to 'restore'' forests to open, low-severity fire conditions may not align with historical reference conditions in most ponderosa pine and mixed-conifer forests of western North America."[90]

Old Growth: **Y2U, AWR, NEC, WLD and WWP oppose the removal or burning of any old growth stands of any species on the Ashley NF. There is not sufficient information on what**

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[88]Rhodes, J.J. and Baker, W.L. 2008. Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests. The Open Forest Science Journal 1: 1-7. https://app.box.com/s/s3dqfmgcxizw0pkrva56ott43qphhjya

[89] Six, D.L., Biber, E., and E.L. Esposito. 2014. Management for mountain pine beetle outbreak suppression: does relevant science support current policy? Forests 5(1):103-133. DOI: 10.3390/f5010103. https://app.box.com/s/4y9y70lbqyza4xnn56a9764abhyr92h8

[90] Odion DC, Hanson CT, Arsenault A, Baker WL, DellaSala DA, et al. (2014) Examining Historical and Current Mixed-Severity Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. PLoS ONE 9(2): e87852. doi:10.1371/journal.pone.0087852.

old growth trees of any species occur on the Ashley NF or will be impacted by future projects within the DEIS.

Current old growth status should be mapped using stand exams and quantitative data required to define timber sales for contract purposes and compared to both the pre-Hamilton definition and that resulting from applying the Hamilton definition[91].

The impact of removing old growth stands of any tree species on nesting sites and home range habitat for, Bald Eagle, Boreal Owl, Flammulated Owl, Great Grey Owl and Northern Goshawk must be included in any NEPA analysis for the Ashley National Forest Plan Revision. What is the potential impact on other wildlife species associated with old growth forests such as Pine Martin, Brown Creeper, Snowshoe Hare and Moose?

Reliance on Best Management Practices: Will the Ashley NF rely on Best Management Practices (BMPs)? The BMPs are assumed to be effective and relied upon. However, **a fundamental aspect of NEPA is to take a "Hard Look" at current management, conditions, assumptions, and implementation**. NEPA requires the Forest Service to account for the current degraded conditions it claims, such as conifer encroachment into aspen stands. But what is the mechanism of the conifer encroachment and lack of recruitment in aspen stands. Is it past fire suppression? Livestock grazing? Past vegetation management implemented by the Forest Service?

What is the history of each individual project area? What Forest actions or permitted activities play a role in the current state of aspen, wildlife habitat, watershed health and other ecosystem attributes? There is no analysis of:

- Validity of assumptions from previous NEPA processes
- Accuracy of predictions from previous NEPA processes
- Adequacy of Forest Service implementation of previous decisions
- Effectiveness of actions taken in previous decisions

The above items are critical for effective decisions and outcomes and for the public to be informed. Without this analysis the validity of the current assumptions cannot be determined. Without analyzing the accuracy and validity of the assumptions used in previous NEPA processes one has no way to judge the accuracy and effectiveness of the current analysis and proposals. The predictions made in previous NEPA processes also need to be disclosed and analyzed because if these were not accurate, and the agency is making similar decisions, then the process will lead to failure. For instance, if in previous processes the agency or permittee said they were going to perform a certain monitoring plan or implement a certain type of management, meet certain goals and objectives, and these were never effectively

[91] Hamilton R.C et al. 1993. Characteristics of Old Growth Forests in the Intermountain Region. USDA, Forest Service, Odgen, UT.

implemented, it is important for the reader and the decision maker to know. If there have been problems with implementation in the past, it is not logical to assume that implementation will now be appropriate. If prior projects have not been monitored to document and compare post project initiation conditions to baseline data, then there is no proof that models or BMPs are accurate, effective, or can be relied upon. What commitments have been made in the previous Forest Plan and subsequent project plans? Have these been realized?

The reliance on BMPs is a flawed approach that assumes they work. Ziemer and Lisle (1993)[92] indicated that there are no reliable data showing that BMPs are cumulatively effective in protecting aquatic resources. Espinosa et al. (1997)[93] provided evidence from case histories in Idaho that BMPs thoroughly failed to cumulatively protect salmonid habitats and streams from severe damage from roads and logging. In analyses of case histories of resource degradation by stereotypical land management (logging, grazing, mining, roads) several researchers have concluded that BMPs increased watershed and stream damage because they encourage heavy levels of resource extraction under the false premise that resources can be protected by BMPs (Stanford and Ward, 1993[94], Rhodes et al., 1994[95] Espinosa et al., 1997). Stanford and Ward (1992) termed this phenomenon the *"illusion of technique."*

The Regionally Significant Wildlife Corridor: Circa 2000, the Wasatch Cache National Forest produced the map shown in Figure 1 representing the Corridor.[96] **The Forest Service should provide a map and analysis of the Corridor in any NEPA analysis for the Ashley National Forest Plan Revision by addressing habitat fragmentation and the presence of core habitat and habitat connectivity for special status species including Canada lynx and wolverine, Roadless Areas, Wilderness Areas, NRAs, areas closed to livestock grazing, security areas, and Northern goshawk and owl home ranges.**

In future proposed management projects, Y2U, AWR, NEC, WLD and WWP would like to see more alternatives that propose additional road closures to attain a scientifically defensible density per square mile, grazing allotment closures, fence removals, and setting noise limits on vehicles. Winter use should be closed or severely limited in the Corridor so that Canada lynx, wolverine, and other far-ranging species (elk, deer) have an opportunity to

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[92] Ziemer, R.R., and T.E. Lisle. 1993. Evaluating sediment production by activities related to forest uses--A Northwest Perspective. Proceedings: Technical Workshop on Sediments, Feb. 1992, Corvallis, Oregon. pp. 71-74.

[93] Espinosa, F.A., Rhodes, J.J. and D.A. McCullough. 1997. The failure of existing plans to protect salmon habitat on the Clearwater National Forest in Idaho. J. Env. Management 49(2):205-230.

[94] Stanford, J.A., and J.V. Ward., 1992. Management of aquatic resources in large catchments: Recognizing interactions between ecosystem connectivity and environmental disturbance. Watershed Management: Balancing Sustainability and Environmental Change, pp. 91-124, Springer Verlag, New York.

[95] Rhodes, J.J., Espinosa, F.A., and C. Huntington. 1994. Watershed and Aquatic Habitat Response to the 95-96 Storm and Flood in the Tucannon Basin, Washington and the Lochsa Basin, Idaho. Final Report to Bonneville Power Administration, Portland, Or.

[96] https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5076928.pdf

migrate and have security cover during all seasons. The Forest Service can use its Prohibition Authority 36 (CFR 261) to regulate noise and other activities detrimental to wildlife such as hunting, trapping, or harassing wildlife.

The FEIS for the 2003 Caribou National Forest Revised Forest Plan provides a section on corridors in Volume IV. In that section (pages D-4 to D-8), a process for assessing connectivity is suggested. This includes:

- Assess historic patterns in vegetation and relative connectivity
- Assess current patterns in vegetation and relative connectivity, including the impacts of human disturbance or physical barriers
- Compare historic and current patterns of relative connectivity to determine if animal movement opportunities have been significantly interrupted.
- Consider ecologically based measures to restore historic animal movement, referring to Table 1 provided therein.

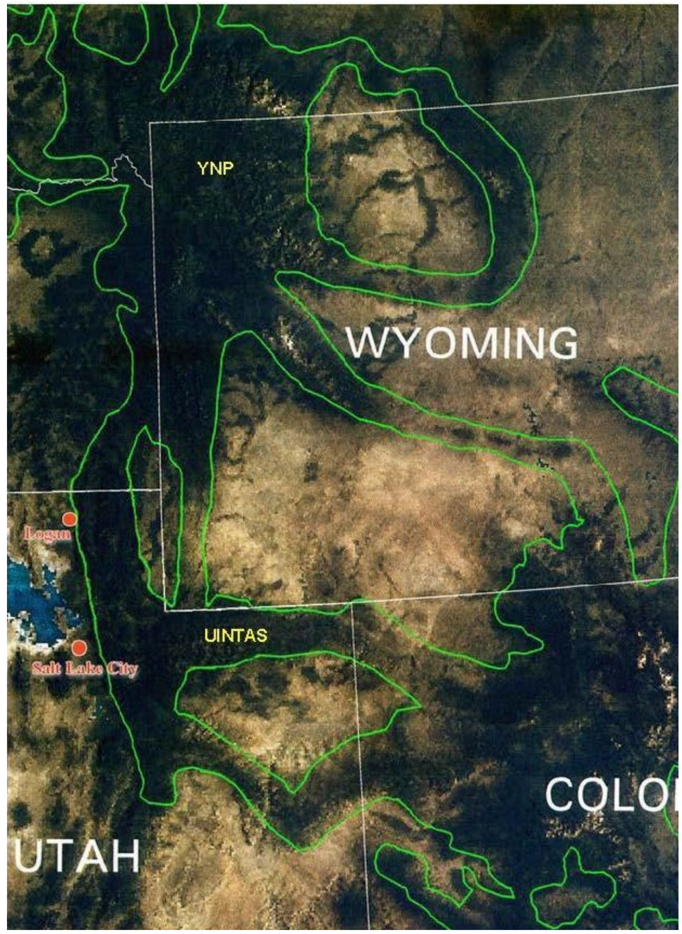

Figure 1. Regionally Significant Wildlife

The FEIS for the 2003 Caribou National Forest Revised Forest Plan also summarizes past efforts at corridor identification, including factors that the Ashley National Forest should consider when identifying linkages. The map in that FEIS (D-5, Figure 1) is referenced in that discussion. This proposed Forest Plan Revision provides the opportunity for the Forest Service to accomplish some mitigation on behalf of wildlife in the region through the closure of additional routes, livestock grazing moratoriums, and snowmobile exclusion during and after the completion of the Forest Plan Revision.

<u>Canada Lynx</u>: The Forest Service provides a map of historic lynx distribution showing that the Ashley NF has historically been used by Canada lynx. (**Figure 2**). There are core and peripheral or linkage areas.[97] The Biological Assessment[98] for Canada lynx documents the importance of peripheral areas as:

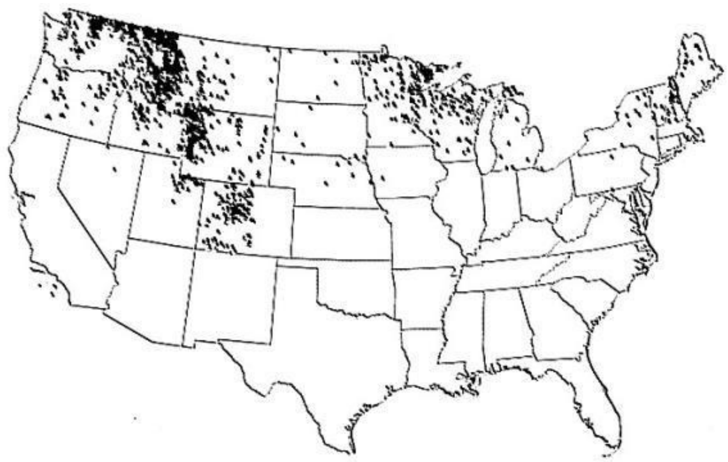

Figure 2. Historical Canada Lynx Distribution

Peripheral populations may contain valuable genetic, physiological, or behavioral adaptations that are unique to their ecological success. Because suitable habitats in areas where populations act as metapopulations are spatially separated, the persistence of a metapopulation is dependent on the efficiency and success of dispersing animals in reaching isolated patches of suitable habitat. When patches are fragmented and connections between patches do not exist, recolonization becomes problematic and the metapopulation may be unable to persist, even though patches of suitable habitat remain (Meffe and Carroll 1997[99]). Additional fragmentation and isolation of suitable habitat occurring as a result of land management activities can not only affect small, isolated habitat patches supporting smaller populations but also large contiguous patches supporting higher population levels.

Ruggierio et al (1999)[100] also discuss the effects of fragmentation on competition with lynx by other carnivores and the loss of connectivity. The Forest Service map of historic lynx distribution for 1842 - 1998 is shown in the referenced link and in Figure 2.[101] This reveals the historical areas used and the pattern of connectivity, which clearly connects Colorado populations to the Greater Yellowstone Ecosystem and northern Rockies. The Ashley, Wasatch-Cache and Uinta NFs also published a map showing lynx analysis units, primary and secondary habitat, and connections (**Figure 3**).[102]

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[97] USDA Forest Service. 2007. Final Environmental Impact Statement Northern Rockies Lynx Management Direction National Forests in Montana, and parts of Idaho, Wyoming, and Utah. Figure 1-1.
[98] USDA Forest Service 1999. Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx. 149p.
[99] Meffe, G.K., and C.R. Carroll. 1997. Principles of conservation biology. Sinauer, Sunderland, Massachusetts 22 Ruggerio, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S., and J.R. Squires (Eds.), Ecology and Conservation of Lynx in the United States. University of Colorado Press, Boulder, CO.
[100] Ruggerio, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S., Squires, J.R. (Eds.), Ecology and Conservation of Lynx in the United States. University of Colorado Press, Boulder, CO.
[101] http://www.fs.usda.gov/detail/r1/landmanagement/resourcemanagement/?cid=stelprdb5160688
[102] https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5076927.pdf

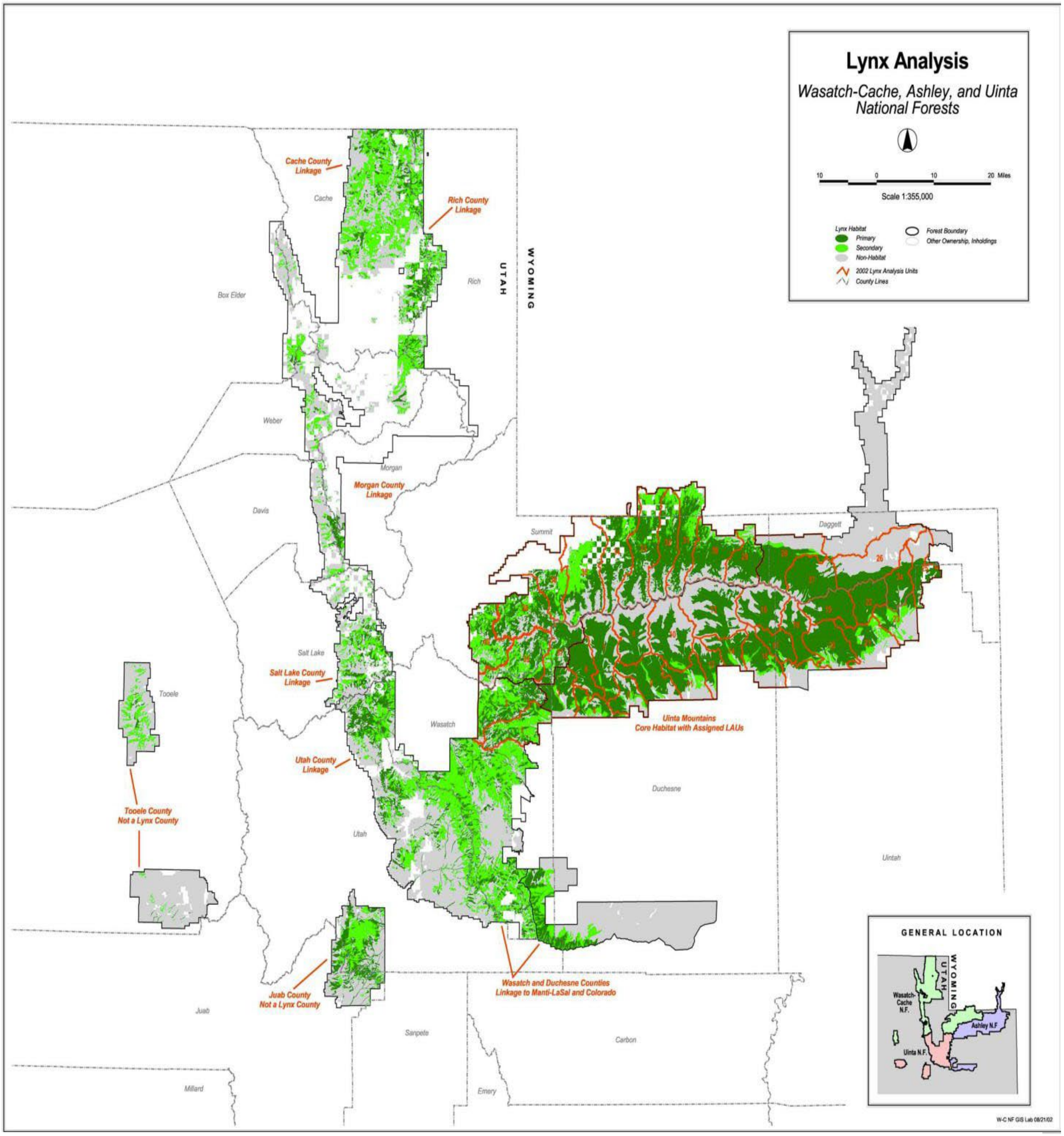

Figure 3. Lynx LAUs, Primary and Secondary Habitat and Connections.

In a sophisticated modeling of lynx habitat, it was determined that the Uintas are core lynx habitat.[103] (**Figure 4**).

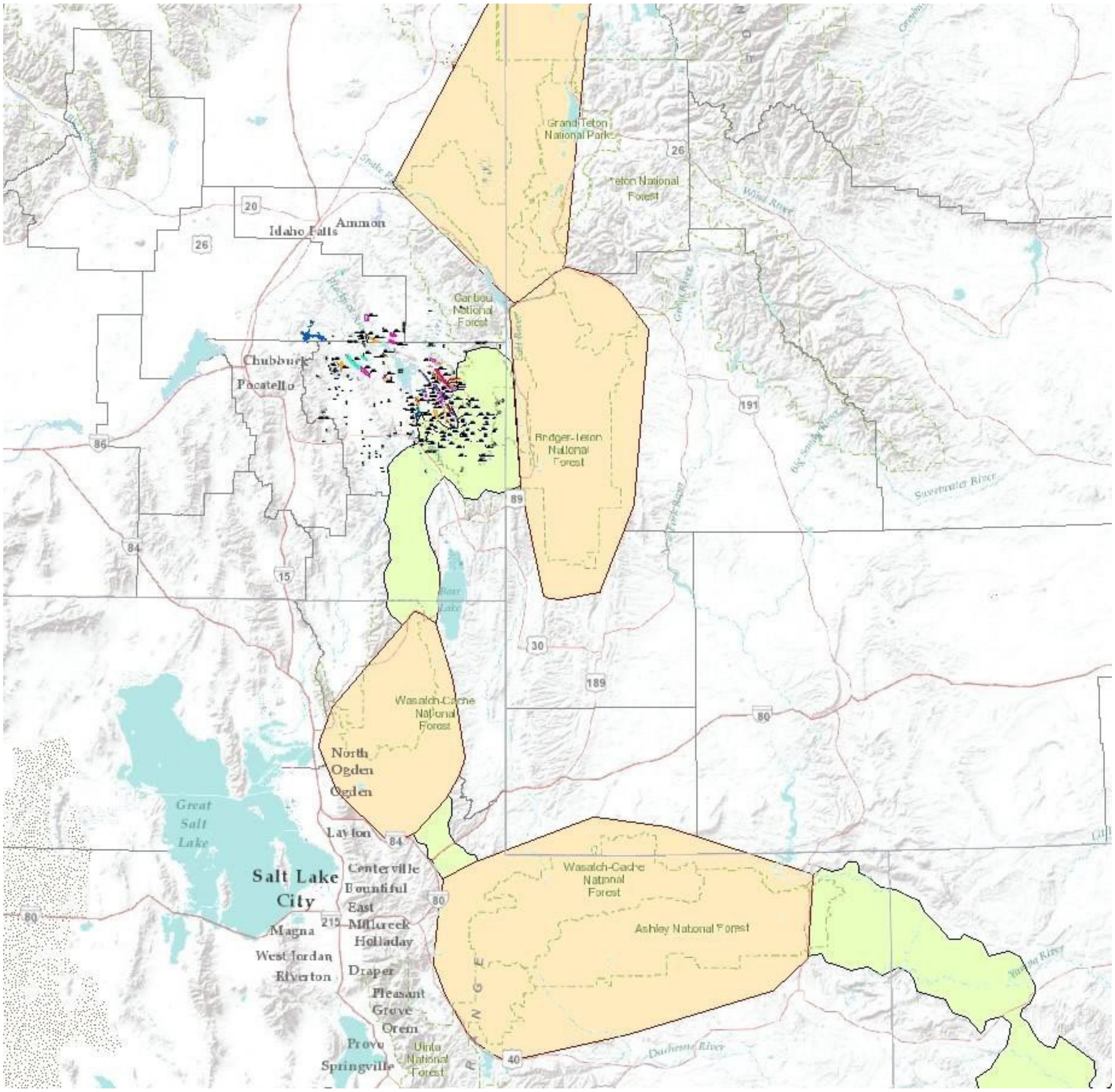

Figure 4. Modeled corridor from Bates and Jones. Orange is depicting a core area for lynx, while yellow are linkages.

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[103] Bates,W. and A. Jones. 2010. Least-Cost Corridor Analysis for Evaluation of Lynx Habitat Connectivity in the Middle Rockies. Wild Utah Project, Salt Lake City, UT. https://app.box.com/s/0g8b1ryqg1iz6r1fd61rdkc8fso97oh5

More recently, the Colorado Division of Wildlife tracked radio-collared lynx released in Colorado. The tracked lynx show a similar pattern of use in the map. (**Figure 5**).[104] These maps show the migration path, and that lynx have been historically using NE Utah and SE Idaho and have many occurred in the Uinta Mountains. 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 and potential core area, it is no surprise that lynx still use the Ashley NF. Indeed, telemetry records confirm that there is a "hot spot" of lynx occurrences at the western end of the Uinta Mountains, where collared lynx 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.[105] 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."[106]

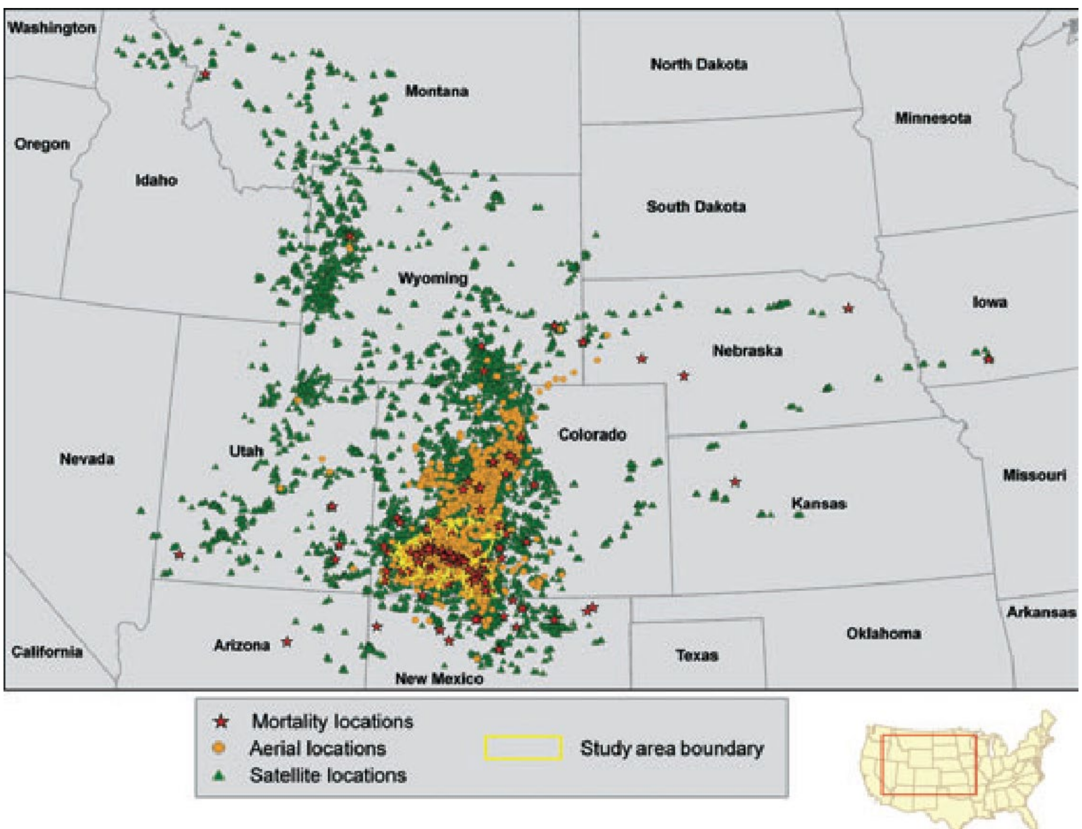

Figure 5. Colorado Division of Wildlife tracked radio-collared lynx.

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104 Devineau P, Shenk T.M., White, G.C., Doherty Jr., P.M. and R.H. Kahn. 2010. Evaluating the Canada lynx reintroduction programme in Colorado: patterns in mortality. Journal of Applied Ecology. doi: 10.1111/j.1365- 2664.2010.01805.x 8 p.

105 Colorado Department of Wildlife (CDOW) Report, 2006-7, Tables 4 and 6, pages 23 and 24.

106 Ibid. page 10; see also Figure 2, page 29.

A recent paper found that lynx exhibited decreasing use of stand initiation structures up to a maximum availability of 25%.[107] Another found that 50% of lynx habitat must be mature-undisturbed forest for it to be optimal lynx habitat and no more than 15% can be young clear-cuts, i.e. trees <4" dbh.[108] The study also found that lynx do not use clear-cuts in winter when they are at most risk of starvation.

It is critical that the Forest Service fully analyze the effect of livestock grazing, the effects of these aspen treatment or restoration projects as well as any other past, present and foreseeable actions in the Ashley NF on Canada lynx habitat and food base, such as hares and squirrels as well as the impact of livestock grazing on accelerating conifer encroachment into aspen and the direct effects of livestock grazing removal of aspen shoots on recruitment.

A "Hard Look" must be conducted of habitat fragmentation, corridor functionality, vegetation treatments, road density, snowmobile, and ATV/OHV activity, trapping and other human activity as well as livestock grazing on Canada lynx. That look must also include all previous Forest Plan requirements and intent as well as embody the best available science applicable to Canada lynx.

Wolverine: Recently, a US District Court ruling remanded the USFWS withdrawal of its Proposed Rule to list the distinct population segment of the North American wolverine occurring in the contiguous United States as a threatened species under the Endangered Species Act for further consideration.[109] The ruling reviewed the science relating to the selection of denning sites in combination with snow presence during the natal period and recent analyses of potential climate change effects to snow pack that indicate a severe reduction in snow cover during this century with negative implications to wolverine populations. This factor alone should place greater emphasis on habitat integrity and restoration for corridors, connectivity for both lynx and wolverine.

The ruling also emphasized that populations in the US, which exist as meta-populations "require some level of regular or intermittent migration and gene flow among subpopulations, in which individual subpopulations support one-another by providing genetic and demographic enrichment through mutual exchange of individuals." If connectivity is lost, "an entire meta-population may be jeopardized due to subpopulations becoming unable to persist in the face of inbreeding or demographic and environmental stochasticity."

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[107] Holbrook, J. D., J. R. Squires, L. E. Olson, N. J. DeCesare, and R. L. Lawrence. 2017. Understanding and predicting habitat for wildlife conservation: the case of Canada lynx at the range periphery. Ecosphere 8(9): e01939.10.1002/ecs2.1939.
[108] Kosterman, M.K. 2014. Correlates of Canada lynx reproductive success in northwestern Montana. Masters Thesis,University of Montana,Missoula, MT. 79p.
[109] US District Court for the District of Montana, Missoula Division. April 4, 2016. Defenders of Wildlife v US DOI. CV 14-246-M-DLC

The study by Copeland, 2010[110], cited in the ruling, analyzed spring snow cover to determine overlap with known den sites, finding 97.9% overlap. They concluded that if reductions in snow cover continue to occur, "habitat conditions for the wolverine along the southern extent of its circumboreal range will likely be diminished through reductions in the size of habitat patches and an associated loss of connectivity, leading to a reduction of occupied habitat in a significant portion of the species range." A second analysis by McKelvey, 2011[111] used Global Climate Models to predict the change in distribution of persistent spring snow cover so that "for conservation planning, predicting the future extent and distribution of persistent spring snow cover can help identify likely areas of range loss and persistence, and resulting patterns of connectivity." McKelvey concluded that they expect, "the geographic extent and connective(ity) of suitable wolverine habitat in western North America to decline with continued global warming" and that "conservation efforts should focus on maintaining wolverine populations in the largest remaining areas of contiguous habitat and, to the extent possible, facilitating connectivity among habitat patches."

In its Proposed Rule, the USFWS accepted these studies as the best available science with climate change as the driving factor. Other threats were considered of lower priority in comparison, "however, cumulatively they could become significant when working in concert with climate change if they further suppress an already stressed population." The USFWS noted harvest, demographic stochasticity and loss of genetic diversity as these secondary factors but avoided mention of habitat integrity and fragmentation by roads, infrastructure and human activity or loss of prey base due to depletion of herbaceous plant communities and cover by livestock grazing.

Robert Inman, PhD, a biologist and Director of the Greater Yellowstone Wolverine Program at the Hornocker Institute/Wildlife Society noted that the USFWS singled out a particular activity, fur trapping, that can cause mortality, while ignoring the full range of human activities such as roadkill, before records were kept. So delineating habitat based on these records can understate actual range for wolverines. He also provides evidence that wolverines can den in areas lacking the presumed snow cover and those conditions suitable for competing for food are also a limiting factor. He further argues that road density was found to be a factor in an earlier telemetry-based habitat analysis, particularly at higher elevations. Wolverines were observed to avoid or alter their travel when encountering housing developments and traffic, infrastructure, transportation that can affect mortality.[112] He also pointed out the extensive

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[110] Copeland, J. P.; McKelvey, K. S.; Aubry, K. B.; Landa, A.; Persson, J.; Inman, R. M.; Krebs, J.; Lofroth, E.; Golden, H.; Squires, J. R.; Magoun, A.; Schwartz, M. K.; Wilmot, J.; Copeland, C. L.; Yates, R. E.; Kojola, I.; and R. May. 2010. The bioclimatic envelope of the wolverine (Gulo gulo): do climatic constraints limit its geographic distribution? Canadian Journal of Zoology. 88: 233-246.

[111] McKelvey et al. 2011. Climate change predicted to shift wolverine distributions, connectivity, and dispersal corridors. Ecological Applications, 21(8), 2011, pp. 2882–2897.

[112] Review of the United States Fish and Wildlife Service's Proposed Rule to List Wolverines as a Threatened Species in the Contiguous United States, May 2013.

trapping that occurred in the US prior to records of wolverine and that they may well have been eliminated from suitable places before records were kept.

So, while the USFWS emphasizes the role of connectivity and genetic exchange in maintaining meta-populations and genetic diversity, it avoids the identification of the connections vital to maintenance and recovery of species. See **Figure 6** which is a map of the USFWS modeled wolverine habitat.[113] This map shows wolverine habitat areas in Montana, Idaho, Utah and Wyoming but provides no indication of travel corridors that wolverine might use to connect these. This map shows the areas in Ashley NF with sufficient snow cover. Connecting these "dots" would likely lead to a connectivity pattern similar to that of Canada lynx, discussed previously. Note the Uintas are considered wolverine habitat.

The Idaho Management Plan for the Conservation of Wolverines identified the movement corridors shown in **Figure 6**.[114] These overlay with the Regionally Significant Wildlife Corridor and the Lynx Least Cost Path shown above, principally emphasizing the corridor from SW Wyoming through SE Idaho and the Bear River Range south to the Uinta Mountains. We call this the Yellowstone to Uintas Connection.

Population trends and viability assessments for this species and its habitats must be completed in any NEPA analysis for the Ashley National Forest Plan Revision.

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https://www.federalregister.gov/documents/2013/02/04/2013-01478/endangered-and-threatened-wildlife-and-plants-threatened-status-for-the-distinct-population-segment

113 https://www.fws.gov/mountain-prairie/es/species/mammals/wolverine/02012013ModeledWolverineHabitatMap%20.jpg.pdf

114 Idaho Department of Fish and Game. 2014. Management plan for the conservation of wolverines in Idaho. Idaho Department of Fish and Game, Boise, USA. https://idfg.idaho.gov/old-web/docs/wildlife/planWolverine.pdf

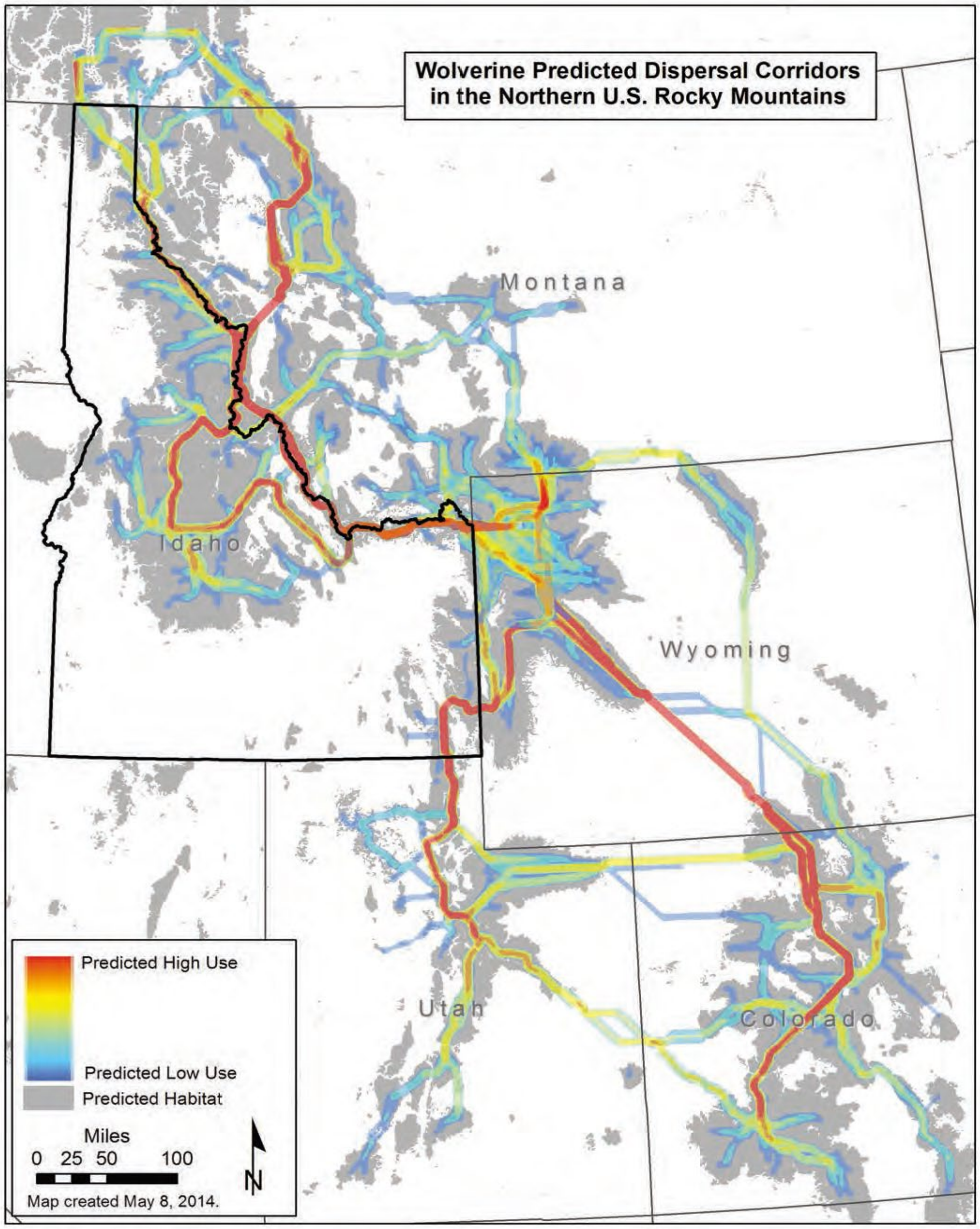

Figure 6. Wolverine predicted movement corridors in the Northern Rockies.

Bald Eagle, Boreal Owl, Flammulated Owl, Great Grey Owl and Northern Goshawk: **Population trends and viability assessments for these species and their habitats must be completed in any NEPA analysis for the Ashley National Forest Plan Revision**. Any active or historical nesting sites for these species occurring in the Ashley NF must be an analyzed to include the current state of post-fledgling family areas, foraging habitat, forage productivity, livestock utilization of forage and the impact of livestock grazing on these species.

Like Canada lynx and wolverine, Northern goshawks also depend on mammals and birds for prey. Reynolds et al (1992)[115] provide specific recommendations that livestock grazing utilization will average no more than 20% in goshawk home range of approximately 6,000 acres, which also includes nesting and post-fledging areas. They also specify forest stand structure needed for goshawk across its home range and the protection of mycorrhizal fungi in the forest floor to aid in nutrient cycling. **Y2U, AWR, NEC, WLD and WWP would recommend a reduction in grazing numbers and season or closures of pastures and allotments throughout the Ashley NF to mitigate the impact of vegetation management on the Northern Goshawk population in surrounding nesting and foraging habitat.**

Forest Structure – Species Composition/Aspen Regeneration/Permitted Livestock Grazing: As stated above in our overall position, **livestock grazing impacts on regeneration of aspen and conifer species must be addressed in any NEPA analysis for the Ashley National Forest Plan Revision**. Y2U, AWR, NEC, WLD and WWP do not agree with the Forest Service's general position that livestock grazing impacts on the forest conditions are outside of the scope of this and any other National Forest project or planning process. A discussion of these impacts should not be dismissed in a NEPA analysis for approval of a Forest Plan impacting this large of an area in our National Forests.

The proposed Ashley National Forest Plan Revision does not fully consider the impact on forest health from livestock grazing in any Alternative presented in the DEIS. Livestock grazing has negative effects on forest health regarding accelerating succession of aspen to conifers and increases the fire hazard in conifer forests. Aspen do not regenerate under the constant herbivory removal of younger age classes. Livestock grazing plays a key role in removing the herbaceous vegetation from the forest floor and disturbing the soil resulting in accelerated establishment of conifer seedlings. This results in thickets of saplings and a dense forest with a reduced herbaceous component and increased risk of high-intensity fires. Y2U has reviewed the aspen literature regarding impacts by livestock and browsers such as deer and elk. That review is available online.[116]

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[115] Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management Recommendations for the Northern Goshawk in the Southwestern United States. Gen. Tech. Rep. GTR-RM-217, Fort Collins, Colorado. U.S. Department of Agriculture, Rocky Mountain Forest and Range Experiment Station. 90p.

[116] https://app.box.com/s/78706949e8651d6c908e

There needs to be more analysis by the Forest Service of the effects of grazing on forest health and the adverse consequences to fuels, fire cycles, fire intensity, insect infestations, infiltration, and nutrient cycling in any NEPA process for the Ashley National Forest Plan Revision as well as in any other subsequently proposed grazing, resource extraction and timber projects on the Ashley NF.

Aspen: The Forest Service typically ignores livestock grazing effects on forest structure, understory conditions as related to potential that might be described in Natural Resource Conservation Service Ecological Site Descriptions. Those ESDs acknowledge the role of livestock and other factors in state changes and degradation of natural conditions. Projects proposed by the Forest Service have consistently deflected around this issue, but it is foundational in determining ecological status of the Forest. It must be addressed Forest wide.

Browsing of aspen has been studied by Forest Service scientists such as Bartos, Mueggler, Campbell and other researchers such as Charles Kay who conducted a historic study for BLM in Nevada.[117] Kay reported the results of a study of hundreds of aspen clones in the Shoshone, Simpson Park, Diamond, Desatoya and Roberts Mountains on BLM lands in central Nevada. Aspen in these areas are found to be in poor condition and many stands have not successfully regenerated in 100 years or more. No evidence of elk presence was found in or near any of the stands, so elk were not contributors to the problem. Forest succession was not a problem as conifer invasion had not taken place in the communities studied.

Other than pinyon pine, conifers were absent from the study area. Kay observes that where aspen in central Nevada has been protected from grazing, aspen has maintained its position in the vegetation community and, in fact, has replaced sagebrush, contrary to the opinion of some that say sagebrush naturally replaces aspen. He cites other exclosure studies that have found that aspen stands have expanded and eliminated sagebrush. Exclosure studies have also suggested that climate has little impact on aspen in central Nevada. Aspen inside exclosures regenerated without fire or other disturbance while aspen in adjacent, unprotected areas did not. Numerous papers were cited that demonstrate that climatic variation does not account for observed declines in aspen.

Fire exclusion was also examined. It was noted that BLM has suppressed fires for a long period and the study areas contained little evidence of fires. In fact, only a few out of the hundreds of clones studied had experienced fire during the past 20 years. Aspen age data suggest that few aspen stands in central Nevada have burned during the past 100 years. Kay points out that while the burned stands did regenerate, in all cases where aspen were protected from livestock

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[117] Kay, Charles E. 2001. The Condition and Trend of Aspen Communities on BLM Administered Lands in Central Nevada – with Recommendations for Management. Final Report to Battle Mountain Field Office, Bureau of Land Management. Battle Mountain, Nevada. An updated (2003) version is available at: https://idahoforwildlife.com/Charles%20Kay/59-%20Aspen%20Management%20Guidelines%20for%20BLM%20Lands%20in%20North-Central%20Nevada.pdf

grazing, aspen regenerated. So, **while fire may benefit the species, aspen declines cannot be attributed to absence of fire.**

Exclosure data indicated that herbivory had a major influence on aspen stem dynamics and understory composition in central Nevada. Most herbivory was from livestock. Pellet counts were used and showed that 59.3% were from domestic sheep, 40.2% from cattle and 0.4% from deer. Exclosures that exclude cattle but not deer, including canyons closed to livestock, had aspen stands that all were regenerating. When fallen trees blocked livestock access, aspen were able to regenerate in the protected spaces. Reductions in livestock numbers also resulted in aspen regeneration. Distance to water and slope were also factors that related to aspen regeneration or the lack of regeneration. Cattle use was generally related to distance from water and slope. Steeper slopes or areas further from water received less use. Aspen stands further from water and on steeper slopes were in better condition than those nearer water or on more gentle slopes, again indicating that grazing by livestock was the operative factor causing declining health of aspen clones. While Kay cites other research indicating that wildlife have impacts on aspen regeneration, he states that in all cases where aspen is protected from livestock, it successfully regenerated and formed multi-aged stands without fire or other disturbance. He concluded by saying, "*The single, stem-aged stands seen in central Nevada and found throughout the West are not a biological attribute of aspen, but a result of excessive ungulate herbivory. … In central Nevada, however, domestic livestock are the predominate ungulate herbivore*."

A recent study in Utah's famous Pando clone looked at the lack of recruitment of aspen. The study documented "4.5 times the amount of cattle use herbivory in two weeks than the mule deer use over six months. Forage utilization by mule deer prior to the onset of livestock grazing was unobservable, while forage utilization by livestock (plus mule deer) during the 2 weeks of cattle grazing consumed 70 to 90 percent of the understory vegetation's annual production."[118] **This demonstrates that the effect of wildlife, in this case, deer, are negligible compared to domestic livestock.**

Age structure of aspen was determined in the Hart Mountain National Antelope Refuge to determine the relationship to the presence of livestock and climate. A significant decline in aspen recruitment occurred in the late 1800s that coincided with the onset of high levels of livestock grazing. Livestock grazing was terminated in 1990 and aspen recruitment increased "by more than an order of magnitude". Climate variables were not a significant factor. "Where long-term declines in aspen are currently underway on grazed lands in the western US, land managers need to carefully consider the potential effects of livestock and alter, as needed,

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[118] Ratner, J.R., E.M. Molvar, T.K. Meek, and J.G. Carter. 2019. What's eating the Pando Clone? Two weeks of cattle grazing decimates the understory of Pando and adjacent aspen groves. Hailey, ID: Western Watersheds Project, 33 pp. https://app.box.com/s/ysuufd9dl5dcaof8ija9f7xy67b8q8vj

management of these ungulates to ensure retention of aspen woodlands and their ecosystem services."[119]

It is incumbent on the Ashley NF to update the capable acres based on Regional Criteria and stocking rates for all allotments in the project area and use current livestock weights and forage consumption rates.[120] Part of this analysis should also be to analyze the impact of sheep bedding areas and proximity of water developments and/or water and livestock on aspen stand dynamics, recruitment, age class, disease. The effect of slope must also be analyzed. [121] This is one of several capability criteria. Region 4 has produced updated capability criteria[122]:

- Areas with less than 45 percent slope for domestic sheep, 30% for cattle.
- Areas producing more than or having the potential to produce an average of 200 lbs. of forage/acre on an air-dry basis over the planning period
- Areas without dense timber, rock, or other physical barriers
- Areas with naturally resilient soils (not unstable or highly erodible soils)
- Ground cover greater than 60%.
- Areas within one mile of water or where the ability to provide water exists.

<u>Livestock Grazing:</u> **Range management is an issue that must be addressed in any NEPA analysis for the Ashley National Forest Plan Revision**. The analysis should not omit any discussion regarding the impacts of continued grazing on the seedling/sapling age classes. Livestock grazing is the principal factor damaging forest and watershed integrity in the Ashley NF. It is the fundamental factor needing to be addressed in the Ashley NF. Over the years, Y2U staff members have monitored conditions and found excessive amounts of bare soil, forest understory litter loss, soil carbon and nitrogen depletion, conifer forest mycorrhizal fungi layer disruption, degradation of riparian areas, sedimentation from erosion impacting spawning habitats, and the resulting depletion of many species such as the native cutthroat trout.[123] Our analyses have shown that National Forest allotments are generally overstocked leading to a native herbaceous plant community greatly below potential with increasers dominating the plant community. Water developments create highly damaged areas as cattle

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[119] Beschta, R.L., Kauffman, J.B., Dobkin, D.S., and L.M. Ellsworth. 2014. Long-term livestock grazing alters aspen age structure in the northwestern Great Basin. Forest Ecology and Management. 329(30-36). http://dx.doi.org/10.1016/j.foreco.2014.06.017

[120] Carter, J. 2016. Updating the Animal Unit Month. Yellowstone to Uintas Connection, Paris, ID. 7p. https://app.box.com/s/zx4xjekrfuht2aq12soruw0qfil8hogk

[121] Carter, J. 2013. Utilization, Rest and Grazing Systems - A Review. Yellowstone to Uintas Connection. 11p. https://app.box.com/s/ngw6723dx52quxw2rd8u

[122] USDA Forest Service. 2003. Final Environmental Impact Statement Wasatch-Cache National Forest. Appendix B9.

[123] Chard, B., Chard, J., Carter, J., 2002. Assessment of habitat conditions Bear River Range Caribou National Forest, Idaho. https://app.box.com/s/ad8412aa500005c761d6

and sheep congregate around them. Livestock grazing also compacts the soil, reduces infiltration, and increases runoff, erosion, and sediment yield.[124, 125]

Livestock negatively affect forest health. Typically, agency analyses and management have not considered the effects of livestock on forest health, including aspen and conifer forests in regard to accelerating conifer succession in aspen and increasing the fire hazard in conifer forests. Livestock grazing plays a key role in removing herbaceous vegetation from the forest floor and disturbing the soil resulting in accelerated establishment of conifer seedlings. This results in thickets of saplings, a dense forest with a reduced herbaceous component, and increased risk of high-intensity fires[126]. Forest stands suffer *"retrogression"* and loss of grasses when grazed by cattle and big-game, but big-game grazing alone did not result in significant effects.[127]

Livestock grazing in Douglas-fir communities caused increased tree numbers, decreased production, cover and frequency of major palatable grasses, and altered dominance of shrub and forb species. Grazing resulted in increased accumulation of downed woody fuel in every size class, increased forest floor duff and decreased herbaceous fuels. The consequences were *"fuel distribution and composition were slightly less favorable to frequent surface fires, highly conducive to vertical spreading of fire and potentially more capable of major conflagrations."* These conditions make prescribed fire more likely to cause high-intensity fires.[128] It was predicted in 1972 that growing fuel accumulation would place forests at higher risk.[129]

A study of tree density and herbaceous understory vegetation on ungrazed Meeks Table and grazed Devils Table in Washington found that herbaceous vegetation was 183% to 254% greater on the ungrazed site with 850 pounds of air-dry herbage per acre compared to 240 pounds per acre in the grazed site. *"While the timbered overstories on the two Tables were similar, Meeks Table had only a very few small trees, but Devils Table had 3,291 small trees per acre."*[130] A study of grazed and ungrazed Ponderosa pine forests in Zion National Park found that grazing by livestock and associated reduction of the herbaceous ground layer promoted the establishment of less

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[124] Trimble, S.W. and A. C. Mendel. 1995. The cow as a geomorphic agent, a critical review. *Geomorphology* 13:233-253.

[125] Kauffman, J. Boone, Andrea S. Thorpe, and E. N. Jack Brookshire. 2004. Livestock exclusion and belowground ecosystem responses in riparian meadows of eastern Oregon. *Ecological Applications* 14:1671–1679.

[126] Belsky, A.J. and Dana M. Blumenthal. 1997. Effects of livestock grazing on stand dynamics and soils in upland forests of the interior West. Conservation Biology 11(2):315-327.

[127] Kreuger, William C. and A. H. Winward. 1974. Influence of cattle and big-game grazing on understory structure of a Douglas-fir Ponderosa Pine- Kentucky bluegrass community. Journal of Range Management 27(6):450-453.

[128] Zimmerman, G. Thomas and L.F. Neuenschwander. 1984. Livestock grazing influences on community structure, fire intensity and fire frequency within the Douglas-fir/Ninebark habitat type. Journal of Range Management 37(2):104-110.

[129] Dodge, Marvin. 1972. Forest fuel accumulation – a growing problem. Science 177:139-142.

[130] Rummell, Robert S. 1951. Some effects of livestock grazing on Ponderosa pine forest and range in central Washington. Ecology 32(4):594-607.

palatable tree and shrub seedlings. [131] Loss of soil nutrients from logging was lower than from grazing.[132] In studies of grazed and ungrazed woodlots, the highly compacted soils of the heavily grazed woodlot had lower moisture content and much lower infiltration rates than in ungrazed soils.[133] Soil disturbance such as this has far-reaching consequences on forest health, including reduced production and increased susceptibility to insects and disease.

The current condition, composition and productivity of the conifer stands in the Ashley NF must be characterized and the effects of past timber projects and livestock grazing on forest stand structure, understory plant communities and woody residue revealed. Security cover must be identified and mapped, and the Forest Plan must be designed to retain and promote security cover. These elements need to be analyzed to meet the intent of NEPA and NFMA.

The Scoping Notice for the recent Ashley Forest Wide Range Improvement Project[134] admits to grazing management issues with condition and trend, range improvements, livestock concentrations, the need to protect springs, streams, and meadows. It appears from this, that the adaptive management/grazing management has been ineffective and now the Forest Service, in collaboration with permittees wishes to install a wish list of infrastructure. The Forest Service must answer the question as to why the present management has failed by a detailed and quantitative assessment of all Forest data over time, including:

- Condition and trend
- Utilization in upland and riparian areas plus stubble height in riparian
- Characterization of stream habitat including width/depth ratios, pool/riffle, woody debris, bank alteration, streambank stability, spawning habitat sediment fines percentages, overhead canopy percentage, streambank overhanging vegetation percentage, undercut banks.
- Current desirable forage production in capable areas
- Status of native bunchgrasses in uplands relative to their potential. This should be done in an Ecological Site Inventory that compares the potential plant community to that present today.
- Analysis of the 1171 long term study plots established in aspen stands and impacts from the various activities monitored. This was presented in the EA for the Ashley NF Aspen Restoration Project[135].

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[131] Madany, Michael H. and Neil E. West. 1983. Livestock grazing-fire regime interactions within montane forests of Zion National Park, Utah. Ecology 64(4):661-667
[132] Smith, David M., Bruce C. Larson, Matthew J. Kelty and P. Mark S. Ashton. 1997. The Practice of Silviculture: Applied Forest Ecology. John Wiley & Sons, New York. 537p.
[133] Barnes, Burton V., Donald R. Zak, Shirley R. Denton and Stephen H. Spurr. 1998. Forest Ecology. John Wiley & Sons, New York. 774p.
[134] https://www.fs.usda.gov/nfs/11558/www/nepa/114949_FSPLT3_5667164.pdf
[135] https://www.fs.usda.gov/nfs/11558/www/nepa/112519_FSPLT3_4879629.pdf

- The effects of various management activities on aspen including livestock grazing, prescribed fire, salvage, logging, thinning, and livestock grazing in combination with these
- Location of all existing water developments and analysis of the proximity of water developments to aspen clones and status of aspen recruitment, age classes and understory herbaceous
- Analysis of the location/proximity of existing water developments to riparian areas (streams, springs, wetlands) and the condition of each of these aquatic ecosystems, the levels of livestock use (utilization, bank alteration, stubble height, ground cover, stream bank stability).
- Analysis of each AMP, the adaptive management strategies and BMPs employed in the Adaptive Management Protocol as to why those have failed and why the Forest Service has not reduced stocking rates to account for the ecosystem degradation and drought that has become a normal feature.
- In the sections below we raise issues about lynx and wolverine habitat, ESA and Sensitive Species habitat, grazing management, stocking rates, water development impacts, cumulative effects, the need for a Cumulative Effects Area for analysis.

On October 6th, 2021, Yellowstone to Uintas Connection, The Alliance for the Wild Rockies, Native Ecosystems Council, and Western Watershed's Project submitted scoping comments on the Ashley Forest Wide Range Improvement Project. **Those comments are applicable to this NEPA planning process and are included in this submission as comments for the Ashley National Forest Plan Revision Draft Environmental Impact Statement (DEIS) by way of Attachment 3 of this document**. Key points from those comments including Stocking Rate Determination, Capability, Forage Consumption Rates of Livestock, Utilization, Rest, Grazing Systems, Riparian Grazing and Livestock Effects on Water Quality are repeated below:

The analysis of domestic sheep grazing in the High Uinta Mountains Wilderness revealed that the Ashley NF and UWCNF failed to update stocking rates to current U.S. Forest Service Region 4 capability criteria, failed to use current forage production and livestock consumption rates to set stocking rates, and failed to use the best science regarding grazing systems, utilization levels, and rest. Forest Service monitoring was generally non-quantitative and in areas more resistant to impacts from livestock.[136]

This NEPA analysis should include data collected in all habitat types and compared to potential plant communities and their production. Due to the grazing of domestic sheep, their bed ground locations need to be located and characterized with the current state of plant species, ground cover and aspen recruitment. Locations in proximity to water developments and salting locations need to be characterized. Cattle grazing is concentrated in areas near water and in low gradient areas, consequently, the conditions in these areas and especially where

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[136] Conservation Community Comments on the DEIS for the High Uintas Wilderness Domestic Sheep Analysis Project. August 05, 2019. https://app.box.com/s/797x21rggtx1t6yayr0gi9kpbouis4sr

aspen stands are nearby need documentation and analysis. Because livestock browsing is a major impact on aspen stands, the lack of this critical information will be a failure to take the requisite "Hard Look" under NEPA. We discuss many aspects of livestock grazing in the following sections. **This science must be applied during the NEPA analysis for the Ashley National Forest Plan Revision to lessen the effects of livestock grazing on ecosystem attributes.**

Determining Livestock Stocking Rate and Management: The Ashley NF Forest Plan and FEIS are over 25 years old and apparently have not been updated to reflect current Forest Service Regional Criteria for determining lands capable for livestock grazing. This must be corrected in this Ashley Forest Plan Revision. The current soil survey, current plant community status and desirable forage production. Typically, the Forest Service allocates 26 lb./day of forage per AUM of livestock. Based on our review of records obtained through FOIA for the High Uinta Mountains Wilderness Domestic Sheep Analysis, there have apparently been no current surveys to determine the amount of desirable and intermediate forage production that is available today after decades of drought. Current management of livestock grazing in both the Ashley NF and UWCNF includes excessive utilization criteria, turn in during active plant growth and before seed ripening, lack of adequate rest to allow grazed plants to recover their vigor and therefore, their productivity; reliance on grazing systems rather than accurate determination of stocking rates; and active, rather than passive, management.

All these factors combine to produce degraded conditions for the native plant communities, soils, and riparian areas. **This NEPA process cannot meet "Hard Look" requirements until all these factors are considered**. More detailed analysis of each issue follows.

Capability: The concept of "capability" for livestock grazing is a core concept directed at limiting soil erosion and degradation of grazing allotment watersheds and plant communities by factoring out areas of steeper slopes, highly erodible soils, dense forest, and barren areas to reduce risk of soil erosion and degradation of plant communities.[137] It also is used to determine stocking rates based on forage consumption rates of livestock and allocates an appropriate proportion of the available, preferred or desirable forage species on the capable acres to livestock so that stocking rates are sustainable and reduce the risk of degradation. To our knowledge, the Ashley NF has not updated its capability and suitability determinations for livestock grazing since the 1960's. This past capability and suitability analysis must be compared to the current USFS Region 4 capability criteria and a revised analysis completed.

The current USFS Region 4 Criteria for range capability were described in a 1998 memorandum by the Forest Service (USDA, 1998). These were:

- Areas with less than 45 percent slope for domestic sheep, 30% for cattle

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[137] USDA Forest Service. 1964. Forest Service Handbook – R4 Range Analysis Handbook.

- Areas producing or having the potential to produce an average of 200 lbs. or more of forage/acre on an air-dry basis over the planning period
- Areas without dense timber, rock, or other physical barriers
- Areas with naturally resilient soils (not unstable or highly erodible soils)
- Ground cover greater than 60%
- Areas within one mile of water or where the ability to provide water exists.

We have not seen any evidence that these criteria are fully addressed in any Region 4 Forest. For example, in its 2003 Forest Plan Revision, the Wasatch-Cache National Forest (WCNF) used only a subset of these criteria.[138] It evaluated the slope of the land using a digital elevation model to determine where the lands of less than or equal to 45 percent slope for grazing domestic sheep or 30% for cattle were located. Lacking current forage production data, the WCNF used a vegetation layer as a surrogate for forage production. While forage production had been determined in the 1960's and was their most recent data, it was not used. The WCNF FEIS described it thusly: *"The vegetation layer was used as a surrogate for minimum forage production. In general, coniferous-forested vegetation types (spruce, fir, pine, Douglas-fir), oak, and barren areas were said to not produce the minimum 200 lbs/acre of forage. All other types were included as potential forage-producing types."* This was not an actual determination of forage currently present.

Therefore, **it is critical that a capability analysis of the allotments in the Ashley NF be updated to reflect the current Regional Criteria.** It is also critical that field data collection be used to determine the current available desirable and intermediate forage for each Soil Map Unit or Ecological Site and the specialized or preferred types that livestock would use such as aspen stands. In our stocking rate analysis for the High Uinta Mountains Wilderness Domestic Sheep grazing project, we collected field data to determine forage production for each soil map unit in areas that were capable based on the physical factors contained in the Regional Criteria: slope, distance to water, not barren, rocky, highly erodible or forested.[139] Once we applied a sustainable proper use criterion of 30% utilization along with current forage consumption rates for the livestock and applied these to the capable acres and amount of usable forage, we determined that the stocking rates should be reduced by more than 90%. This is likely the case on the many allotments throughout the Ashley NF.

<u>Forage Consumption Rates of Livestock</u>**:** The NRCS, in its National Range and Pasture Handbook, defines an Animal Unit (AU) as one mature cow of approximately 1,000 pounds and a calf as old as 6 months, or their equivalent, and states, "*An animal unit month (AUM) is the*

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[138] USDA Forest Service. 2003. Final Environmental Impact Statement Wasatch-Cache National Forest Revised Forest Plan: Appendix B9. Salt Lake City, Utah.

[139] Carter, J., Vasquez, E. and Jones, A. (2020) Spatial Analysis of Livestock Grazing and Forest Service Management in the High Uintas Wilderness, Utah. Journal of Geographic Information System, 12, 45-69. https://doi.org/10.4236/jgis.2020.122003

amount of forage required by an animal unit for one month".[140] NRCS further defines the actual forage consumption as 26 pounds of oven-dry weight or 30 pounds of air-dry weight per day as *"the standard forage demand for a 1,000 pound cow (one animal unit)".* This is 2.6% of body weight for oven-dry weight and 3% of body weight for air-dry weight of forage. (Note that there is no forage allowance for the calf in this consumption rate. The same would be true for lambs, when considering sheep grazing.)

We looked up current USDA statistics for live weights of cattle and sheep.[141] The average weight of adult cattle processed during April 2021 ranged from 1,203 lbs to 1,369 lbs with an overall average of 1,316 lbs. Calves ranged from 266 lbs to 366 lbs with an overall average of 300 lbs. Weights will increase throughout the grazing season, but for an average monthly forage consumption, we have used these average weights and 3% of body weight to obtain the monthly forage consumption as air-dry weight for an AUM for cattle. This is 48.5 lb air dry forage per day or 1,473 lb air dry forage/month per AUM for a cow/calf pair. Updating this factor alone would reduce the stocking rate by nearly half compared to the 26 lb/day we typically see.

Domestic sheep and lambs were reported as a group by USDA. The average live weights ranged from 95 to 126 lbs with an average of 114 lbs. Since permits can include ewes, rams and lambs, we calculate that a ewe and two lambs would consume 312 lbs per month and since an AUM includes 5 adult sheep (with lambs), the total consumption by sheep would be 1,564 lb air dry forage/month for an AUM. We note that the literature suggests mature sheep can be much larger than these numbers depending on species.

Utilization: Allowable use or utilization rates are typically 50% or more on public lands we have addressed. This is double that based on actual evidence. The following summary of studies provides a historical perspective on the relationship between utilization and plant community production or range condition. Many studies are reviewed, demonstrating the overwhelming evidence for lower utilization rates than agencies use today. **We have known for decades that 50% utilization is not proper, or sustainable, in arid areas such as the Ashley NF or UWCNF**.

The effects of different livestock grazing intensities on forage plant production were studied in a ponderosa pine type in Colorado in the 1940's.[142] Livestock forage consumption at a rate of 57% resulted in forage production of double that at a rate of 71%. An area ungrazed by livestock for 7 years produced three times as much forage as the 71% use area. The authors concluded that, as grazing use increased, forage production decreased. During that same period, a classic paper on the use of quantitative ecology in range management presented

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[140] USDA Natural Resources Conservation Service. 2003. National Range and Pasture Handbook Revision 1, Chapter 6. Grazing Lands Technology Institute.
[141] USDA National Agricultural Statistics Service. 2021. Livestock slaughter. https://www.nass.usda.gov/Publications/Todays_Reports/reports/lstk0521.pdf. Accessed on 5/21/2021.
[142] Schwan, H.E., Donald J. Hodges, and Clayton N. Weaver. 1949. Influence of grazing and mulch on forage growth. Journal of Range Management 2(3):142-148.

examples of how stocking rates must be adjusted based on precipitation and range condition. This included a rating based on the departure from the potential plant community.[143] A utilization range of 25 – 30 % use of all forage species by livestock was considered proper.[144] This level was recommended because routinely stocking at capacity would result in overgrazing in half the years and necessitate heavy use of supplemental feed. Even with this system, they recognized that complete de-stocking would be needed in 2 or 3 out of ten years due to drought or below normal precipitation. This is because plant production is related to precipitation and is lower during lower precipitation years, including drought. During these lower precipitation years, not only is production lower, but the ability of plants to recover from grazing is lessened.

A USDA study on root growth stoppage from plant top removal provided quantitative measurements of plant re-growth under different amounts of removal.[145] Three mid-west perennial grasses were grown in a greenhouse in pots under ideal conditions of watering and fertilization. After sixty days of growth, these potted grasses were clipped once at intervals from 10% to 90% of the above ground biomass. Repeat clippings of the potted grasses were made every two days to return the plants to the same height as the original clipped percent. The experiment lasted thirty-three days at which time root growth of unclipped controls became inhibited by the size of the pot. The author concluded that under these ideal growing conditions, if these species of grasses had 40% or less of their aboveground biomass clipped either once or many times, then the net root mass was the same or more at the end of the experiment. This was used to assume that grazing during the entire growing season at 40% or less would sustain plants from one season to the next. However, the data showed that root production was actually reduced at clipping levels of 20%. This study has been used to justify the 50% or "take half/leave half" proposition that range managers have used for decades. But this does not apply to natural conditions found in arid systems as these grasses were grown in greenhouses under ideal conditions of water and nutrients, conditions that do not exist in the Ashley NF or UWCNF and especially under current drought conditions. The effect of conservative (30 – 35%) vs. heavy (60 – 65%) grazing use on grasses and forbs by cattle was determined in a New Mexico study.[146] The study area consisted of two pastures that had experienced conservative use for over 10 years. In 1997, one pasture was changed to heavy use. Measurements at key locations in both pastures in the following year, while being rested, showed that heavy stocking rates resulted in significant declines in productivity in the following year. Perennial grass production was reduced by 57% and forbs by 41% in the heavily grazed pasture compared to the conservatively grazed pasture.

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[143] Dyksterhuis, E. J. 1949. Condition and management of range land based on quantitative ecology. Journal of Range Management 2:104-115.

[144] Hutchings, S.S. and G. Stewart. 1953. Increasing forage yields and sheep production on Intermountain winter ranges. U.S. Department of Agriculture Circular 925. 63p.

[145] Crider, Franklin J. 1955. Root-growth stoppage resulting from defoliation of grass. Technical Bulleting No. 1102. USDA Soil Conservation Service. 23p

[146] Galt, Dee, Greg Mendez, Jerry Holechek and Jamus Joseph. 1999. Heavy winter grazing reduces forage production: an observation. Rangelands 21(4):18-21.

Long-term stocking rate studies from three different locations in Arizona, New Mexico and Utah documented similar patterns. In the Desert Experimental Range in Utah, a 13-year study with moderate (35%) and heavy (60%) use by sheep resulted in annual forage production of 198 lbs/acre and 72 lbs/acre. The authors recommended 25 – 30% use of all forage species.[147] A 37-year study at the Jornada Experimental range in New Mexico involving conservative (33%) and moderate (45%) use showed that the lower grazing intensity resulted in greater black grama (perennial grass) cover. Lowland areas with high clay content and periodic flooding grazed at moderate intensity had higher cover of Tobosa, a perennial grass, than heavily grazed areas. They recommended 30% be used as a stocking intensity with no more than 40% removed in any year. A 10-year study at the Chihuihuan Desert Rangeland Research Center looked at four grazing intensities of 25%, 35%, 50% and 60%. Light (25%) and moderate (35%) use produced 70% more forage than 50% use and more than double that achieved at 60% use. Here, the authors recommended conservative stocking at 30 – 35%.

A review of the "classic" range studies, which are the long-term stocking rate and grazing system studies that provided much of the scientific foundation for modern range management showed that light use is closer to sustainable use, while heavy use is not.[148] Definitions of "heavy", "moderate" and "light" grazing developed in 1961 were cited. Heavy grazing was defined as the degree of forage utilization that does not allow desirable forage species to maintain themselves. Moderate grazing was defined as the level at which palatable species can maintain themselves. Light grazing was defined as the degree of utilization at which palatable species maximize their herbage producing ability. When averaged across all the long-term studies for all regions, heavy grazing was 57% use of primary forage species, moderate use was 43% and light use was 32%. In arid regions, the research showed that moderate grazing use was 35 – 45%. When the average forage production change over time was compared with use, heavy stocking resulted in a 20% decline in production, moderate use experienced no change and light use resulted in an 8% increase. During drought, moderately stocked pastures produced 20% more forage than heavily stocked pastures, light grazing produced 49% more forage than heavy and 24% more than moderate stocking levels. Heavy stocking resulted in a downward trend and light stocking an upward trend in ecological condition. Moderate stocking showed a slight, but not significant increase in condition, resulting in depleted ranges being maintained in depleted condition.

The Holechek et al (2004) Range Management Principles & Practices book lists the percent use of key species for moderate grazing in different range types.[149] In sagebrush grassland and semi-desert grass and shrubland, this level of grazing is 30-40%. **Recommended utilization rates are 20% for alpine ranges grazed during the growing season or in poor condition, while**

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[147] Holechek, Jerry L., Milton Thomas, Francisco Molinar and Dee Galt. 1999b. Stocking desert rangelands: what we've learned. Rangelands 21(6):8-12

[148] Holechek, Jerry L., Hilton Gomez, Francisco Molinar and Dee Galt. 1999. Grazing studies: What we've learned. Rangelands 21(2):12-16

[149] Holechek, Jerry L., Rex D. Pieper and Carlton H. Herbel. 2001. Range Management: Principles and Practices, Fourth Edition. Prentice-Hall, New Jersey. 587p.

for ranges in good condition and grazed during the dormant season 30% is recommended. The table goes on to note that rangelands *"in poor condition or grazed during active growth should receive the lower utilization level."* This principle would apply to the Ashley NF because allotments are grazed during the growing season. Further they state that while 50% utilization may apply to humid grasslands, this level of utilization *"results in rangeland deterioration in the semi-arid grasslands, desert and coniferous forest rangelands."* They also recognized that trampling by livestock and consumption by rodents and other wildlife must be included as part of this utilization, otherwise, rangeland productivity would suffer even at these levels of use.

Galt et al (2000) recommended that 25% of forage be allocated to livestock, 25% to wildlife and 50% to watershed protection.[150] They also note NRCS has adopted guidelines for reduction in capacity for distance to water and slope with areas more distant or upslope having reduced use and therefore reduced capacity.[151] **These adjustments are necessary for this NEPA analysis for the Ashley National Forest Plan Revision**. Reynolds et al (1992)[152], recommended an average of 20% utilization of herbaceous forage species in goshawk home ranges, which are 6,000 acres. They also stressed the importance of maintaining mycorrhizal fungi function in these home ranges.

Rest: Over-utilization and lack of required rest are common across Forest Service and BLM managed lands in the west. Agencies refer to deferment as "rest", but areas are still grazed each year. Forest Service researchers originally developed guidance for rest-rotation grazing based on intensive field studies.[153] They stated, *"While the idea of incorporating rest in grazing management is not new, the concept of longer rest periods than have heretofore been recommended, at least for mountain bunchgrass ranges, and of closer correlation of resting and grazing with plant growth requirements, is new."* Some points of interest from the study were that, even with the rest-rotation system, some areas were more heavily used than others, regrowth was minimal on clipped plants after the seed-in-milk phase and clipping during active growth reduced total herbage yield during that year. A single season of clipping reduced basal area of forbs and grasses the next year. Four consecutive seasons of clipping at the seed-in-milk phase reduced basal area of Idaho fescue 80%, bottlebrush squirreltail 62%, longspur lupine 91% and wooly Wyethia 16%. Four years' rest after four years' clipping resulted in little or no recovery of Idaho fescue, wooly Wyethia and longspur lupine. They also found that cool-season grasses such as

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150 Galt, D., Molinar, F., Navarro, J., Joseph, J., and Holechek, J. 2000. Grazing capacity and stocking rate. Rangelands 22(6):7 - 11.

151 USDA Natural Resources Conservation Service. 2003. National Range and Pasture Handbook Chapter 5 Management of Grazing Lands. Tables 3 - 12 and 3 - 13. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1043064.pdf Accessed on 6/15/2021.

152 Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management Recommendations for the Northern Goshawk in the Southwestern United States. Gen. Tech. Rep. GTR-RM-217, Fort Collins, Colorado. U.S. Department of Agriculture, Rocky Mountain Forest and Range Experiment Station. 90p.

153 Hormay, A. L. and M. W. Talbot. 1961. Rest-rotation Grazing – A New Management System for Perennial Bunchgrass Ranges. USDA Forest Service Production Research Report No. 51.

Idaho fescue varied in production by a factor of three due to changes in annual precipitation, while the beginning of growth varied by up to a month with similar variations on time to flowering and seed ripening. Based on this research, the basic principle was to require adequate years of rest to allow the native plants to recover their vigor before again being grazed. They also recommended that it is important to include adequate monitoring of each grazed unit or pasture to determine if these rest periods are sufficient to maintain or restore production.

Native cool-season perennial bunchgrasses can be very sensitive to defoliation and growing season use. Regarding bluebunch wheatgrass, *"Effects of growing season defoliation injury are well documented: basal area, stem numbers and both root and forage yields are reduced, and mortality can be high. … Defoliation to very short stubble heights during the boot stage has been reported to essentially eliminate plants within as few as three years. … Vigor recovery has been found to require most of a decade, even with complete protection from grazing."* [154] The author went on to describe experiments in which a single clipping of the grass during the growing season resulted in 43% less herbage and 95% fewer flower stalks the following year than unclipped plants. Under a deferred system in eastern Oregon, it was reported that bluebunch wheatgrass could not be maintained at 30 – 40% use in the boot stage (early June). A one-time removal of 50% of the shoot system during active growth may require six years' rest even in an area with 17" precipitation. *"The belief that range improvement will occur after one or two years of rest following a single season of more than 'light' use during the growing season is erroneous."* Idaho fescue of moderately low vigor required 3 years of rest for recovery and plants of bluebunch wheatgrass and Idaho fescue in very low vigor may require 8 years and 6 years of rest, respectively, for recovery. [155]

Other studies concluded that no management system appears to be satisfactory if that system results in overgrazing during the growing season to defer or rest vegetation in other grazing periods. These concluded that the amount of deferment and rest provided by the three-pasture system was not sufficient to overcome the effects of periodic overuse. They recommended utilization levels that allow plants of desirable species to respond to proper management by adjusting stocking rates to forage production levels. [156, 157]

Grazing Systems: In a review paper that considered grazing systems, grazing intensity and season of use, it was determined that, *"financial returns from livestock production, trend in ecological condition, forage production, watershed status and soil stability are all closely associated with grazing*

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[154] Anderson, Loren D. 1991. Bluebunch wheatgrass defoliation, effects and recovery – A Review. BLM Technical Bulletin 91-2, Bureau of Land Management, Idaho State Office.
[155] Mueggler, W.F. 1975. Rate and pattern of vigor recovery in Idaho fescue and Bluebunch wheatgrass. Journal of Range Management 28(3):198-204.
[156] Eckert Jr., Richard E. and John S. Spencer. 1986. Vegetation response on allotments grazed under rest-rotation management. Journal of Range Management 39(2):166-174.
[157] Eckert Jr., Richard E. and John S. Spencer. 1987. Growth and reproduction of grasses heavily grazed under rest-rotation management. Journal of Range Management 40(2):156-159

intensity." [158] Grazing systems such as rest-rotation had limited or no benefit in arid systems. Long-term studies in Arizona, after 12 years of rest-rotation management compared to continuous grazing, found neither forage plant densities nor forage plant production differed between the treatments. Grazing intensity employed was 30 – 35% use with occasional high use of 50% or more. *"Rest and deferment were not sufficient to overcome the effects of periodic heavy use on primary forage plants when rest-rotation grazing was applied on big sagebrush range in northern Nevada."* In an Arizona study comparing winter-spring grazing with summer-fall rest to continuous grazing, the rotation scheme was inferior to the year-long system from the standpoint of perennial grass density and production. Perennial grass production was closely associated with the degree of use and was highest where grazing use was lowest. A Vale, Oregon study, lasting over 20 years compared moderate grazing intensity and rotational grazing. Rotational grazing showed no advantage over season-long grazing in improving range condition or forage production. *"The key factor in range improvement appeared to be the reductions in grazing intensities that were applied when the project was initiated...."*

Relying on additional water developments, fences and grazing systems will not alleviate the problem. The use of range improvements and rotation systems is not sufficient to correct over-stocking. A review of results from 18 western grazing system studies found that adjustment of livestock numbers, or stocking intensity was more important than implementing grazing systems to improve herbage production. [159] The various claims made by advocates of short-duration or time-controlled grazing were not proven. [160] The most comprehensive review on this topic to date analyzed outcomes of over 30 separate studies that compared rotational grazing to continuous grazing. [161] Eighty-nine percent of the experiments analyzed reported no difference in plant production or standing crop between rotational and continuous grazing with similar stocking rates. Stocking rate emerged as the most consistent variable influencing vegetation response.

A discussion of rest-rotation is found in Clary and Webster's General Technical Report titled *"Managing Grazing of Riparian Areas in the Intermountain Region."*[162] They summarized studies showing significant increases in forage production occurred with decreased intensities of grazing. The report described the improvements found in reducing grazing from heavy, to moderate and then to light grazing. Grazing with utilization above 50% was described as heavy, moderate was 30 - 50% and <25-30% was called light grazing in most of these studies. The study

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[158] Holechek, Jerry L., Hilton de Souza Gomes, Francisco Molinar and Dee Galt. 1998. Grazing intensity: critique and approach. Rangelands 20(5):15-18

[159] Van Poollen, H.W. and J. R. Lacey. 1979. Herbage response to grazing systems and stocking intensities. Journal of Range Management 32:250-253.

[160] Holechek, Jerry L., Hilton Gomez, Francisco Molinar, Dee Galt and Raul Valdez. 2000. Short-duration grazing: The facts in 1999. Rangelands 22(1):18-22.

[161] Briske, D.D., Derner, J.D., Brown, J.R. et al., 2008. Rotational grazing on Rangelands: Reconciliation of perception and experimental evidence," Rangeland Ecology and Management, 61(1):3–17.

[162] Clary, Warren P and Bert F. Webster. 1989. Managing Grazing of Riparian Areas in the Intermountain Region. USDA Forest Service GTR-INT-263.

concluded that *"managers should place more emphasis on proper stocking intensity and less on grazing system implementation. The concentrated use of grazing pastures is not compensated for during rest years if grazing use is heavy. In summary, although grazing systems have great intuitive appeal, they are apparently of less consequence than once thought. In fact, as long as good management is practiced so that there is control of livestock distribution and grazing intensity, the specific grazing system employed may not be significant."*

<u>Riparian Grazing:</u> **Livestock grazing also negatively impacts the Aquatic Influence Zone (AIZ) or riparian zones as well as willow and aspen regeneration.** Browsing of willows is a problem that needs to be addressed in riparian areas as well.

In a Forest Service research paper, Clary and Webster (1989) also found that vigorous woody plant growth and at least 6 inches of residual herbaceous plant growth at the end of the growing/grazing season typified riparian areas in excellent, good, or rapidly improving condition. **This corresponds to a riparian utilization rate of 24 – 32**%. "*Most riparian grazing results suggest that the specific grazing system used is not of dominant importance, but good management is – with control of use in the riparian area a key item*." Degraded riparian areas may require complete rest to initiate the recovery process.[163] An important consideration for sheep grazed areas is to define and document the locations and conditions in bedding areas. The bedding locations change daily throughout the grazing season and denude bedding areas, leaving non-palatable species such as tall larkspur, mint, and others as the dominant understory in forested areas in the Ashley NF.

A Forest Service study determined the order in which cattle grazed particular areas; "*Ravine bottoms were usually grazed first. Next in order were openings in timber stands on gentle slopes, areas near water, areas along fences and ridgetops, salt grounds, accessible openings in timber stands on steeper slopes, areas under large trees, and finally areas covered by tree thickets."* [164] In another study, *"cattle dispersion was constrained by the spatial distribution of water and slope. Across 3 seasons, 77% of observed use was within 366 meters of water. Approximately 65% of the land area was beyond 723 meters from water and sustained only 12% of observed use. Cattle concentrated use (79%) on slopes less than 7%. Consequently 35% of the area, on or surrounded by slopes > 10%, received only 7% of observed use. Loamy, grazable woodland and wetland sub-irrigated range sites were most preferred and accounted for over 65% of observed use while occupying less than 35% of the land area. Overall, coarse upland, very shallow and shallow loamy sites were not preferred"* [165]

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[163] Clary, Warren P and Bert F. Webster. 1989. Managing Grazing of Riparian Areas in the Intermountain Region. USDA Forest Service GTR-INT-263.
[164] Hormay, op. cit.
[165] Pinchak, W.E., Smith, M.A., Hart, R.H., and Waggoner, J.W. 1991. Beef cattle distribution patterns on foothill range. Journal of Range Management, 44(3):267-275.

W. S. Platts reviewed grazing systems and found that none were compatible with healthy aquatic ecosystems[166]. A study of long-term riparian exclosures found that, after 30 years of livestock exclusion, willow canopy cover was 8.5 times greater in livestock exclosures than in adjacent grazed riparian areas. [167] Grasses were 4 to 6 times greater in cover within the exclosure than outside. Mean peak standing crop of grasses within the exclosure was 2,410 Kg/Ha (1950 lb/acre), while outside in caged plots, mean peak standing crop was 1,217 Kg/Ha (1083 lb/acre).

Another study of upland and wet meadow communities that had livestock excluded for 9 – 18 years found major differences between the ungrazed communities and those continuing to be grazed. In each case, the area without grazing had greater belowground plant biomass, lower soil bulk density and higher soil pore space. In dry meadows the infiltration rate was 13 times greater than those dry meadows continuing to be grazed and in wet meadows, infiltration of rested areas was 2.33 times greater.[168] A long-term study in Utah sage-steppe comparing results of implementing a deferred rotation grazing system and upland water troughs found that riparian use did not decrease after implementation of the new system and troughs.[169] Riparian use remained extreme at 90 - 100% and while greenline stubble heights declined following implementation, bank alteration remained constant at 80%.

The implications of these studies relative to Forest Service NFMA requirements for sustainable use and preventing impairment of productivity are clear. Grazing systems do not compensate for over-stocking, light use is necessary to sustain productivity and long-term rest is essential to restore productivity following livestock grazing. Current livestock management practices in the Ashley NF and UWCNF are not compliant with the Multiple Use Sustained Yield Act and NFMA provisions for sustainability.

<u>Livestock Effects to Water Quality:</u> Of particular concern with growing recreational demand is the pollution of surface waters by livestock. E. coli are typical of fecal bacteria found in the digestive tracts of animals and humans and are used as indicators of fecal contamination. Their presence may also be indicative of contamination by other bacteria or protozoans that can cause illness resulting in diarrhea, nausea, and vomiting. They can cause eye, ear, nose, and throat infections, or even death such as that experienced in the Milwaukee cryptosporidium outbreak

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[166] Platts, W.S. 1991. Livestock Grazing. In Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication 19:389-423.

[167] Schulz, Terri T and Wayne C. Leininger. 1990. Differences in riparian vegetation structure between grazed areas and exclosures. Journal of Range Management 43(4):295-299.

[168] Kauffman, J. Boone, Andrea S. Thorpe, and E. N. Jack Brookshire. 2004. Livestock exclusion and belowground ecosystem responses in riparian meadows of eastern Oregon. Ecological Applications 14(6):1671-1679.

[169] Carter, J., Catlin, J., Hurwitz, N., Jones, A., and Ratner, J. 2017. Upland water and deferred rotation effects on cattle use in riparian and upland areas. Rangelands 39(3-4):112-118. doi 10.1016/j.rala.2017.06.003

in 1993.[170] Cattle have been shown to produce 5.4 billion fecal coliform and 31 billion fecal streptococcus bacteria in their feces per day. Since cattle spend a significant portion of their time in or near streams, lakes, and wetland areas and average 12 defecations per day, they can contribute significant numbers of these organisms to surface waters.[171]

Recent research in areas used by cattle, recreationists, pack animals or wildlife is pertinent to this effort. Research conducted in wilderness areas in the Sierra Nevada mountains included areas of high use by backpackers, high use by pack animals and cattle grazed watersheds. Fifteen areas used by backpackers yielded only one site containing E. coli and this site was significantly lower than those used by cattle or pack animals.[172] Five years of data collection from these sites found similar results, concluding, "*Surface water from watersheds below cattle areas and those used by pack animals is at high risk for containing coliform organisms. Water from Wild, Day Hike, or Backpack sites poses far less risk for contamination by coliforms*".[173]

The costs of nutrients and bacteria from cattle grazing in the Sierra Nevada were characterized as, "*summer cattle grazing on federal lands affects the overall water quality yield from this essential watershed as cattle manure is washed into the lakes and streams or directly deposited into these bodies of water. This organic pollution introduces harmful microorganisms and also provides nutrients such as nitrogen and phosphorus which increase algae growth causing eutrophication of otherwise naturally oligotrophic mountain lakes and streams. Disinfection and filtration of this water by municipal water districts after it flows downstream will become increasingly costly. This will be compounded by increasing surface water temperatures and the potential for toxins release by cyanobacteria blooms*."[174]

Another study in the Sierra Nevada mountains sampled for coliform bacteria in one ungrazed site and four sites grazed by cattle. Before cattle entered the area, all sites were below criteria for coliforms and E.coli. After cattle entered the area, the ungrazed site remained low, while the grazed sites rapidly increased above criteria and remained there until after cattle left the area, then quickly declined.[175] The influence of differing climatic regimes on coliform bacteria in cattle grazed areas in the Sierra Nevada mountains showed, "*Water year 2009 had near normal precipitation; 2010 had late precipitation and snowmelt; and 2011 had 150% above normal precipitation*"

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170 Rock C, B Rivera. 2014. Water quality, e. coli and your health. University of Arizona College of Agriculture and Life Sciences. AZ1624.

171 Howard G, Johnson S, Ponce S. 1983. Cattle grazing impact on surface water quality in a Colorado front range stream. J. Soil and Water Conservation. March-April 1983:124-128.

172 Derlet R, Carlson J. 2006. Coliform bacteria in Sierra Nevada wilderness lakes and streams: What is the impact of backpackers, pack animals, and cattle? Wilderness and Environmental Medicine 17:15-20.

173 Derlet R, Ger K, Richards J, Carlson J. 2008. Risk factors for Coliform bacteria in backcountry lakes and streams in the Sierra Nevada mountains: a 5-year study. Wilderness and Environmental Medicine 19:82-90.

174 Derlet R, Goldman C, Connor M. 2010. Reducing the impact of summer cattle grazing on water quality in the Sierra Nevada Mountains of California: a proposal. J. of Water and Health:08.2:326-333.

175 Myers L, Kane D. 2011. The impact of summer cattle grazing on surface water quality in high elevation mountain meadows. Water Qual. Expo. Health 3:51–62.

… *"After the beginning of grazing, mean E. coli counts increased as follows: 2009 from 8 to 240 CFU/100mL, 2010 from 7 to 561 CFU/10mL; 2011 from 7 to 657 CFU/100mL ($p < 0.05$ all years)."*[176]

In a study of the effect of high precipitation years on benthic algae and coliform bacteria in areas grazed by cattle, areas used predominantly by pack animals, recreation areas used only by humans and remote wildlife areas in the Sierra Nevada mountains, mean benthic algae coverage was 29.5% in cattle grazed areas compared to 8.5% in pack animal areas, 3.7% in human use areas and 1.8% in wildlife only areas. E. coli attached to the benthic algae was 90% at cattle grazed sites, 23% at pack animal sites, 0% at human and wildlife sites. E. coli was detected suspended in water at concentrations greater than 100 colony forming units/100 ml at 70% of cattle grazed sites and none at pack animal, human or wildlife sites.[177] While this study focused on E. coli impacts, it is worth noting that livestock have many negative effects on stream systems. They impair water quality and quantity by increasing nutrients and sediment. They alter channel morphology through hoof shear causing channel widening and reducing depth. They alter hydrology by destroying bank stabilizing vegetation, increase water temperature by loss of stream shading vegetation and cause loss of fish and wildlife populations as a result.[178]

Water quality monitoring data collected for streams potentially supporting cutthroat trout, tributaries to the Colorado River system and its Threatened and Endangered fish species needs to be analyzed and reported. The effects of diversions for livestock and irrigation on stream flows should all be analyzed for the NEPA analysis for the Ashley National Forest Plan Revision. The cumulative effects from recreation, logging and vegetation management occurring throughout the Ashley NF and the associated livestock grazing and soil damage (erosion, bare soil, compaction) on watershed function and stream flows for TES species should be analyzed and reported in this NEPA analysis for the Ashley National Forest Plan Revision.

Annual Operating Instructions (AOIs): How is the Forest Service ensuring that the requirements outlined in the AOIs for the project area grazing permits are being met? **Y2U, AWR, NEC, WLD and WWP requests that the Forest Service disclose the level of permittee compliance with terms and conditions of allotment management plans and grazing permits as well as utilization and other monitoring protocols and results.**

By choosing Alternative C, vegetation management is focused on the use of natural unplanned ignitions to "manage" vegetation. Guidelines for soil and water would include additional restrictions on resources use to limit impacts. Forage for livestock would be limited to a level of

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[176] Myers L, Whited B. 2012. The impact of cattle grazing in high elevation Sierra Nevada mountain meadows over widely variable annual climatic conditions. Journal of Environmental Protection: (3): 823-837.

[177] Derlet R, Richards J, Goldman C. 2012. Does above-normal precipitation reduce the Impact of mountain cattle grazing on watershed algae and bacteria? Water Qual Expo Health (4):105–112.

[178] Belsky A, Matzke A, Uselman S. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. J. Soil and Water Cons. 54(1):419-431.

40 percent utilization and a stubble height of 4 inches. For bighorn sheep, this alternative would include additional and more stringent plan direction for separation from domestic sheep. New domestic sheep or goat allotments would not be permitted unless separation from wild bighorn sheep is demonstrated. In addition, when domestic sheep or goat grazing permits are voluntarily waived without preference, and if the allotment does not provide separation from bighorn sheet, the allotments would be closed to provide separation between domestic sheep and goats and bighorn sheep (DEIS p. 19). **While choosing Alternative C would be the best Alternative presented in this DEIS, Y2U, AWR, NEC, WLD and WWP would recommend the following to ensure a Sustainable Ecosystem and Wildlife on the Ashley National Forest:**

- Updating the capability, suitability, and stocking rate determination for the Forest to reflect the factors we have described and based on an updated forage determination.
- Providing science-based standards including 25% utilization in upland and riparian areas and pointing out that sedge stubble heights on the green line do not represent riparian use. Monitoring must be done in the riparian zone between the green line and uplands.
- Pastures should be provided complete rest in 1 year out of three.
- Water developments should be removed from aspen stands and any area within 1/4 mile from an aspen stand.
- Sheep bedding should be prohibited in aspen stands.

9. Social and Economic Contributions

Under Alternative C, social and economic contributions from the Ashley National Forest would be retained. Under alternative C, management would support visitors who value a natural visual setting and nonmotorized recreation experiences. In addition, an increased emphasis on habitat connectivity would support ecosystem services associated with this value, including habitat for hunting, fishing, and wildlife viewing. Increased restrictions on resources uses, such as timber, would support ecosystem services associated with clean water, including municipal water supplies (DEIS p. 19).

In 2020, the US Department of Commerce, Bureau of Economic Analysis released the Economic Output for outdoor recreation. The Recreation Industry generated $788 Billion Dollars in 2019, which is $ 10 Billion Dollars higher than in 2018. The outdoor recreation economy continues to grow and outperform the economic growth in the United States during the pandemic. Individuals are continuing to reach out and recreate in the great outdoors across the United States. The latest report shows that Outdoor Recreation, as part of the Gross Domestic Product, is 2.1%. What does that mean? Outdoor Recreation produces more of the GDP and is bigger than mining and agriculture[179].

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[179] https://www.bea.gov/news/2021/outdoor-recreation-satellite-account-us-and-states-2020

Recreation Ecology: The study of outdoor recreation activities and their associated ecological disturbance—has a more than 60-year history with over 1200 published studies. This knowledge collectively suggests that while outdoor recreation visitors on public lands can cause substantial ecological disturbance to natural resources, effective management works to minimize these disturbances and can sustain both recreation and conservation goals. The primary findings suggest that outdoor recreation on public land is in very high demand in many locations on the Colorado Plateau, largely due to the unique, nature dependent experiences and cultural history the region provides. Many areas also harbor sensitive resources, suggesting that recreation use must be planned for and managed in a manner to sustain ecological integrity and the experiences these resources provide. Although specific research on recreation impacts on the Plateau is somewhat limited, this knowledge, combined with the broader recreation ecology literature, suggests that concentrating visitor use in previously impacted or hardened sites and trails will likely be a successful management strategy, while dispersal strategies may result in a proliferation of recreation disturbance. The demand for public lands to accommodate contemporary outdoor recreation pursuits has increased to unprecedented levels, particularly over the last decade. Rapidly changing social and technological factors continue to influence how, when, and where visitors use public lands for recreation and tourism activities, often resulting in dramatic shifts in use. These increases in use levels, types and locations have been observed in many areas worldwide (Balmford et al., 2015) and at the individual park and park system level, including in many U.S. national parks (NPS, 2020). Managers of national parks, forests, and other public lands are often legally required to maintain a high degree of ecological quality while also allowing for an "unconfined" recreation experience with minimal visitor regulation and burden. This can be a challenging mandate, especially during times when use levels are rapidly increasing. While providing great benefits to individuals and society, outdoor recreation activities in wildlands can have undesirable consequences to ecological conditions. Recreation and tourism activities have been shown through many studies to cause direct and indirect disturbance to soil, vegetation, wildlife, water, and natural sound components of a natural system. A virtually universal management objective in parks and public lands is minimizing this disturbance to a level acceptable to visitors and assuring sustainable ecologic conditions. Determining the threshold of a sustainable level of disturbance to natural systems is often challenging, and frequently requires a thorough decision process, informed by the best available social and ecological science.[180]. **Various management strategies outlined by Dr. Monz are summarized below and must be considered in any NEPA analysis for the Ashley National Forest Plan Revision**.

Management Strategies: Management strategies and actions that concentrate visitor use to minimize vegetation and soil impacts can be employed in a similar way to minimize wildlife impacts (Marion, 2019). Wildlife often adapt to consistent, non-threatening recreational activities. Containment strategies that spatially concentrate use on formal trails and impact-

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[180] Monz, Christopher, PhD., 2021, Outdoor Recreation and Ecological Disturbance;A Review of Research and Implications for Management of the Colorado Plateau Province.

resistant recreation sites can limit negative wildlife impacts. Modifying the location and timing of use, such as shifting trails and recreation sites away from areas of high-quality wildlife habitat to areas of lower-quality habitat is also an effective strategy. Off trail activities can be discouraged or prohibited in particularly sensitive areas or during sensitive times, such as temporary prohibitions on use near a bird rookery or nest (Gutzwiller and Knight, 1995). Use-level reductions may or may not be an effective strategy to minimize recreation impacts on wildlife, as modest limits in high-use locations are unlikely to lessen wildlife disturbance. However, in locations without established use, maintaining little to no use will maintain quality habitat (Marion, 2019). **Managers considering these strategies should always be mindful that opportunities to view and experience wildlife in their native habitat is one of the most valued aspects of an outdoor recreation experience.** An emerging perspective within wildlife and recreation management is the potential fragmentation of habitat by recreation access roads, trails, and recreation infrastructure. Although much remains unknown about the role of recreation in habitat fragmentation, and consequently its role in affecting distributions across the landscape, the general literature regarding landscape fragmentation suggests that recreation may have a significant effect. It would be prudent, therefore, to consider any alterations in recreation use or new trail, road or facility development that may expand use into new areas with full consideration of how it will affect critical habitat, migration corridors, the effective size of habitat patches and other landscape-level concerns.

<u>Minimizing Disturbance to Aquatic Systems</u>: In freshwater river and lake environments, water-based and shoreline recreation activities should be managed to minimize the potential inputs of pollutants (e.g., sunscreen, food scraps, pathogens, sediment runoff from trails and recreation sites) and direct trampling disturbance of shorelines and littoral zones (land areas closest to the water). This is particularly important in oligotrophic (nutrient poor, low productivity) lake ecosystems common to high mountain environments but may be less vital to high-volume river systems on the Colorado Plateau. As mentioned above, research suggests a linear relationship with use and some response variables such as E. coli bacteria (Hadwen et al., 2010; Monz et al., 2013). Therefore, in some spatially limited, high-use settings, limiting total numbers of recreationists at any one time may be an effective strategy.

<u>Managing Natural Soundscapes:</u> While many anthropogenic noise impacts originate outside public land boundaries and therefore may be beyond the ability of managers to directly influence, emerging research also suggests that significant noise sources result from visitor activities within boundaries. For example, road noise from vehicle traffic within a U.S. national park was shown to extend over 1.5km into backcountry areas at some locations, requiring visitors to hike this distance to experience natural sounds (Park et al., 2009). This suggests that management interventions, such as reductions in vehicle speeds, roadway surface treatments, and noise limits for motor vehicles and equipment (such as those recently adopted by the U.S. National Park Service—NPS, 2019) may be options to minimize noise propagation. Other research suggests that noise from hikers (e.g., loud talking, cell phones, etc.) can be reduced by 2-3 dB with educational interventions (Manning et al., 2010). Overall, these studies suggest the

importance of noise management, and that some reduction is possible with indirect management strategies.

Minimizing Impacts to Cultural Resources: A contemporary approach, the Cultural Resource Management (CRM) framework is broadly inclusive of all aspects of the physical and metaphysical environment to which people ascribe meaning relating to culture (King, 2011). The idea of managing cultural resources is often seen as a bit of a misnomer—managers often focus on events that affect cultural resources as opposed to the resources themselves. Thus, activities such as the administration of public land, proper sighting of construction projects, protection of artifacts from unintentional damage and theft, interpretive programs to allow the public to develop meaningful connections to cultural resources, etc., are often the focus of programs of CRM. Effective CRM should seek to incorporate cultural resource issues into planning, avoid or eliminate adverse effects, provide interpretive services, and prescribe appropriate uses and care of cultural resources via the involvement of groups with cultural or spiritual ties to the resources to be managed (NPS, 2021).

As such, the management of public land visitors and visitor activities would be included under a broad program of CRM and is often required to be included as part of a comprehensive land management planning process. Within comprehensive planning processes, recreation activities are often managed via "management by objective" strategies, with the most recent framework being the Interagency Visitor Use Management (VUM) approach (IVUMF, 2021). This and related frameworks rely on the development of indicators of quality and thresholds of acceptability in order to initiate and evaluate effective management. While properly executed VUM approaches can be effective for a wide range of visitor activities, it has long been acknowledged that indicator-threshold approaches are not useful in situations where no compromises can be made in the condition of the resource, i.e., for resources that are not renewable (McCool and Cole, 1997). For example, it would not be acceptable to allow some annual loss of artifacts from an archaeological site in order to allow visitors a more unregulated experience because over time the quality of the sites would be lost, and they are not restorable. These ideas have been explored more recently in the context of a research framework to advance management approaches, as significant knowledge gaps exist in how visitors experience and interact with cultural resources (Miller et al., 2021).

Considering some of these complexities in managing cultural resources, contemporary public land visitor management approaches to minimize resource damage (Hammitt et al.,2015) and managing depreciative behavior in a cultural resource context (e.g., Marion and Reed, 2007; Ward and Roggenbuck, 2003; Hedquist et al., 2014)) suggest numerous interventions to limit or eliminate physical damage and social impacts (Table 3). Although a range of strategies including limiting road and OHV access, site closure, guided entry, interpretive programs, and law enforcement are possible, studies suggests that no one single strategy except for closure will completely eliminate damage or loss of cultural resources. This is problematic because even very low levels of damage or theft of artifacts results in significant degradation over time that cannot be practically restored (Widner and Roggenbuck, 2000). Several explanations as to why this depreciative behavior occurs have been explored including issues with moral development and rationalizing seemingly insignificant actions (i.e., "Tragedy of the Commons"; Ward and Roggenbuck, 2003) and "deviant leisure" where actions such a theft and destruction are part of the experience (Miller et al., 2021). Until a greater understanding of some of these complexities is gained, it is prudent to develop very precautionary management strategies that emphasize protection of cultural resources by combining several of the established visitor management strategies to limit resource impact, including site closure and limiting road and OHV access. In addition, since cultural resources are not renewable or replaceable, this suggests a high level of risk associated with many visitor activities to both resource preservation and the long-term visitor experience, and thus restrictive management actions may be warranted (Miller et al., 2021).

Economic Benefits of Wilderness: The heart of the Wilderness Act is recognition of the value of wilderness, yet this value goes well beyond activities like camping and hunting. The actual language in the Act devoted to that subject is very concise—it's a document of action, after all, mostly concerned with the logistics of implementation and rules yet peppered with eloquent language defining the essence of wilderness. The Act suggests wilderness is valuable for its "ecological, geological, or other features of scientific, educational, scenic, or historical and cultural value." Wilderness is often said to represent a "baseline": a landscape with a mosaic of ecosystems that function with as little influence from human beings as any on Earth. To explain the nuances of our influence in other, more manipulated or modified sites, it's useful to reference wilderness processes. The Wilderness Act also defines wilderness as a place with "outstanding opportunities for solitude or a primitive and unconfined type of recreation," and one purpose of protecting such places as "for the use and enjoyment of the American people in such a manner as will leave them for future use and enjoyment as wilderness[181]."

It is no easy task quantifying the full economic dimensions of wilderness, but it's an important one. One myth about wilderness is that it imposes economic costs on local communities. This idea is often embodied in the "jobs vs. environment" argument, suggesting that there's an inherent tradeoff between economic prosperity and strong environmental protection. Some opponents of wilderness designation claim it "locks up" acreage that otherwise could generate revenue through the extraction of timber, minerals, and other resources, or the motorized recreation prohibited in wilderness. Wilderness areas protect the environment and positively impact local and national economies. Parsing out the dollars and cents of wilderness may be a relatively new endeavor, but it's important to remember that economic evaluations have shaped land management for centuries. Consider the fact that, in many cases, areas that meet federal standards for wilderness are often those that had been deemed too unproductive, infertile, remote, or rugged to harvest, cultivate, or develop. The same is true for certain national parks and other protected wildlands. In other instances, wildernesses have been established in places

[181] https://wilderness.net/learn-about-wilderness/benefits/

already logged, farmed, mined, or otherwise utilized and then essentially abandoned for those purposes [182].

The wilderness.net website further explains that the revenue generated by wilderness visits includes a range of spending types, and we can use a hotel as an example to explain the differences. Direct spending is the payment by the wilderness visitor to spend a night or two at a hotel, before or after their wilderness trip. Indirect spending is represented by supply purchases made by hotel owners to provide food, drinks, and cleaning services for the wilderness visitor. Induced spending includes the recirculation of hotel worker's income, as they spend their paychecks on things like groceries and entertainment for their families. An economic analysis published in 2017 in the Journal of Society and Natural Resources estimated that, in 2012, 9.9 million wilderness visitors directly spent $500 million in communities adjacent to wilderness areas, generating 5,700 jobs and a total economic effect nationwide of $700 million (including all three types of spending).

Aside from recreation, there are many other monetary benefits derived from wilderness. An off-site wilderness benefit is the scientific one—the value of science conducted in wilderness areas. One study suggested the societal value of journal articles focused on wilderness equals some $6.6 million per year. So-called "passive-use" or "non-use benefits" such as bequest, option, and existence values are harder benefits to pin hard numbers to. But recent decades have seen more and more studies attempting to do just that by, for instance, surveying people's willingness to pay for wilderness to be protected for those intrinsic benefits with the knowledge that they can visit wilderness areas, or that future generations can, or simply that wilderness exists. A 2014 article in the International Journal of Wilderness compared a number of studies of wilderness passive-use values and produced a "conservative" estimate of their total yearly benefit at $5 billion—ten times that generated by recreation spending. Passive-use values aren't the only non-use benefits wilderness areas confer. Wilderness also performs a staggering suite of ecosystem services—watershed protection, carbon sequestration, water filtering, animal habitat, nutrient cycling, and others—which directly benefit humankind at the most basic and life-sustaining level. The Forest Service, for example, estimates that one out of every five Americans drinks water that comes from wilderness. The same International Journal of Wilderness article estimated such ecosystem services delivered by wilderness areas may equate to a monetary value of some $3.5 billion annually. In total, the International Journal of Wilderness article gauged the combined yearly benefits to the U.S. population from wilderness recreation, passive-use, and ecosystem-services values on the order of $9.4 billion ($85 per acre)[183].

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[182] https://wilderness.net/learn-about-wilderness/benefits/economic.php#

[183] https://wilderness.net/learn-about-wilderness/benefits/economic.php#

Economics of Livestock Grazing on Federal Public Lands: Dr. Thomas Power, Chair of the Department of Economics at the University of Montana, has presented the best analysis of the economic impact of public lands livestock grazing in the eleven western states[184]. Claims of the importance of public lands to local and regional economies typically exaggerate the relative contribution of this portion of the economy. Dr. Power presents a simple and straightforward set of questions that most accurately determine that contribution. These are:

1. What portion of the value produced by cattle and sheep operations is associated with the feed used?
2. What portion of the feed for those cattle and sheep operations comes from grazing on federal lands?
3. What portion of the total agricultural activity involves raising cattle and sheep?
4. What part of the total economy is represented by agriculture?

Dr. Power summarized the importance of Federal Lands Grazing for each western state. See **Table 1** below which includes Utah. It demonstrates the insignificance of the economic impact of permitted grazing. This should be balanced by the damage caused by permitted livestock grazing regarding water pollution, watershed and water storage depletion, loss of productivity in vegetation communities, loss of topsoil, displacement of wildlife such as elk and deer or bighorn sheep.

Table 1. The Relative Importance of Federal Lands Grazing as a Source of Jobs and Income, 1997

State –>	**NM**	**OR**	**UT**	**WA**	**WY**	**Eleven Western States**
Agriculture as a source of income	1.5%	1.1%	0.7%	1.2%	1.5%	**1.0%**
Agriculture as a source of jobs	2.4%	3.5%	1.6%	2.5%	4.2%	**1.9%**
Livestock's share of agriculture	68.9%	30.0%	74.9%	34.9%	77.5%	**39.2%**
Cattle/sheep's share of livestock	57.5%	59.2%	46.1%	42.9%	93.5%	**52.8%**
Federal forage's share of total cattle/sheep feed	32.2%	16.3%	31.7%	2.6%	21.1%	**18.6%**

[184] Power, T. 2002. Taking stock of public lands grazing – an economic analysis. In: Welfare Ranching, The Subsidized Destruction of the American West, Wuerthner, G. and Mattson, M. [eds]. p. 263-269.

% of income derived from federal forage	0.19%	0.03%	0.08%	0.00%	0.24%	**0.04%**
% of jobs derived from federal forage	0.30%	0.10%	0.18%	0.01%	0.64%	**0.07%**
Days of real income growth to replace federal grazing	23	4	7	1	54	**8**
Days of job growth to replace federal grazing	43	14	17	2	120	**16**

A report by New Mexico State University cited USDA values for grazing permits based on AUMs permitted[185]. However, these permits have not been adjusted down in permitted AUMs to account for today's heavier cattle and calves, which are consuming double the forage the Forest Service allocates per AUM. This issue was outlined earlier in these comments. This adjustment in numbers would cut the permitted AUMS in half, therefore lowering permit values as collateral for loans or for sale. Other factors would include the uncertainty over Forest Service actions that may reduce these AUMs based on updating stocking rate calculation, allotment or pasture closures or reductions to address increasing drought and lowered forage production.

Y2U, AWR, NEC, WLD and WWP would request that the Forest Service include an easily understandable accounting of all costs for the various types of vegetation treatments, including prescribed fire application in IRAs and Wilderness Areas and for commercial logging, fuels reduction, and prescribed burning throughout the Ashley NF. We would like to know what the estimated cost is "per acre" for each treatment. We would also like to know the costs for construction of new temporary roads, reconstruction of existing roads, and road obliteration and/or decommissioning per mile of road.

By choosing Alternative C, certain social and economic contributions from the Ashley National Forest would be retained. Under alternative C, management would support visitors who value a natural visual setting and nonmotorized recreation experiences.

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[185] Torell, L.A., Bartlett, E.T., Obermiller, F.W. The Value of Public Lands Grazing permits and the Grazing Fee Dilemma.College of Agriculture and Home Economics, New Mexico State University. 8 p.

In addition, an increased emphasis on habitat connectivity would support ecosystem services associated with this value, including habitat for hunting, fishing, and wildlife viewing. Increased restrictions on resources uses, such as timber, would support ecosystem services associated with clean water, including municipal water supplies (DEIS p. 19). **Alternative C is the most responsible choice in terms of Social and Economic implications and sustainability of the resources.**

10. Goals, Desired Conditions, Objectives, Standards, and Guidelines

The Definition and Importance of Goals, Desired Conditions, Objectives, Standards, and Guidelines Desired Conditions, Objectives, Standards and Guidelines are the road map or building blocks of a forest plan. The following definitions of these building blocks are found in the 2012 forest planning rule[186].

Goals (GL): A Forest Plan may include goals as plan components. Goals are broad statements of intent, other than desired conditions, usually related to process or interaction with the public. Goals are expressed in broad, general terms, but do not include completion dates. Note: While a forest plan must include Desired Conditions, Objectives, Standards and Guidelines, the inclusion of Goals is optional.

Desired Conditions (DC): A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates.

Objectives (OB): An objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets. 1 36 Code of FR Part 219. 2012. National Forest System Land Management Planning[187]. Note: Objectives indicate what actions the Ashley NF plans to take on what approximate timelines to retain or move the Forest toward the Desired Conditions. The big caveat is that non-fire budgets for the national forests are abysmal. Staff are shunted off to fires during the fire season, and there has been a steady decline in funding for national forests, leading to skeleton staff. We don't see the appropriate monitoring being done on any of the National Forests in the Intermountain Region.

Standards (ST): A standard is a mandatory constraint on project and activity decision making, established to help achieve or maintain the desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. Note: Standards are the mandatory constraints on activities, projects, and other activities that the Ashley NF commits itself to follow. They are

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186 https://www.fs.usda.gov/detail/planningrule/home/?cid=stelprdb5359471
187 https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5362536.pdf 2

the sideboards for Forest Service, commercial, recreational and other activities that are likely needed if the Ashley NF expects to move toward Desired Conditions. Under the 2012 planning rule, they are enforceable, binding, and mandatory. While Standards are the important commitments in which the public can have the greatest trust, the Forest Service tries to limit the number and nature of Standards because the agency wants flexibility.

Guidelines (GD): A guideline is a constraint on project and activity decision making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desire condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. Note: Like Standards, Guidelines are constraints on projects and decision making, but unlike Standards, they are not mandatory, which means they don't have to be strictly followed. It is important to note whether a commitment in the Ashley NF proposed plan is a Standard or a Guideline, because the public can have much less assurance that Guidelines will be followed.

A number of conservation organizations, each with experience and expertise in the different aspects of forest management, have been developing the Conservation Alternative since early 2019[188]. This Conservation Alternative and initial Ashley NF proposal can be directly compared for these elements. The Conservation Alternative outlines thoroughly the proper monitoring protocol that must be adhered to ensure that the Goals, Desired Conditions, Objectives and Standards are being met and to inform future management decisions on project specific NEPA following the implementation of the Revised Forest Plan for the Ashley NF. **This monitoring protocol or a similarly comprehensive monitoring protocol should be included in this NEPA analysis for the Ashley National Forest Plan Revision.**

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188 https://www.mantilasalconservationalternative.org/

Respectfully,

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