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Eastern States Office
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Attention: RIN 1004-AD42

Re: Comment on Proposed Revision to Grazing Regulations for the Public Lands

Western Watersheds Project, a 501c3 non-profit corporation is submitting these comments on (1) The Proposed Revisions to Grazing Regulations for the Public Lands, Draft Environmental Impact Statement DES 03-62, dated December, 2003 and (2) Proposed regulations 43 CFR 4100 described in Federal Register Volume 68, No. 235 released on December 8, 2003/Proposed Rule. We previously commented on the Advanced Notice of Proposed Rulemaking (ANPR) which was published in the Federal Register on March 3, 2003. Our comments were submitted on May 2, 2003 and are hereby incorporated by reference.

Western Watersheds Project is a non-profit membership conservation organization with offices in Utah, Montana, Idaho and Wyoming. WWP, on behalf of all its members, has been working for over a decade to beneficially influence the management of BLM administered lands in the western United States. WWP has a long history of close involvement as an interested public on most of the grazing allotments administered by the BLM in Idaho, Nevada, Utah, western Wyoming, and portions of eastern Oregon and southwest Montana.

WWP is knowledgeable of literally hundreds of grazing allotments which are failing the most minimal of environmental health criteria because of livestock grazing on BLM administered lands. We can only conclude that even the current rules are insufficient to recover the health of these lands. The evidence we provide in these comments makes the case that these lands continue to be severely overstocked with livestock. BLM's own data and current management shows this to be the case. We argue, using the best quantitative peer-reviewed range science, that continued emphasis on structural facilities erroneously called "range improvements" is a flawed strategy. BLM supports these projects rather than adjusting livestock numbers and seasons within the current capacity of the land – in order to avoid political pressure from permittees and allies. Without addressing this issue, the productivity and diversity of the land will continue to fall and both livestock producers and wildlife will suffer over the long term.

Therefore, as part of these comments, WWP will also be proposing improvements to BLM's scientific analysis in this DEIS. We furnish and refer to voluminous scientific literature and reports that BLM has omitted from consideration. Inclusion of these are necessary to provide a "balanced" approach to the issues. Their inclusion is essential for BLM to comply with NEPA's mandate to take a "hard look" at science and do a thorough and integrated analysis of all disciplines. Some of these references are provided in hard copy and some in electronic format on CD. This is explained in the References section. We propose changes to the current and proposed rules delineated in 43 C.F.R. 4100 and related sections of the Code of Federal Regulations.

Our comments are organized by sections including:

1. Introduction
2. A Look Back in Time
3. What About Range Science?
4. Comments on the Draft EIS
5. Comments on the Proposed Rule
6. References

1.0 Introduction and Background

WWP is concerned that the BLM is initiating this proposed rulemaking only in response to the desires of public lands ranching permittees who feel aggrieved by the Range Reform regulations which were adopted by the BLM in 1995. Under all the three pertinent federal statutes (FLPMA, PRIA and the Taylor Grazing Act) the BLM has legal responsibilities to administer these lands in the long-term interests of the American people and not a handful of stockmen, who are permittees, on the public lands. Our concern includes the political motivations of western livestock producers, congressional representative and senator as well as the Bush Administration.

The Union of Concerned Scientists has released a report analyzing the Bush Administration's handling of science in policymaking (UCS 2004). This report can be found on line at http://www.ucsusa.org/global_environment/rsi/index.html . This Administration is characterized by UCS as *"Across a broad range of issues—from childhood lead poisoning and mercury emissions to climate change, reproductive health, and nuclear weapons—the administration is distorting and censoring scientific findings that contradict its policies; manipulating the underlying science to align results with predetermined political decisions…"* We believe this proposal and DEIS is evidence of more of the same.

Livestock permittees are a small minority of livestock producers in the eleven western states and are insignificant in number or economic contribution to the States and their Rural or Urban Counties. Their numbers and contribution pale in comparison to the public and the future of its land which are really at stake here. See the analysis by Dr. Thomas Power, Chairman of the University of Montana's Economics Department in Wuerthner and Matteson (2002). He points out the minimal economic contribution of federal public lands to local, State and regional economies. He also points out that the majority of public lands livestock producers depend on non-agricultural sectors of these local, state and regional economies for employment, not

livestock production. It is not in the public's interest to implement regulatory changes to benefit this small minority by a restoration of primacy which they came to expect before 1995, while disenfranchising the remainder of the public, the land and its wildlife.

BLM must include in its analysis the detailed analyses and data provided in several recent publications before continuing on this path to rule revision. These three books provide volumes of meaningful assessments of the unfortunate current condition of public lands and the failing economic and social realities of public lands ranching. They are provided with these comments. They are:

- *Welfare Ranching, The Subsidized Destruction of the American West* (Wuerthner and Matteson 2002)
- *The Western Range Revisited: Removing Livestock from Public Lands to Conserve Native Biodiversity* (Donahue 1999)
- *Waste of the West* (Jacobs 1991)

In addition, BLM must consider in detail the publication referenced in these comments and also National Research Council (2002), *Riparian Areas: Functions and Strategies for Management.* All of these publications are clear in describing the flaws in current methods of livestock management on public lands and should serve to inform every proposal initiated by the BLM under this rulemaking if it should proceed.

Additionally, the BLM's *Rangeland Reform '94 DEIS* and *Executive Summary* (RRDEIS, BLM 1995) reported that riparian areas *"have continued to decline and are considered to be in their worst condition in history"*; livestock grazing is identified as the chief cause. Indeed, some riparian areas have literally been destroyed; that is, they no longer exist or have any potential for restoration. The EIS further acknowledges that the condition of areas that receive less than 12 inches annual precipitation have not improved under BLM management. (See generally, pp. 3-29 to –32, 3-42 to –47, and Summary at pp. 1, 21., 28). BLM must address how their management affects each physiographic region in sufficient detail to provide a quantitative expression of how their management has affected the land and its resources. We provide specific requests for information to fulfill that need in our comments.

2.0 A Look Back in Time

In a series of articles in Harper's in the 1940's, reproduced in his book, The Easy Chair, Bernard DeVoto shined a bright light on western public lands issues (DeVoto, 1955). He exposed the greed and corruption of stockmen and their congressional allies, their taxpayer subsidies, their damage to the land and their actions to defund the Forest Service and Grazing Service (later to become BLM). Their efforts were directed at monopolizing and ultimately obtaining ownership of these public lands which belong to the American people.

DeVoto wrote about the results of a three-year attack by western stockmen and their allies on the Grazing Service, which was formed to assist grazers and protect the public interest after passage of the Taylor Grazing Act. DeVoto writes, *"When it took the latter purpose seriously it was emasculated and this year has been killed by*

Western members of Congress, under the leadership of Senator McCarran of Nevada." The Grazing Service was then merged with the General Land Office to form the BLM. McCarran then succeeded in getting its appropriations reduced to the point where it could not perform the functions originally assigned to the Grazing Service.

The stockmen and their allies met in August, 1946 in Salt Lake City. This meeting of the Joint Committee on Public Lands of the American National Livestock Association and the National Woolgrowers Association outlined their plans for our public lands. Devoto published these in Harpers in 1947, resulting in a public outcry which stopped the effort, at least for the time. Among the objectives of the stockmen were:

1. Conversion of National Forest and Taylor Act lands grazing privileges that were subject to regulation into a *"vested right guaranteed them and subject to only such regulation as they may impose on themselves".*
2. Distribution of all the Taylor Act grazing lands to the individual states as a preliminary to disposing of them by private sale. In August, 1946, at a meeting of the American National Livestock Association and National Woolgrowers Association meeting in Salt Lake City, the most common price suggested was 10 cents an acre.
3. Reclassification of lands in the National Forests and removal from Forest Service jurisdiction of all the lands that could be classified as valuable for grazing and their distribution to states and then to stockmen and woolgrowers as soon thereafter as possible.

In that same year, 1947, Walter Cottam, recounted the 100th anniversary of Brigham Young entering the Salt Lake Valley. He did this in a lecture and publication on the fate of Utah's plant communities titled, Is Utah Sahara Bound? (Cottam, 1947). In this paper, he quoted from journals of explorers and early settlers that give us a basis for comparison today. Captain Howard Stansbury described Tooele Valley, Utah in 1849 by saying, *"grass is very abundant and numerous springs are found on both sides of the valley."* Another early resident of Tooele County, Philip De LaMare, said *"as a boy he remembered a valley full of high, waving grass … and it was not uncommon for stockmen to be unable to find their animals because of being lost in this high grass which spread over the valley."*

Today, after a century and a half of intensive livestock use, Tooele County has lost this waving sea of grass and is dominated by cheatgrass. Many of the springs have been eliminated either by loss of watershed function from livestock grazing and trampling or as a result of being piped into water troughs for livestock. The loss of ground-covering vegetation and soil crusts has opened up the soil in Tooele County to rates of wind erosion in excess of 200 tons per acre per year (USDA, 1992). BLM's Salt Lake Field Office solution to this infestation of cheatgrass over an allotment of 335,000 acres was to accept the Skull Valley permittee's proposal to build a 150-mile pipeline and over 100 water troughs for livestock. Yet, under decades of BLM jurisdiction, little or nothing appears to have been done to halt the march of cheatgrass, except to ignore the problem and continue status quo grazing and exploitation. These proposed regulations and their DEIS ignore BLM's consistent turning away from these degraded conditions in their efforts to continue unsustainable livestock production at the expense of the land.

Cottam then provides a narrative about Mountain Meadows, a small valley west of Cedar City, Utah that was first described by Captain John C. Fremont in 1844. He said, *"We found here an extensive Mountain Meadow, rich in bunchgrass and fresh with numerous springs of clear water, all refreshing and delightful to look upon… The meadow was about a mile wide, and some ten miles long, bordered by grassy hills and mountains."* Compare this to H.H. Bancroft's description in 1877. *"Over that spot the curse of the Almighty seems to have fallen. The luxuriant herbage that clothed it twenty years before had disappeared: the springs were dry and wasted, and now there was neither grass nor any green thing save here and there a copse of sagebrush or scrub oak that served but to make its desolation still more desolate."*

Cottam went on to describe the soil erosion, floods, mudslides and other effects of the continuing intensification of livestock production in this arid environment. Today, both the Forest Service and BLM appear to be "dumbing down" ecosystem status to include livestock as native herbivores. BLM ignores basic range science and ecology, and claims that watersheds with heavily compacted soils, damaged nutrient cycles, depleted native plant communities and streams that are downcut 20 feet are in proper functioning condition. Even Thad Box has been moved to ask if range conservationists have become *"apologists"* to the livestock industry at the expense of the land (Box, 2000).

In the 1980's, the Sagebrush Rebellion had an ally with Ronald Reagan's administration. This movement to give control of these lands to the states – and ultimately to the moneyed interests of the extractive industries - timber, mining and grazing was re-fueled by its friends in Washington. The Reagan Administration was successful in gutting the collection of meaningful quantitative data on the biological communities of our public lands. This data could have been used to establish sustainable livestock levels and compare future conditions to management of livestock grazing in a quantitative manner. Of course, this would have lead to the inevitable grinding down of numbers of sheep and cattle until they were in balance with the capability, capacity and needs of the land. This was the motivation for doing away with adequate quantitative data collection. Of course, the damage to our land, its waters and wildlife remain obvious. It is only in defense from pro-industry, anti-environment land managers and stockmen that quantitative data is needed.

Larry Walker, retired BLM Range Conservationist, describes the history of BLM's efforts to establish a data-based program. This was known as SVIM (Soil, Vegetation, Inventory Method). It was used to determine range capacity. Larry's discussion of this issue can be found on-line at:

http://www.rangebiome.org/editorials/SVIM.html

The Reagan Administration wrote new regulations, the worst of which were overturned in federal court in 1985. But, in different form, these proposed regulatory changes today are attempting to accomplish the same thing. The court decision by Judge Ramirez in 1985 is online at:

http://www.rangebiome.org/genesis/ramirez.html .

The Reagan Administration reorganized BLM in a big way. While the intent was supposedly to make the organization less top-heavy and increase capabilities on-the-ground, the effect was to pretty much lobotomize science. The science teams in the Denver Service Center were disbanded because State Offices had supposedly developed their own capability. That was true except that the State Office science teams were disbanded at the same time to send more people to field offices. While most of the scientists remained in BLM, most synergy was lost by scattering them to the four winds and placing them further down the management chain (Email notes from Larry Walker, 2/14/04).

They attempted to amend Department of Interior Regulations to institute Cooperative Management Agreements (CMA's). These CMAs would have allowed stockmen to graze livestock on the public lands in the manner which the stockmen deemed appropriate, in essence turning over control of the public lands to them.

Judge Ramirez writes in his decision, *"From the mid-nineteenth century until 1934, when Congress first enacted comprehensive legislation regulating rangeland management, the key battles over the public lands were between ranchers, who sought to monopolize the range for their own uses, and'homesteaders, nomadic herders and a few government officials, who struggled to keep the public lands open and available to all comers. The frontier attitudes of western ranchers made the western cattle industry firmly opposed to legal regulation."* It is clear that Judge Ramirez understood this history of stockmen's attempts to "take" the public lands away from the American people.

Regarding CMA's, the plaintiffs (Sierra Club, NRDC, Defencers of Wildlife, The Wilderness Society et al) in the case argued that CMAs were, *"a naked violation of defendants' (BLM's) affirmative duties under the Taylor Grazing Act, FLPMA and PRIA."* Judge Ramirez ruled that *"The statutes cannot be reasonably interpreted to allow defendants to tie their own hands with respect to their authority to modify, adjust, suspend or cancel permits. … Permittees must be kept under a sufficiently real threat of cancellation or modification in order to adequately protect the public lands from overgrazing or other forms of mismanagement. Any other interpretation of Congressional intent is inconsistent with the dominant purposes expressed in the Taylor Grazing Act, FLPMA and PRIA. … it is the public policy of the United States that the Secretary and the BLM, not the ranchers, shall retain final control and decision-making authority over livestock grazing practices on the public land."*(emphasis added)

Now, in 2004, BLM under the Bush Administration, is proposing changes to the grazing regulations that will cut the Interested Public out of the process during important steps such as determinations of active use, setting of stocking rates, issuing temporary use permits and 10-year permit renewals while also failing to require that NEPA will be followed in these actions. In addition, BLM is tying its own hands in dealing with impaired lands and drought by requiring multi-year phase-ins of reductions. Finally, BLM is proposing to vest livestock permittees in ownership of water rights and structural range improvements, forgetting that they get to graze at about 10% of market value, which more than compensates them for maintaining range improvements. It must be remembered that much of the cost of these "range improvements" is funded directly by BLM and the counties out of grazing receipts, increasing the subsidy and the cost to the American Taxpayers.

Given this egregious history, one must ask why any fair-minded person would go along with the purported goals stated in the DEIS *of "consultation, cooperation, and communication all in the service of conservation"* , when these goals are merely cover for turning back the clock to a time when stockmen ruled the land and conservation was considered a waste of forage. This is still the predominant way of thinking among permittees, who like to portray themselves as "conservationists". Nothing could be further from the truth. These proposed changes do nothing more than perpetuate the industrialization of our public lands using failed techniques in an effort to avoid dealing with the realities of overstocking. They do nothing to adequately and quantitatively monitor conditions or require tight management controls on livestock producers.

3.0 What About Range Science?

The entire underpinnings of the DEIS and Proposed Rule Changes lack attention to range science. They bypass consideration of best available science and pretend that grazing management is just fine if Interested Publics would just quit holding up BLM and Permittee proposals by creating an administrative paperwork burden. They pretend that greater cooperation with stockmen will somehow result in improvement by merely "tweaking" stocking rates, but then go on to admit in DEIS Chapter 4 that this seldom happens, that changes in grazing really only amount to changes in season or location of use and that *"Changes in active grazing use in excess of 10% are infrequent."* (DEIS p 4-28).

In BLM's RRDEIS, definitions were given for the status of upland plant communities. These were:

- Potential Natural Community (PNC) = existing vegetation is between 75 – 100% of the sites potential natural plant community.
- Late Seral Community = existing vegetation is between 50 – 74% of the sites' potential natural plant community
- Mid Seral Community = existing vegetation is between 25 – 49% of the sites' potential natural community
- Early Seral Community = existing vegetation is between 0 – 24% of the sites' potential natural community.

The status of these plant communities taken from the RRDEIS and the current DEIS is summarized in Table 1.

Table 1. Comparison in Upland Condition Between RRDEIS and Current DEIS

Community Status	RRDEIS	Current DEIS	Change '94 to date
PNC	4%	6%	+2%
Late Seral	34%	31%	-3%
Mid Seral	40%	34%	-6%
Early Seral	15%	12%	-3%
Unclassified	7%	17%	-10%

Table 1 indicates that management of uplands since the passage of the last Rangeland Reform regulation in 1995 has not resulted in improvement of condition. In fact, by BLM's definitions, condition has declined. It also shows that productivity of those lands is greatly below potential and that BLM's management has failed in the intervening 10 years to take meaningful actions to improve conditions. The following paragraphs discuss the management implications of these conditions.

In its RMP for the Little Snake Resource Area, BLM showed a livestock grazing preference of 166,895 AUMs in the Resource Area (BLM 1989). The RMP stated that this was in excess of the forage estimate of 148,821 AUMs in the Little Snake Resource Area based on studies conducted in 1981-1983. These numbers show that the forage allocated to livestock was greater than the forage produced without making any allocations to wildlife or watershed protection. In the RMP, BLM stated, *"Estimates of stocking rates contained in the plan do not necessarily reflect the need or intent to commensurately reduce stocking levels."*

This illustrates that even when BLM collects data that indicates livestock numbers are out of balance with the capacity of the land, they are not willing to adjust livestock numbers to correct the problem. GAO (1988) reported that overstocking was occurring and that assessments of the number of livestock the land can support were needed. Yet, even when BLM documented overstocking of the land,, numbers were not reduced. That same GAO report stated, *"Because of the generally arid condition of much of the public rangelands, recovery from past damage is slow, and in some cases, recovery never occurs."*

The Little Snake RMP also stated that it would provide forage to support: 66,400 mule deer; 6,500 elk; 6,300 pronghorn; and 70 bighorn sheep. Using figures from Holechek et al (2001), wildlife forage requirements in AUMs are: mule deer (0.15); elk (0.7); pronghorn (0.12); bighorn sheep (0.18). Therefore, the total annual forage requirements for these large mammals is:

Mule deer	66,400 x 0.15 x 12 = 119,520 AUMs
Elk	6,500 x 0.7 x 12 = 54,600 AUMs
Pronghorn	6,300 x 0.12 x 12 = 9,072 AUMs
Bighorn sheep	70 x 0.18 x 12 = 151 AUMs

This is a total annual forage requirement for these big game species of 183,343 AUMs and does not count migratory birds, sage grouse, small mammals and watershed needs. The total forage requirement for livestock and large mammals set by the RMP is therefore, 332,164 AUMs with only 148,821 AUMs present. This is an over-allocation of some 220%, with livestock receiving an allocation of 112% of the known forage produced in the Resource Area.

In spite of the fact that GAO recognized this problem in 1988 and that the Resource Area was overstocked, BLM in its RMP proposed more monitoring studies to more accurately determine carrying capacities and the condition and trend of plant communities before changing livestock and/or wildlife numbers. So, no matter whether BLM monitors, or does not monitor they do not intend to correct overstocking with livestock, only to propose monitoring as a delay tactic.

Moving forward in time, the Little Snake Field Office released an Environmental Assessment (CO-100-LS-00-007), FONSI and Notice of Final Decision in 2001 for renewing livestock permits on 256,772 acres of BLM land. In 2003, the Little Snake Field Office issued an EA (CO-100-LS-00-018) and Notice of Proposed Decision for renewing livestock permits on an additional 81,118 acres of BLM land. Neither of these EAs and Decisions provided the monitoring data promised in the RMP, which BLM stated was needed to adjust stocking rates. Instead, over 10 years after making that commitment, BLM continued authorizing heavy use by livestock of 50% of upland herbaceous vegetation. We hereby incorporate these two EAs by reference.

In Utah in 2001, BLM issued 14 Environmental Assessments[1] and Final Decisions for livestock permit renewals on nearly 1.5 million acres of BLM land in three northern Utah counties (Box Elder, Rich and Toole). These lands also include areas of highly erodible soils where livestock grazing and trampling can lead to wind erosion rates of over 200 tons per acre per year. Once again, BLM failed to provide any determinations of current forage capacity and authorized continued heavy use levels. The RMPs and MFPs for these three counties were old and outdated.[2] These EAs also revealed that much of the landscape affected by the Decisions consisted of highly erodible soils, loss of plant communities, severe erosion and other impacts.

In spite of this evidence of widespread loss of plant productivity and ground cover, accelerated erosion and BLM's own documentation of rapid declines in species such as sage grouse, BLM's answer in these proposed actions as well as its proposed regulations is to take a step backward. BLM chooses not to address livestock impacts in any meaningful way. Instead, BLM proposes more water developments, grazing systems and additional deference to permittees. This ignores that in the 1960's, BLM began a massive program of developing water, putting streams and springs into pipelines, seeding with crested wheatgrass, building fences, engaging in rotation grazing, and spending millions of dollars to "even out livestock distribution".

An early example of this, among others, was in BLM's Vale District, where millions of dollars were spent on seedings and structural range improvements. Today, many of these systems have fallen into disrepair, our public lands have failed to recover and we are faced with more and more proposals to install grazing systems, water developments, plow and seed – not reduce livestock numbers. This is in spite of the fact that long-term studies, including those from the Vale District have shown that stocking rate is the critical variable, not grazing systems. These are cited in a later section.

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[1] The EA reference numbers are: EAs No: 020-01-092; UT-020-2001-102; UT-020-01-050; UT-020-01-82; UT-020-2001-108; UT-020-2001-86; UT-020-00-014; UT-020-01-38; UT-020-01-37; UT-020-00-12; UT-020-01-72; UT-020-2001-0078; UT-020-01-172; UT-020-01-70.

[2] These EAs and their accompanying Decisions are incorporated into these comments by reference. In addition, we incorporate the RMPs, MFPs and RODs (BLM 1980, BLM 1985, BLM 1986, BLM 1989 and BLM 1990) into these comments by reference. Electronic copies of our protests and appeals of those EAs and Decisions are included with these comments with the references provided. These are cited in the references section as WWP (date):

This is all in the context of the failure of BLM to scientifically and accurately determine those lands which are capable and suitable for livestock grazing. We must add to this the further failure of BLM to accurately and quantitatively determine how much forage (i.e. forage capacity) is currently available. On top of this, there is the failure of BLM to properly allocate that forage to watershed and stream protection, wildlife habitat and food, then to livestock if available. Then there is the failure to provide for long-term rest to facilitate recovery. Finally, we must add the unwillingness of permittees to use peer-reviewed range science principles for management and their strong opposition to the most minimal standards of performance. These failures by BLM and livestock permittees have prevented the recovery of damaged ecosystems in order that they might sustain use as envisioned in the Multiple Use Sustained Yield Act, the Taylor Grazing Act and FLPMA.

Instead, BLM claims that the take "half/leave half" principle they include in their normally specified livestock use levels of 50% of forage is proper They do this without providing any scientific foundation. The following paragraphs provide a summary of the relevant range science regarding utilization levels, plant growth and productivity, effects of precipitation regime, capability and suitability, capacity determinations, stocking rates and range economics. These principles are well founded in the range science literature. The DEIS and the proposed regulations must include a detailed analysis and consideration of them them and their implications.

3.1 Utilization Levels, Plant Growth and Precipitation.

The origin of that principle of take half/leave half (50% use by livestock) is a paper by Franklin Crider of the Soil Conservation Service in which he used clippings of grasses to determine at what levels of use and how often a grass might be clipped and sustain its root system, critical to survival (Crider, 1955). His results showed that a single clipping of 50% resulted in minimal root-growth stoppage. Thus the take half and leave half religion was born. However, in his results for repeated clippings which simulate grazing during active growth, he showed that even at the 50% level, significant reductions in root growth occurred. In fact, when repeatedly clipped to simulate normal grazing by livestock, he found that at the 50% level, smooth brome experienced root growth of only 25% of controls. A final fact that is never taken into account is that Crider's study was based on ideal conditions, where plants were grown in controlled conditions with no competition and no nutrient and water limitations such as those that exist under natural conditions. In addition, allowing consumption of 50% of perennial grasses by livestock does not take into account the additional consumption of vegetation by wildlife, invertebrates and other forms of loss. When all are added together, much greater than 50% use occurs. By Crider's criteria, significant loss of root mass and production will occur at these levels..

In order to understand the implications of grazing livestock at these heavy forage utilization levels in arid regions, it is important to understand the precipitation regime and its relationship to forage production. Holechek et al (2001) point out what we all understand at the most basic level. That is, precipitation is the single most important factor determining the type and amount of vegetation in a particular area. In the 11 Western States, 80% of the area receives less than 500 mm (19.6 inches) of annual average precipitation. Further, this precipitation is subject to great year-to-year variation.

Three locations representative of Intermountain Region BLM lands precipitation are used for illustration. Long-term precipitation records were analyzed for Escalante and Kanab, Utah and Mountain Home, Idaho. The annual variations in precipitation are important to understand in relation to plant production and grazing management. Table 2 provides a summary of annual precipitation statistics for these locations. Data was obtained from the Western Regional Climate Center database which can be found on line at http://www.wrcc.dri.edu/index.html . Figure 1 provides plots of annual precipitation and percent occurrence of below average and drought years for these locations.

The statistics were calculated for years of record with no more than five days of missing data in any given month. The analysis uses the Standard Precipitation Index (SPI) developed by McKee et al (1993) which considers drought, or extremely dry conditions, as years with 2" less than average precipitation.

Table 2. Summary of Precipitation Statistics for Three Intermountain Locations

Description	Escalante, Utah	Kanab, Utah	Mountain Home, Idaho
Period of Record	1909 – 2001	1903 – 2002	1949 – 2002
Years of Record	65	86	40
Average, inches	10.9	45	9.8
Range, inches	5.5 – 21.7	5.4 – 26.6	4.6 – 19
Year below average	39	45	25
Percent years below average	60%	52.3	62.5
No drought years based on Standard Precipitation Index (>2" below avg)	18	31	11
Percent drought years based on SPI	27.7	36	27.5

Figure 2 shows the monthly distribution of precipitation at these locations. The differences in overall precipitation amounts as shown in Table 1 are reflected in the relative magnitudes of monthly precipitation at each of the locations. All locations are consistent with lower moisture during spring than winter. The Colorado Plateau locations in southern Utah (Escalante and Kanab) have more moisture during late summer and early fall compared to the Mountain Home, Idaho location. Mountain Home experiences drier conditions during late summer and fall. In each area, the most consistent precipitation inputs are during the winter months.

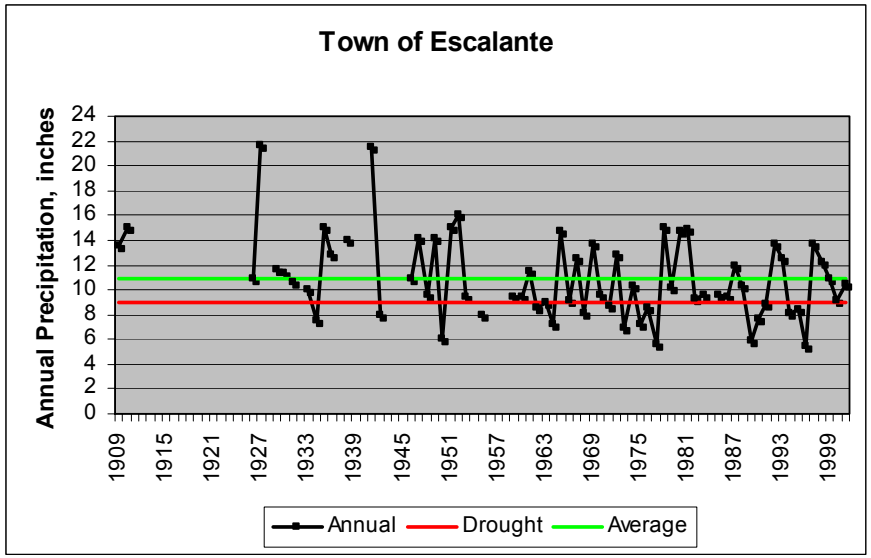
These periods of precipitation vary in their effects on the plant communities. Typically, the fall-winter period is the period of greatest increase in soil moisture due to the lower temperatures and lower evapo-transpiration occurring then. Summer precipitation effectiveness varies with the storm intensity. Summer storms must be of high enough intensity to promote recharge of the soil profile into the root zone to be effective for plant growth. Generally, this is greater than 0.6 inches in desert shrub types, although very high intensity storms may not be effective due to rainfall rates in excess of infiltration that result in overland runoff and flash. Spring plant growth in arid areas depends on the amount of moisture received and retained during the fall-

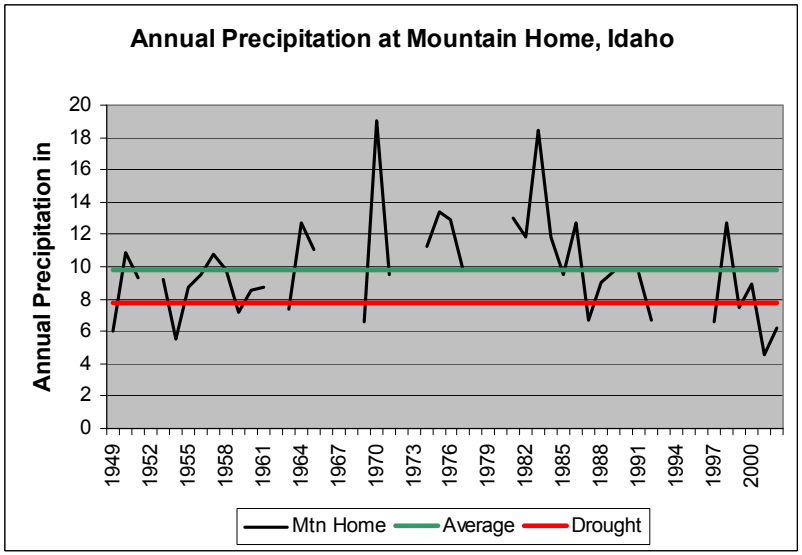
winter period. *"Unless more rains come in the spring, the soil moisture will be depleted in a few weeks and growth will slow and ultimately cease, and the perennial plants will assume their various forms of dormancy."* (id.). Relatively dry summers may allow little regrowth and by the time September comes, temperatures may be low and growth limited. Trampled and compacted soils exacerbate this effect flooding (Blaisdale and Holmgren 1984). Some desert shrubs such as Artemisia sp. with both shallow and deep root systems can take advantage of both shallow and deep soil moisture (West 1983).

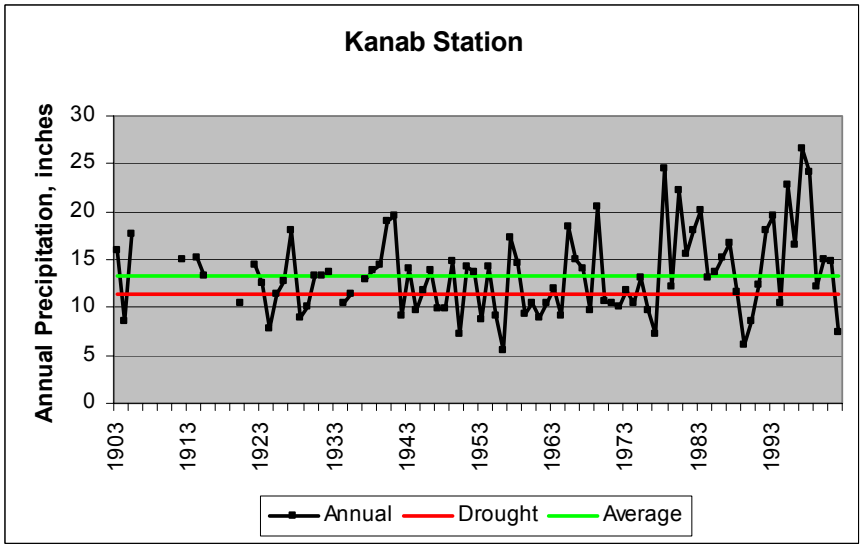
Annual production of available forage at the Desert Experimental Range in western Utah was highly correlated with total annual precipitation, showing an 800% variation in forage production between the driest and wettest years (Hutchings and Stewart, 1953). Scientists developing quantitative ecosystem relationships for the Prototype Oil Shale Program managed by BLM in Utah's Uinta Basin found that annual sagebrush stem leader growth used as an index of production had a high correlation with winter precipitation (October – March) and that spring annual plant biomass was correlated with spring precipitation (ERI 1984; WRSOC 1984).

Analysis of twenty years of data for perennial grass production and annual precipitation for a study area at the Chihuahuan Desert Rangeland Research Center in New Mexico showed a high correlation (Holechek et al, 2001). A graph of this data is shown in Figure 3. Annual perennial grass production varied between 6 and 750 lbs per acre, corresponding to the second-lowest and highest precipitation years. The linear regression plot of the same data is provided in Figure 4. Results of long term studies of crested wheatgrass production from experimental plots on BLM land at Malta, Idaho showed that crested wheatgrass production was most closely related to May-June precipitation (Sharp et al, 1992). They found that annual production of crested wheatgrass during 35 years averaged about 500 pounds/acre and ranged between 130 and 1090 pounds/acre depending on precipitation (Figure 5). These relationships demonstrate that this is a predictable phenomenon that should be taken into account in setting livestock grazing seasons, stocking rates and management on an annual basis as well as over the longer term. The Soil Survey of Rich County, Utah (USDA, 1980) shows that total production of potential plant communities varies by about 300% between favorable and unfavorable years. This wide range in production between dry and wet years is typical in the arid regions of the West.

Much of the relevant recent research and analysis of livestock grazing management, plant productivity and economics has come out of the Department of Animal and Range Sciences at New Mexico State University. This work has been presented in a series of textbooks and papers in the range science literature. These references provide analyses of the interactions of livestock stocking rates, plant productivity and economics based on a set of long term grazing management studies from native rangeland types. They provide recommendations for determining livestock grazing intensity to maintain vegetative productivity and economic stability, while taking into account the effects of inherent variation in precipitation in desert ecosystems.







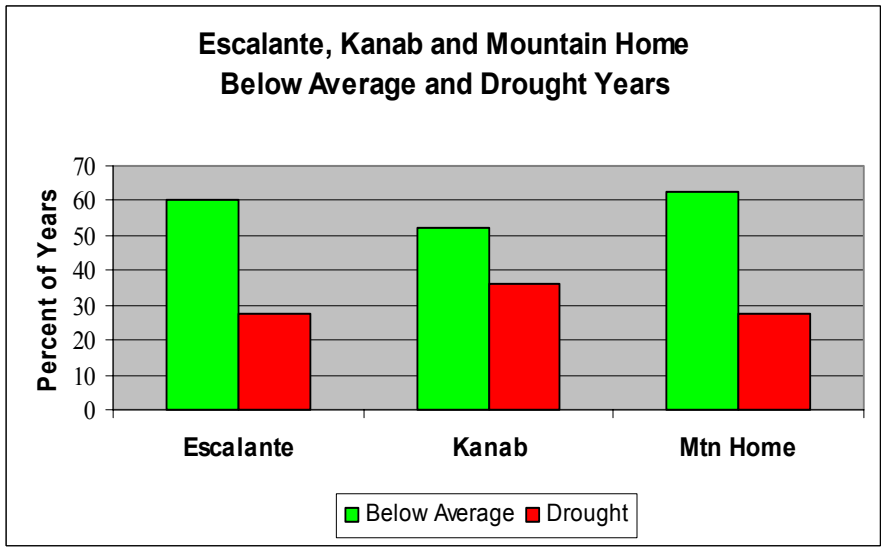
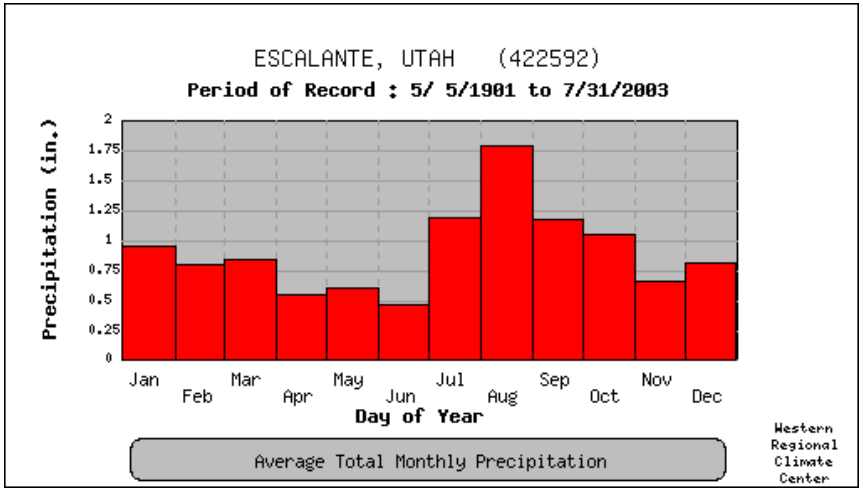
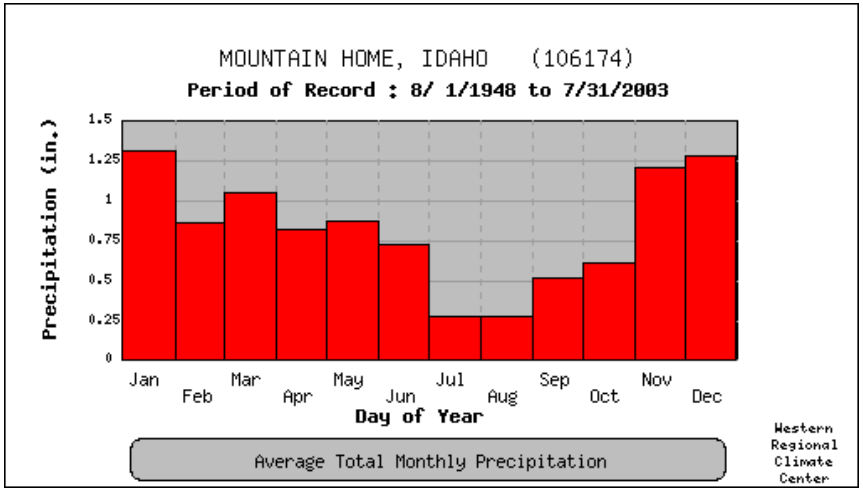


Figure 1. Annual precipitation patterns in Escalante and Kanab, Utah and Mountain Home, Idaho.





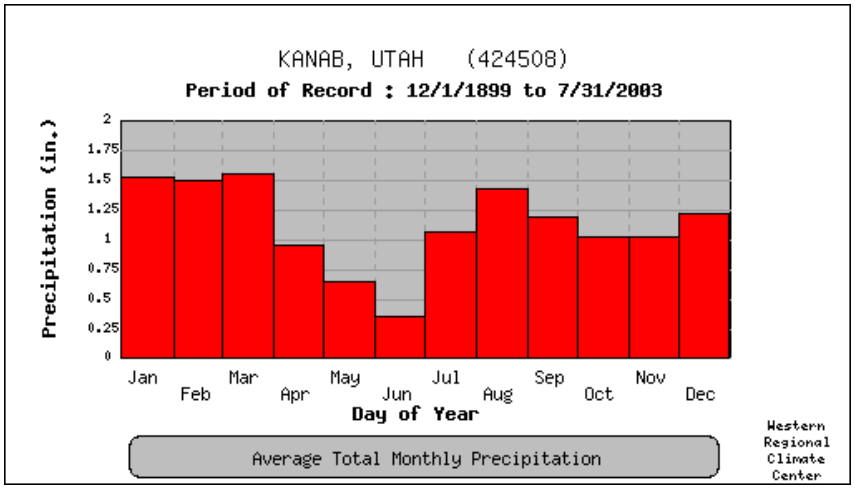


Figure 2. Monthly precipitation patterns in Escalante and Kanab, Utah and Mountain Home, Idaho.

Figure 3. Annual Precipitation vs Forage Production

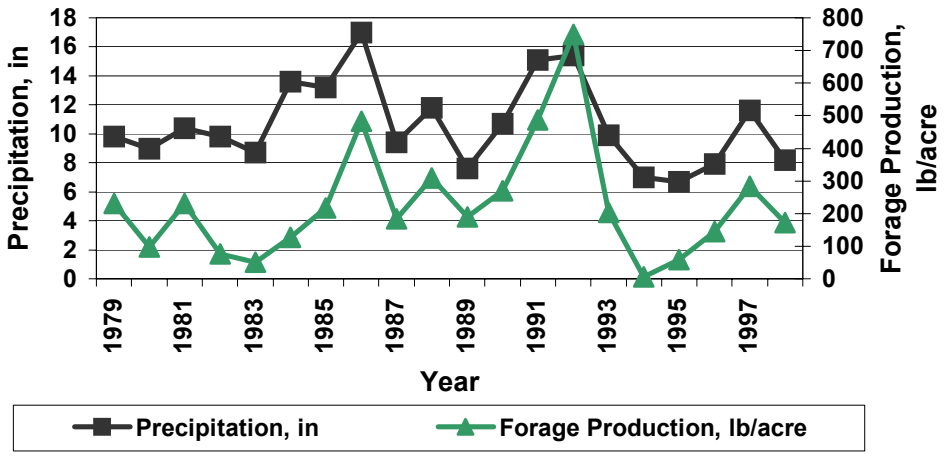


Figure 4. Forage Production vs Precipitation

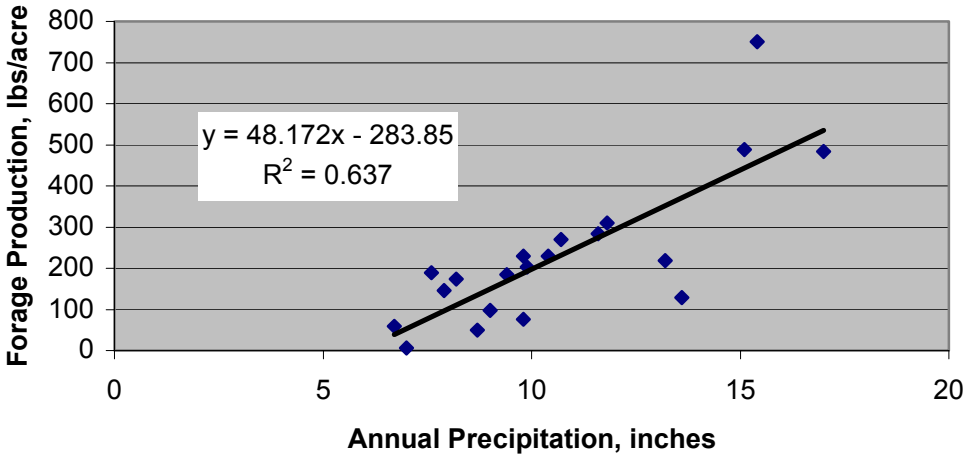
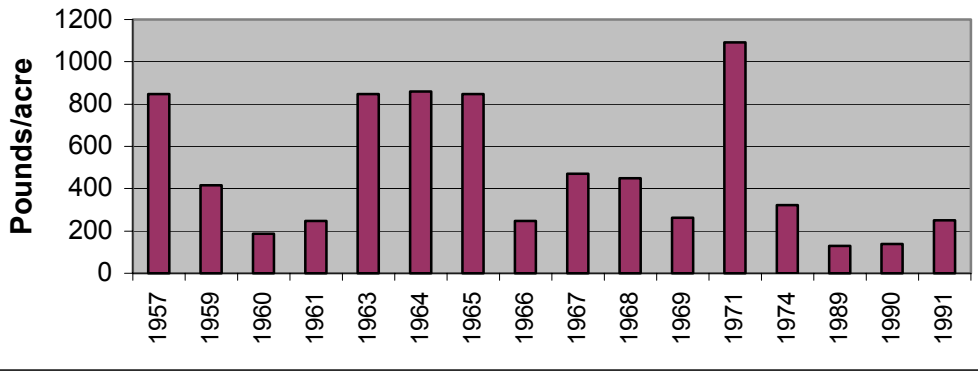


Figure 5. Crested Wheatgrass Production at Malta, Idaho



The effects of different livestock grazing intensities on forage plant production was studied in a ponderosa pine type in Colorado as early as the 1940's (Schwan et al, 1949). This study showed that forage consumption at a rate of 57% produced an average of twice as much forage as one used at a rate of 71%. An area left ungrazed for 7 years produced three times as much forage as the heavily grazed (71% use) area. The authors concluded that, as grazing use increased, forage production decreased. During that same period, Dyksterhuis (1949), in a classic paper on the use of quantitative ecology in range management, presented examples of how stocking rates must be adjusted based on precipitation and range condition, which included a rating based on departure from potential, or the climax community. NRCS (USDA, 1982) considers proper grazing management as that management that sustains the potential plant community.

Schulz and Leininger (1990) studied long-term riparian exclosures compared to areas that continued to be grazed. They found after 30 years that willow canopy cover was 8.5 times greater in livestock exclosures than in adjacent grazed riparian areas. Grasses were 4 to 6 times greater in cover within the exclosure than outside and mean peak standing crop of grasses within the exclosure was 2,410 Kg/Ha, while outside in caged plots, mean peak standing crop was 1,217 Kg/Ha.

The effects of conservative vs. heavy grazing use by cattle on two pastures was determined in a New Mexico study (Galt et al, 1999). Both of these pastures had experienced conservative use for over 10 years. In 1997, one pasture was changed to heavy use. Conservative use was 35 – 40%, while heavy use was 60 – 65% of forage species including grasses and forbs. Quantitative measurements at key locations in both pastures in the following year, while being rested, provided the results shown in Table 3.

Table 3. Standing Crop of Grasses and Forbs from Galt et al (1999)

Location/Forage Component	Spur Pasture Heavy Stocking Rate Pounds/acre	Deep Lake Pasture Conservative Stocking Rate Pounds/acre
Perennial Grasses	352	824
Forbs	256	436
Total Forage	608	1260

This study showed that heavy stocking rates resulted in serious declines in productivity in the succeeding year. Perennial grass production was reduced by 57% and forbs by 41% in the heavily grazed pasture compared to the conservatively grazed pasture. The authors cited a number of other studies in arid environments that showed heavy stocking was accompanied by decreases in forage production when compared to conservative use. After drought, the ability of forage plants to recover was directly related to the standing crop levels maintained during the dry period. The studies cited showed that grazing during different seasons was less important than grazing intensity.

In a study of five long-term stocking rate studies from three different locations in Arizona, New Mexico and Utah, similar patterns were documented (Holechek et al 1999a). In the Desert Experimental Range in Utah, a 13-year study using 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. A 10-year study at the Santa Rita Range in Arizona demonstrated that perennial grass cover and yield showed an inverse relationship to grazing intensity, while burroweed, an undesirable species, increased with increasing forage use. The authors recommended a 40% use level. 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 heavy, or 60% use. Here, the author recommended conservative stocking at 30 – 35%.

Hutchings and Stewart (1953), suggested that 25 – 30 % use of all forage species was proper. They recommended this level because routinely stocking at capacity will result in overgrazing in half the years and necessitate heavy use of supplemental feed. Even with this system, they recognized that destocking would be needed in 2 or 3 out of ten years. Holechek et al (1999a) concluded that the research is remarkably consistent in showing that conservative grazing at 30 – 35% use of forage will give higher livestock productivity and financial returns than stocking at grazing capacity. They also recognized that use by rodents and other wildlife must be taken into account as part of this utilization. Otherwise, rangeland productivity would suffer even at these levels of use. Galt et al (2000) recommended levels of 25% utilization for livestock and 25% for wildlife with 50% remaining for watershed protection. Even these consumption levels for wildlife and livestock combined exceed the levels that Crider's experiments show would cause reduced root production and would be unsustainable.

3.2 Grazing Systems. In a review paper that considered grazing systems, grazing intensity and season of use, Holechek et al (1998) determined that, *"financial returns from livestock production, trend in ecological condition, forage production, watershed status and soil stability are all closely associated with grazing intensity."* They found that grazing systems such as rest-rotation had limited or no benefit in arid systems. Citing long-term studies in Arizona they documented that after 12 years of rest-rotation management compared to continuous grazing, 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. In a Vale, Oregon study, lasting over 20 years at moderate

grazing intensity, 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.."*. This is the Vale, Oregon District project costing millions of dollars and involving massive seedings, pipelines, water developments and rotation grazing mentioned earlier.

A review of the "classic" range studies, which are the long-term stocking rate and grazing system studies that provide the scientific foundation for modern range management again shows that light use is closer to sustainable use, while heavy use is not (Holechek et al 1999a). 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 are able to maximize their herbage producing ability. However, it is clear that using even "moderate" grazing in depleted areas will not allow them to recover.

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.

Table 4 provides summary statistics from that paper. It must be remembered that these comparisons are to prior heavy use, not to ungrazed lands. It is apparent from these studies that "moderate" use levels will not allow significant recovery of severely depleted range. In fact, in studies of long-term rest at Idaho National Engineering Laboratory, the recovery rate of grasses in sagebrush communities was slow, progressing from 0.28% to 5.8% over 25 years (Anderson and Holte, 1981 and Anderson and Inouye, 2001). It is clear from these examples that heavily depleted sites will require decades to recover in the absence of livestock, while their ability to recover in the presence of livestock at any level of use has not been demonstrated.

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. Results from 18 western grazing system studies by Van Poollen et al (1979) found that adjustment of livestock numbers, or stocking intensity was more important than implementing grazing systems to improve herbage production. Holechek et al (1999a) recognized that *"various rotation grazing systems cannot overcome the rangeland deterioration associated with chronic overstocking."* Holechek et al (2000) also showed that the various claims made by advocates of short-duration or time-controlled grazing were false.

Table 4. Summary of Data from 25 Classic Grazing Studies (Holechek et al 1999a)

Description	Heavy	Moderate	Light
Average Forage Use %	57	43	32
Average Forage Production lb/acre	1,175	1,473	1,597
Drought Years Production lb/acre	820	986	1,219
Average Calf Crop %	72	79	82
Average Lamb Crop %	78	82	87
Calf Weaning Weight lbs	381	415	431
Lamb Weaning Weight lbs	57	63	--
Gain per Steer lbs	158	203	227
Steer/calf Gain per Day lbs	1.83	2.15	2.3
Steer/calf Gain per Acre lbs	40.0	33.8	22.4
Lamb Gain per Acre lbs	26.0	20.4	13.8
Net Returns per Animal $	38.06	51.57	58.89
Net Returns per Acre $	1.29	2.61	2.37

Holechek et al (2001) have indicated that, depending on topography, areas of severe degradation, or *"sacrifice areas"* occur around water sources including water developments. These can extend from 1 mile to several miles from these sources and out further if stocking rates are too high. Based on this, a single water development can result in an area of soil compaction, erosion and severe loss of ground cover and vegetation for thousands of acres. They also indicate that installing water developments in locations that have had limited access to livestock in the past may increase ecological damage to areas that are important refuges for relict plant communities and wildlife that have not been displaced by livestock. It is critical that BLM not rely on future water developments and other "range improvements" such as fences and grazing systems to correct overstocking as the evidence is clear that these only exacerbate existing problems.

3.3 Economic Considerations. These studies showed that light stocking results in greater forage production and improvement in range condition when compared to both heavy and moderate use. Moderate and light use provided greater returns than those obtained with heavy use. Because these financial figures included data from humid areas, a separate analysis taking into account the necessity for destocking during drought in arid regions showed that conservative stocking (35% use) would provide the highest long-term financial returns on semi-desert rangelands in Arizona.

Economic analyses cited in (Holechek et al, 1999b) show that conservative stocking rates yield better returns. For example, in the sheep experiment at the Desert Experimental Range in Utah, the lower stocking rate (35% use) yielded a financial return of $0.39/acre compared to $0.14/acre for the higher stocking rate (60% use). A modeling study that evaluated 29 years of financial returns for a cow-calf operation revealed that a relatively constant stocking rate of 35% use was considered the best approach.

Winder et al (2000) reported on comparisons of stocking rates and financial returns using 30 or 40% of current years perennial grass growth. The 30% use level provided greater vegetation productivity and financial returns. After drought in 1994 through 1996, forage production on the pastures with the lower stocking rate (30% use) increased 71% compared to 35% increase on those with the moderate stocking rate (40%). Economic returns were $0.52/acre for the conservative use level and $0.31/acre for the moderate use level. A combination of stubble heights, clippings and ocular measures were used to set annual stocking rates, termination of the grazing season, sale of cattle to balance numbers with capacity and destocking during drought. Under these criteria, all pastures were destocked in the summer of 1994 and the moderately stocked pasture was destocked in May, 1999. After livestock were removed due to drought, pastures were rested for two years, then stocked in late fall according to current year's forage production.

Results of seven years research in New Mexico's Chihuahuan Desert to evaluate the relationship between range condition and financial returns showed similar relationships (Holechek et al 1996a). Condition was evaluated using the Dyksterhuis (1949) definitions based on departure from climax. This study showed a relationship between forage production and range condition. Higher condition range, or that nearer climax community plant composition, had higher production of forage and more preferred forage species than lower condition range. Excellent range condition provided over four times the financial return of fair condition range and 65% greater return than good condition range.

Reasons for this were the high costs of management and the energy lost by livestock in seeking forage in lower condition range. In a companion paper, livestock returns were compared to conventional investments such as bonds or stocks (Holechek et al, 1996b). This analysis showed that over-capitalization in infrastructure, coupled with over-stocking lead ranchers into a boom and bust cycle as climatic conditions change. In wet years, they added livestock, generally when prices were high then sold off their herds during dry, or bust periods when prices and productivity are low. The final analysis concluded that conservative stocking, minimal investment in range improvements and greater spacing of watering points reduce fixed costs and insulate the operation from the vagaries of precipitation and market forces.

3.4 Grazing Capability and Suitability Determinations. Current range science recommendations include adjusting the stocking rate for livestock in order to account for distance from water and steepness of slope (Holechek et al, 2001). The Natural Resources Conservation Service has adopted these guidelines for slope adjustments (Galt et al, 2000). Their suggested reductions in grazing capacity for cattle with distance to water and increasing slope are provided in Table 5.

They note that on cold desert ranges of the U.S., snow reduces water availability problems in winter. Also, sheep do not require water every day and can use areas further than 2 miles from water. Sheep on New Mexico winter ranges used slopes of less than 45% with no adjustment necessary for slope, whereas slopes greater than 45% were hardly used. Regional criteria for the Intermountain Region of the Forest Service designate lands with greater than 30% slope as not capable for cattle and greater than 45% slope as not capable for sheep). Other factors used by the Intermountain Region of the Forest Service for determining lands that are not capable

include: current vegetation production less than 200 lb/acre, forested areas and areas with highly erodible soils ((Blackwell 2001; USDA 2001).

Table 5. Adjustments for Distance to Water and Slope for Cattle (Galt et al, 2000)

Distance from Water miles	Percent Reduction in Grazing Capacity
0 – 1	0
1 – 2	50
>2	100
Slope %	
0 – 10	0
11 – 30	30
31 – 60	60
>60	100

Suitability determinations should be performed on those lands that are found capable for livestock to determine whether or not livestock grazing should be allowed. For example, important or critical fish and wildlife habitat, recreation areas, locations of sensitive populations, natural research areas, watershed protection areas among others should not be considered suitable and should be closed to livestock. These capability and suitability determinations are critical components in meeting the definitions and mandates of MUSYA, FLPMA, PRIA, NEPA regarding sustainability and multiple use.

Section 4.0 Comments on the Draft EIS

Our comments are organized by reference to the paragraph numbering system in the DEIS. Therefore, reference to **(1.1.1)** would indicate reference to the DEIS Section **1.1.1 Laws Governing the BLM Grazing Program**.

1.1.1 Laws Governing the BLM Grazing Program. Reference to FLPMA and PRIA emphasizes the mandate for managing the public lands for multiple use and sustained yield and to improve the condition of the public rangelands so they *"will become as productive as feasible for all rangeland values, requires a national inventory of public rangeland conditions."* As the range science and cases we have cited demonstrate, BLM is not meeting these mandates. There is no current systematic and quantitative inventory of range condition, plant communities and riparian areas. These proposed regulations indicate there will be no funding for that purpose. They state only that funding for monitoring will come from other program areas with no mention of funding for these capacity and condition surveys mandated by the law and promised at various levels throughout BLM, such as the example of the Little Snake Resource Area in Colorado.

1.1.4 Overview of the Livestock Grazing Program. BLM states that in 2002, the 18,142 grazing permits and leases (permits) allowed 12.7 million AUMs with 7.9 million authorized as active use and 4.8 million as temporary non-use or conservation use. In 2003, AUM usage declined to 6.9 million dur to drought. As our discussion above showed, during drought rest should have occurred, yet BLM continued at levels near normal during this multi-year west-wide drought. The RRDEIS stated that *"BLM authorizes more than 15 million AUMs of forage for the lands it administers; 2.1 million of those AUMs are in suspended non-use. Suspended nonuse referes to forage that at one time livestock could graze but was later suspended fro grazing because an evaluation found that the rangeland could not support that high a level of grazing."*

Given the figures provided, it is evident that BLM needs to quantitatively determine the forage capacity of its lands and re-set preference or permitted use downward to reflect that current condition. It must do this while employing scientifically defensible utilization rates for livestock based on protective allocations for watersheds, wildlife as we have described. These watershed and wildlife values must be given priority in order to assure the continued productivity of the land and that livestock grazing at the revised levels is then sustainable. Without these determinations and adjustments, these proposed regulatory changes will continue the degradation of the land by: continued shielding of permittees from personal responsibility; by preventing timely reductions in stocking; by preventing rest during drought; by relying on structural range improvements; and by ignoring the benefits of stocking rate reductions and long-term rest for recovery.

1.2.1 General Purpose and Need. Here, BLM relies on its new mantra, *"consultation, cooperation, and communication all in the service of conservation"*. In reality this means cooperation and consultation with permittees, not the public. While seemingly an admirable goal, this mantra ignores that BLM has engaged in this type of deference to permittees for decades and it has not worked. It did not work prior to Rangeland Reform when permittees could have ownership in range improvements and water rights and has not worked since Rangeland Reform as the summary in Table 1 shows. It is clear to those familiar with the current state of affairs on the ground in the West that these proposed regulatory changes have come about as a result of environmental litigation to protect the land and the desire of permittees and their Congressional Representatives and Senators to thwart these efforts for land protection.

BLM states, *"The changes that are proposed are driven by specific issues and concerns that have come to BLM's attention through experience with the current regulations and from public comments provided to the BLM."* We are unclear as to the forum in which these comments have been provided to BLM. In that regard, Western Watersheds Project is requesting under the Freedom of Information Act that BLM provide for the eleven western states:

- Copies of all correspondence, telephone memos and meeting records between BLM representatives and Senators, Congressmen(or women) or their staff relating to complaints or proposals that BLM's management or regulations be changed. Provide only records after January 1, 1995.
- The same from Department of Interior Secretary's Office
- The same from White House staff

- The same from State Administrations, legislators or their staff.
- The same from County Commissioners or their staff.
- The same from the Farm Bureau.
- The same from National or State Livestock Associations.

2.0 Description of the Proposed Action and Alternatives. NEPA 40 CFR 1501.2 (c) requires that agencies *"Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by section 102(2)(E) of the Act."* NEPA further requires that a range of reasonable alternatives be explored and evaluated in order that the issues are sharply defined and a basis exists for a clear choice among alternatives (40 CFR 1502.14).

In its DEIS, BLM provides three alternatives. These include a No Action alternative designed to preserve the status quo, the Proposed Action and a Modified Action Alternative which BLM admits *"is similar to the proposed action with some modifications."* Essentially, BLM is providing two alternatives, hardly a "range" of reasonable alternatives. The interested public are provided a choice between current domination of public lands by livestock interests who are a small minority of users or an increased level of that domination by livestock interests, but with an even smaller voice for the interested public in management of its public lands. This violates NEPA in that here, BLM is attempting to justify a decision it has already made and is not providing a reasonable range of alternatives, another violation of NEPA.

It is clear from BLM's analysis in this DEIS that it lacks funding and manpower to engage in adequate monitoring and management of livestock grazing, yet it proposes to require monitoring and assessment in order to adjust livestock grazing in the future. Clearly, BLM must come up with additional alternatives that:

- address its failure or inability to adequately determine the current capacity of the land to support wildlife, watershed function and livestock
- adjust of livestock stocking rates according to that capacity and suitability using the best available science, much of which we have provided in Section 3.0 above
- design and implement a well-funded, consistent, quantitative and scientifically defensible monitoring plan to assess the Fundamentals of Rangeland Health and ensure that water quality meets criteria, that plant communities are making significant progress in diversity and productivity towards potential.
- requires allotments to have demonstrated statistically significant improvement in these FRH according to set time constraints such as during the permit term.
- requires that allotments not demonstrating this improvement in FRH during the permit term will be adjusted downward in stocking rate by 25% or the allotment will undergo suspended use (long-term rest) until statistically significant improvement occurs.
- eliminates deference to permittees as demonstrated in this DEIS and its Action Alternatives by leveling the playing field so the Land is protected and the

Interested Public has equal opportunity to meet with, provide input and collaborate with BLM on all issues.

2.2.1 Social, Economic and Cultural Considerations. In its discussion of Social, Economic and Cultural Consideration in (**2.1.1**), BLM claims that *"An environmental assessment is prepared for most grazing decisions."* However, as these proposed regulations contemplate, the Interested Public will be excluded from the permit renewal process and other steps where significant actions may be taken with regard to livestock grazing. The proposed regulations are vague and do not offer any clear statement that NEPA will be used in these decision-making processes. BLM claims it needs to revise the regulations at §4110.3-3 in order to ensure NEPA compliance and consistency in analyzing social, economic and cultural effects.

NEPA (40CFR1508.8) recognizes that the analysis of effects must include ecological, aesthetic, historic, cultural, economic, social, or health. BLM has clouded the distinction between "cultural" as applied to historical features such as buildings, artifacts, paleontological resources with societal lifestyle issues, in particular, with an abstraction called "lifeways". This distinction needs to be clearly drawn. It appears BLM is trying to draw in "lifestyle" or "lifeways" as some sort of cultural feature that is given protection by the cultural preservation laws it cites and SHPOs. This is not the intent of these laws or NEPA. If it were, would not "lifestyles" or "lifeways" other than livestock production also deserve protection, consideration and analysis?

NEPA, at 40 CFR 1501.2 (b) states that federal agencies must *"Identify environmental effects and values in adequate detail so they can be compared to economic and technical analysis."* MUSYA, clearly describing Congress' intentions towards good stewardship, at 16 CFR 531(a) states that *"Multiple use means: the management of all the various surface renewable resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and condition; that some land will be used for less than all the resources; … without permanent impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combinations of uses that will give the greatest dollar return or the greatest unit output."*

Other than asserting in various ways that continued livestock grazing at current levels provides for preservation of rural values and lifestyles, BLM generally does not provide any economic analysis of the costs and benefits of public lands livestock grazing and its contribution to local and regional economies. It does not analyze the values of uses foregone in favor of livestock grazing and its infrastructure. See the 16 Environmental Assessments we have referenced from Utah and Colorado for examples of this failure. In addition, refer to the detailed and quantitative analysis by Dr. Powers in (Wuerthner and Matteson 2002).

This general approach hardly passes the NEPA test of "taking a hard look". The Department of Interior should ensure that all the intent and provisions of NEPA, FLPMA, CWA, ESA and other Federal Laws pertaining to actions on our Public Lands

are fully analyzed by issuing a Directive in that regard. An amendment of regulation is hardly necessary as these requirements already exist.

Economic analyses conducted by BLM under NEPA should include:

- costs of BLM administration
- costs of installation and maintenance of range improvements borne by BLM and/or funded by county range improvement funds
- grazing fees collected and their distribution to various entities
- grazing fees collected and net return to BLM and the American people
- value of livestock grazing gross revenue to the permittee at current market rates
- value of wildlife-associated recreation (DOI 2002)
- loss in value of wildlife associated recreation to livestock grazing by using equivalent AUMS consumed by livestock as applied to wildlife needs (AUMs) and economic benefits
- cost of soil erosion and loss of groundwater recharge and streamflow
- cost of water pollution
- the net contribution of the individual livestock operations under consideration to the county and regional economy
- compare the individual livestock operation in dollars and jobs to the local, state and regional economy and report what percentage BLM lands and the Duck Creek allotment comprise of this total
- compare these various economic values with other economic and employment sectors at those local,state and regional levels.

2.2.2 Implementation of Changes in Grazing Use. Here, BLM proposes to limit changes in Active Use by modifying §4110.3-3 to require that changes in stocking rates be phased in over five years to *"lessen sudden adverse economic effect(s) that may arise from a reduction, or to allow time to plan livestock management changes or to adjust herd size."* Once again, BLM comes down on the side of permittees rather than the needs of the land. It intentionally biases the regulation to limit protection of the land and favor permittees. If the land fails, then the permittees will fail. However, by grazing at levels the ecosystem can sustain, permittees may be able to graze at these levels that are lower than today over the longer term. The sooner recovery of these damaged lands is allowed to occur, the sooner a stable, sustainable level of use may occur.

This phase-in limitation on changes in use is reflective of BLM: (a) continuing to overstock the land with livestock by not doing capacity analysis and studies, while allocating unsustainable levels of forage consumption to livestock; (b) failing to recognize that vegetation production in these arid systems varies over a wide range from year to year in response to precipitation; (c) that grazing during drought and at unsustainable levels reduces productivity and the plant community and soils can take decades or more to recover; and (d) ignores the need for long-term rest to allow for recovery.

These factors have already been discussed in these comments and clearly demonstrate that grazing use below 25 – 30% is best. Levels exceeding this in arid systems are

damaging to the productivity of the land as well as creating hardships on permittees from the need to destock during dry years. The proposed regulation will tie the hands of BLM to manage in a timely manner during below average year to match use with available forage. We have noted the tendency of BLM in Idaho's Jarbidge Resource Area to grant temporary use of "excess" forage on an annual basis, nearly doubling AUMs allocated to livestock. That has been an annual occurrence for nearly 10 years, even during the several years of severe drought experienced there. It appears BLM is more interested in these proposed changes to limiting downward adjustments, while allowing annual doublings of use if, perchance, a normal or wet year occurs rather than allowing that unusual pulse of growth to be used to help heal the land. Allowing TNR, however, can keep the land locked in a degraded condition by removing the additional growth that could lead to recovery of the plant community and protection of the soil.

BLM admits in the DEIS that it seldom makes changes to stocking rates, instead relying on changes to timing and duration of grazing. If numbers are held constant, these do constitute changes to stocking rate and therefore would also be subject to this proposed change.

McLean and Tisdale (1972) documented that overgrazed ranges in rough fescue and ponderosa pine types recovered to excellent condition with 20 to 40 years of complete rest from livestock. In exclosures, after 10 years, little change in plant composition had occurred. Anderson and Inouye (2001) showed that, while slow, recovery of perennial grasses was occurring after 45 years of rest at Idaho National Engineering and Environmental Laboratory. Yet, BLM fails to consider long-term rest in its alternatives. Long-term rest fits well into the multiple use concept. It provides some of what the public expects by allowing them to recreate in native communities recovering or free from livestock damage, allows wildlife to flourish and watersheds to become healthy.

2.2.3 Range Improvement Ownership. Here, BLM proposes to revise §4210.3-2(b) to allow permittees to share ownership of structural range improvements in proportion to their initial contribution to on-the-ground project development and construction costs. What gets left out of the equation here is the fact that permittees get to graze public lands at about 10% of market value, half of which goes back to the counties to pay for range improvements, which in turn benefit permittees. The taxpayer is not only providing a direct subsidy to permittees of nearly 95%, but is now being asked to countenance encumbering the land in such a way that BLM will have its hands tied on grazing decisions. After all, these reduced grazing fees are partly in return for permittees installing and maintaining range improvements. Let's not also forget that under Cooperative Agreements, BLM provides needed support in a variety of ways, including materials, surveys etc.

By having an ownership interest, permittees can throw up legal roadblocks to BLM decisions such as closing allotments, reducing numbers, transferring preferences. What if a permit is canceled due to violation of terms and conditions? BLM may be unable to lease this permit to another permittee due to the ownership encumbrance on range improvements. The additional recordkeeping of deeds, titles, recordings and so forth will add costs and administrative paper-work burdens. BLM proposes this

change to stimulate greater permittee participation in "range improvements". However, BLM admits in the DEIS, that under the prior regulations which allowed this same provision, permittee investments in structural range improvements began to decline in the early 1980's. This was some 15 years prior to Rangeland Reform. Under the current regulations we continue to see permittees investing in structural range improvements such as wells, pipelines, water developments and fences. Private money is being provided for seeding and vegetation treatments. BLM has not justified this proposed change on any firm basis of need.

As the science clearly demonstrates, these types of range improvements and associated grazing systems do not improve range condition or productivity. BLM must provide an analysis in its EIS that analyzes past range improvement projects across the west. This analysis should include:

- Annual summary of types and numbers of projects by state
- Annual summary of project costs by state adjusted to current dollars
- Evaluate of changes in the vegetation and soils of the affected areas when compared to prior years by using their long-term quantitative range monitoring data.

Before BLM writes regulations more friendly to these type of improvements, it has the burden of scientifically demonstrating their costs and benefits to the native plant community, soils, water quality and wildlife. See Jacobs (1991) and Austin (2003a, 2003b) for discussions of the implications of water developments and their impacts to wildlife.

2.2.4 Cooperation with State, Local, and County Established Grazing Boards. The current regulations allow BLM to cooperate with State, County and Local agencies in administering the laws related to livestock, livestock diseases, sanitation and weeds. The proposed regulatory change to §4120.5-2 does nothing to enhance the cooperation with these public agencies. BLM has provided no evidence that cooperation with individual permittees, their interests or any group or entity are currently limited. Any individual or group can become an interested public under the current regulations and engage in consultation with BLM.

The intent of this change is clear. Its goal is to interpose livestock interests between BLM and the interested public, in particular, environmental organizations by stacking the deck even more in favor of livestock interests. This also places an additional unneeded burden on BLM. It favors permittees by raising their private vested interests to the level of government agencies, which are supposed to represent the interests of all the people, not just those with a vested financial interest. Where are the provisions requiring cooperation with local environmental groups and wildlife supporters? Permittees already can propose projects and they can be sent out for public review by all parties. There can be no reason for this change other than giving livestock producers another seat at the table in addition to the one each permittee already has, but the public gets no other seat at the table, instead BLM pulls the chair out from under the public.

2.2.5 Review of Biological Assessments and Evaluations. In proposing this change to §4130.3-3, BLM appears to be modifying language to favor permittees over

other interests. In (**2.1.5**), BLM states, *"Although the current regulations do not specifically mention any role for the permittee or lessee in the preparation of biological assessments or evaluations, such assessments or evaluations are reports used as a basis for grazing decisions."* While later in that paragraph, BLM admits the current regulations have the following requirement. *"BLM is required to provide affected permittees or lessees, as well as States having lands or responsibility for managing resources within the affected area, and the the interested public, with an opportunity to review, comment and give input during the preparation of reports that evaluate monitoring and other data that are used as a basis for making decision to increase or decrease grazing use or to change the terms and conditions of a permit or lease."*

It is clear that under present regulation, any reports that might be used to adjust livestock grazing are subject to review by all parties. BLM appears to reveal its hand in (**2.1.5**) when it states, *"Although the current regulations do not specifically mention any role for the permittee or lessee in the preparation of biological assessments or evaluations, such assessments or evaluations are reports used as a basis for grazing decision."* (emphasis added) Here, BLM seems to indicate it is troubled by lack of specific language regarding permittee participation in preparation of reports, it does not apply the same standard to the States or interested public. BLM qualifies this change with the phrase *"where practical",* indicating it will pick and choose with whom it collaborates during the preparation of BE/BAs or other reports.

BLM has done little to clarify when comment may be provided on BE/BAs. While the current rules do not mention these specifically, if BLM wants to clarify this issue, a directive could do that without encumbering the regulations. There is also a practical side to providing opportunities to comment on BE/BAs. Compare two situations. The first is when no review or comment is allowed and the BE/BA is then used as the basis for a decision. Here, a complete EA/EIS or other decision can be issued based on a flawed BE/BA. This could result in an immediate challenge to the EA/EIS due to the inadequacy of the BE/BA. Then both documents would need to be reanalyzed and released for review if the challengers prevailed. The second situation is where the BE/BA is subject to input and comment by all parties prior to BLM arriving at a decision. Review of the BE/BA or other report by interested parties could ensure its integrity prior to its use in a decision document. On the face of it, it seems that the BE/BA is the basis upon which the decision or EA/EIS stands and it would be more cost-effective to ensure its viability prior to final inclusion in the decision document, EA or EIS. This seems better than having a decision withdrawn due to an inadequate BE/BA. BLM must fully analyze which path is the more efficient and legally sufficient way to proceed.

2.2.6 Temporary Nonuse. It is critical that BLM have mechanisms for allowing long-term recovery of lands damaged by grazing. It is a positive outcome when permittees request non-use to allow recovery to happen. Under the current regulations, only 3 consecutive years of non-use may be taken. This proposal to modify §4130.2 and 4130.4 to approve temporary non-use only on a year-be-year basis increases paperwork and administrative costs to BLM. It also creates greater uncertainty for permittees who may be relying on longer term rest or reduced use of their allotment. This change makes them subject to judgemental bias or whims of BLM whereby BLM can punish a permittee by requiring the use when the permittee for whatever reason is unable to meet that requirement. It is better for the permittees and the land if

temporary non-use could be taken for the entire permit period of up to 10 years, with reconsideration at the time of permit renewal, when staff can concentrate on all the issues affecting the allotment or permit in one integrated analysis. That would provide greater efficiency in administration.

Another troubling aspect of this regulatory proposal is regarding temporary non-renewable use as described in §4130.2(h) and 4130.6-2. If a permittee requests non-use, these provisions allow BLM to permit that use to another permittee. This prevents the healing of the land and restoration of its productivity by allowing continued livestock grazing of that forage. In (**2.2.6**), BLM states that *"nonuse would only be approved by the BLM for a legitimate purpose or need to provide for: (1) natural resource conservation, enhancement or protection, including more rapid progress toward meeting resource condition objectives or attainment of rangeland health standards; or (2) the business or personal needs of the permittee or lessee."* It is certainly clear from the science that these are not separate issues. Healing of the land and restoring of its production and environmental values also benefits permittees as the economic studies we cited demonstrate. Allowing the use to be transferred prevents accomplishment of those goals. The regulation should be changed to prevent the transfer of use when the permittee with preference has requested temporary nonuse.

2.2.7 Basis for Rangeland Health Determinations. Catlin et al (2003) in their report, "Multiple Use Grazing Management in the Grand Staircase Escalante National Monument" have provided a detailed scientific and regulatory analysis of grazing management in arid lands. In that document, the authors provide various tools to assist BLM staff in making rangeland health determinations. The report also provies tools and analysis to assist BLM in determining capability and suitability and establishing stocking rates that are ecologically sustainable. The appendices of that document provide tools that refine BLM's riparian PFC assessment methodology to remove major limitations in the manner in which it is currently applied, and to provide a science-based tool for determining whether livestock grazing is the cause of failure to meet rangeland health standards. It also provides an analysis of time-controlled grazing, otherwise known as the Savory grazing method, showing it does not work.

In (**2.1.7**), BLM states that *"There are no requirements under the present regulations on how those determinations are made."* The determinations referred to are whether livestock grazing management or levels of use are significant factors in failing to achieve the standards for rangeland health. BLM proposes new regulations at §4180.2 that would require that these determinations be based on the results of standards assessments and monitoring data. However, BLM does not define the methodologies or their scientific basis. BLM does not address the use of quantitative data and statistics for measuring "significant" changes. The Catlin et al (2003) report and statistical tests should be incorporated into the DEIS.

There are many factors in determining when standards are not being met and current grazing practices are the cause. Not the least of these are the well known range science applications such as determining current forage capacity, potential and establishing stocking rates based on the physical limitations of the land, distance to water and use rates of 30% or less. When these conditions are not met, it is prima facie evidence that current grazing is the cause or failure to meet ecological criteria in the fundamentals of rangeland health.

Current regulations allow BLM to consider all its available information, not just assessments and monitoring. In fact, BLM has insufficient staff to conduct adequate monitoring and this has been the case since the Reagan era when efforts such as the SVIM studies were eliminated. So, BLM proposes monitoring and assessment it cannot carry out within a reasonable timeframe in order to delay determinations while instead leaving the timing of these efforts to the imagination. It is safe to say, grazing determinations would be delayed indefinitely under this provision.

2.2.8 Timeframe for Taking Action to Meet Rangeland Health Standards.
In (**2.1.8**), BLM lays out a seemingly long and complicated process to address situations where livestock grazing is the cause of degradation and failure to meet one or more of the FRH. For example, BLM states the *"authorized officer must – no later than the start of the next grazing year – consult, cooperate and coordinate with the permittee or lessee, the State and the interested public on possible actions to achieve standards, must complete any NEPA analysis requirements and documentation, must comply with any other applicable laws and requirements, …. Issue a proposed decision subject to protest and appeal, and must implement the appropriate action."*

Here, BLM weaves in consultation requirements and compliance with other laws and regulations in an attempt to build up a need for excessive review, consultation and input for making decisions it is empowered to make without these requirements. The proposed extension in timeframe merely seems to be a means of delaying action. For example, in many field offices, schedules for doing assessments (when established at all) extend out for nearly a decade. If BLM supposes it can make no change in management without NEPA, it is forgetting FLPMA or its ability to engage permittees to reduce stocking, rest allotments and otherwise alter grazing use to address most problems.

BLM's own land use plans show many allotments that are degraded below potential (I category allotments) and are, therefore by definition, not meeting the FRH. This knowledge is of decades-long standing and constitutes documentation that certain allotments are inherently not meeting FRH. BLM should have been using this information to begin the process of negotiating agreed upon changes with permittees to reduce stocking rates and seasons of use without any need for NEPA. BLM could also be pursuing the detailed regulatory analysis it describes above in EISs across each Resource Area to reset long term management of these allotments. Most land use plans are outdated and should be or are currently being revised. Grazing stocking levels and allotments needing total rest could be assigned for the next planning period in these documents.

While this is ongoing, of course, additional determinations can be made on individual allotments according to a schedule. Under the existing regulations, however, BLM can reduce stocking rates without NEPA or BE/BAs. Of course, permittees can appeal these decisions and obtain stays which will delay the change.

It is possible to paint a scenario in which BLM takes 10 years to get around to doing assessments in order to make a "determination", then "consults" for two years, then

engages in NEPA compliance, then issues a final decision. This means many allotments would not be addressed for 15 to 20 years. According to (**2.2.8**), the proposed rule (§4180.1) would *"provide for implementation of appropriate action no later than the start of the next grazing year after completing all consultation and compliance with other laws and regulations."* On top of that, BLM would modify §4180.2(c) *to "require the BLM to formulate, propose, and analyze appropriate actions to address the failure to meet the rangeland health standards or to conform to the guidelines for grazing management no later than 24 months after the determination."* The years add up.

It is clear that BLM needs to clarify the regulations to allow the authorized officer to immediately reduce stocking rates or close allotments to livestock in order to meet the FRH. Otherwise, the intent of the regulations at 4180 will never be met.

2.2.10 Definition of Preference, Permitted Use and Active Use. Removal of the term "conservation use" from §4100.0-5 may constitute housecleaning, but issuing new regulations to accomplish this hardly seems necessary.

The change in definition of "preference" is troubling. Currently, "preference" means a priority position against others for the purpose of receiving a permit. This priority is attached to base property owned by the permittee. The new definition would redefine "preference" as *"the total number of animal unit months on public lands and attached to base property owned by a permittee, lessee, or an applicant for a permit or lease."* This redefinition allocates forage to that base property and appears to be a means of adding value to the base property for obtaining loans or other purposes rather than just giving the permittee or applicant a priority. This could confound BLM in changing or transferring permits because, if enacted, the permittee could claim ownership in the forage on the public lands just based on this definition. Even though it is clear that permittees have no right, title or interest in the public lands and its forage, this could cloud that issue and result in more attempts by livestock producers to establish property rights. This is unacceptable. BLM also needs to address the concept of "grazing associations" which are generally not incorporated or licensed in any way as legal entities. What are they, clubs? Coffee drinking associations? Many of these individual members may not even have base property. Perhaps those without base property should be paying sub-leasing prices for grazing. Those are about triple normal fees.

The change in definition of "active use" in combination with the re-definition of preference is especially troubling. The proposed regulation intends to modify this definition to be, *"that portion of the grazing preference that is available for livestock grazing use based on rangeland carrying capacity and resource conditions in an allotment under a permit or lease, and that is not in suspension."* The intent of this change appears to be to reallocate forage that was in suspension or conservation use or intended for land recovery or wildlife use to active use by livestock by merely changing a definition. Rather, BLM should be engaging in an analysis of carrying capacity and allocating forage to livestock at sustainable levels while protecting watersheds and wildlife. Unless BLM intends to carry out a program of determining current carrying capacity using the best available science we have as we have proposed, this is the only possible reading of this proposed definition.

Then, without specificity as to what it really intends, BLM proposes to replace the term "permitted use" with "grazing preference", "preference", or "active use" depending upon the regulatory context. This appears to be another means of hiding efforts to re-allocate forage to livestock by changing contexts within the regulations. It is unacceptable and BLM must clearly and exhaustively examine the effects of these proposed changes to the numbers of livestock on the ground.

A problem of significance here is that BLM discusses active use of forage amounts based on carrying capacity and conditions in an allotment. Yet BLM has not systematically determined what the current forage production and carrying capacity of the lands are using methods accepted by the scientific community. This information is essential in establishing livestock use levels. By failing to do this, BLM continues to ignore these limitations which are obvious to objective range scientists and have been confirmed to Western Watersheds Project by a number of leading University Range Science Professors and Agency Professionals, whose names we cannot reveal.

These changes may seem innocent on the surface, but can be misused in numerous ways. They can allow increases in grazing use on depleted land by refusing to determine current grazing capacity. This is in order to retain a preference established in some poorly documented fashion decades ago that bears no resemblance to current condition on the ground. By having preference levels far in excess of the current capacity of the land, it becomes easy for land managers to increase active use without accurate and current capacity determinations. That is where "permitted use" comes in. It distinguishes between an out-dated "preference" and current conditions. The terms introduced in 1995 were a reasonable attempt to define differences. The proposed change will cloud that difference. What is needed is a requirement to determine carrying capacity on a regular basis prior to permit renewal by use of field studies. Then the "preference" as applied to an implied forage amount should be redefined to mean current carrying capacity following allocations to wildlife, watershed protection and land recovery. In addition, prior to permit renewal, permittees should be required to have management plans that include their grazing on private land and public land that demonstrates they individually have the forage available to support their planned operation when not grazing public lands and/or when dry, or drought years occur and public lands need rest.

When permits are transferred or renewed, or land use plans revised, preference levels should be changed to reflect this current capacity of the land.

2.2.11 Definition and Role of the Interested Public. In (**2.1.11**) BLM points out that under present regulations, *"whenever BLM is required to consult, cooperate and coordinate with or seek review and comment from affected permittees or lessees or the State having lands or responsible for managing resources within the area, current regulations also require doing so with the interested public."* Now BLM wishes to change this broad, inclusive definition to exclude the public, the American people, to whom these lands belong, in order to hide its dealings with permittees from public scrutiny and input.

In (**2.2.11**) BLM lists 10 occasions under the current regulations in which it engages in consultation with the interested public. <u>The proposed regulatory changes eliminate 6 of those opportunities.</u> There is also an inherent conflict in the proposal. On the

one hand, BLM states it will retain requirements for consultation, cooperation and coordination with the interested public for *"Apportioning additional forage on BLM managed lands"*, yet would eliminate that requirement for changing active use or issuing temporary non-renewable grazing permits. How is one possible without the other?

BLM proposes excluding the interested public from participating in consultation on actions which would: (a) change allotment boundaries; (b) change active use; (c) issue emergency modifications; (d) issue or renewing grazing permits; (e) modifying grazing permits or leases; and (f) issue temporary nonrenewable grazing permits. All of these actions can have significant impacts on the public land. Yet BLM excludes the public while retaining this consultation with permittees. This has all the appearance of shutting out legitimate discourse with those members of the public who have an expressed interest and concern in these matters. There is no guarantee that NEPA analysis or formal decisions subject to review will take place on any or all of these occasions and if not, the public will have effectively been banned from participating in those decisions.

These are the lands of the American people, not the exclusive property of the permittees, although over the decades, we have seen numerous moves by livestock producers and their allies to obtain title to our public lands, national forests and parks. The amazing part of all this is that BLM is proposing rules changes to advance the cause of this conservative, Wise-Use agenda. This is especially egregious when you consider that the people who are being favored by these proposed rules changes are the very ones who wish for privatization of public lands, doing away with BLM, the Forest Service, the Park Service and our public assets, so they can return to the pre-Taylor Grazing Act system of fiefdoms, yet BLM allies itself with the enemy while shutting out the public. This is outrageous!

Any citizen in the United States should be allowed to be an interested public when they express that interest, regardless of where they live, however remote. Anyone requesting to be in interested public on a particular grazing allotment should automatically have standing. They should be informed of these pending actions so they can participate when they wish on those issues they wish. With today's electronic communication, this is an easy task, requiring no postage, no paper and simultaneous communication with as many individuals as needed.

2.2.12 Water Rights. BLM proposes to change §4120.3-9 to allow permittees to obtain water rights on BLM lands for livestock watering purposes. This issue goes hand-in-hand with provision (**2.2.3**) Range Improvement Ownership. Granting ownership of water rights on public lands to these private interests will eliminate BLM's ability to regulate grazing on these lands. If, for example, BLM has a permittee that violates terms and conditions or the land is degraded to the extent it needs long-term rest, BLM will be over a barrel. It can't then use the water for reclamation, wildlife, or for permit issuance to other grazing permittees without first settling with the current permittee who has the right. This could prevent BLM enforcement of the Standards and Guidelines. It could have the effect of all existing water sources on public land being filed for by permittees. This could effectively tie up water for the

future, create major legal and administrative costs and delays in implementation of projects that can benefit the public interest.

2.2.13 Satisfactory Performance of Permittee or Lessee. BLM has failed to provide any rationale for why the changes to §4110.1 and 4130.1-1 are necessary. What problems have occurred in the past due to the language as it is currently written? BLM should provide a breakdown of the types of problems and their frequencies that have been occurring to clarify and perhaps, justify this proposed change.

2.2.14 Changes in Grazing Use Within the Terms and Conditions of Permit or Lease This proposed change appears interactive with (**2.2.6**) in which active use was redefined to include suspended use and conservation use. It is immediately apparent that the proposed changes to §4130.4, *"temporary changes within the terms and conditions of the permit or lease to mean changes to the number of livestock and period of use that may be granted in any one year either: (1) in response to annual fluctuations in time and amount of forage production; or (2) to meet locally established range readiness criteria."* are a serious issue.

This change could lead to immediate activation of forage for livestock that was formerly included in suspended or conservation use. While this suspended or conservation use might be needed to restore the land and its productivity, it could be sacrificed to livestock without the public ever being notified or having the opportunity to become involved. BLM exposes its motive in (2.2.14) in its statement, *"If BLM approves the change, no formal action other than the issuance and payment of a relevant grazing fee billing would be required."* This is a naked attempt to provide permittees additional AUMs without public review or land use plan amendment. Combined with BLM's attempts to remove the public from the process, this is especially outrageous!

The issue of "range readiness" should be taken into account in current permit terms and conditions. There is no need to open up the permits to additional enforcement problems by effectively extending the grazing season by one month under the guise of "flexibility". This will just foster abuse of grazing turnout and off dates.

2.2.15 Service Charges. The increase in fees proposed for §4130.8-3 may be appropriate, but in light of the ridiculous grazing fee formula in 43 U.S.C. § 1905, if BLM were receiving fair market value for grazing privileges, as FLPMA would require (but for the outdated fee formula)**,** no other fees and this proposed rule would be unnecessary. At best this proposal is window dressing; at worst it is an evasion of the real issue. The revenues that could be generated by the suggested fees would be miniscule. Furthermore, if the agency's goal in these tentatively proposed rules is to "promote conservation," BLM should be striving to (among other things) reform the grazing fee formula to prevent the artificial and unsustainable demand for public lands forage generated by below-market grazing fees. (The evidence for this demand, as well as for the fact that federal grazing permits are under-priced, is considerable, and includes the market for subleasing of grazing privileges.) WWP recommends that the BLM initiate as part of any rule making an analysis of increasing the grazing fee to

actual market rates through a bidding process and a minimum acceptable rate equal to the average cost per AUM of private land grazing leases in each western state.

2.2.16 Prohibited Acts

BLM proposes to change §4140.1(c) to excuse public lands livestock permittees or applicants for leases or permits from especially egregious acts relating to poisons, violating the Endangered Species Act or state livestock laws unless those violations occurred on the permittee's own allotment. Given the current wave of wolf killings, poachings and unlicensed use of poisons across our public lands, many of the people who perpetrate these acts could merely continue by doing so on other land than their own allotment. This would remove a serious deterrent to these acts and should not be allowed. It is almost inconceivable what motivation, other than accommodating these rural county anti-wildlife ranchers, that BLM could possibly have in considering such a pass to violators.

2.2.17 Grazing Use Pending Resolution of Appeals When Decision has been Stayed. In the current environment of Appropriation Riders that exempt BLM from requirements to do NEPA in order to renew permits, a provision such as this seems unnecessary. In addition, BLM has not cited statistics to support that this is a problem. BLM should provide a summary showing the results of application of the existing law. That summary could include facts such as:

- Number of permit renewal decisions issued by year and by state
- Number of those decisions appealed by permittees, others
- Number of stays granted to permittees, others.

The fact is that when BLM issues decisions changing grazing use levels or preferences by reducing grazing or instituting quantitative standards of performance, permittees appeal readily and often and obtain stays. This results in continuation of the status quo and ongoing damage. The regulations should allow decisions implementing standards or reducing stocking rates to go into effect immediately in order to protect the land. Increases in use should not be granted immediately on appeal and stay due to the inherent risk to the land.

Changing the regulations to allow continuation of temporary nonrenewable use is unacceptable. TNR is intended to be only for one year. Exempting that from current stay requirements could result in severe resource degradation, given IBLA/OHA's inability to address appeals and stays in a timely manner. It is not uncommon for cases to drag out for five to ten years without a decision. This would result in tying BLM's hands and allowing excessive use on annual grasslands and from TNR permits for many years without BLM being able to stop it.

In consideration of preference transfers, these should be considered new permits. Prior to their issuance, the allotments' house should be set in order. BLM should conduct capacity surveys, condition assessments, evaluations of monitoring data and NEPA compliance and rest the allotment while the process of considering the transfer is ongoing.

2.2.18. Treatment of Biological Assessments and Evaluations in the Grazing Decision-Making Process. Removing the appeal provisions for BE/BAs is not wise for the reasons pointed out in our comments on **2.2.5**.

3.2 Physiographic Setting. The DEIS discusses the physiographic setting of the various environments occurring on western public lands. A key omission is any discussion of the role of microphytic, or biological crusts. Our comments include a discussion on this topic below.

3.3 Drought. The DEIS discusses drought and the consequences of drought. Our review in Section 2.0 of these comments discusses the implications of drought and drier than normal years on plant production, stocking rates and management. BLM must include more thorough discussions of grazing management principles during these condition and provide regulatory requirements that ensure destocking during drier than normal years, total rest during drought and time for full recovery following drought. Permittees should be required to submit drought management plans to demonstrate that their livestock production operations will be stable during these conditions by providing information on amount of grazable land, irrigated hay production, type of operation and an analysis of how the permittee plans to manage in order to remain a viable permittee.

3.4 Grazing Administration. BLM omits reference to Federal Advisory Committee Act (FACA), given its desire to establish grazing boards and weight the process in the favor of livestock permittees. FACA should be invoked to ensure that fair consultation is occurring.

3.4.1 Issuing, Modifying or Renewing Permits or Leases. BLM in establishing the Purpose and Need for regulatory change has indicated the necessity to make administration of permits more efficient. The motive for this is clearly to shut out the voice of the interested public, who are appealing and litigating BLM decisions that do not obey the law and result in land degradation. Rather than force compliance with the law, BLM wants to change the law. BLM claims it has processed over 10,000 permits and issued over 13,000 permits, some under Annual Appropriation Acts. BLM should break down these numbers to show what percent of permits outstanding were renewed each year, how many were renewed under these "riders", how many were appealed (see discussion of this analysis previous). This would help establish a more quantitative assessment of the need for change, regardless of the direction of change.

3.4.2 Implementing Changes in Grazing Us. BLM is referred to Catlin et al (2003) and Stevens et al (2002) as well as the detailed discussions these comments. The scientific and economic principles expressed in these writings should be incorporated into BLM's analysis and permit renewal process in order that appropriate adjustments in stocking rate, changes in season of use and provision for rest are exercised to bring all its allotments within capacity and restore their native biodiversity and productivity.

3.4.3. Range Improvements. BLM has placed great emphasis on structural range improvements, grazing systems and vegetation treatments for decades. Millions of dollars have gone into these efforts on the promise that livestock use would be more evenly distributed and conditions improve. BLM's own data analyzed in Table 1 shows that, in reality, condition has declined.

The DEIS acknowledged that the rate of implementation of range improvements has been declining since 1980, well before Rangeland Reform. BLM's proposal to vest permittees with property rights to structural range improvements is claimed to be to promote more interest in permittees to install more of these. Yet the data clearly show

that when the permittees had this provision in the law, the rate of implementation of improvements was declining. We have seen permittees willing to invest in pipelines, water developments and fences during the past 10 years and the ownership rights have not interfered with that.

Because BLM has placed such great emphasis on these vestings in range improvements, it is essential that it provide an analysis and summary of its historical range improvement program. That analysis and summary should include at a minimum:

- Breakdown of the number of projects (fences, wells, water troughs, ponds, pipelines, vegetation treatments, and seedings) by years and by state. This should present the breakdown in appropriate units (miles, acres and so forth).
- Breakdown of the cost of these projects by type, years and state and the portion paid by BLM or from county range improvements funds.
- Analysis of the current condition of these improvements.
- Projections of the future trend and cost for each category.

3.4.5 Authorizing Temporary Changes in Use. BLM describes the condition under which periods of rest from grazing may occur. These include *"permittee or lessee mutual agreements, allotment closures, suspension through grazing decisions, and others to achieve a variety of resource or vegetation objectives. This nonuse is not at the request of the permittee or lessee."* The DEIS should provide a summary of how many allotments/acres have been affected by each of these types of rest during each year to a period before Rangeland Reform. The ecological conditions resulting from those facilities should be reported in the form of statistics from each state. This information is necessary for BLM, the interested public and others to make an informed analysis and decision regarding proposed changes to the regulations.

3.5 Rangeland Health. In proposing to change the grazing regulations, BLM has placed major emphasis on rangeland health determinations, administrative burden, eliminating interested pubic participation in important grazing decisions, and other issues. BLM has presented some statistics regarding the numbers of allotments assessed and their condition. Because BLM argues for change to existing regulations, it must justify this need. In order to make an informed decision and analysis, BLM, the interested public and others must see more detail. Beginning prior to Rangeland Reform, in order to illustrate trends and the impact of regulatory requirements, BLM should summarize its monitoring and assessment effort. At a minimum, this analysis and summary should provide the following:

- Year and State
- No. of allotments and Acres assessed by quantitative or PFC assessment technique. Describe survey methods used.
- No. of allotments, type and number of water sources sampled for compliance with water quality standards.

- Results of monitoring, surveys or assessments in terms of their compliance or non-compliance with requirements.

In Table 1 we provided a comparison between condition categories between the RREIS (BLM 1995) and the figures reported in this Draft EIS. That comparison clearly showed a downward trend in condition. In its 2002 summary of the National Rangeland Inventory reporting system, BLM presents summary statistics on range condition and trend. BLM should clarify what is meant by the condition categories. These were defined in the RHEIS (BLM 1995) as:

- Potential Natural Community 75 – 100% of potential community
- Late Seral Community 50 – 74% of potential community
- Mid Seral Community 25 – 49% of potential community
- Early Seral Community 0 – 24% of potential community
- Unknown or Unclassified

These definitions are vague at best. There is no clarification of biodiversity or production requirements that relate to the Fundamentals of Rangeland Health. They are best characterized by the Dyksterhuis (1949) terminology of excellent, good, fair and poor range condition. It is also important for BLM to clarify that these represent "range" condition terminology directed at livestock and do not embody a particularly well defined ecological state. In essence the categories are disingenuous and misleading, fooling people into thinking conditions are better than they are. One could as easily equate them as follows:

- Potential Natural Community Up to 25% loss in potential
- Late Seral Community Up to 50% loss in potential
- Mid-Seral Community Up to 75% loss in potential
- Early Seral Community Up to nothing left

For example, by claiming a particular location is in "Late Seral" condition, it can be perceived by the uninformed that this location is in fine shape. However, if it is only at 50% of potential, which it can be and still be classed as "Late Seral", this really mean that half of its potential plant community and its productivity has been lost. The term misleads one into thinking this is an ecologically mature and well functioning community at near potential – not at half potential.

If the condition class percents given in the DEIS are standardized by omitting those lands not known, the net condition classes become:

- PNC = 6% ÷ 0.83 = 7.2% PNC
- Late Seral = 31% ÷ 0.83 = 37.3% Late Seral
- Mid Seral = 37% ÷ 0.83 = 41% Mid Seral
- Early Seral = 12% ÷ 0.83 = 14.5% Early Seral

Using these figures and the mean value for each condition category, the weighted average condition can be estimated as:

{(7.2%)*(0.875) + (37.3%)*(0.62) + (41%)*(0.37) + (14.5%)}*(0.12)}/100 = **40.4% of the potential natural community**.

Under the historical BLM designations, this is only Fair Condition and halfway from Fair to Poor. This is a shameful report card after all that has been spent on livestock management, range improvements and administration. The Figures provided in this DEIS for trend show that a majority of lands are not improving, in fact 63% are declining or static. If these figures are adjusted to factor out those lands without trend determinations, 74.9% of the trends reported in the 2002 National Rangeland Inventory are static or down. Comparing this to figures from the RRDEIS, we see that those figures are similar at 79.1%. Given the nature of these condition estimates, it is probable there is no difference in trend between today and 10 years ago when the RRDEIS was written. In addition, BLM should break out its analysis to separate lands into precipitation regimes of <12" annually and >12" annual to further explore the effects of its management on drier, vs wetter environments.

Given the overall condition of the land and the investment in livestock grazing to date, it is clear that BLM has failed to act in accordance with its mandates for sustainability, productivity and multiple use for all values. Here, it clear that the decades-long reliance on "range improvements" has not resulted in improvement, instead the result has been regression. This is because BLM, as it admits in this DEIS, almost never significantly reduces stocking rates. It only engages in other management, mostly reliance on water developments, fences, seedings with non-native species and grazing systems – which clearly have not worked.

In its discussions on vegetation, BLM has ignored the problem of livestock grazing and aspen in the west. Bartos and Campbell (1998) noted a 60% decline in aspen in the six National Forests in Utah. They state, *"Changes in the abundance of aspen dominated landscapes have occurred over the past 125+ years partly as a result of livestock grazing, wildlife use and a reduction in fires. The historical fire regime was altered in the mid-1800's after European settlement. Fire exclusion resulted from a combination of excessive grazing, timbering, and people extinguishing wildland fires. Grazing removed the fine fuels which generally carried the fires."* In another study, Bartos and Campbell (1998b) noted that 2.83 inches of water is lost when fir forests replace aspen and 7.32 inches lost when spruce replaced aspen, the authors calculated that 250 to 500 acre-feet of water/1,000 acres was lost through transpiration annually, depending on the conifer species replacing aspen. Since about 1.5 million acres of aspen have been converted to conifers in Utah, this translates to an annual loss of water for streamflow and plant production of 375,000 to 750,000 acre-feet per year. Consider the impacts of this loss west-wide.

Kay and Bartos (2000) evaluated existing aspen exclosures on the Dixie and Fishlake National Forests in Utah. These were studied to determine the effects of livestock, deer and elk on aspen regeneration and associated vegetation. Five of eight exclosures had three-part construction that provided total exclusion, livestock exclusion and combined use. Aspen within all total exclusion plots successfully regenerated without the influence of fire or other disturbance. Aspen subject to

browsing by wildlife regenerated at stem densities (2498/ha) significantly lower than on total exclusion plots (4,474/ha). On combined livestock-wildlife-use plots, most aspen failed to regenerate successfully or did so at low densities (1,012/ha). Herbivory by ungulates altered understory vegetation. Utilization by deer reduced shrubs and tall palatable forbs and favored growth of grasses. Combined use including livestock reduced native grasses and promoted introduced species and bare soil. The authors concluded that *"communities dominated by old-age or single-age trees appear to be a product of ungulate browsing, not a biological attribute of aspen… . There was no evidence that climatic variation affected aspen regeneration. Observed differences are attributed to varied histories of ungulate herbivory."*

Kay (2001) reported the results of studies 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. Kay observed that where aspen in central Nevada has been protected from grazing, aspen has maintained its position in the vegetation community and, in fact, has actually replaced sagebrush, contrary to the opinion of some that say sagebrush naturally replaces aspen. Exclosure data indicated that herbivory has 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. All aspen stands regenerated in exclosures that excluded cattle but not deer and in canyons closed to livestock. 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 is generally related to distance from water and slope. Steeper slopes or areas further from water receive 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 concludes 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 (predominant) ungulate herbivore."*

Grazing livestock in arid ecosystems significantly contributes to the spread of exotic species, including cheatgrass. The DEIS glosses over weed issues. Grazing aids the spread and establishment of alien species in three ways: 1) dispersing seeds in fur and dung (Lacey 1987); 2) opening up habitat for weedy species; and, 3) reducing competition from native species by eating them (Mack 1981, D'Antonio and Vitousek 1992). Studies that have found increased densities, cover or biomass of exotic plant species in grazed versus ungrazed sites in the western U.S. include Ohmart and Anderson (1982), Hobbs and Huenneke (1992), Green and Kaufman 1995, and Harper et al. 1996. In addition, as we have discussed, grazing destroys microphytic soils that many native plant species rely on for essential nutrients (Belnap 1995; Belsky and Gelbard 2000). Livestock grazing is clearly responsible for the spread of non-native plants. BLM and this DEIS fails its duty to analyze how its past, current and

proposed management impacts the presence or trend of weed population. It fails to analyze the impact of structural range improvements on the spread of weeds. It fails to analyze the heavy grazing use it allows, the consequent alteration in dominance between native palatable species and non-native or non-palatable species.

3.5.2 Riparian and Wetland Vegetation. BLM cites studies claiming that other methods besides livestock exclusion can restore riparian areas. In citing the GAO (1988) study, BLM conveniently omitted that GAO determined the most successful means of promoting riparian recovery was livestock exclusion. In the other studies cited, BLM claims that changes in livestock management can often be effective without expenditure for exclosure fences. It has failed to demonstrates with its own quantitative data that this is so. BLM also forgets that riparian exclosure fences are unnecessary if pastures or allotments are rested to allow recovery. BLM also fails to analyze studies and its own information to show what components of streams, springs and wetlands were affected and in what manner by the various "management" schemes. It is important for BLM to lay out what constitutes its applied management options and then show based studies of these how they improved conditions. It must address whether changes in stocking rates were implemented along with the "management" described.

BLM cites its Riparian PFC assessment efforts as demonstrating marked improvements in riparian areas. As Catlin et al (2003) and Stevens et al (2002) point out, a number of elements of this current PFC assessment process are flawed. It is highly subjective and with evident bias in the way it is applied. We have participated in assessments with BLM staff and have seen streams that are downcut and have lost their original floodplain stated to be PFC or at worst, FAR. Yet, as BLM (1993) points out, incised streams that have lost their floodplain are, by definition, not functional. See the Carter and Chard (2001) report for streams in Rich County, Utah. This effort was stimulated by BLM Salt Lake Field Office assertions that the North Fork of Sage Creek were FAR due to the highway that was adjacent. This study showed BLM's pro-permittee bias by providing its own assessments and photographs that showed those areas within the fenced highway right-of-way were in much better condition that the areas with livestock access.

In the RRDEIS, the GAO (1988) report was cited and that document pointed out that the major cause of riparian degradation on Forest Service and BLM lands was livestock grazing. It also stated that field observations in the late 1980's showed that riparian areas were in the worst condition in history and had continued to decline. Condition assessments from the RRDEIS are presented below along with values adjusted for lands that were not assessed shown in parentheses:

- PFC 15% (33%)
- Functioning at Risk 21% (46.6%)
- Non Functioning 9% (20%)
- Unknown 55%

The DEIS provides new numbers and claims that 96% of stream systems have been assessed as of October, 2001. A summary showing numbers of assessments and

miles of stream assessed by year, state and Resource Area should be provided to better inform the process. As reported in the DEIS, conditions are:

- PFC 42%
- Functioning at Risk 43%
- Non Functioning 11%
- Unknown 4%

BLM must explain whether the changes in condition as reported in the time since the RRDEIS and given to support regulatory change are based on real, or subjective data. It is especially important to show whether the 9% increase in streams in PFC between 1995 and 2001 is real, or an artifact of these subjective methods. Exclosure studies by Duff [1977, 1979]in Big Creek, Utah as well as studies cited in the DEIS have shown tremendous increases in fish populations in areas where livestock were excluded. Catlin et al (2003) and Stevens et al (2002) have demonstrated the scientific flaws in BLM's current PFC assessment methodology which omits water quality and sedimentation from its assessment. These two factors alone can eliminate or severely reduce fish populations. Sedimentation can also occur from upland erosion and affect the stream and fish populations even in areas with exclosures. PFC assessments that rely on indicators such as "greenline" sedge presence say nothing about fish habitat. BLM should report quantitative results own or state agency fish habitat surveys and fish population surveys by year and state

The DEIS fails to address the extent of streams that have been dewatered and lost due to livestock grazing, water developments and erosion. Its reported assessments only apply to streams that currently are flowing. What about all the streams that have been lost? There must be a quantitative accounting of this loss in stream miles by state.

The DEIS reports on conditions for lentic areas. Springs, seeps and wetlands have long been destroyed by livestock trampling and capturing of their water through catchments or pipelines to feed water developments. BLM reports that 51% of these were in PFC. BLM needs to summarize what they are and how many have been lost due to water developments and livestock grazing. Are they springs, seeps or wetland areas? BLM also needs to account for the acres of wetlands and riparian lost due to the elimination of these natural sources of water. An analysis of the number of springs, seeps and wetlands that have been captured, drained and placed into livestock watering facilities needs to be provided so the BLM, the interested public and others can see the extensive loss of natural water sources, particularly as BLM is designing its proposed regulations in an attempt to stimulate more water developments.

3.6 Fire and Fuels. The DEIS mentions the problem of cheatgrass and its role in fire cycles. The DEIS fails to discuss the role of livestock in spreading cheatgrass by preferentially consuming native perennial vegetation, trampling and disturbing the soil. As previously discussed in these comments, BLM has sat by and watched millions of acres convert to cheatgrass as a result of inappropriate livestock grazing. BLM should discuss the ability of lands that have not yet become dominated by cheatgrass to recover with rest from livestock which would allow restoration of

cryptogammic soils or biological crusts and the native perennial grass community [Anderson and Holte 1981; Anderson and Inouye 2001; Belnap et al 2001, Brotherson et al 1983, McLean and Tisdale 1972).

3.6.2 Understory Fire Regimes. Here, BLM shows its bias. It totally ignores the science regarding the role livestock grazing plays in shrub and forested habitats. Livestock remove the herbaceous plant community resulting in increased establishment of woody species. This changes the fire regime from beneficial "cool, ground fires" to high intensity fires. Belsky and Blumenthal (1997) reviewed the literature and showed that 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. This is exactly the condition described in USDA (1996).

A study by Kreuger and Winward (1974) showed that forest stands suffered *"retrogression"* when grazed by cattle and big-game, but big-game grazing alone did not result in significant effects. Cattle grazed areas suffered a loss of grasses. Zimmerman and Neuenschwander (1984) showed that livestock grazing in Douglas-fir communities in Idaho 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 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."* They noted these conditions make use of prescribed fire a greater risk to cause high-intensity fires.

Dodge (1972) predicted that this growing fuel accumulation would place forests at higher risk. Rummell (1951) studied densities of trees and herbaceous understory vegetation on ungrazed Meeks Table and grazed Devils Table in Washington. Herbaceous vegetation ranged from 183% to 254% greater on the ungrazed site and had 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 3291 small trees per acre."* Madany and West (1983) studied grazed and ungrazed Ponderosa pine forest in Zion National Park and found that, *"Heavy grazing by livestock and associated reduction of the herbaceous ground layer promoted the establishment of less palatable tree and shrub seedlings. Fire, however, played an important secondary role in maintaining savanna and woodland communities."* Smith et al (1997) pointed out that loss of nutrients from logging is principally replaced by soil weathering, but is much less depletive than grazing. Barnes et al (1998) found in studies of grazed and ungrazed woodlots that the highly compacted soils of the heavily grazed woodlot had lower moisture content and much lower infiltration rates than the ungrazed soils. Soil disturbance has far-reaching consequences on forest health, including reduced production and increased susceptibility to disease and insect infestation.

These cumulative effects between livestock grazing and forested vegetation have resulted in serious and costly fire-related issues and loss of wildlife habitat that are significant. Current fire issues and their costs and management across the west show that this is a significant issue. The DEIS has failed to analyze the costs of livestock

grazing in shrub and forest habitats relative to increased need for vegetation and fuels treatment as well as fire suppression.

3.6.3 Mixed Fire Regimes. In its discussion of pinyon-juniper, BLM mentions savannahs and fire intervals that existed before the introduction of livestock. The discussion leaves the reader hanging, however, because it is incomplete. Is BLM saying that pinyon and juniper have expanded because livestock eliminated millions of acres of savannah that formerly burned frequently and kept pinyon-juniper limited in its extent? Commonly, we see BLM proposing treatments to halt juniper expansion, claiming that junipers eliminate the grass. If the original pinyon-juniper was a savannah or intermingled with savannah, it seems contradictory to assert that juniper eliminates grass. It is evident and BLM implies in the DEIS that livestock have eliminated these grasslands. Is this true?

Similarly, in sagebrush habitats, whether in Basin sage or sage-steppe, the preferential grazing by livestock on herbaceous plants and the trampling and elimination of cryptogammic crusts has favored establishment of sagebrush and the loss of perennial grass cover (West 1983, Welch 2002, Welch and Criddle,2003). BLM must discuss the role of livestock in changing the dynamics and moisture characteristics of these communities on fire frequency and intensity. Research such as that by Wambolt et al 2001) should be incorporated into the analysis since emphasis is placed on sagebrush treatments on BLM lands both for fire prevention and vegetation management.

3.7.1 Upland Soils. In its discussion of the different soil types, BLM fails to address the extent of the different soil types in acres or percent of BLM lands. It fails to address the severity of erosion hazard for these soils and the implications of livestock grazing. In these comments we have described capability and suitability criteria for livestock grazing. Factors related to accelerated erosion in upland soils include soil type, ground cover and slope. It is critical for BLM to begin recognizing the need for grazing management that takes these into account. This information is available in NRCS soil surveys. As stated in the DEIS, *"Uplands on many rangeland landscapes have an extensive gully network, replacing former grass-covered swales. This has altered water flow patterns, resulting in increases in size and frequency of runoff, and sediment yields to streams."*

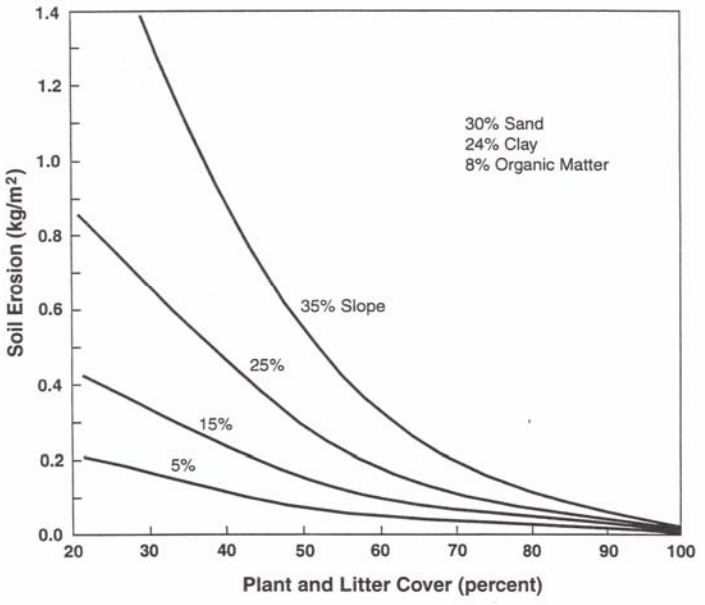


Figure 5. Erosion rate vs cover and slope

Packer (1998) documented in field experiments during his research career with the Forest Service that loss of soil in Utah and Idaho National Forest watersheds through erosion and runoff increased

as ground cover decreased. He provided recommendations for ground cover for soil types typical of the Bear River Range. At the lowest gradient of 5%, erosion begins to rapidly accelerate when ground cover drops below 60%. At 35% slope, erosion is accelerating rapidly as ground cover decreases below 100% (Figure 5).

It is interesting to see BLM admit this problem since a vast amount of public land has exactly these conditions. This geomorphic damage needs to be evaluated in view of the condition assessments presented in the DEIS for uplands which show that most uplands are not improving and are nowhere near the potential plant community. It is highly inconsistent with claims that 42% of streams are in PFC. How is this possible due to the loss of groundwater recharge, alterations in timing and duration of flows, and increased sedimentation that this statement implies. Some quantification of the land area affected and the stream miles affected by these conditions should be provided.

BLM provides a brief mention of biological soil crusts and their critical role in carbon and nitrogen fixation, soil surface stability, reduction of annual grass invasion and their role in moisture balance in soils and plant communities. BLM fails to discuss the current and potential extent of biological crusts in the different soils described or the role of livestock in eliminating or reducing these crusts over large land areas.

The DEIS does not adequately address studies that uniformly conclude that biological crusts, cryptogammic crusts or microphytic soils are central to the ecological processes protected by the Fundamentals and Standards and Guidelines. BLM also ignores the adverse role that livestock grazing has on crusts and microphytic soils and the crucial role that these play in the health of lands and the ecosystems they support. See studies by Belnap (1995), Belnap (1996), Belnap et al (1997), Belnap et al (2001), Brotherson et al (1983), Johansen (1993) and West (1983) for discussion of the role of crusts in soil and plant water balance, prevention of erosion, nutrient cycling and biodiversity. These crusts are fundamental components of properly functioning watersheds in arid regions and their role, current and potential occurrence on BLM lands must be disclosed and analyzed. These are the very values that FLMPA, the Fundaments and the Standards and Guidelines require the BLM to protect and restore through its management of the public lands.

Furthermore, BLM must consider cumulative impacts to microphytic soils as part of its NEPA obligations. Such an analysis must determine the cumulative impacts of past, present and reasonably foreseeable actions, including the impact of past and present grazing practices, road building, ORV use and surface disturbing activities on these crusts. To complete such an analysis, the agency must make a good faith effort to compare the present and past condition with the potential condition of these crusts and thereby quantify the total impacts of past grazing practices on these soils. Without such base line data, the agency cannot undertake adequate cumulative impact analysis. Where there is uncertainty, the agency must make a good faith effort to predict and model its analysis.

Publications such as Holechek et al (2001) have indicated, that depending on topography, areas of severe degradation, or “sacrifice areas” occur around water sources including water developments. These can extend over 1 mile from these sources and out further if stocking rates are too high. Based on this, a single water development can result in an area of soil compaction, erosion and severe loss of ground cover and vegetation for thousands of acres. Even this single activity across

BLM lands has been catastrophic to biological crusts. Factors such as this should be incorporated into BLM's analysis.

Finally, the DEIS states that as much as *"90% of rangeland productivity occurs in the soil. … Any activities that permanently reduce soil organic matter content will have a profound effect on rangeland health and long-term productivity."* This is an extremely important statement, but it lacks analytical context. In the DEIS, BLM states that existing permits and leases allow for 12.7 million AUMS of livestock grazing. BLM fails to discuss the implications of this annual forage removal on soils, plant communities, nutrient cycles and productivity. West (1981) provided a discussion on this topic. His literature review showed the nitrogen consumed in forage is lost to the atmosphere rather that being reincorporated into the soil. Recognizing that even greater rates of forage consumption occurred in the past, this annual removal of organic matter has constituted a major loss of organic inputs to the soil. For example, 12.7 million AUMs represents up to 12.7 billion pounds of forage, depending upon what definition is used for forage amount. BLM must demonstrate that whatever level of livestock use it allows is sustainable.

3.8.1 Riparian Hydrology. This section of the DEIS avoids mention of livestock and their role in stream and riparian damage. One cannot address stream ecosystem effects of livestock grazing without recognition of the interwoven and connected nature of watersheds, riparian zones, streams and watershed activities. Activities affecting watersheds or riparian zones also affect stream ecosystems directly, indirectly and cumulatively. Several recent reviews of livestock impacts on stream and riparian ecosystems have covered this topic in detail using hundreds of government documents and peer-reviewed scientific papers. These have included Armour et al (1991), Belsky et al, (1999), Fleischner (1994), Gregory et al (1991), Kauffmann and Kreuger (1984) and Platts (1991). The following discussion is drawn to a large degree from these references.

It is first important to understand that there is no portion of a watershed that is not connected to its riparian and stream ecosystem. It was said extremely well by Gregory et al (1991); *"More than any other ecosystem, the structure and processes of lotic ecosystems are determined by their interface with adjacent ecosystems. The narrow, ribbon-like networks of streams and rivers intricately dissect the landscape, accentuating the interaction between aquatic and surrounding terrestrial ecosystems. Along this interface, aquatic and terrestrial communities interact along steep gradients of ecosystem properties. The linear nature of lotic ecosystems enhances the importance of riparian zones in landscape ecology. River valleys connect montane headwaters with lowland terrains, providing avenues for the transfer of water, nutrients, sediment, particulate organic matter and organisms. These fluxes are not solely in a downstream direction. Nutrients, sediments and organic matter move laterally and are deposited onto floodplains, as well as being transported off the land into the stream. River valleys are important routes for the dispersal of plants and animals, both upstream and downstream, and provide corridors for migratory species."* It is this interconnectedness that is often overlooked by land managers. Thus, roads, timber harvests, livestock grazing and other watershed activities also affect streams that appear to be distant and unconnected to these activities.

Within uplands, soil, plant and animal communities developed and evolved over long periods of time and exist in a state of dynamic equilibrium with climatic and geologic forces. The soils and associated plant communities and plant litter absorb precipitation and allow it to percolate into the groundwater, reducing flooding and erosion. Animals and microorganisms work and aerate the soil and break down organic matter, maintaining the carbon and nutrient cycles upon which the ecosystem depends. The removal of vegetation and trampling by livestock denudes and compacts the soil, promoting drying, heating and alteration of the biological community. Precipitation is less effectively captured by the soil and runs off, carrying away the topsoil. In areas of the Bear River Range in northern Utah, as a result of livestock grazing, topsoil loss has approached one or two feet (Winward, 1999). The DEIS admits that many areas of BLM land have suffered severe rill and gully erosion, but does not address how many acres or how many streams have been affected or lost by this.

This alteration in the watershed results in more rapid delivery of storm or snowmelt runoff into watercourses, carrying with it increased sediment and nutrient loads. This increase in runoff reduces the amount of water infiltrating into the ground and depletes the groundwater, resulting in lowered water tables and desertification. The net result for the stream ecosystem is a change in the duration and timing of inflows and decreased summer baseflows from the loss of late season groundwater inputs.

The riparian zone creates well-defined habitats within the drier surrounding landscape. While they make up a small portion of the overall area, riparian zones are generally more productive in plant and animal biomass than the surrounding areas and are high in diversity. Kauffmann et al (1984) point out examples of riparian diversity in a study area in Oregon. Within the area, 258 stands of riparian vegetation represented 60 discrete plant communities. Cummins and Spengler (1978) showed that riparian vegetation provides up to 90% of the organic matter necessary to support headwater stream communities and Cummins (1974) that 99% of stream energy input may be imported from bordering riparian vegetation and only 1% derived from instream photosynthesis. Loss of riparian vegetation from livestock grazing reduces habitat and the food supply supporting the aquatic food chain. Woody debris derived from riparian tree and shrub communities is important in slowing the stream, reducing energy and controlling erosion. It also provides diversity of habitats in small streams, helping create pools, settling out sediment, providing substrate for invertebrates and cover for fish. In addition, riparian vegetation provides shading for the stream, consequently lowering stream temperatures and providing cover for fish.

Dissolved nutrients are transported into streams primarily in the groundwater Gregory et al (1991). Because of the riparian zone position within the watershed, it intercepts the soil solution as it passes through the rooting zone prior to entering the stream. Riparian zones also contribute seasonal pulses of dissolved constituents derived from plant litter into streams. Thus the riparian zone functions to remove nutrients and modify inputs to the stream. Peterjohn and Correll (1984) showed that riparian forests were responsible for removal of more than three-quarters of the dissolved nitrate transported from croplands into a Maryland river. Because of their unique position at the interface between terrestrial and aquatic ecosystems, riparian zones play a critical role in controlling the flow of nutrients from watersheds. Livestock grazing and elimination of riparian grasses, trees and shrubs caused a loss of this ability to absorb

nutrients. It also destroys the ability of riparian areas to filter sediments, manure, nutrients and pathogenic bacteria in surface runoff, leading to increased stream pollution.

Within streams organic inputs from the terrestrial ecosystem such as leaves, litter, woody debris, insects and photosynthesis provide the food or energy base supporting the aquatic biota. Algae, bacteria and fungi use organic substrates, nutrients and light for growth. Invertebrates process plant and other organic material, algae and microbes. Fish are adapted at various lifestages from larval to juvenile to adult to use these sources of energy in their different forms. Many other forms of life including birds and mammals also depend upon these various organisms as a food source.

Livestock can interrupt the balance of this dynamic and diverse system by: trampling and compaction of soils which increases runoff; removal of vegetation which increases temperature and promotes drying of soils; the lowering of water quality in streams; and increasing temperature in streams. Removal of streamside vegetation: reduces in-stream cover; changes stream channel morphology, shape and quality of the water column; and the structure of streambank soil. These changes result in changes in stream biota. The following paragraphs describe the direct and indirect effects of these alterations in the terrestrial ecosystem on the physical, chemical and biological components of stream ecosystems.

The removal of riparian vegetation has severe effects on stream channel characteristics. Streambank stability is reduced due to: fewer plant roots to anchor soil; less plant cover to protect the soil surface from erosion; disturbance and the shear force of trampling hooves. These result in: increased streambank sloughing, increased erosion, increased channel width and reduced depth; streambank undercuts are reduced due to streambank breakdown by sloughing and trampling; and the stream channel contains fewer meanders and gravel bars due to increased water velocity. Pools decrease in number and quality from increased sediment and loss of woody debris (Belsky et al 1999). Marcuson (1977) found average channel width in a grazed area to be 53 meters and in an adjacent ungrazed area 18.6 meters while the ungrazed area had 686 meter/km of undercut banks and the grazed area only 224 meters/km. Duff (1977, 1979) found the stream channel width in a grazed area was 173% greater than the stream channel not grazed for 8 years. Platts (1991) stated, *"When animals graze directly on streambanks, mass erosion from trampling, hoof slide and streambank collapse causes soil to move directly into the stream".*

The loss of stream channel integrity and diversity results in impacts to fish populations. For example, Marcuson (1977) studied the difference in habitat and fish populations in grazed and ungrazed stream sections. The study documented 80% more stream alteration in the grazed area than in an adjacent ungrazed area. The grazed area lost 11 acres of a 120 acre pasture. The ungrazed section produced 256 more pounds of fish per acre than the grazed section. Exclosure studies in Big Creek , Utah showed that after three years of livestock exclusion, there were 3.6 times more fish in the ungrazed section than in the grazed reach downstream (Duff 1977, 1979). Habitat studies showed the habitat inside the exclosure recovered significantly while areas outside the exclosure continued to decline under continued livestock use. Instream bank stabilization and habitat structures washed out in grazed areas but

remained functional and in place within the exclosure. Native willows showed vigor and regrowth after four years rest (Duff 1977).

Sediment load and turbidity increase from: watershed inputs; instream trampling; disturbance and erosion from denuded streambanks; reduced sediment trapping by riparian and instream vegetation; and loss of bank stability and increased peak flows from compaction. Fine sediments increase in depositional environments (pools, quiet water areas) from the increased erosion. White et al (1983) found sediment yield 20-fold higher in a grazed watershed when compared to an ungrazed watershed. USDA (1981) reported that topsoil erosion rates from grazed forest and rangeland were 4.2 tons/acre-year and 3.1 tons/acre-year compared to less than 1 ton for healthy forest and range. The Soil Survey for Rich County (USDA 1982) cited earlier also indicates that erosion rates must remain below about 1 - 3 tons/acre to maintain productivity. Trimble and Mendel (1995) estimated that peak storm runoff from a 120 ha basin in Arizona would be 2 to 3 times greater when heavily grazed than when lightly grazed. Lusby (1970, 1979) showed that exclusion of livestock in erodible soils in Colorado's Beaver Wash for 12 years resulted in decreased runoff and a 68% drop in sediment yield. The benefits to streams from this change are evident. Owen et al (1996) showed that exclusion of livestock from the stream and adjacent wooded areas on both sides resulted in a decrease of 50% in stream sediment concentration and a 40% decrease in the rate of soil erosion. It is time BLM took this type of evidence seriously and incorporated it into their management. It is clear that significant improvements in the condition of uplands, streams and riparian areas can occur given a few years of total rest from livestock.

Sediments cover and fill rocky substrates, entomb eggs and larval fish and hinder emergence of hatched fish. Water flow in gravel is impaired, developing embryos do not receive sufficient oxygen and metabolic wastes are not flushed. Foraging succes of aquatic organisms is reduced, fish migration can be disrupted, gill and respiratory systems of invertebrates and fish can be impaired. Species composition and numbers of invertebrates are changed by increased sedimentation and resultant habitat changes. Pools can be filled, dam and reservoir capacity reduced and filtration costs for domestic water supplies increased (Belsky et al 1999). Mortality for rainbow trout can exceed 75% when water column sediment concentrations approached 200 ppm. When sediment approaches 30% of substrate, <25% of eggs develop to emergence compared to >75% at sediment fractions <20% (Armour et al 1991).

Overland flow increases due to reduced water infiltration into soils from compaction and loss of ground cover. This increases sheet and rill erosion and flooding. Groundwater recharge is reduced and the water table is lowered. Peak flows increase from larger runoff volumes flowing directly into the channel. Higher peak flows increase water velocity due to reduced resistance from streambank and instream vegetation and woody debris. The increased erosive energy results in downcutting, removal of submerged vegetation and woody debris for pool formation and reduced habitat diversity. Summer and late season flows are decreased due to less water stored in soil and lowered water table. The end result is loss of aquatic and riparian species, perennial streams become ephemeral and ephemeral streams are lost (Belsky et al, 1999).

3.8.2 Water Quality. BLM obfuscates around the true impacts of livestock on water quality and fails to address those impacts. It fails to discuss the mechanisms and scope of livestock impairment of water quality. The Environmental Defense fund summarized statistics from the 1997 U.S. Department of Agriculture Census of Agriculture (EDF 2000). The amount of animal manure and urine generated in the United States on an annul basis is staggering. Table 6 provides a summary of the waste generated and the amounts of nitrogen and phosphorous contained in that waste by type of livestock. A further summary of livestock waste produced in the eleven western states is shown in Table 7. Cattle are by far the largest generators of waste, producing about 3.5 tons/year for every man, woman and child in the U.S.

Table 6. Summary of Animal Wastes in the United States

Livestock Type	Number	Waste tons/yr	Nitrogen in Waste tons/yr	Phosphorous in Waste tons/yr
Hogs	57,450,288	110,000,000	650,000	225,000
Cattle	99,275,900	750,000,000	4,100,000	1,000,000
Poultry	1,316,425,230	50,000,000	650,000	205,000
Sheep	7,588,377	3,000,000	32,000	6,500
Total	1,480,739,795	913,000,000	5,432,000	1,436,500

Table 7. Livestock Waste Generated in the 11 Western States

State	Cattle Waste tons/yr	Sheep Waste tons/yr	Hog Waste tons/yr	Poultry Waste tons/yr
Arizona	6,900,000	30,000	17,000	400
California	51,000,000	310,000	380,000	2,800,000
Colorado	19,000,000	230,000	850,000	1,600
Idaho	15,000,000	100,000	55,000	820
Montana	19,000,000	170,000	290,000	5,800
Nevada	4,100,000	36,000	2,300	210
New Mexico	13,000,000	120,000	11,000	540
Oregon	11,000,000	110,000	60,000	78,000
Utah	7,000,000	170,000	550,000	21,000
Washington	11,000,000	21,000	69,000	230,000
Wyoming	11,000,000	280,000	150,000	520
Totals	**168,000,000**	**1,577,000**	**2,434,300**	**3,138,890**

Cattle waste exceeds all others by approximately 100-fold in these states and the total waste generated by all forms of livestock comprises about 18% of the national livestock waste stream.

In their 1992 National Water Quality Inventory Reports to Congress, eighteen states reported on agricultural non-point pollution by specific categories. These categories and their percent of agriculturally impaired stream miles were feedlots (26%), rangeland (25%), irrigated cropland (42%) and non-irrigated cropland (31%). Manure accounts for significant percentages of the nitrogen and phosphorous inputs to watersheds across the country. For example, in the western United States, manure accounted for 39 percent of phosphorous and 53 percent of nitrogen input to streams. Statistical studies also indicated that increases in stream loadings of these nutrients were correlated with increases in the concentration of livestock populations in the watersheds (GAO 1995).

Public concern has been raised by the occurrence of drinking water contamination, fish kills, shellfish contamination, swimming advisories, nuisance odors and the links of these problems to agricultural practices. According to EPA (1998a), livestock feeding operation can cause a range of environmental and public health problems, including oxygen depletion and disease transmission in surface water, pathogens and nutrient contamination in surface and ground water, methane emissions to the air, and excessive buildup of toxins, metals and nutrients in soil. Feeding operations have also been identified as substantial contributors of nutrients (e.g. nitrogen and phosphorous) in water bodies that have experienced severe anoxia (i.e., low levels of dissolved oxygen) or outbreaks of microbes, such as Pfiesteria piscidia. In 1991, a billion fish died from a Pfiesteria bloom in North Carolina's Neuse River Estuary (Burkholder 1999).

EPA efforts to address environmental and health concerns from livestock feeding operations began in the 1970's. These efforts have included issuing permits under the Clean Water Act and promoting voluntary efforts among livestock producers to limit pollution. These efforts have not worked, the problem persists and has intensified as the size and numbers of these operations have increased. Evidence suggests that EPA's regulatory and voluntary efforts to date have been insufficient to solve the environmental and health problems associated with livestock feeding operations. On our public lands, heavy concentrations of livestock occur around water developments, in and around streams, springs and wetlands. Agricultural practices in the United States are estimated to contribute to the impairment of 60 percent of the nation's surveyed rivers and streams; 50 percent of the Nation's surveyed lakes, ponds, and reservoirs; and 34% of the Nation's surveyed estuaries..." (EPA 1998a).

Livestock grazed on public lands amount to defacto concentrated animal feeding operations, yet permittees escape regulation and attention by BLM, the States or EPA. (Jacobs 1991; Wuerthner and Matteson 2002) provide numerous photographs of these livestock concentrations and document their effects on water bodies. When Ratliff and Keeports (2000) sampled water bodies in BLM's Carico Lake Allotment in Nevada, they found severe degradation of water bodies from livestock trampling and fecal coliform bacteria. It is clear that when agencies actually monitor water quality, livestock pollution and exceedances of standards are readily documented. This is why BLM obfuscates around this issue and as the EAs we referenced in Utah and Colorado show, claims water bodies meet criteria because they are not listed on the states 303(d) list. This is BLM's way of denying a well known problem so they don't have to deal with it. If they did, livestock would have to be removed from proximity to water

bodies and stocking rates reduced across the board. These changes would have to be accompanied by much more intensive management by livestock producers rather than the "laissez faire" management of today.

The Federal government owns approximately 316 million acres of land in the 11 contiguous western states. Of these, 174 million acres of Bureau of Land Management land (Carlson and Horning, 1992) and 95 million acres of Forest Service (FS) land are grazed by livestock (USDA 1996b). In addition, 212 million private acres are grazed by livestock (Armour et al 1991). Livestock grazed on BLM lands in 1994 included 7,639,992 cattle and horses and 8,587,695 sheep and goats (BLM 1996). Animals grazed on Forest Service land in 1989 included 1,150,565 cattle, horses and burros and 1,035,472 sheep and goats (USDA 1990). These constitute a major source of water pollution both on federal and private lands in the west.

Armour et al (1991) presented startling figures on watershed, wildlife habitat and riparian conditions. According to their analysis, 52 million acres of big game habitat, 100 million acres of small game and non-game habitat on BLM lands have declined in quality and 19,000 miles of sport fishing streams have declined due to land management practices including livestock grazing. They indicate similar losses on western National Forests (41 million acres) and private rangeland (134 million acres.) Fleischner (1994) pointed out that the ecological costs of livestock grazing include loss of biodiversity, declining populations, disruption of ecosystem functions, changes in community organization and change in the physical characteristics of terrestrial and aquatic habitats. Platts (1991) stated, *"Many streams in the west are in their present degraded condition partly because many small annual effects have accumulated to become major detriments to fisheries; western streams reflect a century of these activities. The literature well demonstrates, however, that improper livestock grazing degrades streams and their riparian habitats."*

Nutrient concentrations increase as a result of runoff from disturbed watersheds, livestock urine and manure deposited on the watershed and in the stream. Nutrients are concentrated in reduced quantities of water (Belsky et al 1999). Saxon et al (1983) documented increases in runoff from more heavily grazed pastures when compared to those with less pressure. They suggested a linear relationship between runoff volume and nutrient loss. Hubbard et al (1987) studied runoff from land application of dairy cattle wastes. Nutrient concentrations in runoff were directly related to the application rate of dairy wastes. Schepers et al (1982) found that precipitation, stocking rate, hydrologic characteristics and sediment content in runoff were directly related to nutrient and chemical outputs.

The widening of stream channels, lowered summer water flows, loss of streamside vegetation, undercut banks and their shading effect result in warming of the water due to increased solar exposure. Removal of streamside vegetation in the hot, arid west can result in stream water temps >85 F (Armour et al 1991) Claire and Storch (1983) cited in Platts (1991) found that willow cover in an ungrazed area within a livestock exclosure provided 75% more shade to the stream than was found in the adjacent grazed area where willows were less abundant. Streams with little or no vegetative canopy are very susceptible to the formation of anchor ice Platts (1991).

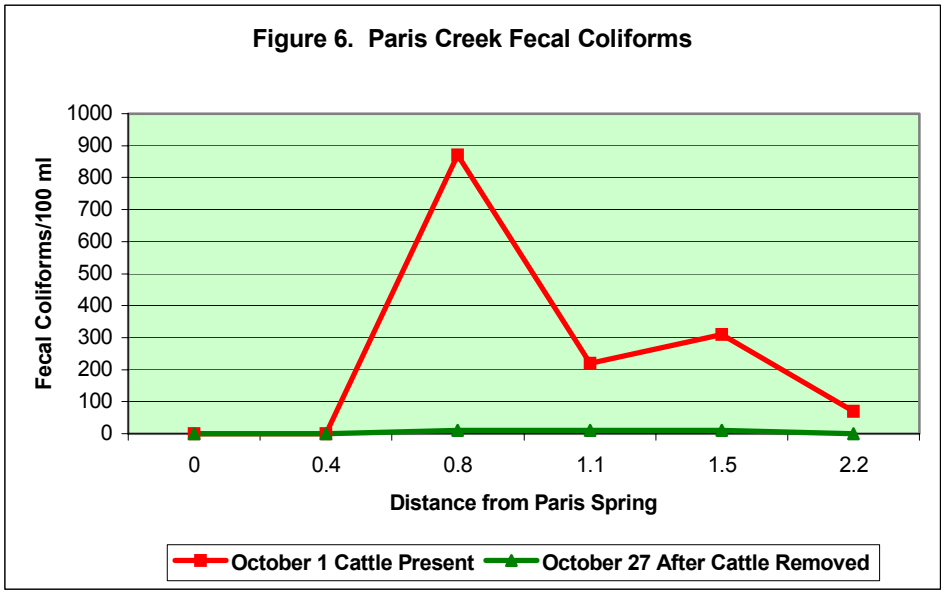
Impacts of increased temperature include increased evaporation and salinity and a poor to lethal environment for salmonids and other temperature sensistive cold-water species. Fish growth is reduced due to an increased metabolic rate and supression in appetite. High temperatures can be acutely lethal, promote disease because of increased stress, adversely impact spawning and reproductive success and impede growth and migration (Armour et al 1991). These factors and increased competition from warm water fish which are more temperature tolerant can bring a shift from salmonids to non-game fish. Belsky et al (1991).

Dissolved oxygen levels decline due to higher water temperatures which lower the oxygen holding capacity of water. Algal blooms deplete oxygen by respiration at night or high oxygen demand for decomposition of algae and fecal material. This lowered oxygen environment means insufficient oxygen in spawning gravels, reduced rate of food consumption, growth and survival of salmonids and other aquatic species, especially at their early life stages (Belsky et al 1999).

Pell (1997) summarized the major pathogens and health effects associated with cattle wastes. Numerous organisms causing health effects in humans from gasteroenteritis to death were discussed. Protozoan species including Cryptosporidium and Giardia; bacteria species including Salmonella, Ecoli O157:H7, Brucella, Leptospira, Chlamydia, Rickettsia, Listeria, Yersinia, and others were discussed. Cryptosporidium oocysts in the Milwaukee water supply in 1993 affected 403,000 people. E. Coli O157:H7 is of concern because many outbreaks have been traced to ground beef and raw milk. E. coli O157:H7 can lead to kidney failure and death in some individuals. Pell (1997) said, *"Aside from the problem of disease transmission among animals, more than 150 pathogens can cause zoonotic infections (from animals to humans)."*

Fecal coliform bacteria are a group of bacteria that reside in the intestinal tract of warm-blooded animals and are used as indicators of water pollution related to waterborne disease (EPA 1976). 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 (Howard et al 1983).

In a study conducted on Paris Creek in the Bear River Range, Idaho we looked at patterns of fecal coliform distribution before and after cattle were present as well as upstream and downstream of areas grazed by cattle (Carter 1999; Carter 2001; Wuerthner and Matteson 2002). Paris Creek arises as a spring and flows through an ungrazed portion of the Forest into a cattle allotment and private grazing land. Downstream of these grazed areas, Paris Creek passes into private property where livestock are excluded. Data was collected on two dates, when cattle were present (10/1/98) and after they were removed on 10/27/98 (Figure 6). During the 10/1/98 sample, approximately 100 cattle were present in the pasture with a smaller number present on the private land. The area occupied by cattle was between miles 0.8 and 1.5. Upstream and downstream, cattle were excluded. The pattern of fecal contamination clearly shows that when cattle are present, fecal coliform levels are elevated above background, and after they are removed, fecal coliform numbers decline. During both periods, samples upstream of livestock were negative for fecal coliforms.



The DEIS cites BLM's strategy for meeting water quality standards. These include BMPs, monitoring of BMPs and monitoring of water quality. In the many BLM grazing decisions we have reviewed, BLM consistently asserts that since no water bodies are on the State 303(d) list, water quality meets standards. This was the case in the 16 EAs we have cited from Utah and Colorado. These provides clear evidence that BLM has no intention of assessing water quality pollution issued related to livestock grazing. The Carico Lakes example is a rare exception. Even knowing the severe impairment to water quality that results, BLM continues to permit livestock to dwell in streams and claim compliance. In our protest of BLM's EA for livestock grazing in Rich County, Utah we analyzed this issue (WWP 7/4/01). While BLM claimed water quality met standards because none of the streams were on the 303(d) list, our review of state and EPA databases showed there were no monitoring stations on BLM lands. Certainly BLM did not provide any monitoring data. The stations that did exist were outside allotment boundaries and showed impairment in dissolved oxygen, a result of organic and sediment pollution – a clear indication of the role of livestock. But, BLM did not bother to look.

The Utah State Office of the Bureau of Land Management is a signatory to the *Conservation Agreement and Strategy for Bonneville Cutthroat Trout in the State of Utah* (UDWR 1997). That agreement states, *"Human activities such as water development, agricultural activities, energy development, mining, timber harvesting, grazing, overfishing and the introduction of non-indigenous species have directly impacted BCT populations and altered the Bonneville Basin ecosystem."* Further, Objective 2 on page 2 of the Agreement states, *"Eliminate or minimize threats to BCT and its habitat to the greatest extent possible."* By signing this agreement, BLM recognized livestock grazing as one of the significant factors causing a decline in Bonneville Cutthroat Trout and its habitat. The streams on BLM lands in Rich County are tributary to the Bear River and are historical BCT habitat. The report by Carter and Chard (2001) has shown direct evidence of this degradation due to livestock. Yet BLM ignored these impacts and its obligations under the Conservation Agreement and Strategy.

BLMs claim that BMPs are used to ensure that livestock grazing meets water quality standards is false. BLM has provided no scientific evidence or data to show either what BMPs it employs or that quantitatively prove these work. BLM has also failed to show how many of its water bodies have been monitored by sampling to demonstrate compliance with water quality standards. A history of BLM's water quality monitoring and sampling effort must be revealed. This analysis should show by years how many

water bodies of each type (stream, spring or lake) have been monitored for compliance with water quality standards and compare this to the total numbers, miles and acres of these bodies that currently exist on BLM land. The State of Idaho in its water quality regulations requires that the effectiveness of BMPs be demonstrated by water quality monitoring. See Idaho Administrative Code (IDAPA 58.01.02), available on line. The fact that BLM, in its DEIS, reaches for the states' 305(b) reports in an attempt to show water quality assessment efforts, proves that it does not monitor water quality on any meaningful portion of public lands streams.

The DEIS then moves on to the Colorado River Salinity Control Act, noting estimates that Federal land contributes 8% of the total salt load in the Upper Colorado River Basin from non-point sources. BLM then claims that *"Salinity and vegetation management are a consideration in all projects initiated in the Colorado River Basin."* Western Watersheds Project has yet to see this topic addressed in the large numbers of grazing permit renewals in Utah, Colorado and Wyoming. In renewing grazing permits on over 300,000 acres of BLM land in the Colorado River Basin, BLM did not address this issue. See the Little Snake Field Office EAs we cited earlier in these comments. BLM ignored the USGS studies (Lusby 1970, 1979) that we provided that showed the effects of livestock grazing in these highly erodible areas. Those studies were conducted in watersheds with similar climatic and soil characteristics to those under consideration in the EAs and showed significant alterations in runoff and sediment yield related to livestock grazing. BLM's response to our request to address this issue under Section 7 of the ESA on behalf of four species of Colorado River Endangered Fish was to claim that livestock are not considered an issue. BLM's response to our request on this matter is included in the references we are providing (Husband 2004). Our letter is attached to the Husband reference.

3.9 Air Quality. As we have alredy pointed out in our comments, BLM ignores air quality relating to livestock grazing as "background". Our protest of BLM's EA [UT – 020-2001-86] raised this point for soils in Tooele County, which is adjacent to Salt Lake county, where particulate air pollution is a serious issue (WWP 7/17/01). In that EA, wind erosion rates in excess of 200 tons per acre per year were described in the USDA Soil Survey for Tooele County (USDA 1992a). Yet, BLM dismissed that issue because it really does not want to address the capability and suitability of those lands for livestock grazing. BLM's claims in the DEIS that *"ambient pollutant levels are expected to be near or below the measurable limits."* is belied by our analysis and their own statement that *"Where soil is exposed, there is a possibility for air quality problems as a result of dust caused by wind over exposed soil."* Yet, in spite of evidence of loss of ground covering vegetation throughout the west (West 1983) and USDA's documentation of the existence of vast areas of highly erodible soil, BLM remains unwilling to address this issue.

3.10 Wildlife. In (**3.10.1**) BLM asserts, *"Grazing, when improperly managed, (such as during the uncontrolled grazing in the late 1800s throught the mid-1930s), has had negative effects on the arid rangeland of the west and has reduced the quality of wildlife habitat."* Here BLM reverts to that familiar refrain. But, even the information in its own DEIS belies that because this document says only 6% of BLM lands are at PNC. This means that 94% are not at potential for native wildlife. BLM also fails to account for the impacts of forage competition with wildlife. The DEIS states that current permits allow for 12.7 million AUMs of forage consumption.

According to Holechek et al (2001) the equivalents between cattle, sheep, deer and elk are:

Mature cow	1.00 animal unit	20 lb daily dry matter intake
Yearling cow	0.75 animal unit	15 lb daily dry matter intake
Sheep	0.15 animal unit	3.0 lb daily dry matter intake
Deer	0.15 animal unit	3.0 lb daily dry matter intake
Elk	0.70 animal unit	14.0 lb daily dry matter intake

At 800 lbs of forage consumption per AUM the number of deer equivalent to the forage removed by livestock on BLM lands at the 12.7 million AUM level is (USDA uses 1000 lb for a cow/calf pair [USDA 2002]):

12,700,000 x 800 ÷ (3 lb/day x 365 days) = 9,278,538 annual deer equivalents

Holechek et al (2001) provide figures for consumption of grass, forbs and shrubs by cattle, sheep and mule deer in sagebrush habitats. Cattle relied on 60 - 76% grass, 3 -10% forbs and 14 – 33 % shrubs; sheep relied on 42% grass, 30% forbs and 28% shrubs; mule deer relied on 0 – 17% grass, 24 – 100% forbs and 0 – 59% shrubs. They also provide figures for Rocky Mountain Elk that show elk rely heavily on grasses, with diets consisting of up to 97% grasses in coniferous forest and 79% in sagebrush habitats. Clearly, there is dietary overlap and for mule deer, depletion of critical winter, fawning and summer ranges can have significant impacts on the population.

Aside from habitat impacts, the calculated annual forage consumption by livestock on BLM land is a significant impact to deer and elk as well as other wildlife species. It must be accounted for. Certainly, the paper by Fleischner (1994) has clearly documented the loss of biodiversity and lowering of population densities of animal populations caused by competition with livestock for food and cover. It is only common sense that what livestock consume is not available to support wildlife populations or provide habitat.

Stewart et al (2002) showed that elk and deer avoid areas used by cattle. Pearce (1988) noted that hiding cover for fawns decreased more rapidly when cattle were present. This subjects fawns to higher predation rates. When no cattle were present, deer selected more meadow-riparian habitat. When cattle were present, deer selected home ranges with less meadow-riparian habitat. With heavy stocking, deer moved into montane shrub habitat. They also increased the size of their home ranges in the presence of cattle. While preferring aspen groves when not grazed by cattle, their use fell significantly when cattle were present. These results are similar to those found by Loft et al (1991). They found that in the absence of livestock, deer preferred meadow-riparian habitat. During moderate livestock grazing, deer moved into montane shrub habitat and used aspen habitat only when no cattle were present. These studies document the added stress placed on deer populations by competition for habitat and forage with livestock.

Julander (1962) pointed out that heavy grazing of mule deer winter range has resulted in a serious reduction or near elimination of the perennial grasses and perennial forbs. This lack of perennial grasses and forbs creates a serious forage deficiency in early

spring and summer when deer prefer the new grasses and then shift to forbs. It is in winter they rely on shrubs, including sagebrush. During fawn rearing, the combination of inadequate forage on overgrazed spring range coupled with poor winter range is responsible for heavy fawn mortality. The depletion of herbaceous species, especially perennial forbs on summer range by livestock limits reproduction in does.

The DEIS is incomplete in addressing these impacts to wildlife through habitat alteration and competition with livestock.

3.10.2 Migratory Birds. The DEIS analysis is lacking in sufficient detail. It discusses various bird species in different physiographic regions and mentions that some respond positively to livestock grazing and some negatively. But, BLM really does not provide a meaningful analysis of livestock impacts to birds and the role livestock play in threatening or endangering many species.

Walker (2002) reviewed New Mexico's "Biota Information System of New Mexico" (BISON-M) for all species of birds contained in that database to determine the expected impact of grazing by domestic livestock on those birds. Of all birds then in the database, 153 were shown to be impacted in some manner by livestock grazing. Table 8 summarizes the results of that examination. The results are dramatic. This report and its links can be found on-line at:

http://rangenet.org/directory/walkerl/swbirds.html

Table 8. Impacts of Livestock Grazing on 153 Species of Southwestern Birds

Impact Class (click link for list)	**Species in Class**	**State Listed Species in Class** [a]	**Percent of Total** (all classes)	**Percent of State Listed Total** (all classes)	**Percent of Class State Listed**
Adverse	118	42	77%	91%	36%
Beneficial	18	3	12%	7%	17%
Variable	17	1	11%	2%	6%
total	153	46			

[a] *Listed in one or more Southwestern state(s) or Mexico as endangered, threatened, or sensitive..*

Even though the DEIS cites Executive Order 13186 and recognizes the great ecological and economic importance of migratory birds, BLM seldom addresses environmental or economic impacts to them from permitted levels of livestock grazing. Having installed untold water developments and destroyed untold numbers of springs and wetlands for livestock, BLM fails to address the implications and impacts of these activities. Two reports prepared by Red Willow Research (Austin 2003a, 2003b) provide documentation and photographs of these impacts and the high numbers of direct deaths from drownings of birds in livestock watering facilities. These reports are included in the electronic files provided with our comments. BLM must summarize the

number of water troughs on public lands and model the mortality to birds based on the Red Willow Research reports.

Connelly et al (2000) and Braun et al (1977) have shown that sage grouse have declined significantly across their historic range. They have also documented the requirements of sage grouse nesting and brood-rearing habitat. These requirements include minimums for sagebrush canopy of >15%, grass and forb canopy of >15%. Herbaceous vegetation height > 18 cm is needed for cover. The 50% livestock use levels BLM typically applies will not meet these criteria. They also noted that nests and brood-rearing areas include close proximity to water sources, the same areas preferred by cattle. Hockett (2002) reviewed the literature on livestock impacts to sage grouse, clearly showing the damage and loss of climax communities favored by sage grouse. These papers all reveal that livestock impacts are detrimental to sage grouse through removal of the herbaceous understory in sagebrush habitats. Of course, the concentration of cattle near water results in heavy trampling and removal of the vegetation needed for cover and food for both nesting and brood-rearing.

The DEIS should analyze in more detail the threats to and losses of all categories of wildlife due to its livestock grazing management. It should also provide more analysis of the economic benefits of wildlife through hunting, fishing and wildlife-associated recreation. These benefits are summarized in the Fish and Wildlife Service *2001 National Survey of Fishing, Hunting and Wildlife-Watching Associated Recreation* (DOI 2002).

3.10.3.1 Cold Water Fisheries. The DEIS cites Chaney et al (1990) to demonstrate the benefits to cold water fisheries of excluding livestock. This study as well as those by Duff (1977, 1979) show large increases in fish populations soon after livestock exclusion. As we pointed out in our discussion on water quality, BLM seldom addresses cold water fisheries in accordance with its multiple use mandate or even when it signs on to Conservation Agreements such as the one for Bonneville Cutthroat Trout in Utah. BLM should provide the interested public with facts and figures to show it is monitoring fish populations and analyzing the different management methods it has used to show the outcome to the fish populations. For example, how many fisheries surveys, stream invertebrate surveys, stream flow surveys have been conducted each year? What portion of the stream miles on BLM land does this represent? Or, is BLM ignoring this ecologically and economically important attribute? This analysis should compare the fish populations and habitat characteristics existing prior to implementation of management strategies to those occurring following implementation. Comparisons of these results to total exclusion of livestock from streams should be made.

While the DEIS recognizes some of the general impacts caused to fisheries by livestock grazing, it fails to provide any analysis of particular habitat attributes in the streams it manages. Where is the data and analysis showing the condition of streamside vegetation, channel width/depth ratios, streamflow, bank stability, substrate fines percent and so forth that could be used to demonstrate “significant” progress for cold water fisheries as a result of its management? This quantitative monitoring data should be used to evaluate BLM’s PFC assessments to show their objectivity.

3.11 Special Status Species. The DEIS has failed to demonstrate that BLM conducts surveys for special status species, including sensitive species as well as T & E species, to determine whether they or their habitat occur in areas affected by livestock grazing. Commonly, grazing permits are issued, water developments and grazing systems implemented without any survey data to ascertain if these species are present in the affected area. BLM should provide a summary of its surveys, how much of its land has been surveyed, what species are considered special status species by state and how they and their habitat are affected by livestock grazing.

3.13 Recreation. BLM claims that *"Studies suggest that recreationists perceive in roughly equal numbers that grazing detracts from or is compatible with their activity on the public lands."* However, different segments of the recreation community are affected differently. Degraded streams affect fishermen. Degraded habitat affects hunters and wildlife watchers. BLM mentions that *"Dispersed recreation depends on open landscapes, with few developments, that allow for self-initiated exploration and discovery."* Yet BLM clouds the impacts on these groups by apparently lumping them with OHV enthusiasts. Distinctions need to be drawn and statistics cited for each user group. Certainly the economic costs and benefits of livestock grazing on public lands must be evaluated relative to the losses in recreation benefits (DOI 2002).

3.14 Special Areas. The DEIS fails to point out whether livestock grazing is occurring in these areas. Which are grazed? Ungrazed? Over a dozen type of Special Areas in Colorado's Little Snake Resource Area were affected in renewing livestock grazing in the EAs we have cited. Yet, even in areas of very high soil erosion hazard, those impacts were not addressed (WWP 1/27/02).

3.15 Paleontological and Cultural Resources. In this section, BLM ignores the effects of livestock grazing and trampling on these resources. In its actions, such as RMPS or structural range improvements, BLM typically addressed impacts of surface-disturbing activities such as fences, pipelines and water developments. But, it fails to address the surface disturbance by livestock which affects a much greater land areas than the associated structural range improvements.

3.15.3 Cultural Resources Through Time. Here, the DEIS introduces the concept of the ranching "lifeway". This is a naked attempt to subvert the definition of cultural resources by incorporating livestock production as a cultural resource. BLM fails to also include the millions of acres of devastated lands and destroyed streams and springs as a cultural resource. This is the real legacy of public lands livestock grazing. Is this, therefore, also a cultural resource? BLM cites many legal authorities in this section, but fails to show where in these various Acts and Executive Orders there is a mandate to protect the ranching "lifeway". BLM admits that these "lifeways" are abstract and cannot show a mandate to protect that abstraction. Instead, it insinuates the "ranching lifeway" in to the DEIS so as to place it in a priority position over other "lifeways" it elects not to mention. What about the "hunting lifeway", the "fishing lifeway", the "wildlife-watching lifeway", and many others that are threatened by the "ranching lifeway." BLM needs to drop this "lifeway" bias instead of trying to codify it to achieve its glaring politically-driven goals.

BLM spends 12 of 52 pages dwelling on rural communities, ostensibly to justify the importance of ranching, socially and economically. These lands do not belong to livestock producers. They belong to the American people. What about the other interests? Other people live in the West and vastly outnumber public lands livestock

producers. What about their values, lifeways and economic contribution? This is bald evidence of where BLM is going with these proposed changes. BLM wants to prop up inefficient, environmentally destructive and uneconomical, heavily taxpayer subsidized livestock grazing on public land on behalf of a mythology of the Marlboro Man.

Instead of dealing with accurate facts and figures that show public lands livestock grazing is insignificant in the local, regional and national scheme of things, BLM spends nearly 25% of the entire Affected Environment section trying to justify the mythology of public lands ranching. It does this while ignoring the point-on factual analysis of Dr. Thomas Power, PhD and Chair of the Economics Department at the University of Montana. In his chapter in (Wuerthner and Matteson, 2002), Taking Stock of Public Lands Grazing – An Economic Analysis, Dr. Power refutes the mythology of public lands ranching with economic facts.

Dr. Power shows that *"Livestock grazing on federal lands is generally unimportant to local economies and even less so to state and regional economies. In terms of income and numbers of jobs provided, the contribution of federal lands grazing is less than 0.1% across the West. Farm and ranch operations are increasingly reliant on nonfarm income sources to be financially feasible, while livestock grazing competes with other uses of public lands – such clean water, recreation, wildlife habitat – that contribute to the ongoing vitality of western economies."*

Dr. Power states that claims about the relative importance of federal grazing to the economies of western states can be analyzed by answering these questions:

1. "What portion of the value produced by cattle and sheep operations is associated with 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."

BLM has not answered these questions or provided the economic analysis we have suggested. Instead it attempts to paint a rosy scenario where ranchers' personal interests are placed above the values of other segments of the population.

Dr. Power analyzed the economies of individual rural counties. He showed that federal lands grazing does not contribute significantly to those economies across the west. In fact, given the high percentage of ranching families that have jobs, either full or part time outside the ranch (60 – 70%), it is ranchers that depend on the other economic sectors for their ability to persist, not federal grazing. The DEIS tries to argue that communities like Leadore, Idaho depend on ranchers to buy groceries and supplies, but the reality is that rural ranchers in Idaho make trips to larger population centers such as Idaho Falls, Pocatello, Boise and Twin Falls to purchase groceries and supplies. Dr. Power states, *"It is not that towns depend on agriculture, but that agriculture increasingly depends on the vitality of urban and nonagricultural rural economies to provide the nonfarm income that keeps farm operations alive."*

4.0 Environmental Consequences. In the previous pages, we have provided detailed analysis of the scientific literature, analyses and citations. We are providing dozens of pertinent documents in hard copy and electronic form. We have pointed out the many shortcomings of BLM's analysis. These are not repeated in the comments on this

section, but still apply. BLM must incorporate this information into its determination of the Environmental Consequences for each Alternative.

4.1 Assumptions. BLM's assumptions are that its budget will be flat over the 20-year analysis period. Since BLM is basing many of its proposed changes on its ability to monitor and assess condition, this anticipated lack of funding for those efforts is a clear demonstration they will not happen. BLM can provide no assurance that its ill-defined monitoring will occur and therefore these changes to the regulations are inappropriate.

BLM also makes the assumption that continued population growth and increased pressure on public lands for multiple uses will occur. Is it BLM's position that the current management of BLM lands does not constitute multiple use? The DEIS needs to make clear what it means. Certainly another assumption makes regarding expected increases in recreation use indicate that greater conflicts will occur with the impacts of livestock grazing economically, aesthetically and ecologically. The proposed regulations have not effectively addressed resolution of these conflicts and the demand for livestock-free lands made by many people.

BLM assumes water demand will exceed supplies and there will be continued drawdowns. Yet, the DEIS avoids dealing with the impacts of livestock grazing on ground water recharge, accelerated runoff, siltation of streams, reservoir and canals and water pollution. In this expected environment, BLM wishes to give permittees rights to water on public lands. This does not make sense. If water supplies are expected to diminish, why tie up the water on public lands in this way?

BLM assumes there will be periods of drought. As our analysis has shown, drought is a regular occurrence in the west. Yet, BLM has proposed changes to the regulations that will increase active use and prevent BLM from making timely adjustments or providing rest during drought as range science shows needs to happen. The productivity of the land will continue to suffer as a result.

BLM assumes invasive species will continue to spread. But, the DEIS has failed to point out how livestock grazing has played the major role in weed infestations on public lands. We have pointed this out in our comments and BLM needs to admit this relationship and closely examine the role livestock play in past, current and future weed infestations.

BLM assumes the number of endangered species will increase. The DEIS fails to analyze the role of livestock grazing on the endangerment of species and delineate how its management will specifically protect each threatened, endangered or sensitive species or their habitat that occurs on BLM lands.

BLM assumes wildfire risk and frequency will increase. The DEIS fails to fully explore the role of livestock in removing herbaceous vegetation, promoting tree and shrub recruitment and ladder fuels thus increasing fire intensity and damage. The contribution of livestock grazing to increased costs of fire suppression are not analyzed.

BLM assumes public interest in archeological sites will continue to increase. The DEIS and BLM's normal management ignore livestock grazing and trampling effects on these resources. BLM has not "balanced" resource uses to protect archeological resources or determine which lands should be grazed as required under the Comb Wash Decision (NWF 1997).

BLM assumes that PM10 (and we add, PM 2.5) air pollution will continue to rise in the West. As our comments have pointed out, many western soils are subject to incredibly high rates of wind erosion. Many of these are very fine-grained soils with salts and mineral that can be transported long distances by wind. Removal of ground covering vegetation and biological crusts accelerates this erosion. Current severe air quality problems relating to PMs in Salt Lake City and Logan, Utah as well as other western population centers may be impacted by livestock grazing surrounding lands. BLM must monitor and model these livestock-induced impacts just as other industries are required to monitor and model their local and regional impacts under the Clean Air Act's PSD rules.

4.2.1 Grazing Administration. BLM claims the current regulation impedes investment in range improvements, yet as we have cited, numerous range improvement projects are being implemented. The problem with this entire concept is the misuse of the word "improvement". BLM has failed to analyze its own history of range projects and their negative impacts to native biodiversity, soils, streams, springs, wetlands, water quality and water quantity. In stating the number of range improvements has decreased since the 1995 regulations were passed, BLM forgets it admitted earlier in the DEIS that the number of range improvements had been decreasing since 1980, 15 years prior to that law. The DEIS projects approximately 1200 new range improvements per year, but gives no description of the type and scope of these.

4.2.2 Vegetation. BLM has presented no evidence that continued heavy use of forage by livestock will allow recovery of native plant communities. References cited show that in areas of 12" or less precipitation, this is highly unlikely. In fact, Table 1 shows that trends reported for uplands by BLM indicate a decline in condition during the past 10 years.

4.2.2.1 Riparian and Wetland Vegetation. The DEIS has not discussed the problems in its current PFC assessment process. As we have described, these allow bias to drive the assessment, ignore sedimentation, water quality and other critical aquatic habitat attributes. The DEIS has not provided any results of fisheries or aquatic invertebrate surveys that document the relation of these various assessed conditions (PFC, FAR, NF) to populations of these native organisms. BLM has not provided any objective, quantitative survey data demonstrating that these various condition categories correspond to differences in stream embeddedness by sediment. The DEIS states that "Some regions would show noticeable improvements in riparian condition, while other regions would show little change." BLM needs to state which regions will improve and which won't, and give the reasons why. How have livestock stocking rates, range improvements and management systems affected this status? BLM needs to provide the analyses relating to these various attributes which we have delineated earlier.

4.2.3 Fire and Fuels. The DEIS claims that interested pubic participation could lead to delays in implementation of treatments. But, the DEIS has provided no statistics describing the various types of treatments it has proposed over the years both prior to and after the 1995 rules changes. Nor has the DEIS summarized of those projects how many of each type have been appealed, protested, stayed or how many proceeded. These figures are needed to provide foundation for this statement.

BLM also forgets to discuss why organizations and individuals protest some treatments. They do this because BLM refuses to acknowledge the role of livestock in creating the conditions used by the agency to assert treatments are needed. Wambolt et al (2001) points out that agencies now use the same arguments to preserve sagebrush that they formerly used to justify poisoning and burning it to get rid of it. His research also showed that there were no long-term improvements in perennial grass cover between treated and untreated areas following burning. Welch and Criddle (2003) also discuss some of the myths agencies use to justify treatments. BLM fails to discuss the role livestock grazing plays in changing fire frequency and intensity. We have provided significant literature on this issue.

4.2.4 Soils. The DEIS has failed to discuss the capability and suitability issue related to grazing on steep slopes, placing water developments in unsuitable area subject to high erosion rates, grazing on highly erodible soils, loss of biological crusts. Livestock impacts are significant under all these conditions and they are universally ignored by BLM. The DEIS has not provided any data to justify its claim that long-term improvement will continue under present management. Different soils have differing susceptibilities. An analysis of the different physiographic regions and their soils should be done to show which ones have potential to improve under current management systems and which do not.

4.2.5 Water Resources. BLM has ignored the well known facts regarding livestock grazing and degradation of water quality. The DEIS states that *"The overall hydrologic function of riparian stream systems would remain static or improve slowly. Soil erosion and sediment discharge caused by streambank trampling in riparian areas would remain static or decrease slightly over the long term. … Nonpoint source salinity in the Colorado River basin would decline less than in other desert shrub communities, because of the slow vegetative response to management."* These are not very hopeful statements regarding BLM's current management. Comparisons of rates of improvement in these attributes in the different physiographic regions and soil types must be made to show how the differing management strategies employed by BLM affects each. Each management strategy should be compared with total rest. BLM must use its own quantitative monitoring data and studies in this analysis as well as that contained in the scientific literature.

4.2.6 Air Quality. BLM has not monitored air quality. It has not assessed air quality using studies or models to determine the impacts of livestock grazing in highly erodible landscapes to regional air quality and human health. We have cited some current BLM projects for reference to show that BLM refuses to address this topic in any meaningful way when it renews grazing permits. Instead, air quality impacts are dismissed as "background".

4.2.7 Wildlife. The DEIS has not provided any data or analysis to show the effects of its current grazing management scheme on wildlife species. Analyses such as we have suggested should be presented to the interested public and others and must be incorporated into the decision-making process.

BLM's discussion of the effects of the proposed rule changes on large mammals was lacking as was any analysis of effects to smaller mammals, birds, reptiles and insects. Small animals are certainly present on BLM lands and are essential components of the ecosystem. The scientific literature has established that these fauna are seriously impacted by livestock grazing. In the arid west, livestock grazing has been shown to

reduce overall rodent densities (Medin and Clary 1990, Bock et al. 1984), as well as rodent species richness (Rosenzweig and Winakur 1969, Hanley and Page 1981, Jones 2000) and evenness (Jones 1999, Jones 2000). Other authors have demonstrated deleterious impacts of grazing on jackrabbit populations (Norris 1950, and Crouch 1982). Lizards suffer deleterious impacts by grazing as well (Jones 1981). Researchers have found livestock grazing to cause reduced species richness of songbirds (Duff 1979), riparian passerines (Taylor 1986), and raptors (Duff 1979) in the arid west. In a comprehensive literature review, Saab et al. (1995) concluded that grazing in the west has led to a decline in abundance of 46% of the 68 neo-tropical migrants that utilize riparian habitats.

GAO (1991) concluded in its analysis of BLM and Forest Service dealings with wildlife, that *"agencies may not authorize levels of use that permanently degrade the land's capacity to provide for future generations."* They point out that wildlife receive only 3 to 7% of staffing and funding, while BLM allocates up to 33 percent for minerals, timber and range programs. They also found that agency managers chose other uses such as livestock grazing when those interests conflicted with wildlife needs. GAO points out, *"Even when wildlife-beneficial action are included in approved land use plans, they have usually been implemented only partially or not at all."* GAO concluded that wildlife are given little while livestock are given all in this statement, *"one land use plan GAO examined called for BLM to reduce livestock forae consumption because 73 percent of the area was in fair or poor condition and unable to support various wildlife populations. The plan still called for giving most of the allocated forage – 96 percent – to livestock, as compared with about 1 percent for wildlife. Since the plans adoption in 1983, however, essentially no livestock forage reduction has occurred."* This validates our running complaint throughout these comments that BLM overstocks the land with livestock counter to range science and the needs of plants, soils and wildlife. The proposed rule changes defer to BLM's "authority" but provide no definitive analysis to support their proposal.

4.2.8 Special Status Species. Same comment is applicable to Special Status Species.

4.2.10 Recreation. We have already pointed out the omission in BLM' s analysis of impacts to recreation earlier. Once again, BLM has not addressed the loss in wildlife-associated recreation under current management. Statistics from DOI (2002) must be included and values of wildlife displaced by livestock on public lands evaluated.

4.2.11 Special Areas. BLM has not explained or justified livestock grazing in its Special Areas, which are generally established for other purposes than livestock grazing. The DEIS has not analyzed livestock impacts on the attributes of these areas that lead to their protection or special designation.

4.2.12 Paleontological and Cultural Resources. BLM has not explained or justified livestock grazing in regard to its mandate to protect these resources. While livestock grazing is admittedly a surface-disturbing activity, its effects are not evaluated. Furthermore, consideration of ranching "lifeways" is not a valid issue in the context of paleontological and cultural resources. That element of analysis must be dropped as BLM is arbitrarily including it while ignoring other "lifeways" and the DEIS admits it is

an “abstract” term. Impacts of livestock grazing to archeological and cultural resources must be evaluated.

4.2.13. Economic Conditions. We have provided comments on the failings of the economic analysis and what needs to be done. We have also provided Dr. Thomas Powers thorough and quantitative treatise on this topic, while BLM avoided bringing in objective economic analysis into the DEIS.

4.3.1 Grazing Administration. In the preceding sections we have exhaustively addressed the failing of the analysis in the DEIS to address the true implications of the proposed rule changes to grazing levels on the ground. BLM makes assertions regarding the supposed benefits of these rule changes, but fails to provide the documentation, based on current conditions and history, that justifies the need for the proposed changes. Anticipating that changes in definitions of preference and active use would encourage permittee participation lacks any explanation. Of course a correct reading and interpretation of the proposed new definitions shows that BLM is using these changes to increase active use by incorporating conservation use and suspended use into active use. This would lead to an immediate increase in livestock stocking rates without allowing the interested public to participate. Coupled with ownership of water rights and range improvements, of course, permittees would be gleeful over these changes. They have wanted to monopolize public lands for decades and these changes move them toward that goal.

We have commented on the range science and ecological implications of the “phase-in” of changes in active use as well as limiting public input on temporary nonrenewable use. These are not justified by best available science. The proposal to delay grazing determinations until some day when BLM might actually monitor an allotment denies reality. That reality is that BLM does not plan for adequate funding of these monitoring efforts, does not describe the amount of monitoring and assessment needed on an annual basis and does not estimate the cost of this monitoring and assessment program. Without these details, BLM cannot make an informed decision and the interested public and others are left with only a promise. The suggested timeframes, for implementing grazing decisions lacks full analysis as our own analysis shows. In effect these expanded timeframes and monitoring could delay decisions on allotments that BLM, itself has documented are degraded. Those delays could extend for decades as we described. We have addressed other proposed rule changes in our previous comments.

4.3.2 Vegetation. We commented exhaustively on upland plant communities and their sensitivity in arid regions to over-use by livestock and the consequent effects to productivity, erosion and hydrologic function. The DEIS has presented no compelling, quantitative analysis to show for each physiographic region, and especially those areas with less than 12” annual precipitation, how the proposed rule changes will affect BLM lands. BLM claims as *“BLM’s administrative efficiency improves, the rate of achieving vegetation management objectives should accelerate.”* Why is this so? There is no logical derivation, based on science, that this is true. BLM has much more work to do to justify these vague suppositions of outcomes. BLM’s analysis here doesn’t provide any distinction between outcomes between the alternatives.

4.3.2.1 Riparian and Wetland Vegetation. BLM has not described the specific effectiveness of the various management options at its disposal. In fact, has not even mentioned some management options. We have pointed out the failings in BLM’s

current assessment process and have requested that additional detail be brought in to the discussion, not only on riparian areas, but in all ecosystem attributes. As we mentioned, BLM has not quantified the amount of riparian or wetland area already lost to livestock grazing. It has not quantified the number of springs destroyed by livestock grazing and trampling or water development. It has not shown systematically that the proposed rule changes improve conditions, in fact, the scientific evidence is that increased stocking, range improvements and grazing systems will negatively affect the FRH. All this information is critical to a well-informed decision.

4.3.3 Fire and Fuels. Once again, BLM claims a benefit but provides no factual information to justify that conclusion. We have pointed out the role of livestock in increased fire risk and intensity. BLM has ignored this fact as well as the costs of livestock grazing that express themselves in additional costs of fire suppression efforts. Here, BLM claims that the additional time they gain from excluding the interested public will allow them more time to coordinate with permittees will be a benefit. The supposed increased ability to reach consensus with permittees is not adequate justification. Where is the evidence that this makes any difference on the ground?

4.3.4 Soils. We provided great detail on livestock impacts to soils, capability and suitability. Here BLM claims no benefit from the proposed rule changes, merely asserts that *"Where the effect on the upland soil resources on an individual allotment has the potential to be adverse, BLM retains the authority under 43CFR4110.3-3(b) to curtail grazing."* The DEIS provided no analysis to show when this authority has been exercised. Has it ever? BLM must do an analysis of the number of allotments closed and the acres protected by this means during the last 20 years. This will include time periods prior to and during application of the 1995 regulations. If BLM seldom uses this authority, even though it recognizes in this DEIS that large areas are affected by rill and gully erosion (non functional), then claiming it has this as a tool in reserve is an empty promise.

4.3.5. Water Resources. BLM has not demonstrated that it monitors water quality or has determined that BMPs it might use actually work. Without analyzing the history of its management and the impacts of that management on water quality as demonstrated by actual sampling, BLM can make no assertions regarding any supposed improvements in water resources due to these proposed rule changes.

4.3.5 Air Quality. The DEIS claims that the proposed action is *"expected to potentially improve air quality slightly when compared with the existing situation…"*. On the one hand, BLM typically claims livestock grazing impacts to air quality don't exist (background) when it issues permits. On the other hand in the DEIS it is saying that existing management impairs air quality. BLM has a major inconsistency here and we have pointed that out in our protests and appeals as referenced. BLM ignores soil surveys and their erodibility classifications when determining the suitability of livestock grazing and, thereby, avoids dealing with air quality issues. BLM must explain how continued livestock grazing in areas with highly erodible soil is justified in view of these facts.

4.3.7 Wildlife. Throughout this discussion, in justification of its proposed changes, BLM claims that it can *"close areas to grazing if conditions warrant"* or that if *"there is an imminent likelihood of significant resource damage, immediate changes can be*

made". With its planned incestuous relationship with permittees, this seems a weak justification. If BLM can't count on the cooperation of permittees to protect wildlife, and let's remember it was for these and other reasons for the Taylor Grazing Act. The intent was to regulate livestock grazing to correct the ongoing Tragedy of the Commons. If BLM is planning a return to that era, it is already indirectly admitting it won't work to benefit wildlife because it has to retain regulatory authority. Which is it? Do we need protective regulations or not?

4.3.8 Special Status Species. We have addressed this topic in detail. Our evidence is that BLM doesn't engage in consultation at appropriate times, doesn't conduct surveys and has not provided an analysis that shows how its management options have affected Special Status Species before and after the passage of the 1995 rules. It has not shown how the proposed rule changes make a difference, either positive or negative while assuming listings will increase. This seems a wake-up call for BLM to engage in stringent measures to reverse declines and prevent future listings. Our example of the failures to address Colorado River Endangered Fish or Utah's sensitive Bonneville Cutthroat Trout in spite signing a Conservation Agreement shows that BLM doesn't engage in active efforts to help these species.

4.3.10 Recreation. In the first paragraph, BLM says it all. *"Overall, the proposed action would have minimal effects on the recreation program, with highest potential for any effect occurring on such recreational activities as hiking, sightseeing and enjoying naturalness. The effects would be negative if the implementation of corrective actions to improve rangeland health are delayed."* So, BLM proposes numerous changes to the rules that will result in delay of actions to improve condition and clearly condemns its own proposal here by saying that only people who care about naturalness will be impacted negatively. Obviously BLM expects a decline in naturalness. How is this then, not a decline in rangeland health? BLM needs to redefine the term "rangeland" health to mean "ecosystem" health.

4.3.11 Special Areas. BLM has not analyzed its different types of special areas, their laws and mandates relative to existing and proposed rules. Without a thorough analysis of the attributes that they were designated to protect, BLM has no foundation for making a determination and the interested public has insufficient information to understand the implications of the proposed rules.

4.3.12 Paleontological and Cultual Resources. The DEIS states, *"In the case of decreasing use, heritage resources could be subject to continued effects before the decision is fully implemented…"* BLM admits that livestock at current levels are damaging these resources, yet only surveys areas where pipelines, water developments and fences are to be installed, while ignoring the much larger area of disturbance from livestock concentration, trampling and grazing. There has been no analysis of the needs for surveys based on probabilities of finding artifacts from existing surveys. BLM should provide data from its surveys to show what these probabilities are for each state and then project the number of sites potentially disturbed or destroyed by livestock. BLM also has not addressed its suitability and balancing requirements flowing from the Comb Wash case to determine which lands should be protected to protect outstanding areas of these resources.

4.3.13 Economic Conditions. BLM admits the effects of the proposed action will be minor. This is a sad outcome given the 12 pages of detailed livestock industry apology presented in Chapter 3.0 of the DEIS. We have provided comment analysis of

that discussion. Omission of seminal, quantitative analyses such as that by Dr. Thomas Power in Wuerthner and Matteson (2002) is a fatal flaw. His analysis shows the true facts and should be incorporated into BLM's analysis by presenting his statistics and facts.

4.4 Alternative Three: Modified Action. This alternative is not distinguishable from the other two in terms of proven benefits on the ground.

5.0 Consultation and Coordination. Western Watersheds Project has participated in scoping and we attended BLM's presentation on the proposed rule changes in Salt Lake City on January 27, 2004. WWP and other members of the environmental community have noted the confluence of the BLM meeting in Salt Lake City with the annual meeting of the Society for Range Management. We have also noted that the public hearing in Phoenix, Arizona was scheduled to coincide with the 2004 Cattle Industry Annual Convention & Trade Show. It appears BLM intentionally tried to load these meetings with livestock industry advocates.

At the meeting in Salt Lake City, we were told by BLM that no questions would be answered, even though the proposed changes are unclear and many of us had legitimate questions regarding the proposed rule changes and the DEIS. This was hardly in the spirit of *"consultation, cooperation, and communication all in the service of conservation"* that BLM has as its mantra for these changes. We protest the lack of communication and cooperation inherent in BLM's refusal to address questions and cite this instance as just one more piece of evidence of BLM's and this Administration's intent to shut down public discourse and debate.

5.0 Comments on Proposed Rule

In our analysis of DEIS Chapters 2.0, 3.0 and 4.0, we have provided detailed comments on the proposed rules and their effects. These tell the story and are incorporated here once again. Western Watersheds Project is appalled at this attempt by BLM to exclude the citizens of the United States from participating in critical decisions that can determine the fate of our public lands for generations to come. We are appalled at the failure of BLM to analyze its proposition in view of the science published throughout the range science, ecological and economic literature. We are appalled at the failure of BLM to analyze the outcome of this proposal with any degree of specificity relating to actual conditions on the ground that may result therefrom, and especially by its failure to report and analyze any of its quantitative monitoring data to support its arguments.

We are incorporating comments from other organizations herein by reference. These include Earthjustice, Oregon Natural Desert Association, National Wildlife Federation and the Natural Resources Defense Council.

Sincerely,

John G. Carter, PhD., Utah Director

Cc: Jon Marvel, Executive Director, WWP

Enclosures

6.0 References:

All references listed are incorporated into our comments and should be used by BLM to correct deficiencies in analysis in the DEIS. **References in blue are provided in hard copy with these comments. References in red are provided in electronic format with these comments.**

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