April 13, 2023

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Re: Upper Green Monitoring Report VIA email

Dear Chad, Greg, and Ivan:

As we noted in our letters leading up to the permit to use utilization cages and do a study on the Fisherman Creek and Upper Green allotments in 2022, we have prepared the attached report in accordance with our commitment. We outlined this commitment in our January 3 and March 17, 2022 letters to the previous Forest Supervisor, Patricia O'Connor, District Rangers Gregory Brooks and Ivan Geroy. The study was designed to inform BTNF monitoring and grazing management. The letters are included in Exhibit 6 of the report.

Prior to livestock entry into the pastures, we placed utilization cages for later measurement and comparison of the quantitative Paired Plot method to height-weight or stubble height estimates. Following livestock leaving the pastures, the plots were clipped to determine the amount of herbaceous vegetation in the ungrazed caged plot compared to the two grazed plots. Green line stubble heights as well as stubble heights along transects in the riparian AIZ between the caged and grazed plots were measured. Comparing the outcomes of these different approaches is intended as a way of validating the current monitoring as carried out by the BTNF, SCCD and Permittees.

Our results demonstrate that the Upper Green and Fisherman Creek allotments are overstocked based on our measures of average upland and riparian utilization using Paired Plots at 73.1 percent and 75.5 percent respectively. These far exceed the 50 percent utilization

or allowable use standard required by the BTNF. They do not meet herbaceous retention needs for wildlife and are nearly triple what range science studies recommend. We note that the stocking rate as represented in the 2022 Annual Operating Instructions for the Upper Green allotments was approximately two-thirds of permitted numbers.

Herbaceous and grass production was lower than potential at all sites, with most in Poor Condition, producing less than 25% of potential. The dominance by increaser species and loss of sensitive native bunchgrasses in uplands is consistent with the characterization of degraded systems in the Ecological Site Descriptions that NRCS uses to characterize plant communities. The loss of production is due to improper range management, overstocking, and inaccurate monitoring. This also affects wildlife such as elk and other big game, as well as grizzly bears that also rely on herbaceous vegetation and prey species that also rely on plants. In the vacant Elk Ridge allotments, after five years with no livestock, production remains low at less than 20% of potential and most sites remain visibly degraded.

Measurement of stubble heights on the key species, Idaho fescue, underestimates utilization when the herbaceous community is quantitatively assessed by the Paired Plot method. The SCCD and Forest Service measurements have underestimated utilization by a large amount. For example, in the 2020 SCCD Cooperative Monitoring Report average utilization was 9 percent using the key species, Idaho fescue. Compare this to the >70 percent results we find using the Paired Plot method. The residual heights do not meet the needs for sage grouse nesting or brood-rearing areas. Upland monitoring locations used by SCCD do not appear to meet Forest Service guidelines to monitor those areas grazed first or sensitive areas for wildlife.

Green line stubble heights were greater than those found on transects within the adjacent riparian area or AIZ that is important to migrant birds, amphibians, small mammals, and sage grouse. Some locations failed to meet the green line stubble height standard while most adjacent riparian AIZ transects would not meet the standard if it were applied to them. SCCD green line monitoring locations are in areas with protection by willows and result in no sites exceeding standards, while adjacent unprotected riparian and meadow areas are degraded.

Capacity calculations reveal a basic problem with SCCD monitoring. At the 9 percent utilization found in 2020, the 74,263 capable acres would need to produce over 5,000 lbs/acre of forage to support the 5,800 cow/calf pairs currently grazing. This ranges from 1.5 to 4.4 times what the ESDs for uplands estimate as potential production. Then, when the current Fair/Poor condition found in the allotments is considered, they are producing less than half of potential, most producing less than 25 percent of potential. Our capacity determination using the recommended range science results in 1,811 cow/calf pairs (31% of current rate) should be allowed to graze.

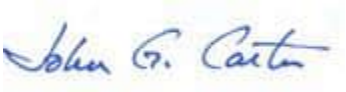
What needs to happen: What is needed at this point is to revamp the current monitoring protocol and also determine current forage capacity and stocking rates along with providing

rest and later turn in. This can be accomplished in a true joint monitoring and management effort involving the Forest Service, SCCD, Permittees, WWP and Y2U that will:

1. Select key areas in upland and riparian areas that meet the advice in the Forest Service guidance and research we have cited. It will include areas grazed first, that is, riparian areas lacking significant willow protection and upland areas that are in valleys, on slopes less than 7% and no more than 366 meters from the nearest water source. These would then be compared to the nearest SCCD monitoring sites.
2. Place cages in these areas, at current SCCD sites, and establish paired plots.
3. Measure the key species, Idaho fescue, along upland transects. Measure sedges along transects in riparian meadows (AIZ). Measure green line stubble heights at each riparian location. Include trampling in the measures.
4. Compare the results from the different methods and locations.
5. Determine the stocking rate on capable areas using the Paired Plot production data and visiting pastures with turn-in after July and clip the vegetation. Inspection of the 2022 AOI indicates six pastures are available if the schedule remains the same.
6. Initiate this in the summer of 2023.

We look forward to engaging in a true monitoring and management protocol with you this summer. Please respond with your suggestion as to how we can implement this program in time to prepare for the summer of 2023. I advise we have a phone discussion by zoom between the four of us early next week and prior to our release of the report or your sharing it with staff.

Sincerely,



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Surveys of Upper Green, Fisherman Creek, and Elk Ridge Allotment Complexes

Western Watersheds Project and Yellowstone to Uintas Connection

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April 13, 2023

Introduction and Summary

This report summarizes visits and data collection on the Upper Green and Elk Ridge Allotment Complexes and the adjacent Fisherman Creek Allotment during 2021 and 2022. The Upper Green and Fisherman Creek allotments have been continuously grazed while the Elk Ridge Complex was vacated from livestock grazing at the end of the 2016 season. Herein we document conditions at photo points and data collection including forage production and utilization. Chronologically, these include:

- Elk Ridge Photo Points – July 7, 2021
- Upper Green Photo Points – July 12, 2021
- Elk Ridge Production Plots – September 14, 2021
- Upper Green and Fisherman Creek Forage (Herbaceous) Production and Utilization Measures – Following cattle exit, summer, 2022.

Elk Ridge Photo Points – July 7, 2021

The photo points, maps and observations are included in Exhibit 1. These were taken along our travel route through the Lime Creek, Elk Ridge, and Tosi Creek allotments. Points were selected as topography and vegetation types varied along the route. They are indicative of the generally degraded and early seral conditions found. Observations representing five years rest from livestock grazing included:

- Low aspen recruitment and sparse understory.
- Significant bare soil with erosion paths and soil pedestaling.
- Idaho fescue in low vigor and short stature, although some litter generation by seed stalks was found. Idaho fescue is an increaser species, i.e. tolerant of grazing, according to the Ecological Site Descriptions (ESDs) discussed later in this report.
- Herbaceous vegetative cover was sparse and of low productivity.
- Upland cover for migrant birds, small mammals and sage grouse was low stature and sparse.
- Forbs were dominated by species of low desirability to cattle.
- Slopes were subject to accelerated erosion.
- North facing slopes had better cover and production than other areas.
- Bluebunch wheatgrass was nearly absent with a few specimens of low vigor, although the ESDs indicate it should be a dominant bunchgrass. It is a species sensitive to livestock grazing pressure and decreases with over grazing and lack of rest.

It is important to keep in mind that these conditions represent five years of rest from livestock grazing. That has been inadequate to restore the plant community. Upland vegetation and cover even in this rested state have not recovered to the point where there is adequate herbaceous cover for small mammals, migrant birds, or sage grouse.

Upper Green Photo Points – July 12, 2021

The photo points, maps and observations are included in Exhibit 2. These were taken in conjunction with a site/monitoring visit with the Bridger Teton NF (BTNF), Sublette County Conservation District (SCCD), and Permittees. The locations were in the Upper Teepee Pasture, Mosquito SE Pasture, and one location in the Fisherman Creek allotment, Pasture 2 at the end of the grazing season. Observations included:

- Upper Green Teepee Creek location (SCCD site TP-23) was located near a ridge top upslope from water. The herbaceous community was dominated by forbs low in desirability as forage.
- Teepee Creek suffered from scoured banks, bank alteration, and was becoming incised with a head cut observed where the creek emerged from a willow stand.
- The uplands on the lower slopes between Teepee Creek and the SCCD site had significant bare soil while the ridgetop location had nearly 100% ground cover.
- Mosquito Pastures appeared low in production and where grazed, little residual cover remained.
- Wagon Creek in the Mosquito SE Pasture was recovering within the exclosure, while the area outside the exclosure remained degraded with bare and sluffing banks, and short residual vegetation. The stream was heavily impacted by sediment.
- An aspen stand in the Mosquito SE Pasture had a barren understory, low recruitment with heavy browsing of shoots.
- The post grazing visit to Pasture 2 of Fisherman Creek revealed that the riparian stubble height was reduced to about 1.5 inches.

The observations of these areas show the effects of overstocking and lack of rest. Standards and monitoring have failed to provide residual cover and vegetation for wildlife, stream bank protection, and aspen recruitment.

Elk Ridge Production Plots – September 14, 2021

On September 14, 2021, 8 plots were established in the mapped ecological sites in the Elk Ridge Allotments. The ArcMap Random Point Generator function was used to generate points within the Elk Ridge allotments. Monitoring points were selected which occurred within areas that had been mapped for soil ecological sites. Eight locations were chosen that occurred within the Shallow Loamy Foothills, Clayey Overflow, and Loamy High Mountain ESDs. At the designated point, a 100-foot tape was strung in one of the cardinal directions that kept the transect within the vegetation type present. Four 9.6 sq. ft. plots were clipped for grasses and forbs at 25-foot intervals along the tape. These samples were air dried and weighed to obtain production data. Maximum and average heights of Idaho fescue (key species) were collected on ten plants at each site. The average weight of the four plots at each site was determined and compared to the production for the ecological site during an average year. Range condition

was determined as either poor, fair, good, or excellent based on the percent of current herbaceous production compared to potential.[1] The site map, data tables, and photos are provided in Exhibit 3. A summary of production and range conditions found is provided in Table 1.

Table 1. Summary of Forage Production and Range Condition – Elk Ridge

Site No	Ecological Site	Site Avg Grass and Forb Production lb/acre	Potential Grass and Forb Production (From ESD) Average Year lb/acre	Current Production as a Percent of Expected/Range Condition
14	Shallow loamy foothills	121	1050	12/Poor
57	Clayey overflow	174	2125	8/Poor
61	Clayey overflow	366	2125	17/Poor
67	Loamy High Mountain	90	2250	4/Poor
72	Loamy High Mountain	166	2250	7/Poor
79	Loamy High Mountain	111	2250	5/Poor
98	Loamy High Mountain	218	2250	10/Poor
145	Loamy High Mountain	108	2250	5/Poor

- Average production of grasses and forbs ranged from 90 to 366 lb/acre air dry.
- All sites were below 20% of expected production.
- Six of 8 sites were below the Forest Service capability criterion of 200 lb/acre forage production.
- All sites were in poor condition.
- Idaho fescue maximum leaf length ranged from 5 – 12" with an average of 6.3".
- Forbs were of generally low desirability as forage for cattle and were a small percent of total herbaceous vegetation.

Fisherman Creek Range Ready Survey - 2021

On June 21, 2021 an inspection of upland locations in the Fisherman Creek allotment Pasture 1 was conducted. (Exhibit 4). Three locations were surveyed to ascertain the readiness of the key species, Idaho fescue. A few flowering heads were beginning to emerge from the boot stage at two of the locations with none at a third location. The plants were generally of low stature and low vigor. A review of the growth stages and timing from the range literature indicated that range readiness would occur most likely in July. These locations were at elevations lower than those in the Upper Green allotments, and thereby would be ready earlier. Grazing should not

[1] Holechek, J.L., Pieper, R.D., and Herbel, C.H. 2004. Range Management: Principles and Practices. Fifth Edition. Prentice Hall, Upper Saddle River, NJ. Chapter 7, p107.

begin in the Upper Green or Fisherman Creek until seeds are ripe which is late July or early August.

Upper Green and Fisherman Creek Monitoring - 2022

This work was undertaken following a long process of requesting permission to place utilization cages in the Upper Green and Fisherman Creek allotments to address public concerns over conditions within the allotments. These concerns included:

- Whether the current monitoring program is capturing the actual conditions on the allotments and the need for a quality control or validation effort,
- Whether the key species, Idaho fescue is under-representing actual utilization,
- Whether green line stubble heights represent utilization in the Aquatic Influence Zone,
- Suitability of the monitoring locations used by SCCD and the BTNF, and
- Use of Wyethia and other forbs as key species.[2]

These and other concerns were described in a series of letters to the Bridger – Teton NF Supervisor, Pinedale, and Big Piney District Rangers. All the concerns other than suitability of Wyethia as a key species were addressed as laid out in the correspondence and subsequent permit.

Methods: Utilization cages (32" x 40" footprint) were placed at 13 locations (6 riparian and 7 upland) within the Upper Green and Fisherman Creek allotments. Cages were placed prior to cattle entry into the pasture and clipped following cattle exit from the pastures. Methods used were the Paired Plot and Stubble Height/Height-Weight from the Interagency Technical Reference.[3] For Paired Plots, two grazed plots were located 100' from the cage within the same vegetation type. For the Height-Weight method, in upland areas, Idaho fescue average heights (grazed and ungrazed) were recorded along the transects. At a subset of the sites, the amount of Idaho fescue trampled was recorded to estimate the effect of trampling on loss of plant availability to grazers (Holechek et al 2004). In riparian areas, green line stubble height on sedges was recorded in addition to stubble heights along the transects. We also measured ungrazed stubble heights either in cages, protected by willows, or in one instance where grazing pressure was low enough, we measured ungrazed sedges along the transects. Samples from the Paired Plots were air dried and weighed with utilization calculated based on the difference. For upland and riparian locations where stubble heights were measured, the data were transformed to utilization percent using height weight curves[4] or a utilization gage. Site location coordinates are provided in Table 2. A map of the sample sites is provided in Figure 1.

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[2] Wyethia is not addressed in this report as it is applicable to the Wyoming Range but was part of our discussion on selection of key species.

[3] USDA and DOI. 1999. Utilization Studies and Residual Measurements. Interagency Technical Reference 1734-3. https://www.blm.gov/sites/default/files/documents/files/Library_BLMTechnicalReference1734-03.pdf

[4] Kinney, J.W. and Clary, W.P. 1994. A Photographic Utilization Guide for Key Riparian Graminoids. USDA Forest Service, Intermountain Research Station. INT-GTR-308.

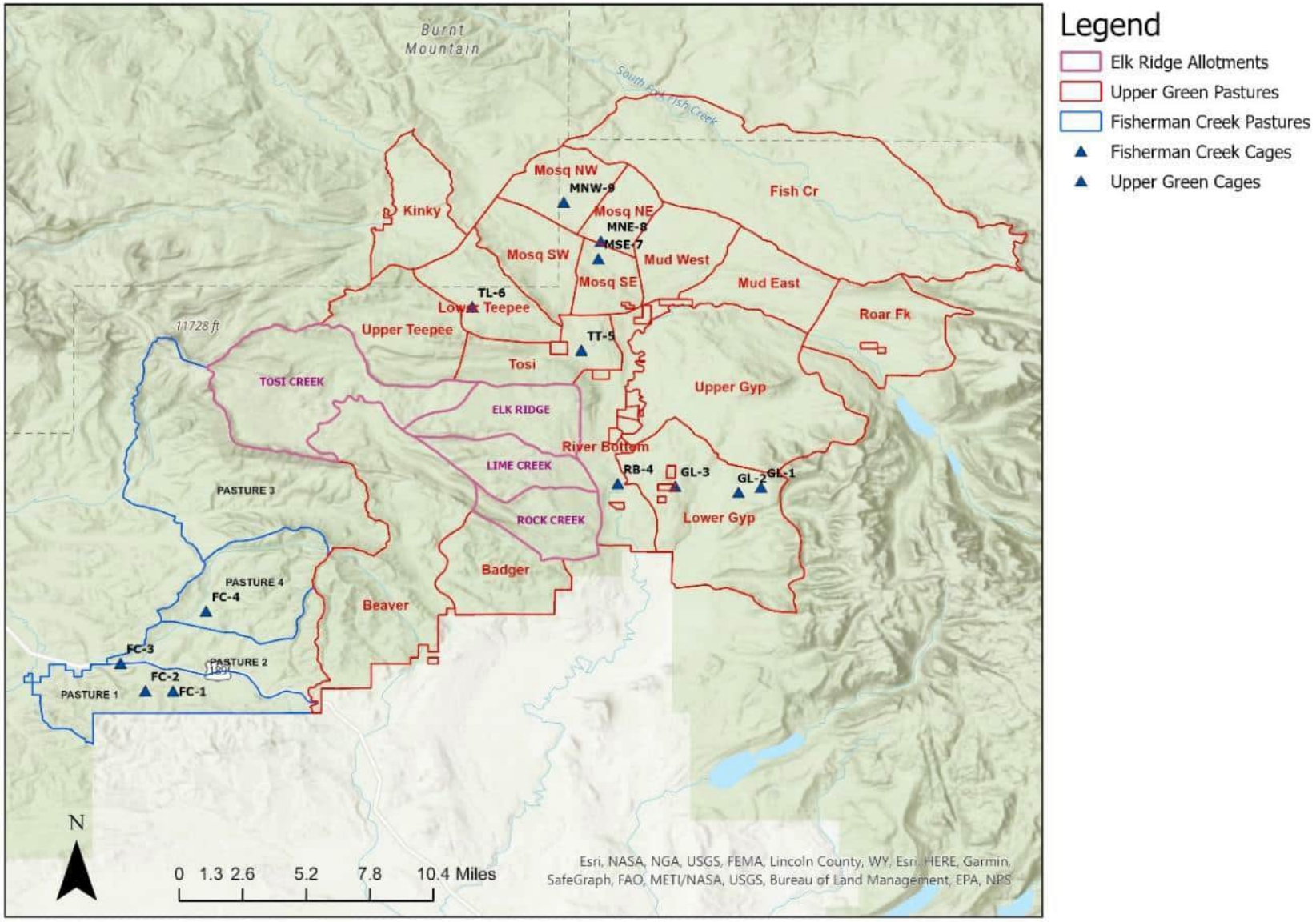
Field data and photographs for sample locations are included in Exhibit 5. Correspondence with the Forest Supervisor and District Rangers regarding the need for monitoring validation are provided in Exhibit 6.

Table 2. Sample Locations and Descriptions

Site No	Pasture	Latitude	Longitude
Riparian Sites			
FC-1	Fisherman Creek Pasture 1	43.139259	-110.285318
FC-2	Fisherman Creek Pasture 1	43.139362	-110.301638
FC-3	Fisherman Creek Pasture 2	43.155714	-110.316313
GL-2	Lower Gypsum Pasture	43.256666	-109.950904
MNE-8	Mosquito NE Pasture	43.40498	-110.032404
MNW-9	Mosquito NW Pasture	43.427988	-110.054333
Upland Sites			
FC-4	Fisherman Creek Pasture 4	43.18639	-110.265797
GL-1	Lower Gypsum Pasture	43.259586	-109.937601
GL-3	Lower Gypsum Pasture	43.260259	-109.988381
MSE-7	Mosquito SE Pasture	43.394659	-110.033826
RB-4	River Bottom Pasture	43.261809	-110.022374
TL-6	Lower Teepee Pasture	43.36621	-110.10833
TT-5	Tosi Pasture	43.340669	-110.043837

Figure 1

Upper Green and Fisherman Creek Allotment
Plot Locations



Upland Height-Weight Utilization Results: Height-Weight utilization gage results for upland locations are provided in Table 3. The ungrazed average height of Idaho fescue ranged from 3.4 to 5.6 inches with an average of 4.6 inches. The average Idaho fescue height on the grazed transects ranged from 1.9 to 3.3 inches with an overall average of 2.5 inches. These averages for the grazed transects included ungrazed plants present on the transect. When the effect of trampling of individual plants was considered, the height of Idaho fescue along the grazed transects ranged from 1.1 to 3.1 inches with an average height of 1.8 inches. Using these numbers and a utilization gage, utilization ranged from 5 to 38 percent with an average of 16.1 percent. When trampling flattened plants to the soil surface and resulted in the plant being unavailable for grazing (stubble height = 0), utilization gage readings ranged from 8 to 63 percent with an average of 35.1 percent.

Riparian Stubble Height Results: Stubble heights and utilization results for the riparian sites are provided in Table 4. The ungrazed stubble height ranged from 5 inches to 7.6 inches with an average of 6.8 inches. The AIZ transect stubble height ranged from 1.6 inches to 4.7 inches with an average of 3.3 inches. The green line stubble height averaged 4.8 inches. The green line average height was greater than the transect (AIZ) average height. Utilization on the AIZ transects ranged from 18 to 48 percent with an average of 31.0 percent. Utilization along the green line ranged from 1 to 45 percent with an average of 17.7 percent compared to 31.0 percent on the transects. Trampling was only considered in one location (GL-2) resulting in a reduction of the grazed stubble height from 4.2 inches to 3.2 inches. For the two transects that included the effects of trampling, average utilization was higher at 37 percent as compared to the transects at that location which had 18 and 28 percent utilization when trampling effects were not incorporated.

Paired Plot Utilization Results: Production and utilization results from the Paired Plots for both upland and riparian areas are provided in Table 5. Utilization in riparian areas ranged from 55.4 percent to 92.6 percent with an average of 75.5 percent. In upland areas, utilization on the total herbaceous vegetation ranged from 49.3 percent to 90.8 percent and averaged 73.1 percent. Utilization on upland grasses ranged from 54.5 percent to 91.0 percent and averaged 70.9 percent. Utilization on grasses closely tracked utilization for all species combined. Overall average riparian utilization was 75.5 percent compared to the average from the height-weight method for the AIZ transects of 31.0 percent, or green line of 17.7 percent. In uplands, paired plot overall utilization was 73.1 percent with grass utilization of 70.9 percent compared to the height-weight results of 16.1 percent on Idaho fescue without considering trampling, or 35.1 percent if trampling is accounted for.

Production Comparison to Ecological Site Descriptions: NRCS Ecological Sites were mapped from the NRCS Wyoming Soil Survey.[5] Climate data indicated that 2022 was a normal

[5] NRCS. 2020. SSURGO database. https://nrcs.app.box.com/v/soils

precipitation year.[6] Figure 2 is a map showing the ecological sites for the Upper Green allotments. No ecological sites were found for the locations in the Fisherman Creek allotment. Table 6 provides the production for a normal year at the historical climax plant community compared to the production found in the caged plots. Five of six sites with ESDs were in Poor or Fair Condition based on expected production. One site was in Excellent Condition based on production expected.

Sites TT-5 and TL-6 were in the Loamy Foothills and Mountains West Ecological Site. These are in Poor to Fair condition with Idaho fescue, an increaser, being the dominant grass. According to the ESD, the absence of cool-season grasses such as bluebunch wheatgrass, a decreaser, indicates a deteriorated state: *"As this site deteriorates because of a combination of frequent and severe grazing, species such as mountain big sagebrush, buckwheat, and yarrow will increase. Less palatable grasses such as Letterman needlegrass, Idaho fescue, rhizomatous wheatgrass, and Sandberg bluegrass also increase. Kentucky bluegrass often invades. Cool-season grasses such as bluebunch wheatgrass, blue wildrye, mountain brome, Columbia needlegrass, and spike fescue will decrease in frequency and production."*

Sites MNW-9, MNW-8, and MNE-7 were mapped as Subirrigated Foothills and Mountains Southeast Ecological Site. The ESD describes it as: *"this site deteriorates from frequent and severe grazing, grasses such as basin wildrye and tufted hairgrass will decrease in frequency and production. Western wheatgrass tends to increase. Under continued frequent and severe defoliation, the plant community will eventually become sod-bound. Over the long-term this sod will ultimately become broken with areas of bare ground developing and species such as Kentucky bluegrass and annuals invading."* MSE-7 occurred in a sagebrush site, so this ESD may not be applicable. Sites MNE-8 and MNW-9 appear to fit the ESD and are in a degraded state. See Figure 3 of site MNE-8. Here you can see a head cut and channel migrating through this sub-irrigated site as the ESD predicts. If not allowed to heal, this can continue downcutting and dewatering the site leading to a change to more xeric conditions and plant community.

Sites RB-4 was mapped as a Coarse Upland Foothills and Mountains West Ecological Site. The ESD describes it as: *"As this site deteriorates because of a combination of frequent and severe grazing, species such as Idaho fescue, mountain big sagebrush and snowberry will increase. Cheatgrass often invades with ground disturbance and fire, especially on south and west facing slopes. Cool-season grasses such as bluebunch wheatgrass, Columbia needlegrass, spike fescue, and woody plants such as bitterbrush will decrease in frequency and production."* The site lacked evidence of species such as bluebunch wheatgrass or bitterbrush and is in a degraded state.

[6] NOAA. 2022. Coop Water Year 2022 for Western and Central Wyoming. https://www.weather.gov/riw/coopwateryear2022

The Annual Operating Instructions for the Fisherman Creek allotment were reviewed for stubble height and utilization criteria.[7] Utilization limits are 50% on riparian key species and 40% on upland key species. There were no green line stubble height criteria. The Annual Operating Instructions for the Upper Green allotment specified utilization will not exceed 50% in upland and riparian areas and green line stubble heights of 4 and 6 inches shall be maintained as identified in the 2019 ROD.[8] In this case, only South Gypsum Creek in the Lower Gypsum Pasture was to have 6" green line stubble height with all other streams to meet 4" green line stubble height.[9]

Based on the upland Idaho fescue stubble height measurements along the transects, none violated any utilization standard, reflecting what the SCCD monitoring finds. When trampling was considered, FC-4 violated the Fisherman Creek upland utilization standard of 40%, however the presence of smooth brome in the cage biased this result. GL-1 violated the upland standard for the Upper Green allotments. The riparian green line stubble height of 4 inches was not met on MNE-8 while the green line standard of 6 inches was not met on GL-2.

The Paired Plot utilization data showed that the upland utilization standard of 40% and the riparian utilization standard of 50% for riparian areas in the Fisherman Creek allotment were not met at all sites. The Upper Green allotments utilization standards of 50% for both riparian and upland areas was not met at any site other than at site TT-5, where it was 49.3% on total herbaceous vegetation, but violated the standard for grass utilization. All other upland and riparian sites in the Upper Green allotments exceeded the standard based on the Paired Plots. These large differences amplify the lack of ability of key species stubble height monitoring to reflect the actual amount of material removed. It is an indicator that underestimates grazing pressure and utilization determinations for the overall plant communities.

[7] Bridger Teton National Forest. Annual Operating Instructions 2022 Fisherman Creek Allotment #2012. Big Piney Ranger District.
https://www.fs.usda.gov/detail/btnf/landmanagement/resourcemanagement/?cid=fsbdev3_063635
[8] Bridger Teton National Forest. Annual Operating Instructions 2022. Pinedale Ranger District. Same link.
[9] Bridger Teton National Forest. 2019. Record of Decision Upper Green River Area Rangeland Project. Pinedale Ranger District. https://www.fs.usda.gov/project/?project=3049

Figure 2

Upper Green Plot Locations and Ecological Sites

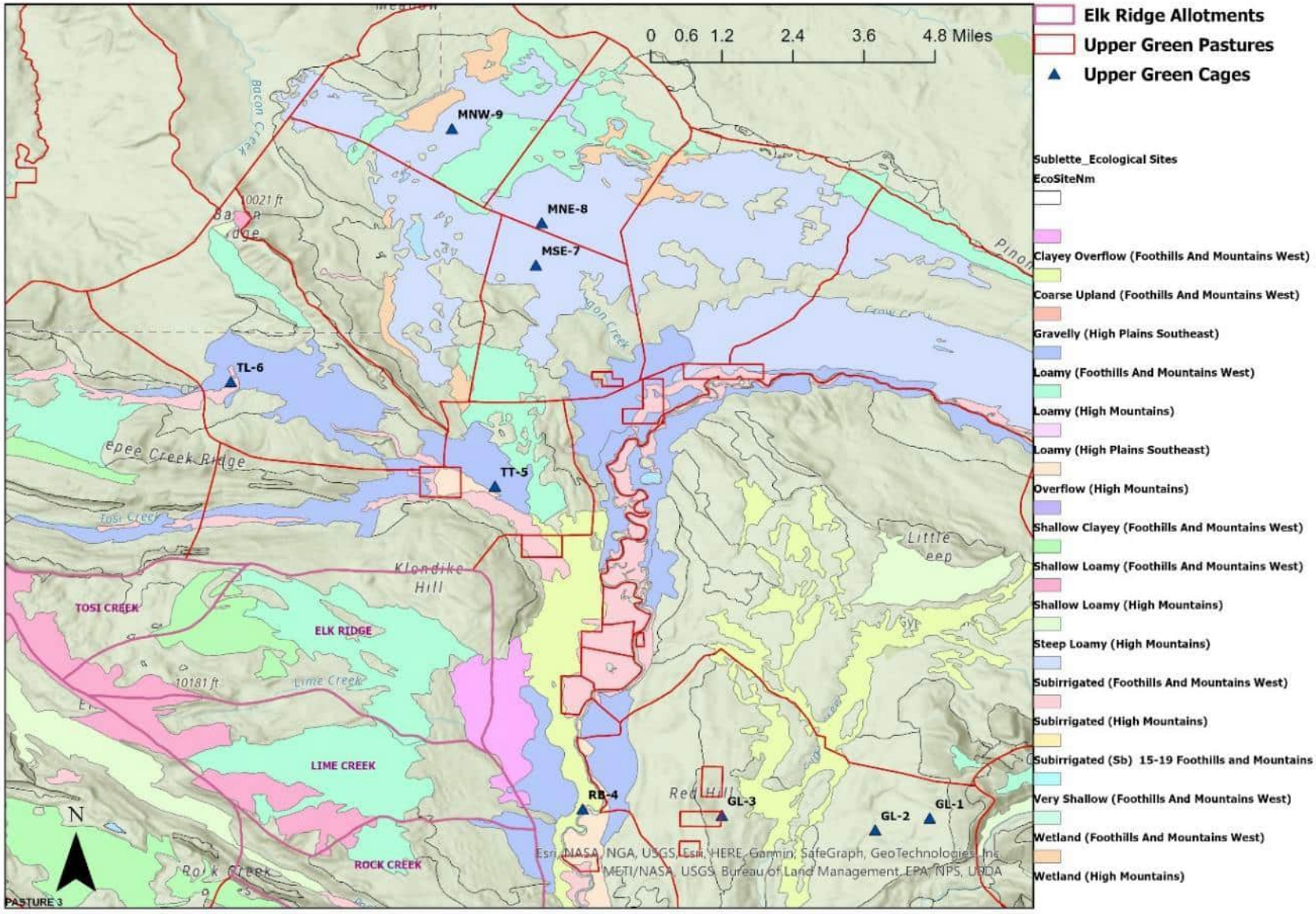


Figure 3. Mosquito Lakes NE Site MNE-8, September 8, 2022. Photos of hummocks, hoof shear, and head cut occurring in this sub-irrigated meadow.

Table 3. Upland Stubble Height and Utilization for Idaho fescue

Upland Site No	Transect	Average Ungrazed Height inches	Transect Average Height inches	Utilization %	Transect Average with Trampling inches	Utilization with Trampling %
FC - 4	East	3.8	2.5	7	1.1	57
FC - 4	West	4.7	2.5	15	1.1	63
MSE-7	North	4.7	2.5	15	1.7	45
MSE-7	South	4.9	2.9	9	2.0	36
TT-5	North	3.4	2.6	5	2.1	8
TT-5	South	4.4	2.4	15	2.2	17
TL-6	North	4.4	2.2	17	-	
TL-6	South	4.7	2.4	15	-	
RB-4	North	5.6	2.4	14	2.1	21
RB-4	South	4.8	1.9	38	1.6	49
GL-1	East	4.1	1.9	25	1.3	51
GL-1	West	5.0	2.2	35	1.4	55
GL-3	North	4.8	3.3	7	3.1	8
GL-3	South	5.4	3.0	8	2.4	11
Averages		4.6	2.5	16.1	1.8	35.1

Blue highlight indicates the site exceeds the standard.

Table 4. Riparian Stubble Height and Utilization on Sedges

Riparian Site No	Transect	Average Ungrazed Height inches	Transect Average Height inches	Utilization %	Transect Average Height with Trampling inches	Transect Utilization with Trampling %
FC-1	Down	7.0	3.3	31		
FC-1	Up	7.0	3.8	25		
FC-1	Green line	7.0	6.9	1		
FC-2	Down	7.3	4.2	22		
FC-2	Up	7.3	3.2	37		
FC-2	Green line	7.3	5.7	8		
FC-3	Down	5	1.6	48		
FC-3	Up	5	2.2	35		
FC-3	Green line	5	3.1	19		
MNE-8	Down	7.3	3.1	38		
MNE-8	Up	7.3	3.2	36		
MNE-8	Green line	7.3	2.6	45		
MNW-9	Down	6.8	3.8	24		
MNW-9	Up	6.8	3.3	30		
MNW-9	Green line	6.8	6.5	3		
GL-2	Down	7.5	4.7	18	3.4	35
GL-2	Up	7.0	3.6	28	2.9	39
GL-2	Green line	7.6	3.7	30		
Average Ungrazed		6.8				
Transect Averages			3.3	31.0	3.2	37.0
Green line Average			4.8	17.7		

Blue highlight indicates the site exceeds the standard. Site FC-3 contained mixed grasses, rushes, and sedges, so utilization was estimated on the combination using the height-weight curves.

Table 5. Production and Utilization from Paired Plots

Site No	Cage Total Herbaceous[10] Production air dry Lb/acre	Cage Grass Production lb/acre	Grazed Plot Herbaceous Residual lb/acre	Grazed Plot Grass Residual lb/acre	Utilization on Herbaceous Residual %	Utilization Grasses Only %
Riparian						
FC - 1	2017.7		899.9		55.4	
FC -2	2809.7		570.8		79.7	
FC - 3	2748.2		203.9		92.6	
GL - 2	878.3		378.7		56.9	
MNE - 8	1164.2		183.4		84.3	
MNW - 9	2842.1		460.7		83.8	
Averages	2076.7		449.6		75.5	
Upland						
FC - 4	1926.0	1864.5	220.1	168.3	88.6	91.0
GL - 1	752.1	419.7	274.1	112.2	63.6	73.3
GL - 3	843.8	785.5	339.9	322.6	59.7	58.9
MSE - 7	881.5	591.3	80.9	60.4	90.8	89.8
RB - 4	454.3	375.5	49.6	39.9	89.1	89.4
TL - 6	746.7	154.3	101.4	70.1	86.4	54.5
TT - 5	304.3	262.2	154.3	105.7	49.3	59.7
Averages	663.8	431.4	166.7	118.5	73.1	70.9

Blue highlight indicates the site exceeds the standard.

[10] Herbaceous applies to all grasslike plants and forbs in the plots.

Table 6. Production in Caged Plots Compared to NRCS Ecological Site Production

Site No.	ESD	Normal Year Herbaceous Production	Normal Year Grass Production	Site Herbaceous Production (lb/acre) and Percent of Potential	Site Grass Production (lb/acre) and Percent of Potential	Range Condition Herbaceous/ Grasses
TT-5	Loamy Foothills and Mountains West R043BY222WY	1800	1500	304.3/16.9%	262.2/17.5%	Poor/Poor
TL-6	"	1800	1500	746.7/41.4%	154.3/10.2%	Fair/Poor
MNW-9	Subirrigated (Foothills and Mountains Southeast) R049XA174WY	3600	3200	2842.1/78.9%		Excellent
MNE-8	"	3600	3200	1164.2/32.3%		Fair
MSE-7	"	3600	3200	881.5/24.5%	591.3/18.4%	Poor/Poor
RB-4	Coarse Upland (Foothills And Mountains West) R043BY208WY	1200	960	454.3/24.4%	375.5/39.1%	Poor/Fair

Observations on Monitoring by the Sublette County Conservation District: We reviewed the 2019[11] and 2020[12] Cooperative Monitoring Reports to understand the monitoring protocols undertaken by the SCCD, BTNF, and Permittees (SCCD from here) and the results obtained. No violations of green line stubble heights or upland utilization standards were found.

When we averaged the non-wetland sedge heights from the 2020 SCCD monitoring report, the average ungrazed height was 11.8 inches and the average grazed height was 9.2 inches. These are greater than the average 6.8 inch ungrazed height and the 4.8 green line height we found. (Table 4). There were no riparian utilization calculations in the 2020 SCCD report, but our paired plot determination for riparian utilization averaged 75.5%. We compared the 2020 SCCD Idaho fescue utilization to our paired plot measures based on clipping and weighing grazed and ungrazed (caged) plots. The SCCD average was 9% across all upland sites. This was on the order of the 16.1% we found using the same method. However, when we incorporated the effect of trampling, this increased from 16.1% to 35.1%. Paired plot results averaged 73.1% utilization compared to the 2020 SCCD average of 9%.

These differences may be explained by a number of factors. In the uplands, Idaho fescue is used as a key species and its height-weight characteristics are used to determine utilization. As noted in the ESD for uplands in a degraded state, Idaho fescue increases, indicating grazing tolerance. It also has fine leaves and a low growth habit, making it less desirable/available, especially when compared to larger bunchgrasses such as bluebunch wheatgrass which should be present on these upland sites. In order to reach 50% utilization on a utilization gage, a 6" Idaho fescue plant would need to be grazed to 5/8".[13] Grazed Idaho fescue plant heights averaged 2.5 inches on our transects and if trampling effects were included, the average was 1.8 inches. The 2020 SCCD grazed plant average was 2.6 inches which is close to our average of 2.5 without considering trampling effects. Another factor affecting utilization results can relate to site location. Are sites selected at significant distances from water? On ridges?

During the 2021 monitoring effort with the SCCD, we visited Site TP-23. We noted that the site being monitored was near a ridgetop with ground cover near 100%. (Figure 5). When we walked back down the hill, as we got closer to the stream, ground cover was reduced. (Figure 6). District Ranger Hoelscher agreed this was the case as he walked along with us. At this point, the stream and riparian area were showing bare soil, hoof shear, bank sluffing, and the stream was incised and impacted by sediment in the reach lacking willows.

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[11] Sublette County Conservation District. Upper Green River 2019 Cooperative Monitoring Report. Prepared for the Upper Green River Cattlemen's Association.

[12] Sublette County Conservation District. Upper Green River 2020 Cooperative Monitoring Report. Prepared for the Upper Green River Cattlemen's Association.

[13] Ratner, J. 2021. Power Point Presentation. https://app.box.com/file/813925693097?s=ootb4tf9eblexzl16f5a18oz57j1w7zw

Figure 5. SCCD Site TP-23 July 12, 2021. Upper photo showing position high on ridge above Teepee Creek. Lower photo of ground cover at near 100%.

Figure 6. SCCD Site TP-23 July 12, 2021. Upper left photo showing bare soil in riparian to upland transition (AIZ). Lower left photo of Teepee Creek showing hoof shear, scouring, and sluffing of banks. Upper right is a photo of a head cut at the point where Teepee Creek emerges from a willow carr, where willows stabilize the banks.

Forest Service research decades ago determined the order in which cattle grazed particular areas; *"Ravine bottoms were usually grazed first. Next in order were openings in timber stands on gentle slopes, areas near water, areas along fences and ridgetops, salt grounds, accessible openings in timber stands on steeper slopes, areas under large trees, and finally areas covered by tree thickets."* [14] In another study, *"cattle dispersion was constrained by the spatial distribution of water and slope. Across 3 seasons, 77% of observed use was within 366 meters of water. Approximately 65% of the land area was beyond 723 meters from water and sustained only 12% of observed use. Cattle concentrated use (79%) on slopes less than 7%. Consequently 35% of the area, on or surrounded by slopes > 10%, received only 7% of observed use. Loamy, grazable woodland and wetland sub-irrigated range sites were most preferred and accounted for over 65% of observed use while occupying less than 35% of the land area"* [15]

In a letter to Forest Supervisor Patricia O'Connor regarding monitoring, we provided some preliminary analysis showing the distance of SCCD upland monitoring locations from water in the Mud Lakes pastures. (Exhibit 6). Distances were much greater than the 366 meters derived from the Pinchak (1991) paper which was based on research in Wyoming. The Forest Service Rangeland Analysis and Management Training Guide describes selection of key areas as: *"Key areas are usually five acres or more and are selected as sites where prescribed use will occur first. Also included are sites where use must be closely monitored because of management plan requirements, such as riparian areas or areas where threatened, endangered, or sensitive species may occur."*[16]

The Forest Service Handbook defines a Critical Area as *"A portion of rangeland which has a critical issue related to it, such as a threatened or endangered or sensitive species, a high use recreation area, a key wildlife habitat, or water quality limited reach. The area serves as a monitoring and evaluation site for the critical issue." (FSH 2209.21 Zero Code 05-Definitions).*

The current monitoring locations do not meet these criteria due to the upland sites being located at great distance from water or being placed on ridges which avoids monitoring the valley bottoms or riparian areas (Aquatic Influence Zones) used first as the Training Guide describes. While the SCCD monitors green line stubble height on sedges, it does not monitor riparian areas or these AIZs which are located between the green line and uplands. These areas are critical to amphibians, migrant birds, and small mammals, some of which are sensitive species.

The SCCD and BTNF riparian monitoring locations were mapped using coordinates we obtained from the Cooperative Monitoring Reports for 2019 and 2020. Some of the points did

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[14] Hormay, op. cit.

[15] Pinchak, W.E., Smith, M.A., Hart, R.H., and Waggoner, J.W. 1991. Beef cattle distribution patterns on foothill range. Journal of Range Management, 44(3):267-275.

[16] USDA Forest Service. 1996. Rangeland Analysis and Management Training Guide. Rocky Mountain Region, Denver, Co.

not map in riparian areas for unknown reasons. But for those that did we found the majority to be in riparian areas with significant willow cover. This is problematic in that many of the forage plants are unavailable for livestock due to the dense shrub cover, so utilization estimates or stubble height measures can be misleading. In our measurements, we treated sedges beneath willow canopy as protected and their average heights were similar to those in our cages or the ungrazed sedges we found along one set of transects. Essentially, the SCCD riparian monitoring is occurring in areas least used by cattle and less sensitive to damage by livestock due to the dense willow cover. See photo of site SCCD site GYP-11 in Figure 7 showing Forest Service personnel measuring riparian stubble heights. Note there is no stream bank alteration in the portion seen in the photograph.

The Upper Green River 2020 Cooperative Monitoring Report lists the participants for each site monitored.[17] The participants included BTNF, SCCD, and Permittees. No members of the public were involved. Our experience in 2021 was not a "cooperative" monitoring effort that involved the public. It was predetermined by the BTNF, SCCD and Permittees.

The Forest Service Handbook FSH 2209.10 Chapter 10 describes public involvement. It is supposed to:

- "Involve the permittee and interested publics in management of the range allotment." (Par. 11.3).
- "Obtain ID team, interested publics, and permittee assistance in securing the necessary inventory and monitoring information and establish criteria for determining allowable use levels." (Par. 12.2).
- "The interdisciplinary (ID) team, the permittee, and interested publics should assist in the rangeland inventory and analysis and in the preparation of environmental documents." (Par. 13).
- "Public participation should be a key element of the NFMA process as well as the NEPA process. Close consultation, cooperation, and coordination with grazing permittees is essential to help them understand the differences between existing and desired vegetation on their allotment and in identifying possible practices that will achieve desired future conditions for vegetation as well as the permittees livestock operation. Other interested parties should be involved as well to identify possible practices that will be responsive to potential concerns or issues they may express. Not only is public participation good business from the standpoint of identifying opportunities and possible practices to achieve desired conditions and reduce controversy later in the planning process, but it is a requirement of law…. Furthermore, in FLPMA's declaration of policy, Congress specifically requires the Secretary of Agriculture to consider the views of the general public, and to allow for adequate third-party participation exercising his discretionary authority. (43 USC (1701(a) (5)))." (Par. 15.7).

[17] Sublette County Conservation District. 2020. Upper Green River 2020 Cooperative Monitoring Report. Prepared for Upper Green River Cattlemen's Association.

- "Benchmark areas should be selected and/or approved by the most experienced and qualified personnel available and agreed upon or coordinated with permittees and in some cases other interested agencies, individuals or groups." (1993 FSH 2209.21 Chapter 40 Par. 40.41).

Our experience with the 2021 Joint Monitoring was that the monitoring sites and methods were established without public participation. Only the SCCD, BTNF, and Permittees appear to have had any meaningful input to the process, site selection or monitoring methodology. The sites do not represent those most sensitive areas such as the riparian zones or uplands where grazing occurs first and do not fit the requirements of the Forest Service Rangeland Analysis and Management Training Guide or research referenced above. This monitoring program now requires revisiting in view of the conflicting results between SCCD and this current report.

Figure 7. Forest Service personnel monitoring stubble heights (or looking for a lost golf ball) at Gypsum Creek site GYP-11 in 2022. Note the dense willows and absence of streambank damage. Sites such as this appear protected from livestock impacts to a significant degree.

Discussion

Summary of Findings: We have summarized our observations and data from a number of field visits to the Elk Ridge Complex, Fisherman Creek, and Upper Green allotments. The damage is evident, and we have documented it with data and photographs. Meanwhile, the agencies and permittees have monitored these same areas and found no issues with overuse. The SCCD reports do not delve into analysis of their site selection process, or the ecological implications of their data collection. No observations are made of streambank damage, head cutting, sedimentation, or lack of cover in the riparian areas without willow canopy. See the example of Wagon Creek in Figure 8 showing severe bank alteration and sedimentation.

The Upper Green allotment complex contains streams inhabited by Yellowstone cutthroat trout and Colorado River cutthroat trout. These are BTNF Management Indicator Species. The Upper Green FEIS (FEIS)[18] notes that invasions by brook trout are causing population declines. This increases the need to have protections for the streams so that banks are not altered, sediment loads are reduced, and habitat is fully functional so these native fish can have a better chance to compete and persist. Livestock grazing is clearly affecting the streams by increasing the sediment loads and inducing high mortality to fish eggs and larvae. Monitoring of spawning habitats for Colorado River cutthroat trout by Western Watersheds Project in 2004 included streams in the project area.[19] Tepee Creek, Wagon Creek, Tosi Creek, Gypsum Creek, North Beaver Creek, Packer Creek, Rock Creek, and Miner Creek all were experiencing levels of substrate sediment fines that result in high mortality of egg to larvae and therefore, low survival to emergence.

We observed that in the Elk Ridge Complex, after five years of complete rest from livestock grazing, aspen recruitment is poor with sparse understory; uplands remain low in production and cover for small mammals, migrant birds, and amphibians; bare soil and accelerated erosion were present in uplands and on slopes; bluebunch wheatgrass, a dominant bunchgrass sensitive to defoliation was near absent. A site visit for joint monitoring with the SCCD, BTNF and Permittees to the Upper Green allotments in 2021 revealed that sampling was biased towards areas with less use by livestock, while sensitive stream and riparian areas were suffering hoof shear, bare soil, head cutting, and bank scour. In September 2021, we assessed production and condition within the Elk Ridge Allotment Complex. All sites were in poor condition based on herbaceous production as they were producing less than 20% of the Ecological Site potential. A range readiness visit to the Fisherman Creek allotment Pasture 1 on June 12, 2021 revealed Idaho fescue of low stature and low vigor with few flowering stalks emerging from the boot stage. Range readiness would not occur until July or early August. This indicates that livestock

[18] USDA Forest Service. 2017. Upper Green River Area Rangeland Project Final Environmental Impact Statement. Bridger-Teton National Forest.

[19] WWP. 2004. McNeil Sediment Core Sampling of 18 Critical Colorado River Cutthroat Trout Spawning Streams. Wyoming Range, Upper Green River and Wind River Range – 2004.

are turning in nearly a month earlier than they should. The Upper Green allotments are at higher elevations and would not be ready until even later in the summer.

Our data collection and analysis of the Upper Green and Fisherman Creek allotments during the 2022 grazing season showed that required or allowable utilization limits of 50 percent (40 percent for Fisherman Creek uplands) are not met with average upland and riparian utilization using Paired Plots at 73.1 percent and 75.5 percent respectively. These rates far exceeded the limits set in the AOIs. We found that green line stubble height averaged 4.8 inches as opposed to 3.3 inches on the transects in riparian meadows away from the green line. Green line utilization of 17.7 percent was less than that on the transects, which averaged 26.6 percent. When trampling effects were considered, utilization was higher.

In the uplands, height weight determinations on Idaho fescue showed an average ungrazed height of 4.6 inches and average transect height of 2.5 inches. The effect of trampling (pressing the plants flat to the ground) resulted in an average height of 1.8 inches. Corresponding utilization rates were 16.1 percent and 35.1 percent. Measures of stubble height failed to accurately depict overall utilization as measured by the Paired Plots. The 2020 SCCD report found only 9% utilization at their upland sites in 2020 using their height weight measures.

Research in Utah evaluated BLM key species height weight monitoring as compared to Paired Plots and found similar results in which the agency found light use while Paired Plots method documented heavy use in both riparian and upland areas.[20] BLM, in order to address the impaired riparian conditions, implemented a four-pasture deferred rotation system and added upland water troughs. A long-term study established in the allotment that was implemented prior to and after the management change showed that the deferred rotation grazing system and upland water did not reduce livestock utilization or bank alteration in the riparian areas, while upland use remained high and increased following the installation of the water troughs.[21]

These grazing system changes, if implemented here would not compensate for the overstocking and overuse occurring in the Upper Green and Fisherman Creek allotments. It is important to also note that our measurements occurred while current stocking levels reflected in the 2022 Upper Green Annual Operating Instructions are approximately 2/3 of permitted use.

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[20] Catlin, J., Carter, J., Jones, A. 2011. Range management in the face of climate change. In Monaco, T.A. et al. comps. 2011. Proceedings – Threats to Shrubland Ecosystem Integrity; 2010 May 18-20; Logan, UT. Natural Resources and Environmental Issues, Volume XVII. S.J. and Jessie E. Quinney Natural Resources Research Library, Logan Utah, USA. https://app.box.com/s/1a47e1d19816fd843968

[21] Carter, J., Catlin, J., Hurwitz, N., Jones, A., and Ratner, J. 2017. Upland Water and Deferred Rotation Effects on Cattle Use in Riparian and Upland Areas. Rangelands 39:112-118. https://app.box.com/s/k5a1uu81qmnafarmhlqdku54ib5ft808

Figure 8. Upper left photo of Wagon Creek in grazed portion of the creek. Hoof shear, bank sloughing, riparian vegetation cropped close to the ground, and streambed filled with sediment characterize this reach. The lower right photo is within the riparian exclosure showing good cover in the riparian area and banks healing.

Utilization, Herbaceous Retention and Rest: The allowable use levels implemented in these allotments are excessive and do not provide the needed cover and habitat for migrant birds, amphibians, small mammals, or sage grouse. Streams and adjacent riparian areas lack protection. There is a lack of planned rest to allow recovery of plant community vigor and production following grazing. Don DeLong, wildlife biologist for the Bridger Teton NF has done detailed studies of the value of herbaceous vegetation retention to support watershed function and wildlife habitat.[22] [23] He provided comparable percent herbaceous retention levels for percent key forage utilization levels. The 50 percent allowable use level does not provide the 80 percent herbaceous retention needed for amphibians.[24] That report also addressed buffer zones and levels of protection needed, including 100 foot, 200 yards, 1/3 mile, and 1 1/2 mile riparian/wetland/upland buffers to provide adequate habitat for amphibians. Table 2 of that report describes the various factors impacting their habitat. The DeLong (2021)[25] Power Point relates utilization, Forest Plan objectives and retention to the needs of many species. Also see Exhibit 7 by DeLong which is a Summary Basis for Building Wildlife Habitat – Needs & Protections into Forage Utilization Limits.

The allowable use or utilization and stubble height standards for Upper Green (note Fisherman Creek lacks stubble height requirements) do not provide the retention needed for wildlife. As Delong notes, 30 percent utilization is more appropriate in providing the retention needed. Excerpts from a review of Utilization, Rest and Grazing Systems by Dr. Carter are provided here.[26] These support a 25 percent utilization standard.

Long standing reseearch has recommended that 25 percent of forage be allocated to livestock, 25 percent to wildlife and 50 percent to watershed protection.[27] The paper also noted that the NRCS has adopted guidelines for reduction in capacity for distance to water and slope with

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[22] DeLong,D. 2015. Literature Review and Analysis of Scientific Information for the Conservation Assessment for Columbia Spotted Frogs and Boreal Toads on the Bridger-Teton National Forest. Reference Document Version 3.0. Bridger-Teton National Forest. 698p. https://app.box.com/s/fiatx8jmndlm27q8ewrjqwgbb262imll

[23] DeLong, D. 2016. Upper Green Allotment Management Planning EIS Supplemental Wildlife Specialist Report Migratory Birds. Bridger-Teton National Forest. 183p. https://app.box.com/s/jpzfwzh9vjlkzj5i7887dnhlc1ixv30w

[24] DeLong, D. 2015. Summary Basis for Building Wildlife Habitat-Needs & Protection into Forage Utilization Limits. West Zone Wildlife Biologist, Bridger-Teton National Forest. 8 p. https://app.box.com/s/nexfkktm2zfd0leqt748vgqqq4wzt38x

[25] DeLong, D. 2021. Forest Plan Direction & Other Wildlife. PowerPoint. 115p. https://app.box.com/s/vuptjmujedgrk1n5xan5z08xk7pzc2zn

[26] Carter, J. 2013. Utilization, Rest and Grazing Systems – A Review. Yellowstone to Uintas Connection. https://app.box.com/file/22619911223?s=ngw6723dx52quxw2rd8u

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

areas more distant or upslope having reduced use and therefore reduced capacity.[28] Early turn in of livestock and lack of adequate rest can reduce plant vigor and therefore, productivity. In a 1953 paper, 25 – 30 percent use of all forage species by livestock was recommended because routinely stocking at higher levels would result in overgrazing in half the years.[29] Even at these use levels complete de-stocking would be needed in 2 or 3 out of ten years. This is because plant production is related to precipitation and is lower during lower precipitation years, including drought. During these lower precipitation years, not only is production lower, but the ability of plants to recover from grazing is lessened. The BTNF has implemented 50 percent utilization and higher in the Upper Green allotments while leading range scientists have documented for decades that 30 percent or less is needed to sustain the plants. Holechek et al (2004) provide that *"use of harvest coefficients higher than 25% invariably leads to land degradation…"*.

In our experience, over-utilization and lack of required rest are common across BLM and Forest Service managed lands in the west. Agencies refer to deferment as "rest", but areas are still grazed each year. Forest Service researchers originally developed guidance for rest-rotation grazing based on intensive field studies.[30] They stated, *"While the idea of incorporating rest in grazing management is not new, the concept of longer rest periods than have heretofore been recommended, at least for mountain bunchgrass ranges, and of closer correlation of resting and grazing with plant growth requirements, is new."* Some points of interest from the study were that, even with the rest-rotation system, some areas were more heavily used than others, regrowth was minimal on clipped plants after the seed-in-milk phase and clipping during active growth reduced total herbage yield during that year. A single season of clipping reduced basal area of forbs and grasses the next year. Four consecutive seasons of clipping at the seed-in-milk phase reduced basal area of Idaho fescue 80 percent. Four years' rest after four years' clipping resulted in little or no recovery of Idaho fescue. They also found that cool-season grasses such as Idaho fescue varied in production by a factor of three due to changes in annual precipitation, while the beginning of growth varied by up to a month with similar variations on time to flowering and seed ripening. Based on this research, the basic principle was to require adequate years of rest to allow the native plants to recover their vigor before again being grazed. They also recommended that it is important to include adequate monitoring of each grazed unit or pasture to determine if these rest periods are sufficient to maintain or restore production.

Native cool-season perennial bunchgrasses can be very sensitive to defoliation and growing season use. Regarding bluebunch wheatgrass, *"Effects of growing season defoliation injury are well documented: basal area, stem numbers and both root and forage yields are reduced and mortality can be*

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

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

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

high. … Defoliation to very short stubble heights during the boot stage has been reported to essentially eliminate plants within as few as three years. … Vigor recovery has been found to require most of a decade, even with complete protection from grazing." [31] The author went on to describe experiments in which a single clipping of the grass during the growing season resulted in 43 percent less herbage and 95 percent fewer flower stalks the following year when compared to unclipped plants. Under a deferred rotation system in eastern Oregon, it was reported that bluebunch wheatgrass could not be maintained at 30 – 40 percent use in the boot stage (early June). A one-time removal of 50 percent of the shoot system during active growth may require six years' rest even in an area with 17" precipitation. *"The belief that range improvement will occur after one or two years of rest following a single season of more than 'light' use during the growing season is erroneous."* Idaho fescue of moderately low vigor required 3 years of rest for recovery and plants of bluebunch wheatgrass and Idaho fescue in very low vigor may require 8 years and 6 years of rest, respectively, for recovery.[32] We see evidence of this in the Elk Ridge Complex after five years of rest in which bluebunch wheatgrass has not recovered, production has not recovered, and Idaho fescue remains in low vigor. Rest is not part of the management of the pastures in the Upper Green and Fisherman Creek allotments.

The Forest Service determined the order in which cattle grazed particular areas; *"Ravine bottoms were usually grazed first. Next in order were openings in timber stands on gentle slopes, areas near water, areas along fences and ridgetops, salt grounds, accessible openings in timber stands on steeper slopes, areas under large trees, and finally areas covered by tree thickets."*[33] In another study, *"cattle dispersion was constrained by the spatial distribution of water and slope. Across 3 seasons, 77% of observed use was within 366 meters of water. Approximately 65% of the land area was beyond 723 meters from water and sustained only 12% of observed use. Cattle concentrated use (79%) on slopes less than 7%. Consequently 35% of the area, on or surrounded by slopes > 10%, received only 7% of observed use. Loamy, grazable woodland and wetland sub-irrigated range sites were most preferred and accounted for over 65% of observed use while occupying less than 35% of the land area."* [34]

We mapped SCCD monitoring locations in the Mosquito Lakes pastures and estimated the distance to water compared to the 366 meters in which most use occurred in the Pinchak et al (1991) study. Table 7 and Figure 9 provide a summary of the distances and maps of the locations. The SCCD Cooperative Monitoring needs to be revamped to focus on the areas in valleys and near water that are used first as the cited research has shown and Forest Service guidance cited above has stated. The public must be involved in developing the monitoring plan.

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[31] Anderson, Loren D. 1991. Bluebunch wheatgrass defoliation, effects and recovery – A Review. BLM Technical Bulletin 91-2, Bureau of Land Management, Idaho State Office.

[32] Mueggler, W.F. 1975. Rate and pattern of vigor recovery in Idaho fescue and Bluebunch wheatgrass. Journal of Range Management 28(3):198-204.

[33] Hormay. op. cit.

[34] Pinchak, op. cit.

Other Forest Service research notes that vigorous woody plant growth and at least 6 inches of residual herbaceous plant growth at the end of the growing/grazing season typified riparian areas in excellent, good, or rapidly improving condition. This corresponded to a riparian utilization rate of 24 – 32 percent. *"Most riparian grazing results suggest that the specific grazing system used is not of dominant importance, but good management is – with control of use in the riparian area a key item."* Degraded riparian areas may require complete rest to initiate the recovery process and recovery may require up to 15 years.[35] We have observed the degraded conditions on some of the streams in the Upper Green allotments. These will require complete rest to recover. As the Wagon Creek exclosure illustrates, after over a decade recovery is still occurring while adjacent grazed riparian areas and the stream banks remain degraded.

Table 7. Estimated Distance from Water to SCCD Monitoring Location, meters.

Location	Distance, m	Notes
MLE-01	1832	Location about 100 feet higher than lake
MLE-02	279	Location on ridge about 100 feet higher than lake
MLE-03	2102	Location several hundred feet higher than stream
MLW-02	1323	Location about same elevation as lake
MLW-02	1890	Location about same elevation as lake
MLW-04	3330	Location about 1,000 feet lower than lake
MLW-04	494	Location about 300 feet higher than stream, steep slopes intervene

W. S. Platts reviewed grazing systems and found that none were compatible with healthy aquatic ecosystems[36]. A study of long-term riparian exclosures found that, after 30 years of livestock exclusion, willow canopy cover was 8.5 times greater in livestock exclosures than in adjacent grazed riparian areas.[37] Grasses were 4 to 6 times greater in cover within the exclosure than outside. Mean peak standing crop of grasses within the exclosure was 1950 lb/acre, while outside in caged plots, mean peak standing crop was 1083 lb/acre. Another study of upland and wet meadow communities that had livestock excluded for 9 – 18 years found major differences between the ungrazed communities and those continuing to be grazed. In each case, the area without grazing had greater belowground plant biomass, lower soil bulk density and higher soil pore space. In dry meadows the infiltration rate was 13 times greater than those dry meadows continuing to be grazed, and in wet meadows, infiltration of rested areas was 2.33 times greater.[38] In both areas, the results show improved water holding capacity in the absence of livestock.

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[35] Clary, op. cit.

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

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

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

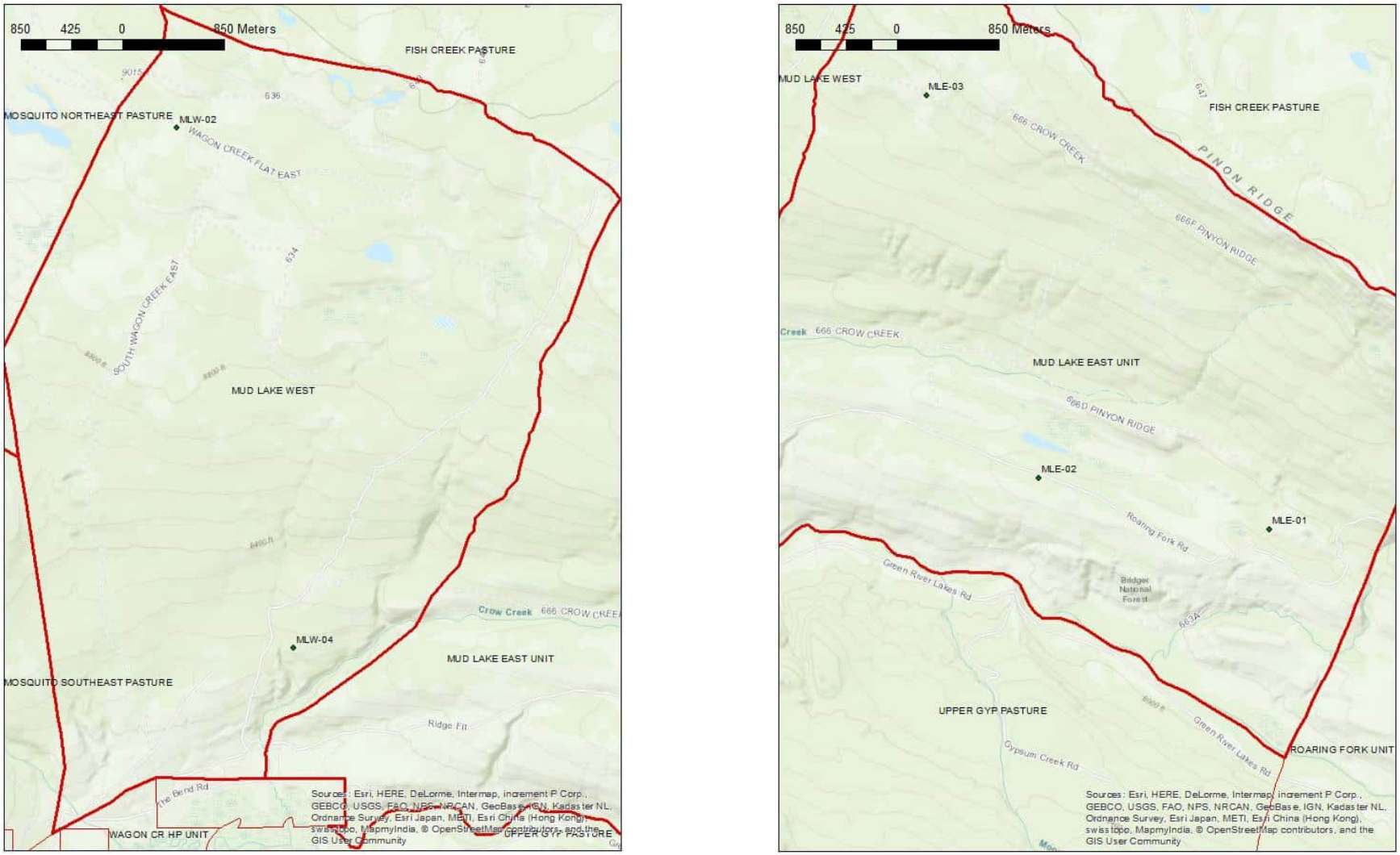

Figure 8. Forest Service and SCCD monitoring locations in Mud Lake Pastures

The implications of these studies relative to Forest Service NFMA requirements for sustainable use and preventing impairment of productivity are clear. Grazing systems do not compensate for over-stocking, light use is necessary to sustain productivity and long-term rest is essential to restore productivity following livestock grazing. Current livestock management practices in the BTNF are not compliant with the science or with the Multiple Use Sustained Yield Act and NFMA provisions for sustainability as evidenced by the loss of upland bluebunch wheatgrass, lowered production, presence of low vigor Idaho fescue, erosion channels in meadows, sluffing stream banks, and visible sediment impairment.

BTNF Examples: At times, the BTNF has indicated an intent to use criteria that are supported by range science when managing livestock grazing. Two examples come to mind. These are the Forage Reserve pastures and their prescribed management, and the Upper Green Allotment Complex Noble Pastures. When the permittee on the Upper Gros Ventre Allotment wished to transfer his permit to the Forest Service, the Forest Supervisor did so because the permittee wished to relinquish the permit without preference, there were no preferred applicants for the permit, and the forage reserve offered an opportunity to reduce conflicts with grizzly bears and wolves. This would assist in meeting *"management goals for the Gros Ventre Wilderness and designated Wild and Scenic Rivers"* and there are active allotments that could make use of the forage reserve in the event of wildfire or predator conflicts.[39]

The BTNF then established the forage reserve with conditions that limited grazing use to no more than 3 seasons in ten years with no more than three years consecutive. Proper use was set at 35 percent for riparian and uplands. Given bighorn sheep concerns only cattle and horses could use the allotment. Grazing is only permitted to the extent it does not result in conflict with grizzly bears and wolves. No control action would occur in conflicts with livestock with livestock being moved until all options are exhausted, then livestock will be removed from the forage reserve.

Here, the BTNF included conditions with rest and lower utilization rates so that plant communities might recover their vigor and productivity and if, by chance, grazed by livestock in the future, conflicts with wolves and bears would be dealt with differently. If conflicts occurred, livestock would be the ones to go, not the bears or wolves. Ultimately, however, problems we have identified with the key species methods and monitoring of areas less used by livestock, the SCCD monitoring would not ensure the specified utilization level would ever be accurately determined. This would result in a failure to guarantee the terms would be met.

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[39] USDA Forest Service. 2015. Upper Gros Ventre Allotment - Forage Reserve. Letter from Acting Forest Supervisor Conant to Dale Deiter, Jackson District Ranger. January 29, 2015.

The Upper Green Allotment Complex FEIS Executive Summary described the Modified Grazing Management for Alternative 4 which would make an exception to the general allowable use levels for specific areas. *"The exceptions to the general allowable use levels were: Noble Pasture 1 in the Noble Pastures Allotment would have a maximum forage utilization of 40 percent on key forage species in the pasture. More restrictive focus area prescriptions on Tosi Creek, Mosquito NW and SW in the Upper Green River Allotment were to have an average forage utilization of 30 percent in the upland and riparian areas over a five-year period with a maximum forage utilization of 50 percent in any given year."* This was changed in the Record of Decision to: *"The Noble Pastures Allotment will have a maximum forage utilization of 60% in uplands and 65% in riparian/meadow areas and all other allotments will incorporate a maximum of 50% forage utilization in the upland and riparian/meadow areas."*[40] Initially the BTNF proposed criteria that approach the use levels supported by science, and the retention level needed by wildlife, although it did not specify rest. Then, in its ROD, the BTNF returned to its excessive allowable use levels, which clearly cannot be supported by science, our data, and the Delong research specific to the BTNF. And with the SCCD finding only 9% average use on Idaho fescue in 2020, the terms and conditions would have always been met regardless of the specified use levels.

Then, the Upper Green FEIS relies on an erroneous allowance for forage consumption by cattle, using 26 lbs/day for both a cow and her calf. This number is oven dry weight, not air-dry weight and has been misstated by agencies for many years.[41] In addition, the forage allowance ignores the consumption by calves. At the 3% of body weight used by NRCS, and at the current weight of cattle (cow plus calf = 1,680 lbs), forage consumption is 50.4 pounds of air-dry weight per day, or 1,532 pounds per month.[42] This is almost double that stated in the FEIS.

The FEIS estimated that the 74,263 capable acres produce 104 million pounds of herbaceous vegetation. It then allocated 6.8 million pounds, or 6 percent to big game, an important wildlife and recreational resource. To generate the 104 million pounds on the 74,263 capable acres means that each capable acre must produce 1,400 pounds of forage, mainly grass preferred by cattle. Our results show current herbaceous production averages 664 lb/acre which is a fraction of potential and less than half the 1,400 pounds/acre.

The FEIS stated 9,089 cow calf pairs graze the allotments. The season is four months between June 14 and October 15. These would then require:

9089 pairs x 1680 lb/pair-month x 4 months = 61,078,080 lb of forage.

At a 25 percent utilization rate, the 74,263 capable acres would have to produce 244,312,320 pounds, or 2.4 times the total capacity claimed in the FEIS. The FEIS claims forage capacity is

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[40] USDA Forest Service. 2019. Record of Decision Upper Green River Area Rangeland Project. Bridger-Teton National Forest.

[41] Carter 2013, op.cit.

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

not reliable for determining stocking rates and reliance must be placed on actual livestock use. But as we see, the SCCD monitoring situation is not lending itself to accurate determinations of utilization. Leading range scientists recommend measuring forage capacity at regular intervals and readjusting stocking levels based on the data.[43] [44] Determining forage capacity, using current forage consumption values applied to the vegetation types within the capable acres (<30% slope, <1 mile from water, adequate ground cover, production> 200 lbs/acre, and other factors) assists in preventing over stocking and guards against excessive use when agency personnel are unable to do adequate monitoring. If an actual determination was made of range readiness, forage capacity, a sustainable utilization rate applied that meets retention needed for wildlife, and adequate rest were implemented, numbers and seasons on the Upper Green and Fisherman Creek allotments would need to be reduced significantly.

How does the 2020 SCCD utilization rate of 9 percent compute? According to the AOI for 2020, approximately 5,800 pairs are currently authorized. The 74,263 capable acres would have to be producing a huge amount of forage for this to occur.

5,800 cow/calf pairs x 50.4 lbs/day x 120 days = 35,078,400 lbs of forage consumed
At a 9% utilization rate total available forage would need to be 35,078,400/0.09 = 389,760,000 lbs

This means the 74,263 capable acres would have to produce 5,248 lb/acre, which ranges from 1.5 to 4.4 times the potential production from the ESDs. As we have noted, most of our sites were in poor condition based on herbaceous production, which is less than 25% of potential.

We have estimated stocking capacity for the Upper Green allotments using the average upland production found using Paired Plots in 2022. Using BTNF capable lands of 74,263 acres, average upland cage values for total herbaceous production of 664 lb/acre, forage consumption of a cow/calf pair of 50.4 lbs/day, allowable use of 25 percent, rest one year in three, and starting the grazing one month later for range readiness, the stocking rate becomes:

74,263 capable acres x 664 lb/acre herbaceous vegetation = 49,310,632 lbs
Available for livestock at 25 percent allowable use = 12,327,658 lbs
Rest one-third of pastures each year = 12,327,658 x 2/3 = 8,218,439 lbs
Range ready adjustment: reduce four month grazing season to three months = 90 days
Available for livestock = 8,218,439 lbs/90 days = 91,315 lbs/day
Number of cow/calf pairs supported at 50.4 lb/day per pair = 91,315/50.4 = 1,811 pairs

This is 31 percent of the approximately 5,800 pairs authorized in 2022 in the Upper Green allotments. It provides evidence that the loss of productivity is caused by past and current management. It is due to a failure to determine actual forage capacity or provide rest. This, combined with unsustainable utilization standards and monitoring that is unable to accurately

[43] Galt 2000, op.cit.
[44] Holechek 2004, op.cit.

determine actual use, have led to the overstocking and degraded conditions that currently exist on the allotments.

As noted, an allocation for big game was made in the FEIS. We obtained geospatial data of wildlife habitats from the Wyoming Fish and Game Department.[45] For example, Rocky Mountain Elk parturition, crucial and seasonal ranges occur in the Fisherman Creek, Elk Ridge, and Upper Green allotments. We find that current herbaceous vegetation production is a small portion of the potential that should be present and livestock use is greater than 70 percent, so there is no proof provided by the Forest Service and SCCD that there is sufficient available forage on these allotments to provide for big game such as elk.

One sage grouse lek, the Wagon Creek lek is an occupied lek occurring in the Upper Green allotment. The residual stubble heights we find in riparian meadows and in uplands is significantly lower than the 7 inches needed by sage grouse for nesting and brood-rearing.[46] In addition, the heavy use of >70 percent by livestock is directly competing with the nesting and brood rearing area needs of sage grouse chicks that require functional habitat with insects, i.e. *"great plant species richness with abundant forbs and insects characterize brood areas"* according to Connelly et al (2000).

According to the FEIS, *"The Green River and the lower reaches of its tributaries flow through open valleys and support well-developed willow riparian communities with abundant herbaceous vegetation (forbs, grasses, sedges) eaten by bears."* The FEIS noted that 52% of the 27 grizzly bear deaths between 2010 and 2014 occurred in the project area, with 18 relocations. All were due to cattle depredation. There were other mortalities resulting from human conflicts. The FEIS described other food resources for grizzly bears, including whitebark pine seeds, ungulate and small mammals, roots, tubers, ants, and berries and stated there is limited forage overlap with livestock. Whitebark pines in the project area have suffered mortality in recent years, diminishing that food source. This increases the importance of these other foods. If livestock are consuming over 70 percent of the herbaceous vegetation, that constitutes a significant loss of food resources for bears in the summer. Currently the BTNF is proposing a Union Pass Farm Bill Salvage Project that will remove whitebark pine and other conifers for commercial harvest and salvage logging.[47] Much of this occurs in the Upper Green allotment area and will remove living trees that can generate seeds and security cover for grizzly bears and other wildlife. This project affects nearly 6,000 acres of forested cover.

[45] WGFD. 2023. Geospatial Data. https://wgfd.wyo.gov/Wildlife-in-Wyoming/Geospatial-Data
[46] Connelly, J.W., Schroeder, M.A., Sands, A.R., and Braun, C.E. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28(4):967 – 985.
[47] BTNF. 2023. Union Pass Farm Bill Salvage Project. https://www.fs.usda.gov/project/?project=58615

Conclusion

Our results demonstrate that the Upper Green and Fisherman Creek allotments are overstocked based on our measures of average upland and riparian utilization using Paired Plots at 73.1 percent and 75.5 percent respectively. These far exceed the 50 percent utilization or allowable use standard required by the BTNF. They do not meet herbaceous retention needs for wildlife and are nearly triple what range science studies recommend. We note that the current stocking rates as represented in the 2022 Annual Operating Instructions for the Upper Green allotments are approximately two-thirds of permitted numbers.

Herbaceous and grass production was lower than potential at all sites, with most in Poor Condition. The dominance by increaser species and loss of sensitive native bunchgrasses in uplands is consistent with the characterization of degraded systems in the Ecological Site Descriptions NRCS uses to characterize plant community characteristics. The loss of production is due to improper range management, overstocking, and inaccurate monitoring. This also affects wildlife such as elk and other big game, as well as grizzly bears that also rely on herbaceous vegetation and prey species that also rely on plants. In the vacant Elk Ridge allotments, after five years with no livestock, production remains low at less than 20% of potential and most sites remain visibly degraded.

Measurement of stubble heights on the key species, Idaho fescue, underestimates utilization when the herbaceous community is quantitatively assessed by the Paired Plot method. The SCCD and Forest Service measurements have underestimated utilization by a large amount. For example, in the 2020 SCCD Cooperative Monitoring Report average utilization was 9 percent using Idaho fescue. Compare this to the >70 percent results we find using the Paired Plot method. The residual heights do not meet the needs for sage grouse nesting or brood-rearing areas. Upland monitoring locations used by SCCD do not appear to meet Forest Service guidelines to monitor those areas grazed first or sensitive areas for wildlife.

Green line stubble heights were greater than those found on transects within the adjacent riparian area or AIZ that is important to migrant birds, amphibians, small mammals, and sage grouse. Some locations failed to meet the green line stubble height standard while most adjacent riparian transects AIZ would not meet the standard if it were applied to them. SCCD green line monitoring locations are in areas with protection by willows and result in no sites exceeding standards, while adjacent unprotected riparian and meadow areas are degraded.

Capacity calculations reveal a basic problem with SCCD monitoring. At the 9 percent utilization found in 2020, the 74,263 capable acres would need to produce over 5,000 lbs/acre of forage to support the 5,800 cow/calf pairs currently grazing. This ranges from 1.5 to 4.4 times what the ESDs for uplands estimate. Then, when the current Fair/Poor condition found in the allotments is considered, they are producing less than half of potential, most producing less than 25 percent of potential. Our capacity determination using the recommended range science results in 1,811 cow/calf pairs (31% of current rate) should be allowed to graze.

What needs to happen: What is needed at this point is to revamp the current monitoring protocol and also determine current forage capacity and stocking rates along with providing rest and later turn in. This can be accomplished in a true joint monitoring and management effort involving the Forest Service, SCCD, Permittees, WWP and Y2U that will:

1. Select key areas in upland and riparian areas that meet the advice in the Forest Service guidance and research we have cited. It will include areas grazed first, that is, riparian areas lacking significant willow protection and upland areas that are in valleys, on slopes less than 7% and no more than 366 meters from the nearest water source. These would then be compared to the nearest SCCD monitoring sites.
2. Place cages in these areas, at current SCCD sites, and establish paired plots.
3. Measure the key species, Idaho fescue, along upland transects. Measure sedges along transects in riparian meadows (AIZ). Measure green line stubble heights at each riparian location. Include trampling in the measures.
4. Compare the results from the different methods and locations.
5. Determine the stocking rate on capable areas using the Paired Plot production data and visiting pastures with turn-in after July and clip the vegetation. Inspection of the 2022 AOI indicates six pastures are available if the schedule remains the same.
6. Initiate this in the summer of 2023.

Exhibit 1
Photographs
July 7, 2020 Field Visit
Elk Ridge Allotments
WWP and Y2U

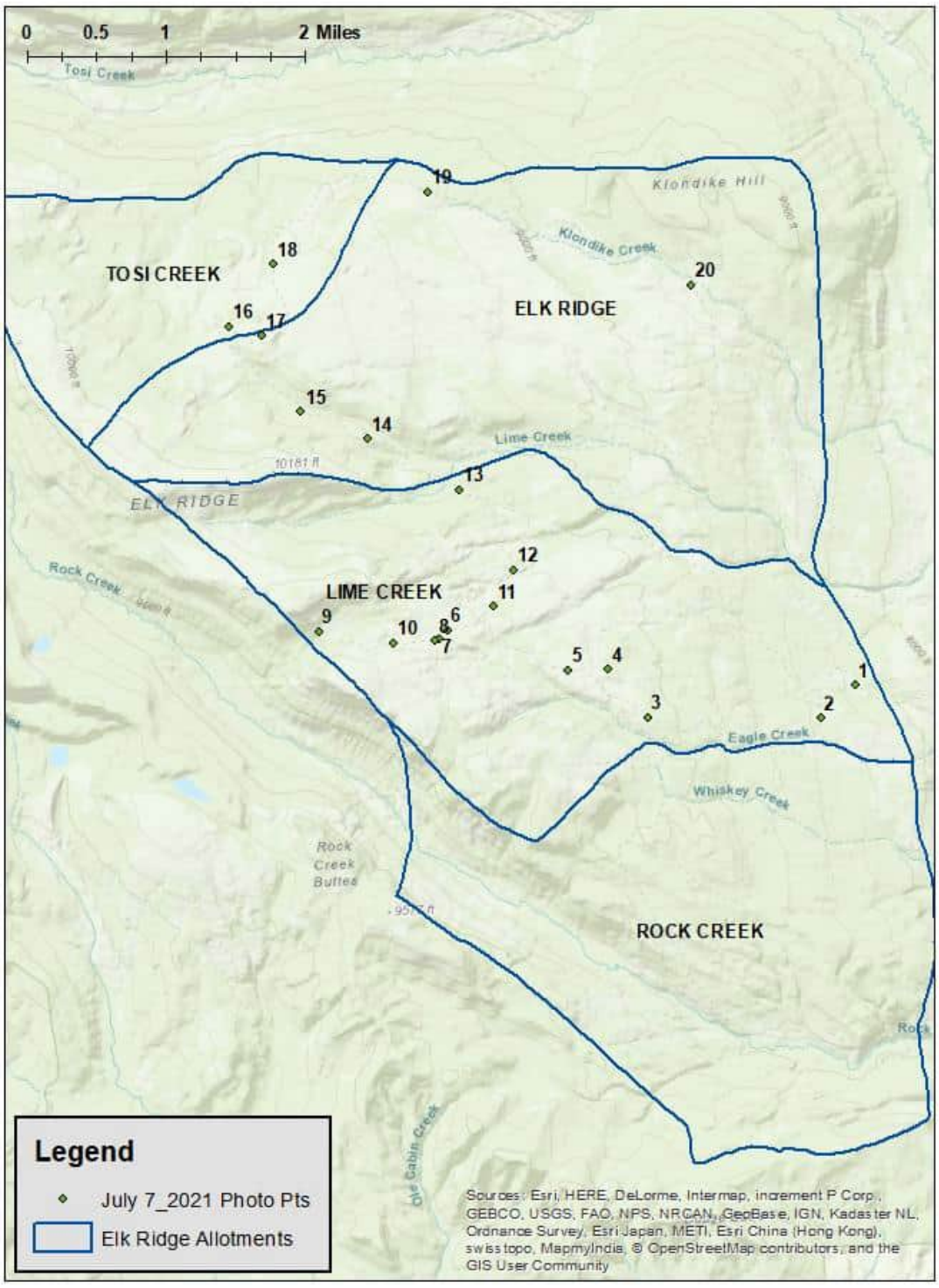


Photo point locations along initial survey route

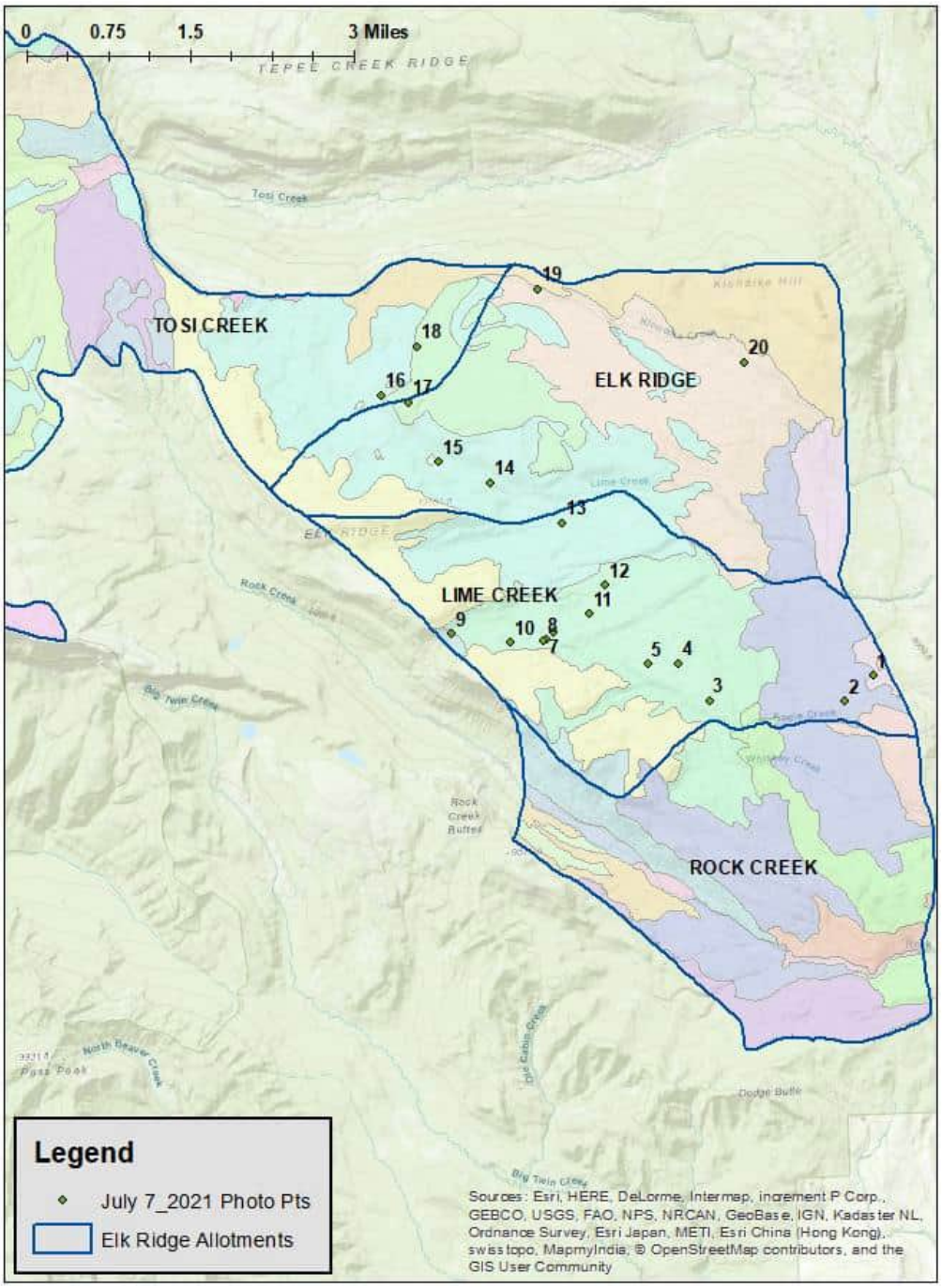
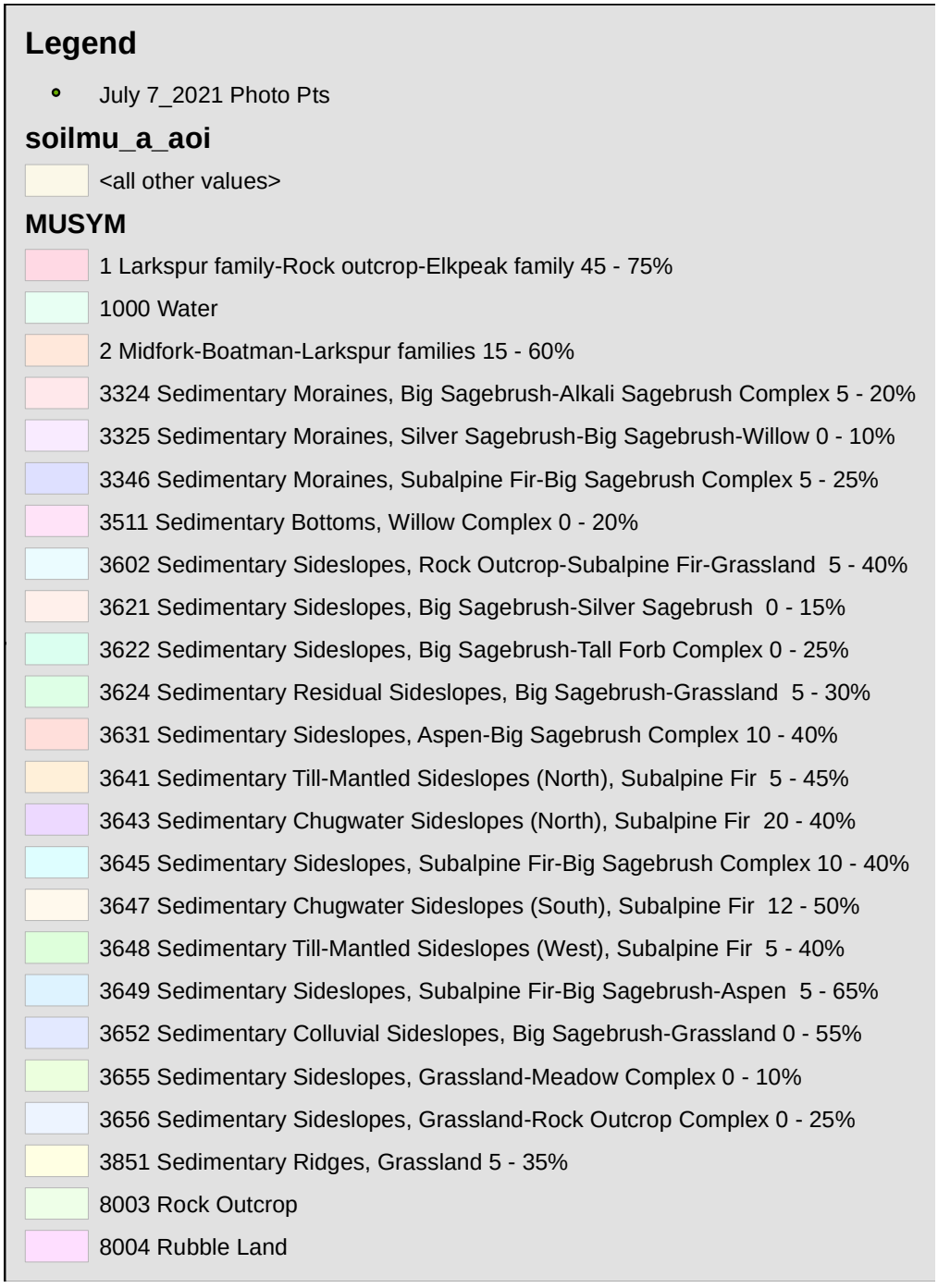


Photo point locations along initial survey route overlain on Soil Map Units from the Sublette County Soil Survey



Sublette County Soil Survey Key to Soil Map Units

Location 1

Low Aspen recruitment after 5 years with no livestock grazing. low vigor Idaho fescue, and significant amount of bare soil. Some evidence of pedestaling. Due to cattle preference for aspen stands for shade and forage, if grazed by livestock, these young suckers may be lost, and future recruitment suffer.

Location 2

Significant bare soil. Low vigor Idaho fescue, but with some seed stalks and last years' growth providing litter to cover the soil. With cattle grazing this litter will be lost.

Location 3

Sparse cover by herbaceous vegetation. Low level of productivity from grasses such as Idaho fescue. Cattle grazing will reduce the grasses to less than 2" which eliminates cover for sage grouse and migrant birds as well as small mammals.

Location 4

Sparse cover by herbaceous vegetation with significant bare soil. Low level of productivity from grasses such as Idaho fescue which remain in low vigor after five years rest. Cattle grazing can reduce the grasses to less than 2" which eliminates cover for sage grouse and migrant birds as well as small mammals.

Location 5

Sparse cover by herbaceous vegetation with significant bare soil. Low level of productivity from grasses such as Idaho fescue which remain in low vigor after five years rest. Cattle grazing can reduce the grasses to less than 2" which eliminates cover for sage grouse and migrant birds as well as small mammals.

Location 6

Sparse cover by herbaceous vegetation with significant bare soil. Low level of productivity from grasses. Cattle grazing can reduce the grasses to less than 2" which eliminates cover for sage grouse and migrant birds as well as small mammals. Even in this rested state, herbaceous cover height is less than needed for sage grouse.

Locations 7 (left) and 8 (right)

Herbaceous community dominated by forbs of low desirability to cattle, such as geranium. Little cattle forage here.

Location 9

At Gros Ventre Wilderness boundary. Rapidly eroding soils and slopes. High proportion of bare soil and plant community dominated by forbs of low desirability for cattle.

Locations 10 (left) and 11 (right)

At Location 10, eroding and barren soils in distance, plant community remains in low seral state with sparse grass cover and forbs of low desirability to cattle. At location 11, high cover of forbs that will degrade as the season ends. Cover dominated by forbs of low desirability to cattle.

Locations 12 (left) and 13 (right)

Location 12 on NE facing slope with Young whitebark pine, sagebrush, and good soil cover. Location 13 with significant bare soil, low herbaceous cover for migrant birds.

Location 14 (left) and 15 (Right)

Location 14 with an ancient whitebark pine. Location 15 showing whitebark die-off and valley with bare soil and significant presence of rushes of low desirability to cattle.

Location 16 (left) and 17 (right)

Location 16 valley with water and steep sides with little apparent forage and erodible slopes. Dead whitebark pines. Location 17 on ridge showing little forage or herbaceous cover in the thin soil.

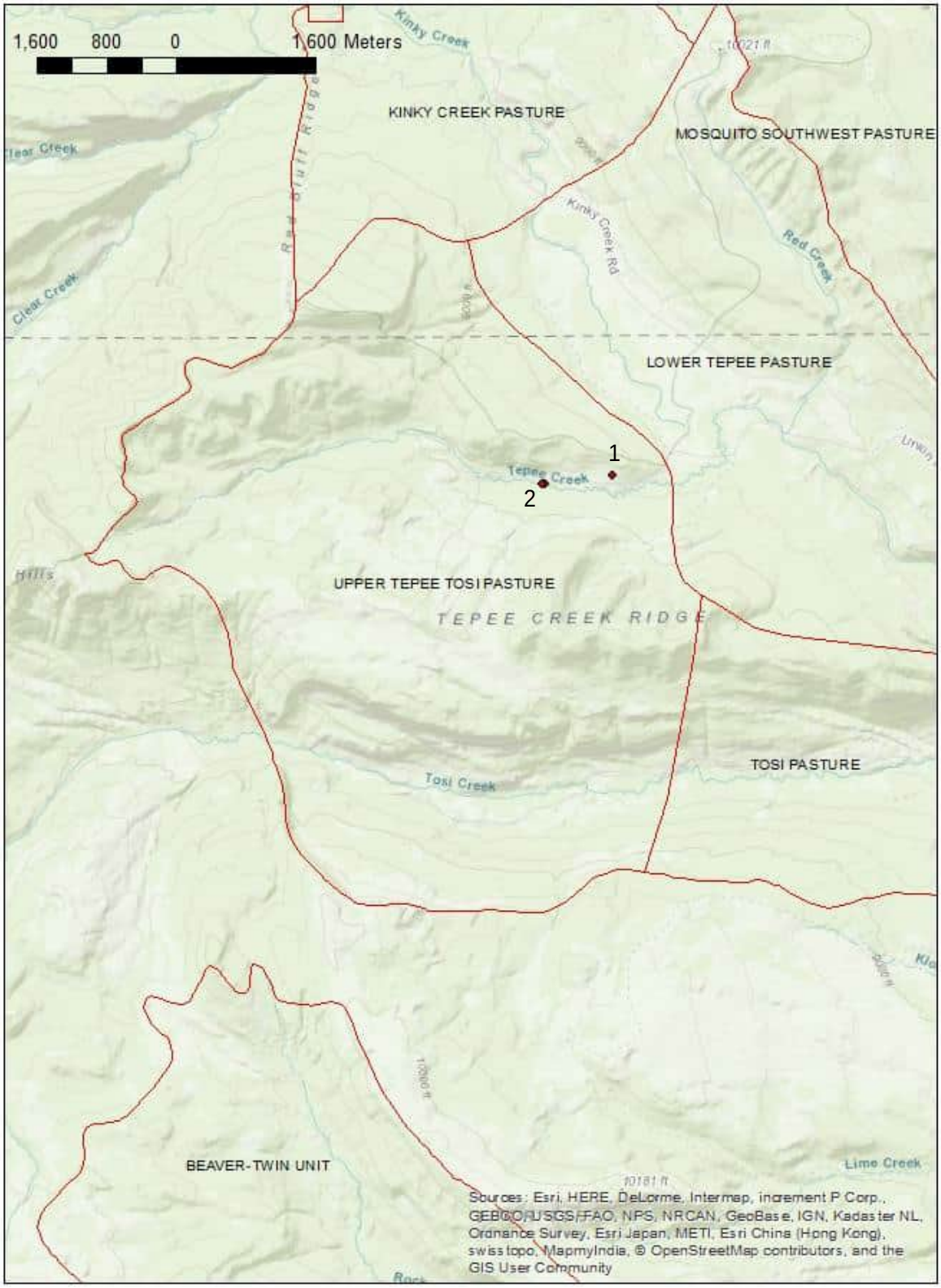
Location 18 (left) and 19 (right)

Location 18 showing barren soils and little herbaceous production, absence of cover for migrant birds and small mammals. Location 19 similarly low in production and high percent bare soil. Little forage in either location.

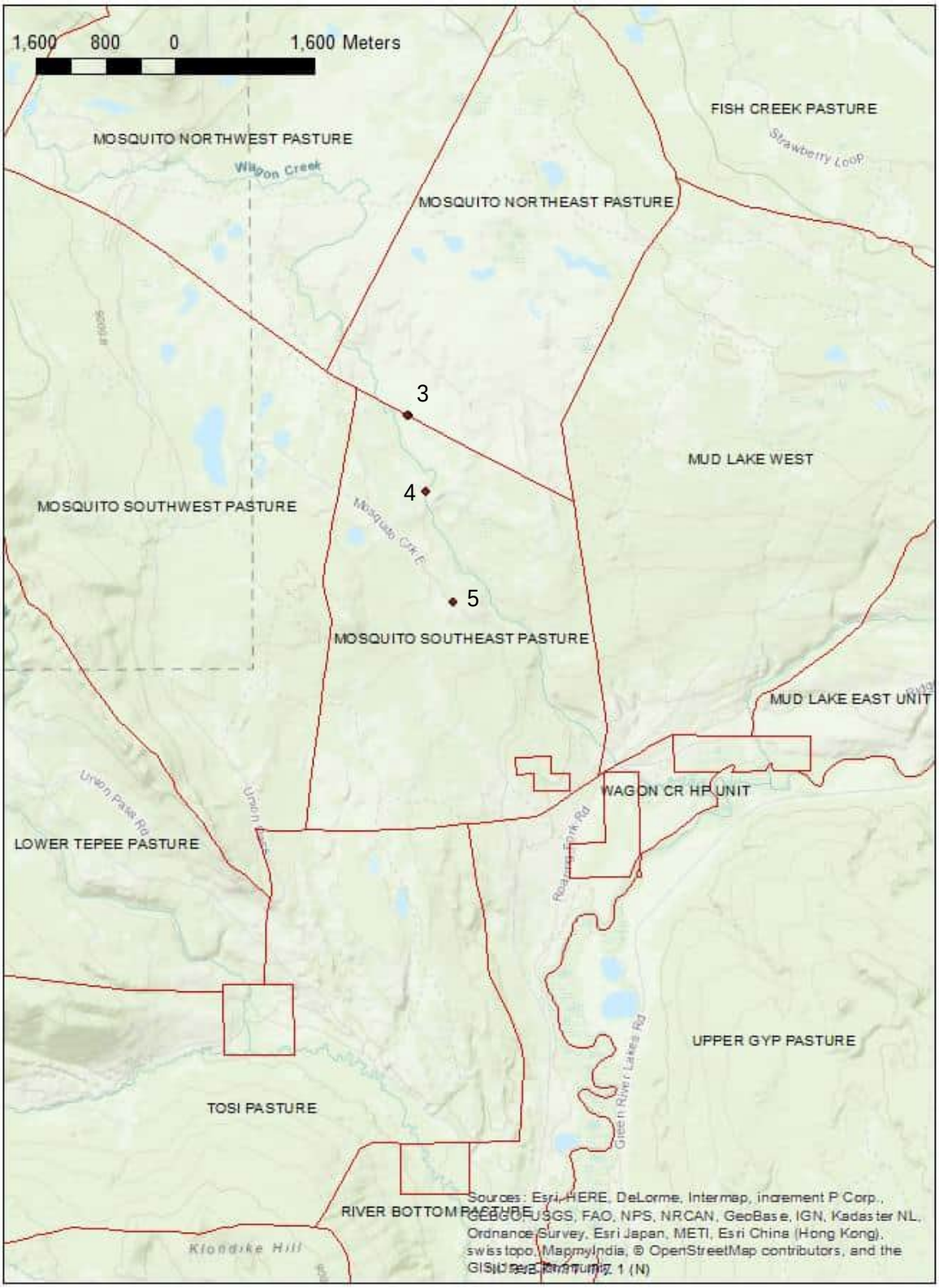
Location 20

Herbaceous cover and production in shrub interspace low.
Significant bare soil.

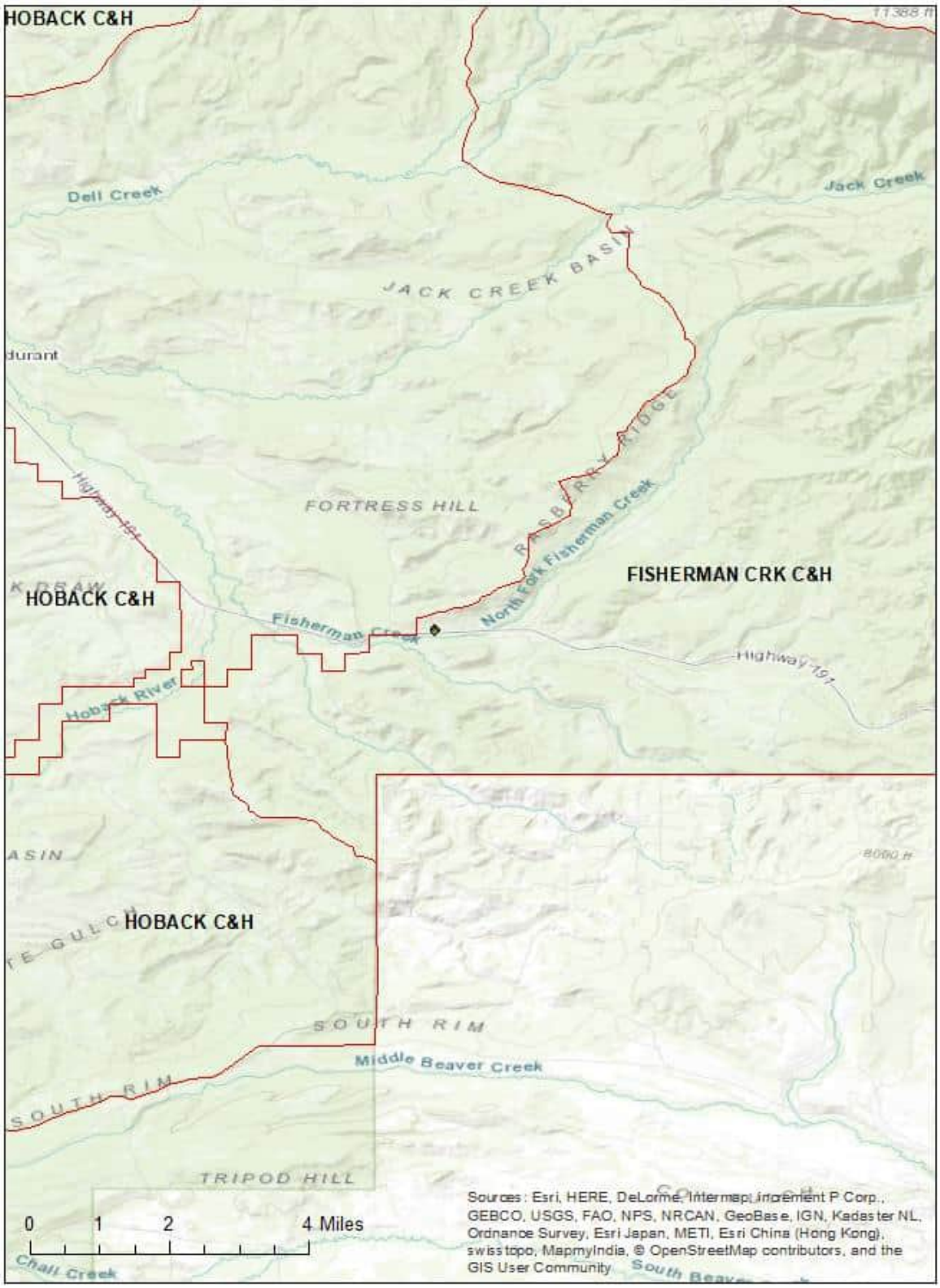
Exhibit 2
Maps and Photo Illustration of Conditions
Upper Green Allotment Prior to Grazing (July 12, 2021)
Fisherman Creek Allotments after Grazing (September 9, 2021)
WWP and Y2U



Locations 1 and 2 in Upper Green Teepee Tosi Pasture July 12, 2021



Locations 3, 4, and 5 in Upper Green Mosquito SE Pasture July 12, 2021



Riparian monitoring point on Fisherman Creek in the Fisherman Creek Allotment on September 9, 2021

Upper Green Location 1 on the ridge overlooking Teepee Creek. This is the Forest Service and Sublette County Monitoring location where line intercept was measured. Note the herbaceous community is dominated by forbs such as geranium and potentilla that are not desirable forage. Of key importance is the selection of a location well above and at distance from the water source.

Upper Green Location 2 at Teepee Creek. Conditions prior to livestock grazing. Teepee Creek is suffering from scoured banks and downcutting. The riparian zone between the greenline and uplands is suffering extensive bare soil. The Forest Service does not monitor use in the riparian zone in their Allowable Use Standards, only the greenline and uplands. So, in this case the upland monitoring site (location 1) shows good ground cover but that does not reflect conditions in the valley and valley sides near water where the cattle concentrate. Here cover is lacking for amphibians, migrant birds, and small mammals.

Upper Green Location 2 at Teepee Creek. Conditions prior to livestock grazing. Further upstream. Upper photos showing head cut where the creek is downcutting. Lower shows trampled banks and sluffing of scoured banks as they cave into the water.

Upper Green Location 3 in Mosquito Southeast and Northeast Pastures. Upper photo showing minimal residual after grazing. Lower photos showing residual after grazing (left) and prior to livestock being turned in (right). The herbaceous cover is sparse even in the ungrazed state. Following grazing there is literally no cover for migrant birds or small mammals.

Upper Green Location 4 (Wagon Creek) in Mosquito Southeast Pasture. Upper photo is an exclosure showing recovering banks and past bank sloughing. Lower photo shows conditions while being grazed, including barren and eroding banks, banks nearing collapse into the stream, minimal herbaceous residual in the riparian area and stream substrate laden with sediment. Needless to say, native fish, migrant birds, amphibians have minimal habitat under these conditions.

Upper Green Location 5 in Mosquito Southeast Pasture. Aspen stand hedged and lacking understory. Recruitment is not succeeding as small shoots are grazed or browsed before attaining a height sufficient to escape browsing.

Fisherman Creek in Fisherman Creek Allotment Pasture 2. These photos taken after livestock have left the pasture. Left photo is along the greenline where the max sedge height is 6" and the average is 3.5". Middle photo in riparian zone showing maximum sedge height of 4.5" and average is 3". Right photo in riparian meadow showing minimal residual with average below 1.5". The riparian zone is depleted with no cover for migrant birds, amphibians, and small mammals.

Exhibit 3

Elk Ridge Plot Data, Maps, and Photographs
September 14, 2021

WWP and Y2U

Idaho Fescue - Maximum and Average Heights at Plots

Plot No	Max Height, in.	Avg Height, in.
61	12	9.1
57	10	8.3
98	9	6.5
72	5	4.1
67	7	4.6
79	9	6.5
14	5	4
145	9	7.1
Averages	8.3	6.3

Elk Ridge Allotments – Plot Clipping Data

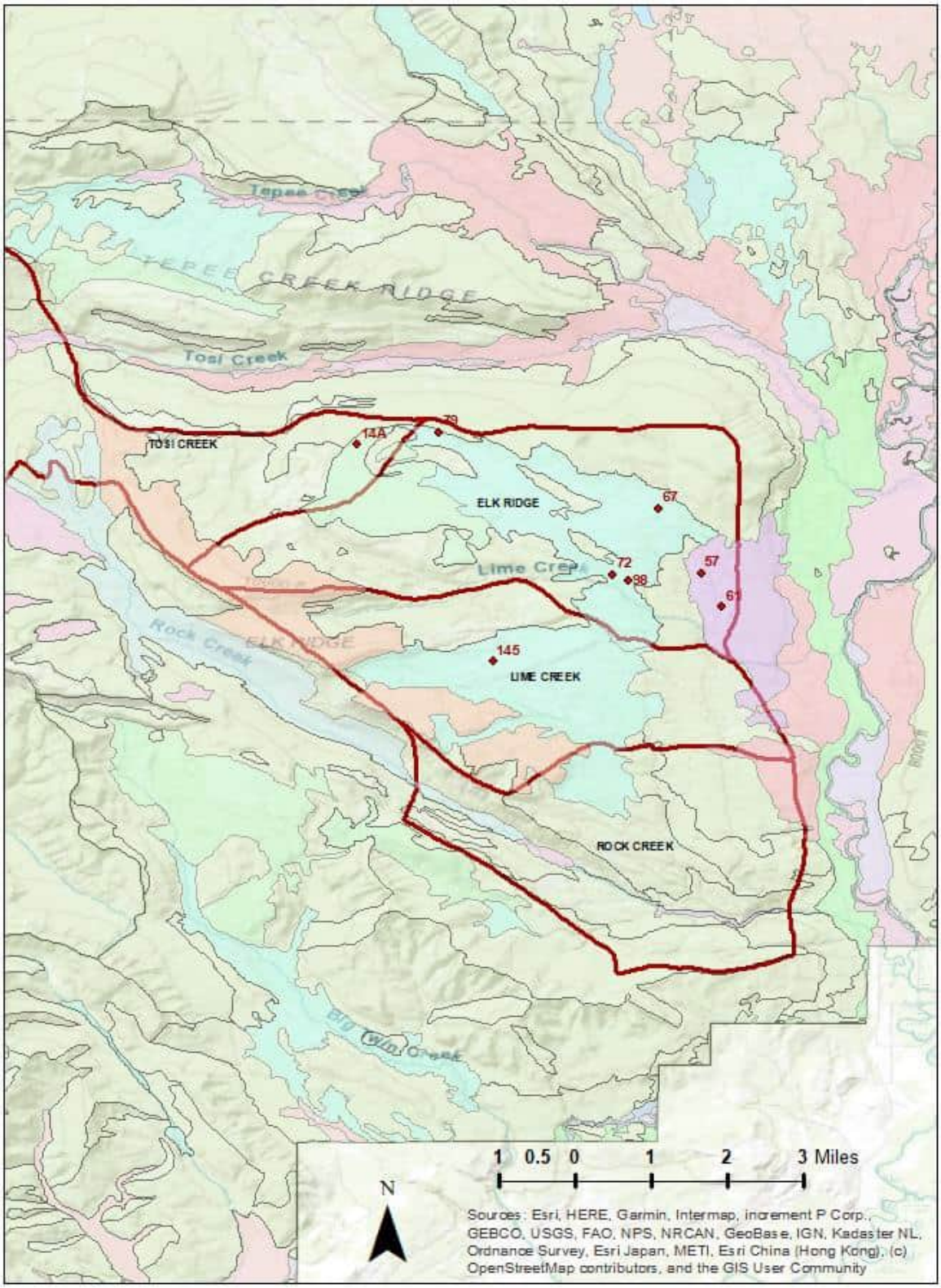
Plot #	Sub Plot #	Species	Plot Size sq. ft	Total weight, gms	Sample weight, gms	Bag Weight, gms	Pounds per Acre
14	1	FEID	9.6	30.8	23.3	7.5	233
14	1	ELTR	9.6	9.6	2.1	7.5	21
14	2	upland sedge	9.6	10	2.5	7.5	25
14	2	FEID	9.6	10	2.5	7.5	25
14	3	forb	9.6	9.2	0.4	8.8	4
14	3	grass	9.6	12.9	4.1	8.8	41
14	4	grass	9.6	22.4	13.6	8.8	136
57	1	ELTR	9.6	15.3	7.8	7.5	78
57	1	FEID	9.6	8.6	1.1	7.5	11
57	2	aster	9.6	9.1	1.6	7.5	16
57	2	ELTR	9.6	11	3.5	7.5	35
57	2	FEID	9.6	21.1	13.6	7.5	136
57	2	upland sedge	9.6	22.9	15.4	7.5	154
57	3	FEID	9.6	22.9	14.1	8.8	141
57	3	forb	9.6	10.5	1.7	8.8	17
57	4	Forb	9.6	10.2	1.4	8.8	14
57	4	grass	9.6	18.2	9.4	8.8	94
61	1	strawberry	9.6	10.9	3.4	7.5	34
61	1	ELTR	9.6	17.6	10.1	7.5	101
61	1	FEID	9.6	39.2	31.7	7.5	317
61	2	FEID	9.6	21.1	13.6	7.5	136
61	2	ELTR	9.6	12.3	4.8	7.5	48
61	3	FEID	9.6	36.2	27.4	8.8	274
61	3	forb 4	9.6	19.6	10.8	8.8	108
61	4	grass	9.6	52.9	44.1	8.8	441
61	4	strawberry	9.6	9.3	0.5	8.8	5
67	1	FEID	9.6	9	1.5	7.5	15
67	1	upland sedge	9.6	9.4	1.9	7.5	19
67	2	upland sedge	9.6	10.8	3.3	7.5	33
67	2	ELTR	9.6	16.7	9.2	7.5	92
67	2	FEID	9.6	16.6	9.1	7.5	91
67	3	grass	9.6	15.7	6.9	8.8	69
67	3	forb	9.6	9.1	0.3	8.8	3
67	4	grass	9.6	12.3	3.5	8.8	35
67	4	forb	9.6	9	0.2	8.8	2

72	1	forb 1	9.6	12.8	5.3	7.5	53
72	1	upland sedge	9.6	12.6	5.1	7.5	51
72	1	FEID	9.6	23.5	16	7.5	160
72	2	FEID	9.6	10.7	3.2	7.5	32
72	2	FEID	9.6	8.8	1.3	7.5	13
72	2	ELTR	9.6	9.4	1.9	7.5	19
72	3	strawberry	9.6	8.9	0.1	8.8	1
72	3	grass	9.6	28.6	19.8	8.8	198
72	4	grass	9.6	22.3	13.5	8.8	135
79	1	FEID	9.6	21.2	13.7	7.5	137
79	1	forb 2	9.6	9.8	2.3	7.5	23
79	2	Forb 3	9.6	8.9	1.4	7.5	14
79	2	ELTR	9.6	9.6	2.1	7.5	21
79	2	FEID	9.6	10.3	2.8	7.5	28
79	3	grass	9.6	20.1	11.3	8.8	113
79	4	grass	9.6	18.2	9.4	8.8	94
79	4	forb	9.6	10	1.2	8.8	12
98	1	ELTR	9.6	8.9	1.4	7.5	14
98	1	upland sedge	9.6	9.8	2.3	7.5	23
98	1	FEID	9.6	20.8	13.3	7.5	133
98	2	FEID	9.6	11.3	3.8	7.5	38
98	2	upland sedge	9.6	13.9	6.4	7.5	64
98	3	grass	9.6	36.8	28	8.8	280
98	4	grass	9.6	20.1	11.3	8.8	113
145	1	FEID	9.6	28.3	20.8	7.5	208
145	2	ELTR	9.6	13.1	5.6	7.5	56
145	2	FEID	9.6	10.9	3.4	7.5	34
145	3	grass	9.6	10.7	1.9	8.8	19
145	4	grass	9.6	20.3	11.5	8.8	115
145	4	forb	9.6	8.9	0.1	8.8	1

Elk Ridge Allotments – Range Condition

Site No and Ecological Site	Forage Production	Lbs. per Acre	ESD Grass and Forb Production Low/Average/Good Year	Percent of Expected	Range Condition
Site 14 Shallow Loamy Foothills	Total Forage Production - Plot 1	254	600	20%	POOR
	Total Forage Production - Plot 2	50	1,050	12%	POOR
	Total Forage Production - Plot 3	45	1,275	10%	POOR
	Total Forage Production - Plot 4	136			
	Average Total Forage Production	121			
Site 57 Clayey Overflow	Total Forage Production - Plot 1	89	1,275	14%	POOR
	Total Forage Production - Plot 2	341	2,125	8%	POOR
	Total Forage Production - Plot 3	158	2,550	7%	POOR
	Total Forage Production - Plot 4	108			
	Average Total Forage Production	174			
Site 61 Clayey Overflow	Total Forage Production - Plot 1	452	1,275	29%	FAIR
	Total Forage Production - Plot 2	184	2,125	17%	POOR
	Total Forage Production - Plot 3	382	2,550	14%	POOR
	Total Forage Production - Plot 4	446			
	Average Total Forage Production	366			
Site 67 Loamy High Mtn	Total Forage Production - Plot 1	34	1,620	6%	POOR
	Total Forage Production - Plot 2	216	2,250	4%	POOR
	Total Forage Production - Plot 3	72	2,700	3%	POOR
	Total Forage Production - Plot 4	37			
	Average Total Forage Production	90			

Site 72 Loamy High Mtn	Total Forage Production - Plot 1	264	1,620	10%	POOR
	Total Forage Production - Plot 2	64	2,250	7%	POOR
	Total Forage Production - Plot 3	199	2,700	6%	POOR
	Total Forage Production - Plot 4	135			
	Average Total Forage Production	166			
Site 79 Loamy High Mtn	Total Forage Production - Plot 1	160	1,620	7%	POOR
	Total Forage Production - Plot 2	63	2,250	5%	POOR
	Total Forage Production - Plot 3	113	2,700	4%	POOR
	Total Forage Production - Plot 4	106			
	Average Total Forage Production	111			
Site 98 Loamy High Mtn	Total Forage Production - Plot 1	170	1,620	13%	POOR
	Total Forage Production - Plot 2	102	2,250	10%	POOR
	Total Forage Production - Plot 3	280	2,700	8%	POOR
	Total Forage Production - Plot 4	321			
	Average Total Forage Production	218			
Site 145 Loamy High Mtn	Total Forage Production - Plot 1	208	1,620	7%	POOR
	Total Forage Production - Plot 2	90	2,250	5%	POOR
	Total Forage Production - Plot 3	19	2,700	4%	POOR
	Total Forage Production - Plot 4	116			
	Average Total Forage Production	108			



Elk Ridge Allotments and Ecological Sites
Legend on following page

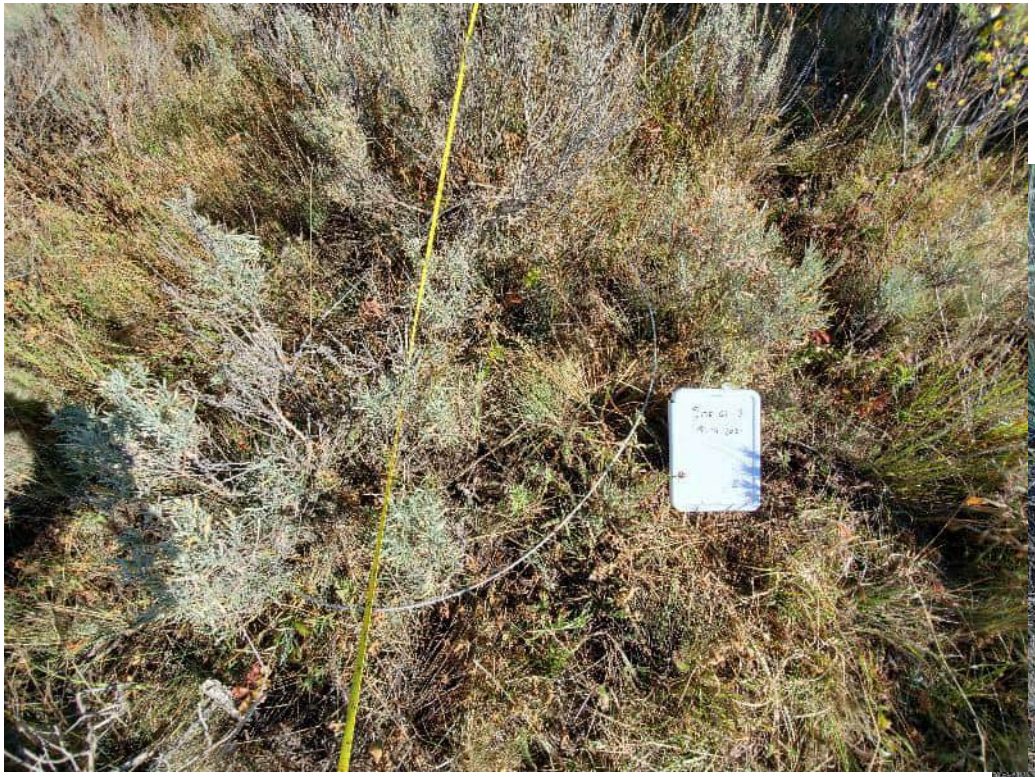

Legend
Elk Ridge Plots
Sublette_ESD
EcoSiteNm
Clayey Overflow (Foothills And Mountains West)
Coarse Upland (Foothills And Mountains West)
Gravelly (High Plains Southeast)
Loamy (Foothills And Mountains West)
Loamy (High Mountains)
Loamy (High Plains Southeast)
Overflow (High Mountains)
Shallow Clayey (Foothills And Mountains West)
Shallow Loamy (Foothills And Mountains West)
Shallow Loamy (High Mountains)
Steep Loamy (High Mountains)
Subirrigated (Foothills And Mountains West)
Subirrigated (High Mountains)
Subirrigated (Sb) 15-19 Foothills and Mountains
Very Shallow (Foothills And Mountains West)
Wetland (Foothills And Mountains West)
Wetland (High Mountains)
ElkRidgeAllotmentBoundaries

Site 61

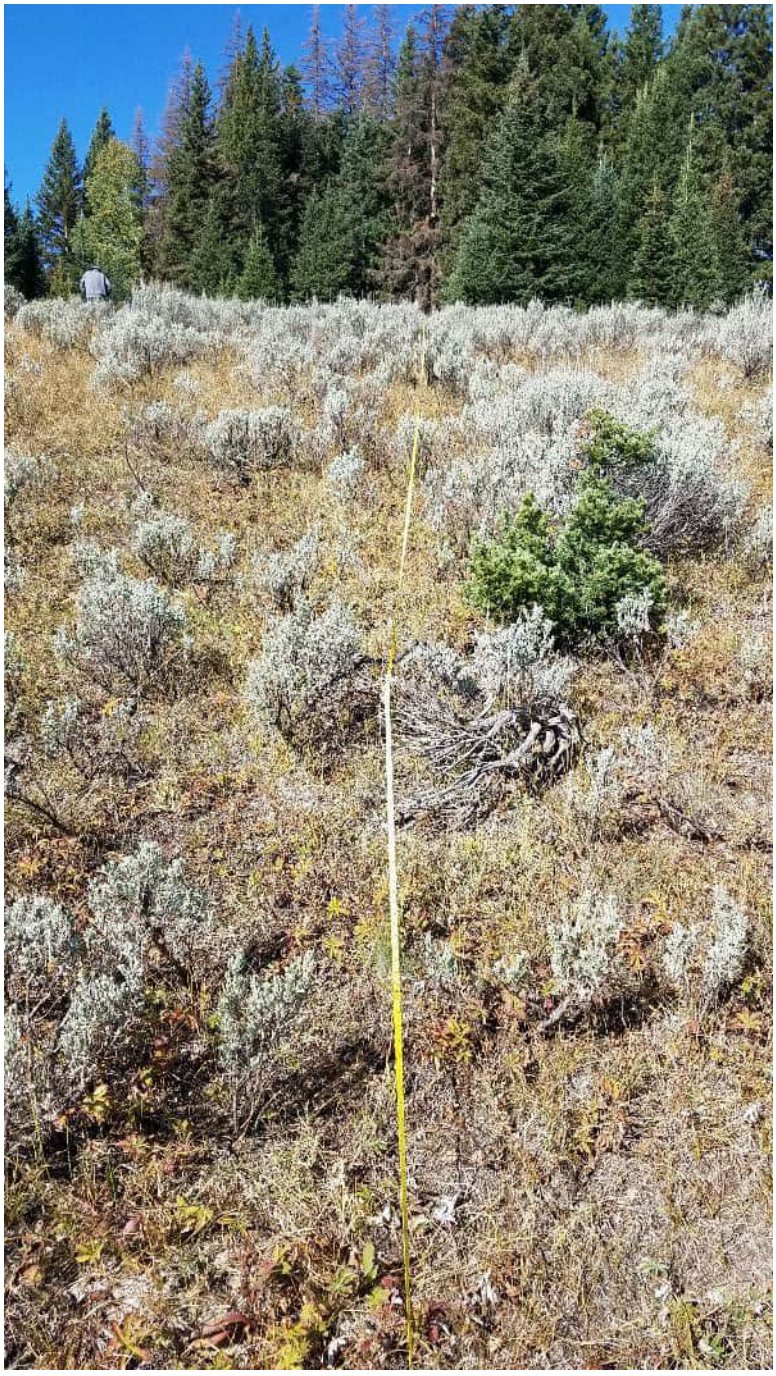
At Site 61, the average grass and forb production was 366 lb/acre compared to ESD potential of 2125 lb/acre. This is 17% of potential and poor condition.


61-1
9-14-21

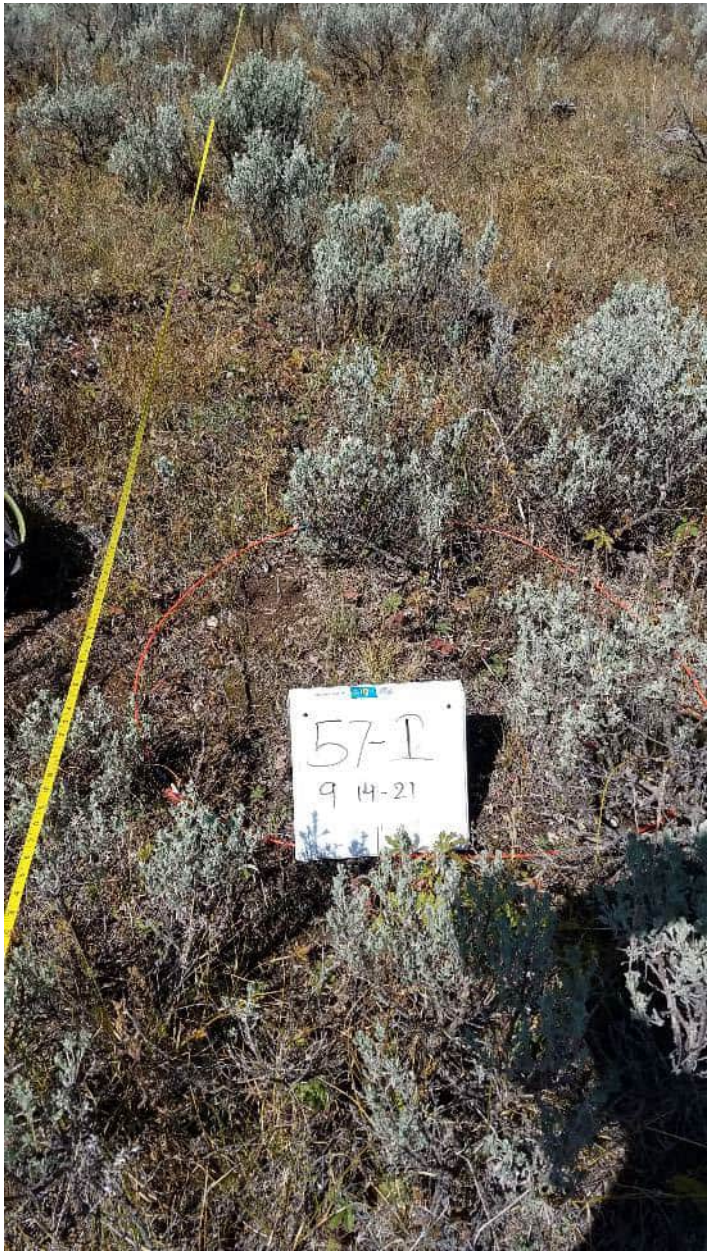

61-2
9-14-21



Site 57



At Site 57, the average grass and forb production was 174 lb/acre compared to ESD potential of 2125 lb/acre. This is 8% of potential and poor condition.


57-1
9 14-21


57-2
9 14-21

Site 57 numbered incorrectly as 67

Site 98

At Site 98, the average grass and forb production was 218 lb/acre compared to ESD potential of 2250 lb/acre. This is 10% of potential and poor condition.


98-1
9-14-21

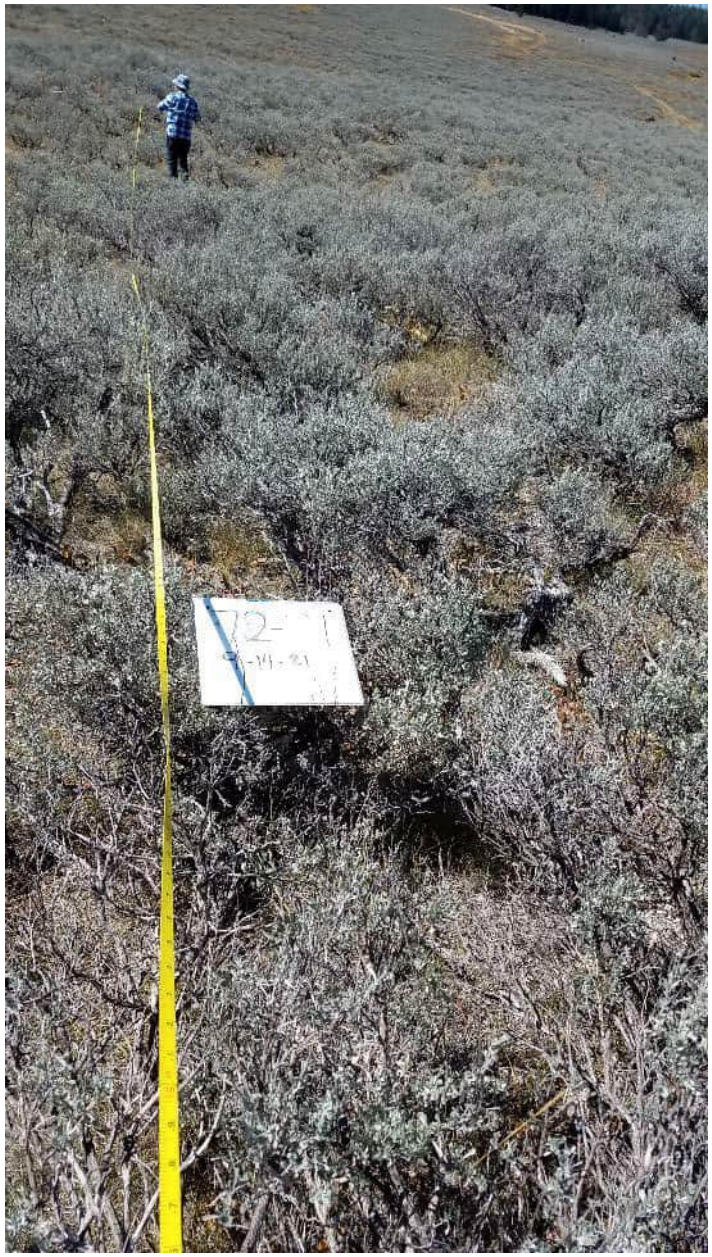

98-2


Plot 98-3
9/14/2021


Plot 98-4
9/14/2021

Site 72

At Site 72, the average grass and forb production was 166 lb/acre compared to ESD potential of 2250 lb/acre. This is 7% of potential and poor condition.



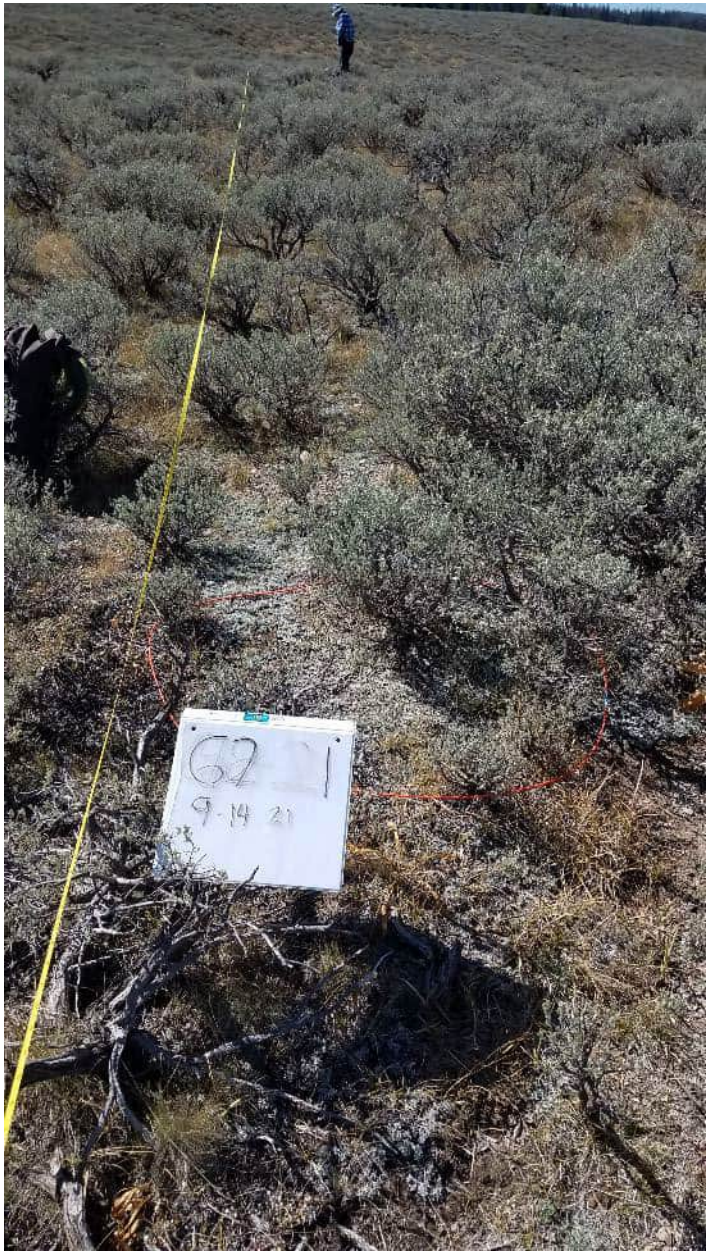

72-2
9-14-21


Plot 72-3
9-14-2021

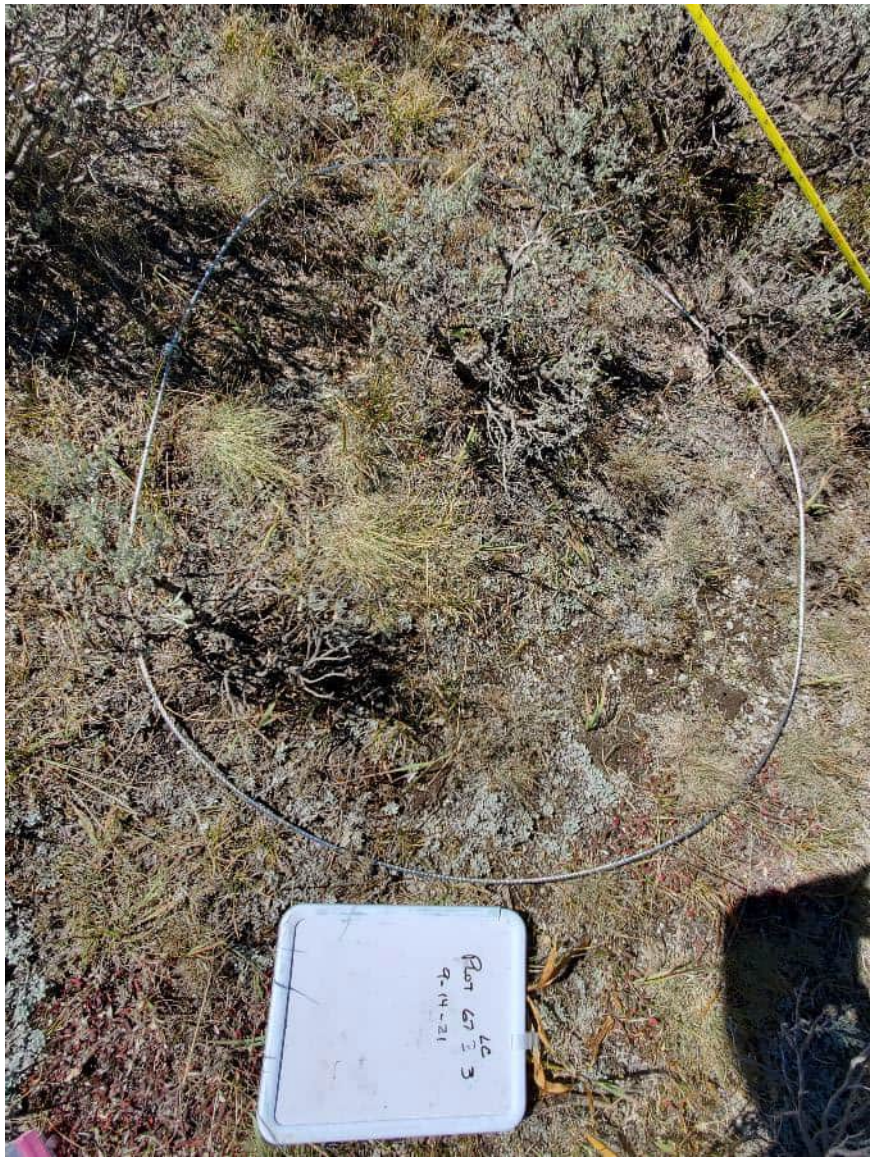

Plot 72-4
9-14-21

Site 67

At Site 67, the average grass and forb production was 90 lb/acre compared to ESD potential of 2250 lb/acre. This is 4% of potential and poor condition.


G2 1
9-14 21


G2 2
9-14 21


Plot 67 LC
9-14-21


Plot 67 LC
9-14-21

Site 79

At Site 79, the average grass and forb production was 111 lb/acre compared to ESD potential of 2250 lb/acre. This is 5% of potential and poor condition.


79 21
9-14-21


79 2
9-14-21


SITE 79-3
9/14/21


SITE 79-4
9/14/21

Site 14

At Site 14, the average grass and forb production was 121 lb/acre compared to ESD potential of 1050 lb/acre. This is 12% of potential and poor condition.


14A-1
9-14 21

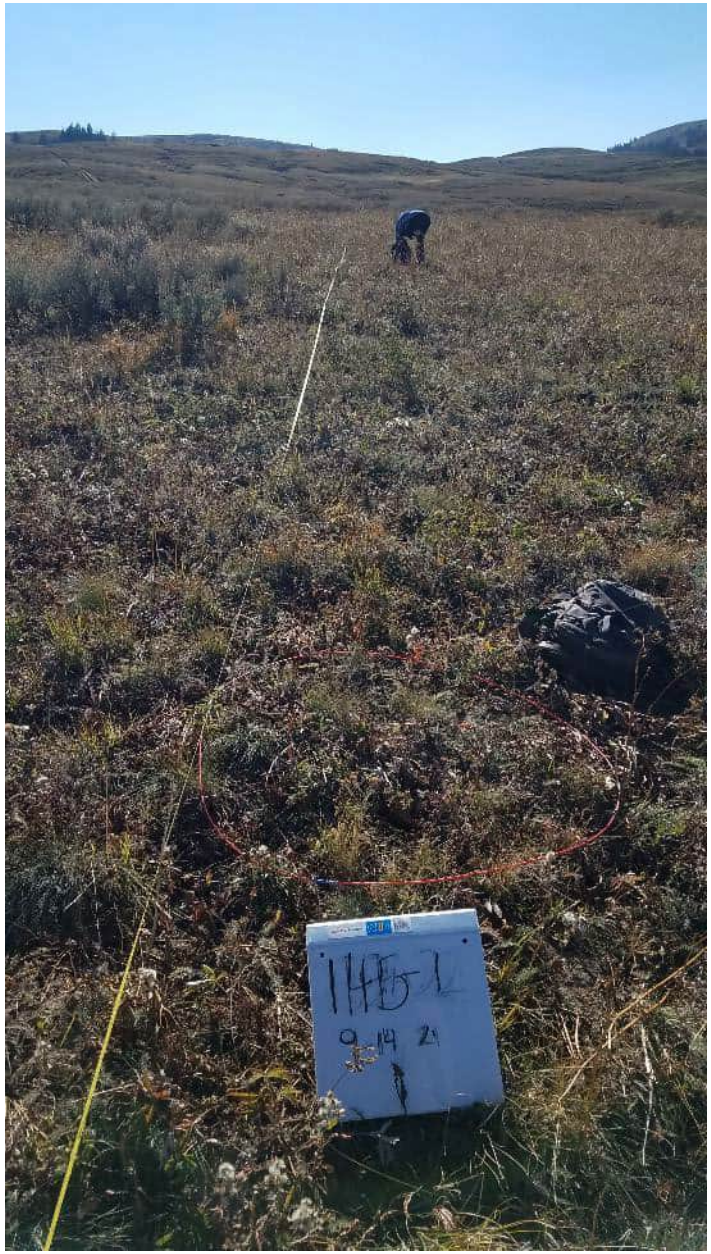

14A-2
9-14 21

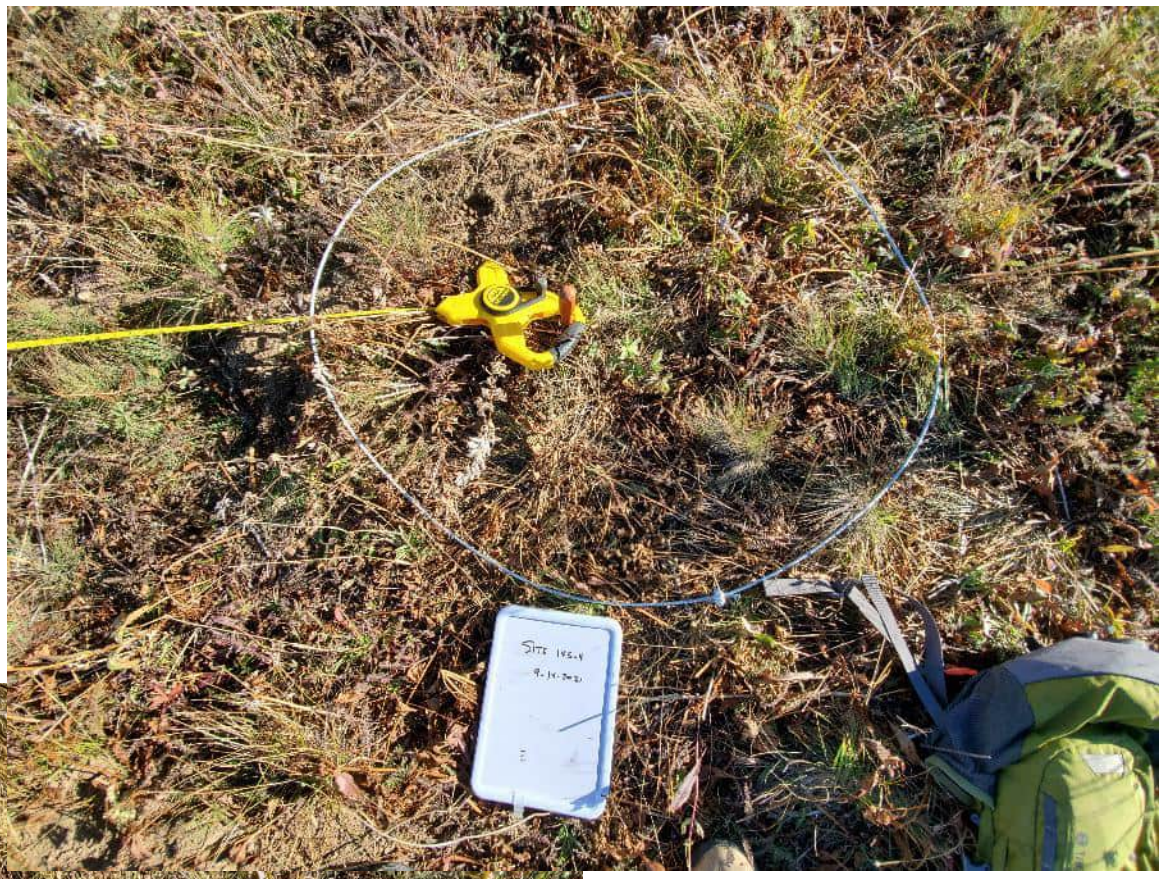

SITE 14A-3
9/14/21


SITE 14A-4
9/14/21

Site 145

At Site 145, the average grass and forb production was 108 lb/acre compared to ESD potential of 2250 lb/acre. This is 5% of potential and poor condition.




Site 145-4
9-14-2021


Site 145-3
9/14/2021

Exhibit 4
Fisherman Creek Range Ready Report
WWP and Y2U

June 12, 2022

Gregory Brooks
Big Piney Ranger District
10418 South US Highway 189
Big Piney, WY 83113

Re: Fisherman Creek Allotment, Range Ready Inspection

Cc: Ivan Geroy, Gary Hayward, Mike Henn, Anita DeLong, Kara Purser, Patricia O'Connor, Terry Padilla, Elise Boeke

Greg:

This is a follow-up to our telephone discussion after last week's Annual Upper Green River Area Rangeland Implementation Meeting. I appreciated your suggestions and the discussion. We discussed the range ready status of the Fisherman Creek allotment and my prior requests for the waypoints for Sublette County Conservation District monitoring locations on Upper Green. I have included all the folks who have been involved in our monitoring and cage discussions, so everyone is updated.

Range Ready: Today, June 12, I drove out from Hoback Ranches to Hwy 191 through Pasture 1 of the Fisherman Creek allotment. I stopped at three locations to inspect the key species, Idaho fescue, to determine its growth stage relative to entry of livestock. I measured the tallest leaf and inspected the plants for flowering stage. Location 1 was a moist site, location 2 a dry site and location 3 was in sagebrush, also a dry site. All were upgradient of the road. Idaho fescue had attained 8" height at location 1, 3.5" at location 2 and 4.8" at location 3. This was the tallest leaf. There were a very small number of Idaho fescue flowers emerging at location 1 and 2. I saw none at location 3. I suggest that it is at least two weeks or more (likely into July) until the rapid growth/flowering phase is past, which is considered a lower risk time to start grazing. My overall impression is that the Idaho fescue in the drier sites is in very low vigor from being grazed every year without rest and reflecting the long period of drought experienced. I also note that this May was an exceptionally wet month which has enhanced plant growth this spring and is not the usual situation.

I have included the table and figure showing the growth curve and sensitive period for grazing from Holechek et al (2004) and the table from Hormay and Talbot (1961) which I sent earlier. Both indicate July is the more appropriate time for start of grazing. A map of locations and photos of what I observed are provided in the following pages. I am attaching the Hormay and Talbot paper as it is worth a read.

Upper Green Waypoints: A year ago, I asked for the waypoints being used by Sublette County for their permittee monitoring of the Upper Green complex. I asked Sublette County for them, and they referred me to the Forest. I asked Gary Hayward and he didn't have them. So, then I

submitted a FOIA to the BTNF and Anita DeLong sent me all the Forest monitoring sites she found. I mapped them all and none were the Sublette County waypoints. I know Sublette County has them as during last years' monitoring the County person was using her tablet and waypoints to navigate to the monitoring location we attended.

Western Watersheds Project recently received a special use permit to conduct monitoring on the Upper Green and Fisherman Creek allotments, including placing utilization cages. One of the provisions of that permit was that WWP provide the waypoints of all locations. This is not a problem and once the cages are installed by sometime in July, the locations will be mapped and provided to the BTNF. It seems inconsistent that WWP is required to provide the waypoints, but Sublette County is not. For whatever reason, however, we are repeating our request for the Sublette County Upper Green waypoints. These should be in a spreadsheet or table in electronic format for mapping and accurate navigation to the locations. We need these for our work in Upper Green this summer.

Sincerely,

John Carter
Yellowstone to Uintas Connection
PO Box 464
Bondurant, Wy 82922

Jonathan Ratner
Western Watersheds Project
PO Box 171
Bondurant, Wy 82922

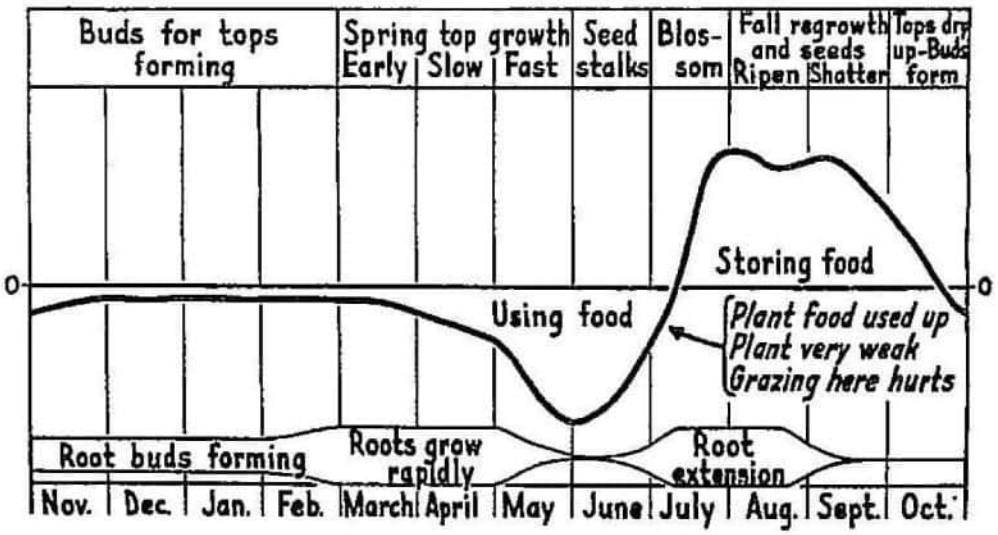


Figure 5.2 Major physiological events during the year for a typical range grass plant for an area with a cold winter and a dry summer. This diagram shows three things going on in a plant during the year: (1) top-growth (top line of diagram), (2) the rate at which the plant uses or stores food that it manufactures (curved heavy line), and (3) root growth. The rate of root growth is shown by the width of the strip just above the months of the year. Plants are most easily injured by grazing when their food storage is used up in the building of tops and roots. (From Parker 1969.)

Plant Phenology Figure 5.2 from Holechek et al (2004) Range Management Principles and Practices

TABLE 2.—*Average date of flowering and seed ripening of some abundant plant species, pine type, the Burgess Spring Experimental Range, 1936–54*

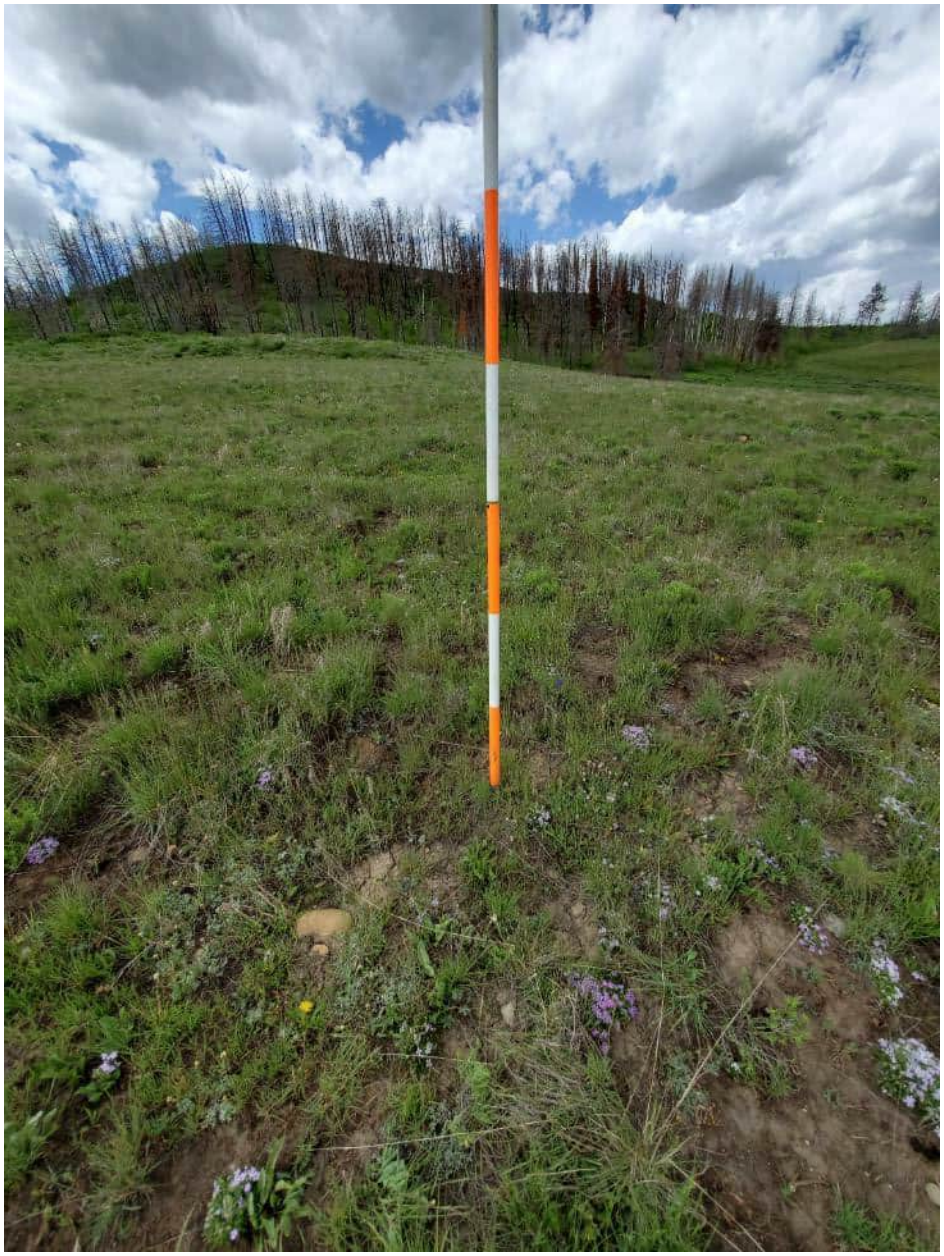
Species	Flowering		Seed ripening	
	Date	Basis, years	Date	Basis, years
		No.		*No.*
Ross sedge	May 15	5	June 24	7
Slender phlox	June 1	3	July 2	2
Littleflower collinsia	June 2	2	July 2	2
Lambstongue groundsel	June 6	4	July 10	4
Antelope bitterbrush	June 10	12	Aug. 5	5
Woolly wyethia	June 18	13	Aug. 1	6
Cheatgrass brome	June 19	10	July 24	8
Lemmon needlegrass	June 19	9	July 23	8
Sandberg bluegrass	June 21	10	July 24	7
Longspur lupine	June 25	14	July 29	6
Mountain brome	July 3	5	Aug. 7	5
Bottlebrush squirreltail	July 4	12	Aug. 6	6
Idaho fescue	July 9	13	Aug. 5	11
Flatpod groundsmoke	July 11	3	Aug. 27	2
Rabbitbrush goldenweed	Sept. 5	12	Oct. 5	6
Big sagebrush	Sept. 8	8	Oct. 6	4

Table 2 from Hormay and Talbot (1961) Rest-Rotation Grazing…A New Management System for Perennial Bunchgrass Ranges. Production Research Report No. 51. USDA Forest Service.

This table shows that Idaho fescue flowers on average around July 9, but that is at the lower elevation of the Burgess Experimental Range. Here in Wyoming at the elevation of Fisherman Creek and Upper Green, it would likely be later, indicating turnout should not occur before mid-July.

Fisherman Creek Allotment Pasture 1. Locations of Range Ready Inspection
June 12, 2022

Fisherman Creek Allotment Pasture 1 - Location 1 - June 12, 2022
Moist site - Idaho fescue top height 8” small number of flowers emerging from boot.
-110.283419 43.126044 Decimal Degrees



Fisherman Creek Allotment Pasture 1- Location 2 - June 12, 2022

Dry site - Idaho fescue top height 3.5” small number of flowers emerging from boot.

-110.283098 43.130042 Decimal Degrees

Fisherman Creek Allotment Pasture 1 - Location 3 - June 12, 2022
Sagebrush site - Idaho fescue top height 4.8” no flowers emerging from boot.
-110.303192 43.145961 Decimal Degrees

Exhibit 5

Upper Green and Fisherman Creek Monitoring 2022

Field Data and Photographs

WWP and Y2U

Location/Stubble Heights, inches	Locations	Down	Up	Greenline	Cage
Riparian - Fisherman Creek Pasture 1 Cage 1	1	7	2.5	4.5	6
Site FC - 1	2	2.5	2.5	4	7
Sedges	3	3	4.5	9	6.5
7/29/2022	4	3.5	5.5	5	6
	5	4	2.5	7.5	6
	6	3	4.5	4.5	6.5
	7	2	4	10.5	6
	8	3	6.5	10	5
	9	3	5.5	10	7.5
	10	3	2.5	3.5	7
	11	3	6	7.5	7
	12	2	3.5	11.5	7
	13	3.5	3	11.5	5
	14	2	2	6.5	5.5
	15	2	3	6.5	7
	16	2.5	3	4	7
	17	2	4	9	7
	18	2	4	9	6.5
	19	4	5.5	7	6.5
	20	3.5	3	6	6.5
	21	2.5	3	6.5	8
	22	2	5	6.5	8.5
	23	2.5	4	7	7
	24	2	5.5	6	7
	25	7	3	6.5	8
	26	3	4	4	7
	27	3	5	5.5	10
	28	3	6	4.5	10
	29	5	3	7	9
	30	3	3.5	7.5	8
	31	7	3.5	5.5	
	32	3.5	0	7	
	33	6	3.5	8	
Mean		3.3	3.8	6.9	7.0
Median		3.0	3.5	6.5	7.0
Standard Deviation		1.5	1.4	2.2	1.2

Location/Stubble Heights, inches	Locations	Down	Up	Greenline	Cage
Riparian - Fisherman Creek Pasture 1 Cage 2	1	2.5	3	8	9
Site FC - 2	2	4.5	4.5	4	8
Sedges	3	4	2.5	5	7
	4	2	3.5	7	3
	5	3	2	4	8
	6	3	2	6.5	8
	7	2	2	4	8
	8	4	3	6.5	8
	9	4.5	1.5	6.5	9
	10	2	2.5	7.5	6
	11	2	2.5	6	7
	12	5.5	3.5	5	8
	13	4.5	2.5	7	9
	14	3.5	3	7	7.5
	15	4.5	5	7	7
	16	3.5	5	3	6.5
	17	3.5		8	6.5
	18	3.5		6	8
	19	3.5		5	9
	20	2		3.5	9
	21	3.5		7	8
	22	5.5	5	6	8
	23	7.5	4	6.5	6
	24	5.5	4	3	7
	25		3	3	6
	26	10.5	2.5	7.5	7
	27	5	3	5	7
	28	3.5	2	8	6
	29	4.5	3.5	7	7
	30	5.5	3.5	4	7
	31	4	5	4	7
	32	6.5	3	6	7
	33	5	4	6	8
Mean		4.2	3.2	5.7	7.3
Median		4.0	3.0	6.0	7.0
Standard Deviation		1.8	1.0	1.6	1.2

Location/Stubble Heights, inches	Locations	Down	Up	Greenline	Cage
Riparian - Fisherman Creek Pasture 2 Cage 1	1	2	1	2.5	5
Site FC - 3	2	1.5	1.5	4	
Sedges	3	1.5	2.5	2	
7/29/2022	4	1.5	2	2.5	
	5	1.5	1.5	1.5	
	6	1	3	3	
	7	1	4.5	3	
	8	2.5	5	2	
	9	1.5	1	2	
	10	1	1	2.5	
	11	1	1.5	2.5	
	12	2	2	2.5	
	13	1	1.5	3	
	14	2	1.5	2	
	15	1	2	2.5	
	16	1	2.5	2.5	
	17	2	2.5	3	
	18	1.5	2.5	2	
	19	1	3	4	
	20	1.5	4	4	
	21	1	3	4	
	22	1.5	1.5	4.5	
	23	1.5	2.5	3	
	24	1	2	2	
	25	1	1.5	5	
	26	1	1.5	5.5	
	27	3	2	4	
	28	2	2.5	3	
	29	1.5	2	3	
	30	2	2	3	
	31	2	2	5	
	32	3	3.5	5	
	33	3	1.5	3	
Mean		1.6	2.2	3.1	5
Median		1.5	2	3	
Standard Deviation		0.62	0.96	1.05	

Location/Stubble Heights, inches	Locations	East Ungrazed	East Grazed	East All Measures	Trampled or Protected	East Grazed Net of Trample	West Ungrazed	West Grazed	West All Measures	Trampled or Protected	West Grazed Net of Trample
Upland - Fisherman Creek Pasture 4 Cage 4	1	2.5		2.5	T	0		1	1		1
Site FC - 4	2		1	1		1		2	2	T	0
Idaho Fescue	3		1	1		1		2.5	2.5	T	0
10/5/2022	4	3		3	T	0		0.5	0.5		0.5
East and West directions from Cage	5	3.5		3.5		3.5	6		6	P	6
	6	4		4	T	0	5		5	T	0
T = Trampled, P - Protected beneath shrub	7		0.5	0.5		0.5	4.5		4.5		4.5
	8	3.5		3.5	T	0		2	2		2
Forbs = cinquefoil, geranium, yarrow very little use	9		2	2		2		1	1		1
Grasses = Idaho fescue, smooth brome	10		2	2		2	6		6	T	0
Most grazed areas trampled, little vertical residual	11		2	2	T	0		1.5	1.5		1.5
Shrubs = big sage, potentilla	12	3.5		3.5		3.5		2	2		2
Gopher took 20% of cage area	13		1.5	1.5		1.5		1.5	1.5		1.5
	14	4		4	T	0	4		4		4
	15	3.5		3.5	P	3.5		2.5	2.5	T	0
	16		3	3		3		1.5	1.5		1.5
	17		1.5	1.5		1.5		0.5	0.5		0.5
	18		1	1	T	0		1.5	1.5	T	0
	19		0.5	0.5		0.5	4		4	T, P	0
	20	4		4		4		2.5	2.5	T, P	0
	21		1	1		1		2	2	T	0
	22	5.5		5.5	T, P	0	5		5	T,P	0
	23	4		4	T	0		1.5	1.5	T	0
	24		4	4	T	0		1.5	1.5		1.5
	25		1	1		1		1	1		1
	26		2	2		2		1	1		1
	27	4		4	T, P	0		1.5	1.5		1.5
	28		3	3	T	0	3		3	T	0
	29		1.5	1.5		1.5	4.5		4.5	T	0
	30		1	1		1		1.5	1.5		1.5
Mean		**3.8**	**1.6**	**2.5**		**1.1**	**4.7**	**1.5**	**2.5**		**1.1**
Median		**3.75**	**1.5**	**2.25**		**1**	**4.5**	**1.5**	**2**		**0.75**
Standard Deviation		**0.72**	**0.94**	**1.35**		**1.28**	**0.97**	**0.59**	**1.62**		**1.47**

Location/Stubble Heights, inches	Locations	North Ungrazed	North Grazed	North All Measures	Trampled or Protected	North Grazed Net of Trample	South Ungrazed	South Grazed	South All Measures	Trampled or Protected	South Grazed Net of Trample
Upland - Mosquito SE Cage 7	1		2	2	T	0	4		4	T	4
Site MSE - 7	2		1.5	1.5		1.5		1.5	1.5		1.5
Idaho Fescue	3		2.5	2.5		2.5		3.5	3.5	T	0
10/10/2022	4		3	3	T	0	5.5		5.5	P	5.5
	5		2	2		2	5		5	T	0
North and South directions from Cage	6		2	2	T	0	5		5	T	0
T = Trampled, P - Protected beneath shrub	7		2	2	T	0	4.5		4.5	T	0
	8	4.5		4.5		4.5	4		4	T	0
Forbs = geranium, buckwheat, antennaria, phlox, sneezev	9	4		4	T	0		3	3	T	0
Grasses = Idaho fescue, sedges	10	4.5		4.5	P	4.5	6		6	P	6
Shrubs = big sage, silver sage, potentilla	11		2	2		2	5		5	P	5
	12		2	2	T	0		0.5	0.5		0.5
	13		1	1		1		1	1		1
	14	7.5		7.5	P	7.5	5		5	P	5
	15		2.5	2.5	P	2.5		1.5	1.5		1.5
	16		1	1		1		1	1		1
	17		1	1		1		2	2		2
	18	4.5		4.5	P	4.5		2	2	T	0
	19	4		4	P	4	6		6	P	6
	20		1	1		1		1.5	1.5		1.5
	21		1	1		1		1.5	1.5		1.5
	22		1	1		1		1.5	1.5		1.5
	23		2	2		2		2	2		2
	24		1.5	1.5	T	0	4		4	P	4
	25		1	1		1	4.5		4.5	P	4.5
	26		2	2		2		1	1		1
	27	4		4	P	4		1	1		1
	28		1	1		1		0.5	0.5		0.5
	29		2.5	2.5	T	0		2	2		2
	30		3	3	T	0		1.5	1.5		1.5
Mean		4.7	1.8	2.5		1.7	4.9	1.6	2.9		2.0
Median		4.5	2	2		1	5	1.5	2		1.5
Standard Deviation		1.25	0.67	1.51		1.85	0.71	0.77	1.80		1.99

Location/Stubble Heights, inches	Locations	Grazed Down Transect	Willow Protected	Net Dn Grazed Stubble w/o willow	Grazed Up Transect	Willow Protected	Net Up Grazed Stubble w/o willow	Greenline
Riparian - Mosquito NE Cage 8	1	2		2	3.5		3.5	3
Site MNE - 8	2	4		4	2		2	3
Sedges	3	2		2	1		1	2
9/8/2022	4	2		2	2		2	3
	5	2		2	3		3	3
	6	2.5		2.5	3		3	2
	7	1.5		1.5	4		4	2.5
	8	1.5		1.5	1		1	1.5
	9	2		2	3		3	1.5
	10	2		2	2		2	2
	11	2		2	2		2	4
	12	2.5		2.5	3		3	4
	13	2		2	4.5		4.5	3
	14	3		3	3.5		3.5	3
	15	2		2	9.5	P		2
	16	5	P		8	P		2
	17	8	P		7	P		2
	18	6	P		4.5		4.5	2
	19	3		3	3.5		3.5	2
	20	3		3	4		4	5
	21	3		3	3		3	2
	22	5		5	2		2	2.5
	23	2		2	2		2	7
	24	2		2	3.5		3.5	2
	25	3		3	2		2	4
	26	3		3	2		2	1
	27	2.5		2.5	2		2	1
	28	4.5		4.5	2		2	2
	29	4		4	3		3	1.5
	30	3		3	1.5		1.5	2
	31	6		6	3		3	
	32	2		2	2		2	
	33							
Mean		3.1		2.7	3.2		2.7	2.6
Median		2.5		2.5	3		3	2
Standard Deviation		1.53		1.07	1.89		0.96	1.25

Location/Stubble Heights, inches	Locations	Grazed Down Transect	Willow Protected	Net Dn Grazed Stubble w/o willow	Grazed Up Transect	Willow Protected	Net Up Grazed Stubble w/o willow	Greenline
Riparian - Mosquito NW Cage 9	1	4		4	2.5		2.5	12
Site MNW - 9	2	3.5		3.5	2		2	12
Sedges	3	3.5		3.5	2		2	12
9/8/2022	4	3		3	2		2	8
	5	3		3	2.5		2.5	6
	6	6		6	2		2	4
	7	2.5		2.5	4		4	3
	8	4		4	3		3	4
	9	5		5	2		2	6
	10	7		7	2.5		2.5	4
	11	4		4	3.5		3.5	4
	12	7		7	3		3	6
	13	2.5		2.5	2		2	8
	14	2		2	2		2	5
	15	7		7	2		2	6
	16	5	P	0	2		2	6
	17	4	P	0	3		3	6
	18	3		3	2		2	6.5
	19	2		2	8	P	0	6
	20	2.5		2.5	4		4	4
	21	2		2	2		2	5
	22	3.5		3.5	11	P	0	5
	23	2.5		2.5	3		3	9
	24	3		3	4		4	9
	25				2.5		2.5	6
	26				3		3	6
	27				3		3	6
	28				2		2	6
	29				5		5	8
	30				3.5		3.5	7
	31				6	P	0	
	32				3.5		3.5	
	33							
Mean		3.8		3.4	3.3		2.5	6.5
Median		3.5		3	2.75		2.5	6
Standard Deviation		1.59		1.89	1.94		1.13	2.37

Location/Stubble Heights, inches	Locations	North Ungrazed	North Grazed	North All Measures	Trampled or Protected	North Grazed Net of Trample	South Ungrazed	South Grazed	South All Measures	Trampled or Protected	South Grazed Net of Trample
Upland - Tosi Cage 5	1		2.5	2.5	T	0		1.5	1.5		1.5
Site TT - 5	2		0.5	0.5		0.5		1	1		1
Idaho Fescue	3		1.5	1.5		1.5		1.5	1.5		1.5
10/10/2022	4		1.5	1.5		1.5		1.5	1.5		1.5
	5		1	1		1		1	1		1
North and South directions from Cage	6		2.5	2.5		2.5		1.5	1.5		1.5
T = Trampled, P - Protected beneath shrub	7	3		3	P	3		1	1		1
	8	3		3	P	3		2	2		2
Forbs = buckwheat, phlox	9	3.5		3.5	P	3.5		1	1		1
Grasses = Idaho fescue, sedges, rushes	10	2.5		2.5	P	2.5		1	1		1
Shrubs = big sage	11	5		5	P	5	3		3	P	3
Appears to be a moist site, high sagebrush car	12	2.5		2.5	P	2.5		1.5	1.5		1.5
Forbs very low stature result of trampling ove	13	4.5		4.5		4.5	5		5	P	5
Idaho fescue very low vigor, thread like leaves	14	4		4	T	0	5		5	P	5
	15		1.5	1.5		1.5		2.5	2.5		2.5
	16	4		4		4	4		4	P	4
	17		1	1		1		3	3	T	0
	18	3		3		3	5.5		5.5	P	5.5
	19	2		2		2		1.5	1.5		1.5
	20	4		4		4		1	1		1
	21	4.5		4.5	T	0	4.5		4.5	P	4.5
	22		2	2	T	0	5		5	P	5
	23		1.5	1.5		1.5		1.5	1.5		1.5
	24		1	1		1	3.5		3.5	P	3.5
	25		0.5	0.5		0.5	4.5		4.5	P	4.5
	26		1.5	1.5		1.5		1.5	1.5		1.5
	27	4		4	P	4		2	2		2
	28	4		4	P	4		0.5	0.5		0.5
	29	2.5		2.5		2.5		3.5	3.5	T	0
	30	2.5		2.5	P	2.5		1	1		1
Mean		3.4	1.4	2.6		2.1	4.4	1.5	2.4		2.2
Median		3.5	1.5	2.5		2.25	4.5	1.5	1.5		1.5
Standard Deviation		0.88	0.64	1.28		1.46	0.81	0.72	1.54		1.63

Location/Stubble Heights, inches	Locations	North Ungrazed	North Grazed	North All Measures	South Ungrazed	South Grazed	South All Measures
Upland - Lower Teepee Cage 6	1		1.5	1.5		1.5	1.5
Site TL - 6	2		2.5	2.5	5.5		5.5
Idaho Fescue	3	4.5		4.5		1	1
9/8/2022	4		1	1		1	1
	5		1	1		2	2
North and South directions from Cage	6		1.5	1.5		1	1
T = Trampled, P - Protected beneath shrub	7	5.5		5.5	3		3
Did not record trampled or protected	8		1.5	1.5	4		4
	9		1	1	4		4
	10		2.5	2.5		2	2
	11		1.5	1.5	4		4
	12		1	1		2	2
	13	3		3		2	2
	14		1	1		1	1
	15	5.5		5.5		1.5	1.5
	16		2	2		1	1
	17	5		5		2	2
	18		2	2		1	1
	19		2	2	6.5		6.5
	20		1	1		1	1
	21	3.5		3.5		2	2
	22		3	3		2	2
	23		2	2		2	2
	24		2	2		2	2
	25		1	1		2	2
	26	4		4		2	2
	27		1	1	6		6
	28		2	2		2	2
	29		2.5	2.5		1	1
	30		1.5	1.5		2.5	2.5
	31		1.5	1.5			
	32		1	1			
	33		1	1			
	34		1	1			
Mean		4.4	1.6	2.2	4.7	1.6	2.4
Median		4.5	1.5	2	4	2	2
Standard Deviation		0.98	0.60	1.36	1.29	0.50	1.52

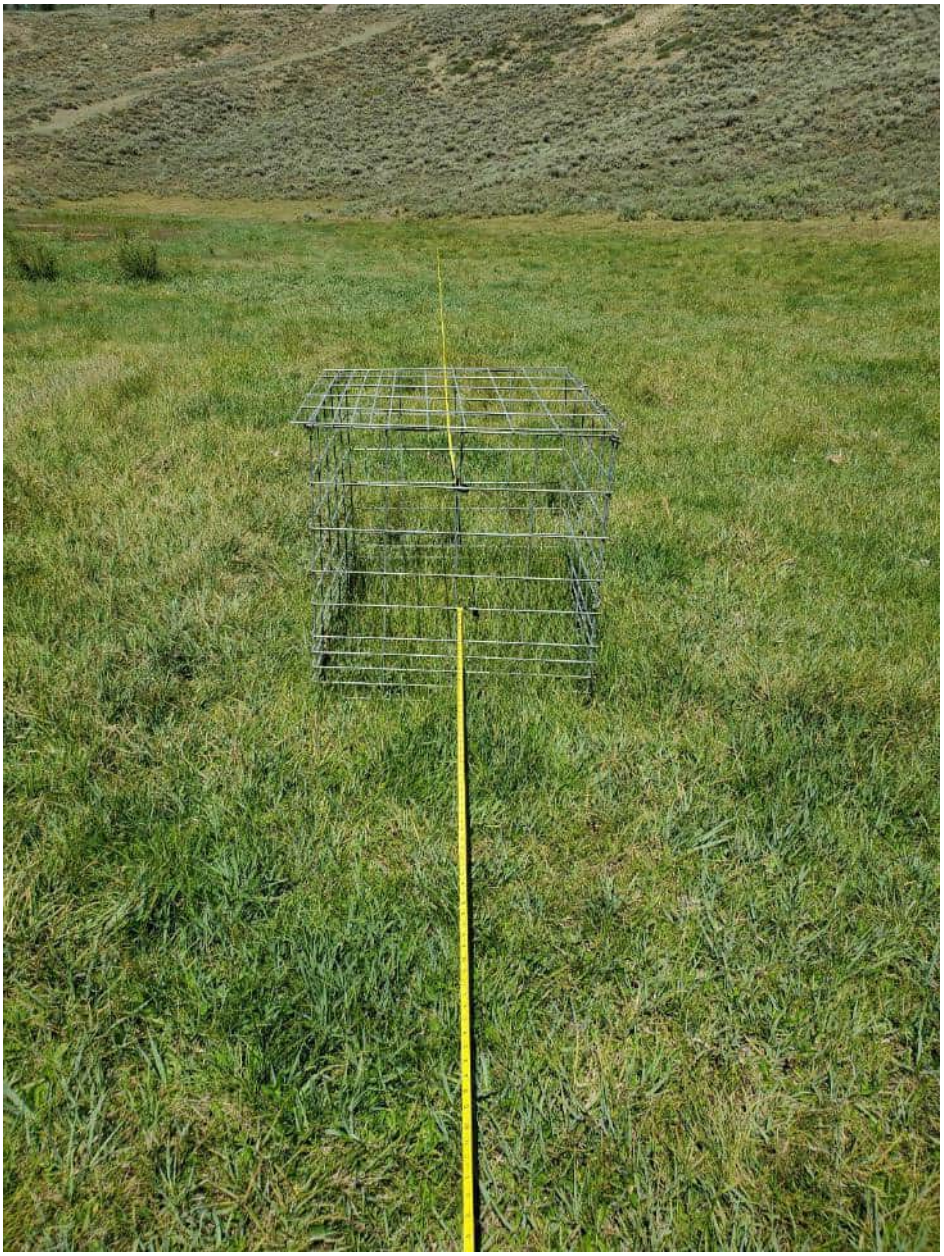
Location/Stubble Heights, inches	Locations	North Ungrazed	North Grazed	North All Measures	Trampled or Protected	North Grazed Net of Trample	South Ungrazed	South Grazed	South All Measures	Trampled or Protected	South Grazed Net of Trample
Upland - River Bottom Cage 3	1		1	1		1		1.5	1.5		1.5
Site RB -4	2	5		5	P	5		1.5	1.5		1.5
Idaho Fescue	3		0.5	0.5		0.5		1	1		1
10/13/2022	4	5		5	P	5	5		5	P	5
	5	5.5		5.5	P	5.5		1	1		1
Up (north) and downstream (south) from cage	6		2.5	2.5		2.5		2	2		2
T = Trampled, P - Protected beneath shrub	7		4.5	4.5	T	0		0.5	0.5		0.5
	8	6		6	P	6		2	2		2
Forbs = buckwheat, phlox, antennaria, aster,lupine	9		1.5	1.5		1.5		1	1		1
Grasses = Idaho fescue, sedges, rushes	10		2	2		2		2.5	2.5	T	0
Shrubs = big sage	11		3	3	T	0		1	1		1
	12							1	1		1
Forbs very low stature result of trampling over time	13		1	1		1		1.5	1.5		1.5
Idaho fescue very low vigor, thread like leaves	14		1	1		1	6		6	P	6
	15		1	1		1	4		4	T, P	0
	16		1.5	1.5		1.5		0.5	0.5		0.5
	17		0.5	0.5		0.5		2	2		2
	18	7		7	P	7		1.5	1.5		1.5
	19		1	1		1		1	1		1
	20		3	3	T	0		1	1	T	0
	21	5.5		5.5	P	5.5	5		5	P	5
	22		0.5	0.5		0.5		0.5	0.5		0.5
	23		0.5	0.5		0.5		1	1		1
	24		1	1		1		1	1		1
	25	5		5	P	5		1.5	1.5		1.5
	26		1	1		1		1.5	1.5		1.5
	27		1	1		1		1	1		1
	28		1.5	1.5		1.5		2.5	2.5	T	0
	29		1	1		1	4		4		4
	30		1.5	1.5		1.5		1	1		1
Mean		5.6	1.5	2.4		2.1	4.8	1.3	1.9		1.6
Median		5.5	1	1.5		1	5	1	1.5		1
Standard Deviation		0.73	1.00	2.02		2.10	0.84	0.56	1.45		1.51

Location/Stubble Heights, inches	Locations	East Ungrazed	East Grazed	East All Measures	Trampled or Protected	East Grazed Net of Trample	West Ungrazed	West Grazed	West All Measures	Trampled or Protected	West Grazed Net of Trample
Upland - Lower Gypsum Cage 1	1	4		4	T	4		2	2	T	0
Site GL - 1	2		1	1		1		2	2	T	0
Idaho Fescue	3		1.5	1.5		1.5		2.5	2.5		2.5
10/19/2022	4		1.5	1.5		1.5	5		5		5
	5	4		4	T	0	5		5	T	0
East and West from Cage	6		1.5	1.5		1.5		1	1		1
T = Trampled, P - Protected beneath shrub	7		1	1		1	4		4		4
	8		0.5	0.5		0.5		1	1		1
Forbs = buckwheat, lupine, buckwheat, cinque	9		0.5	0.5		0.5	4.5		4.5		4.5
Grasses = Idaho fescue, sedges, slender wheat	10		1	1		1		1	1		1
Meadow site - no shrubs adjacent to slope wit	11		1.5	1.5	T	0		1.5	1.5		1.5
Idaho Fescue low vigor (across all sites)	12		1	1		1	4.5		4.5	T	0
	13		0.5	0.5		0.5		1	1		1
	14	4		4		4		1.5	1.5		1.5
	15		0.5	0.5		0.5	5		5	T	0
	16	3		3		3		1	1		1
	17		0.5	0.5		0.5		1	1		1
	18		2	2	T	0		1	1		1
	19	3.5		3.5		3.5		0.5	0.5		0.5
	20		1.5	1.5		1.5	7		7		7
	21		1.5	1.5		1.5		1	1		1
	22		2	2		2		1.5	1.5		1.5
	23	5.5		5.5	T	0		0.5	0.5		0.5
	24		1	1		1		3	3	T	0
	25	4.5		4.5		4.5		3	3	T	0
	26	4		4	T	0		1.5	1.5	T	0
	27		0.5	0.5		0.5		1	1		1
	28		1	1	T	0		1.5	1.5		1.5
	29		1	1		1		0.5	0.5		0.5
	30		0.5	0.5		0.5		1.5	1.5		1.5
Mean		4.1	1.1	1.9		1.3	5.0	1.4	2.2		1.4
Median		4	1	1.5		1	5	1	1.5		1
Standard Deviation		0.73	0.50	1.46		1.29	0.96	0.71	1.73		1.68

Location/Stubble Heights, inches	Locations	Up Ungrazed	Up Grazed	Up All Measures	Trampled or Protected	Up Grazed Net of Trample	Down Ungrazed	Down Grazed	Down All Measures	Trampled or Protected	Down Grazed Net of Trample	Greenline Ungrazed	Greenline
Riparian - Lower Gypsum Cage 2	1		1	1		1		1	1		1		3.5
Site GL - 2	2		4	4		4		3	3		3		3
Sedges	3		3	3	T	0		6	6	T	0		3
10/19/2022	4	7		7		7		1.5	1.5		1.5		2.5
	5	7		7		7		7	7	T	0		2.5
	6		1.5	1.5		1.5		5	5	T	0		4
	7		5	5		5		4	4		4		6
	8		3.5	3.5		3.5		1	1		1		1
	9		4	4		4		4	4		4	6	6
	10		2	2		2		7	7	T	0		2
Meadow site - few stunted willows	11	6		6		6		3	3		3		2
	12		5	5	T	0		2	2		2		3.5
	13		2.5	2.5		2.5		4	4		4		2
	14		2.5	2.5		2.5		4	4		4		2
	15		2.5	2.5	T	0		6	6	T	0		3
	16		4	4	T	0		3	3		3		3
	17		2.5	2.5		2.5		1.5	1.5		1.5		1.5
	18		2	2		2		1	1		1		2.5
	19		2	2		2	6		6		6		1.5
	20		3	3	T	0	5		5		5		2
	21	8		8		8		1.5	1.5		1.5		3
	22		1	1		1		2	2		2	6	6
	23	7		7		7		6	6	T	0	7	7
	24		2	2		2		2	2		2		1.5
	25		3	3		3		3	3		3		2
	26		1.5	1.5		1.5		3.5	3.5		3.5	9	9
	27						10		10		10		1.5
	28						8		8		8	9	9
	29							9	9	T	0	7	7
	30							2	2		2		5
							7		7		7		2
							8		8		8		3
							9		9		9		2.5
							7		7		7		4
							6		6		6	9	9
							9		9		9		
Mean		7.0	2.7	3.6		2.9	7.5	3.6	4.7		3.4	7.6	3.7
Median		7.0	2.5	3.0		2.3	7.5	3.0	4.0		3.0	7.0	3.0
Standard Deviation		0.71	1.17	2.03		2.45	1.58	2.17	2.68		2.97	1.40	2.30

Location/Stubble Heights, inches	Locations	North Ungrazed	North Grazed	North All Measures	Trampled or Protected	North Grazed Net of Trample	South Ungrazed	South Grazed	South All Measures	Trampled or Protected	South Grazed Net of Trample
Upland - Lower Gypsum Cage 3	1		2.5	2.5		2.5		1.5	1.5		1.5
Site GL - 3	2		1	1		1		1.5	1.5		1.5
Idaho Fescue, sedge, rush combined heights	3	5		5	T	5		2	2		2
10/19/2022	4	4		4		4		2	2		2
	5		1	1		1		2.5	2.5		2.5
North and South from Cage	6		1.5	1.5		1.5	6		6		6
T = Trampled, P - Protected beneath shrub	7		2.5	2.5		2.5		1	1		1
	8	6		6		6		2	2		2
Forbs = antennaria	9		2.5	2.5		2.5		3.5	3.5	T	0
Grasses = Idaho fescue, sedges, rushes,wheat	10		1.5	1.5		1.5		2	2		2
Meadow site - no shrubs adjacent to slope wit	11		2.5	2.5		2.5		1	1	T	0
Idaho Fescue low vigor (across all sites)	12	4		4	T	0		3	3		3
Mesic site	13	4		4		4		2	2		2
	14		2.5	2.5		2.5		0.5	0.5		0.5
	15	4		4		4		2.5	2.5		2.5
	16	6		6		6		3.5	3.5	T	0
	17	4		4		4		1	1		1
	18		2	2		2		1.5	1.5		1.5
	19		2	2		2	5		5		5
	20	5		5		5	4		4	T	0
	21		2	2		2		4	4	T	0
	22		2	2		2	4		4		4
	23	5		5		5	6		6		6
	24		1	1		1	5		5		5
	25		2	2		2		1	1		1
	26	5		5		5		2	2	T	0
	27	6		6		6		1.5	1.5		1.5
	28		2.5	2.5	T	0	7		7		7
	29		4.5	4.5		4.5	5		5		5
	30		4.5	4.5		4.5	7		7		7
Mean		4.8	2.2	3.3		3.1	5.4	2.0	3.0		2.4
Median		5	2	2.5		2.5	5	2	2.25		2
Standard Deviation		0.83	0.99	1.59		1.78	1.13	0.93	1.89		2.19

Allotment	Pasture	Site No	Site Description	Date	Plot	Grass, Forb or Combined	Sample + Bag, gms	Bag, gms	Net Air Dry, gms
Fisherman Creek	Pasture 1	FC - 1	Riparian - Meadow/Greenline	7/29/2022	Cage (1)	C	163.3	47.5	115.8
Fisherman Creek	Pasture 1	FC - 1	Riparian - Meadow/Greenline	7/29/2022	Cage (2)	C	118.7	47.5	71.2
Fisherman Creek	Pasture 1	FC - 1	Riparian - Meadow/Greenline	7/29/2022	Dn Grazed	C	124.3	47.5	76.8
Fisherman Creek	Pasture 1	FC - 1	Riparian - Meadow/Greenline	7/29/2022	Up Grazed	C	137.5	47.5	90
Fisherman Creek	Pasture 1	FC - 2	Riparian - Meadow/Greenline	7/29/2022	Cage (1)	C	203.5	47.5	156
Fisherman Creek	Pasture 1	FC - 2	Riparian - Meadow/Greenline	7/29/2022	Cage (2)	C	151.9	47.5	104.4
Fisherman Creek	Pasture 1	FC - 2	Riparian - Meadow/Greenline	7/29/2022	Dn Grazed	C	97.5	47.5	50
Fisherman Creek	Pasture 1	FC - 2	Riparian - Meadow/Greenline	7/29/2022	Up Grazed	C	103.2	47.5	55.7
Fisherman Creek	Pasture 2	FC - 3	Riparian - Meadow/Greenline	7/29/2022	Cage (1)	C	173.3	47.5	125.8
Fisherman Creek	Pasture 2	FC - 3	Riparian - Meadow/Greenline	7/29/2022	Cage (2)	C	176.4	47.5	128.9
Fisherman Creek	Pasture 2	FC - 3	Riparian - Meadow/Greenline	7/29/2022	Dn Grazed	C	71.9	47.5	24.4
Fisherman Creek	Pasture 2	FC - 3	Riparian - Meadow/Greenline	7/29/2022	Up Grazed	C	60.8	47.5	13.3
Fisherman Creek	Pasture 4	FC - 4	Upland - Big sage	10/5/2022	Cage	F	14.9	9.2	5.7
Fisherman Creek	Pasture 4	FC - 4	Upland - Big sage	10/5/2022	E Grazed	F	10.9	9.2	1.7
Fisherman Creek	Pasture 4	FC - 4	Upland - Big sage	10/5/2022	W Grazed	F	17.1	9.2	7.9
Fisherman Creek	Pasture 4	FC - 4	Upland - Big sage	10/5/2022	Cage	G	220.3	47.5	172.8
Fisherman Creek	Pasture 4	FC - 4	Upland - Big sage	10/5/2022	E Grazed	G	63.2	47.5	15.7
Fisherman Creek	Pasture 4	FC - 4	Upland - Big sage	10/5/2022	W Grazed	G	24.6	9.2	15.4
Upper Green	Lower Gypsum	GL - 1	Upland - Mesic Meadow	10/19/2022	Cage	F	40	9.2	30.8
Upper Green	Lower Gypsum	GL - 1	Upland - Mesic Meadow	10/19/2022	E Grazed	F	23	9.2	13.8
Upper Green	Lower Gypsum	GL - 1	Upland - Mesic Meadow	10/19/2022	W Grazed	F	25.4	9.2	16.2
Upper Green	Lower Gypsum	GL - 1	Upland - Mesic Meadow	10/19/2022	Cage	G	48.1	9.2	38.9
Upper Green	Lower Gypsum	GL - 1	Upland - Mesic Meadow	10/19/2022	E Grazed	G	20.5	9.2	11.3
Upper Green	Lower Gypsum	GL - 1	Upland - Mesic Meadow	10/19/2022	W Grazed	G	18.7	9.2	9.5
Upper Green	Lower Gypsum	GL - 2	Riparian - Meadow/Greenline	10/19/2022	Cage (1)	C	46.5	9.2	37.3
Upper Green	Lower Gypsum	GL - 2	Riparian - Meadow/Greenline	10/19/2022	Cage (2)	C	53.3	9.2	44.1
Upper Green	Lower Gypsum	GL - 2	Riparian - Meadow/Greenline	10/19/2022	Dn Grazed	C	49.1	9.2	39.9
Upper Green	Lower Gypsum	GL - 2	Riparian - Meadow/Greenline	10/19/2022	Up Grazed	C	39.5	9.2	30.3
Upper Green	Lower Gypsum	GL - 3	Upland - Mesic Meadow	10/19/2022	Cage	F	14.6	9.2	5.4
Upper Green	Lower Gypsum	GL - 3	Upland - Mesic Meadow	10/19/2022	N Grazed	F	10.5	9.2	1.3
Upper Green	Lower Gypsum	GL - 3	Upland - Mesic Meadow	10/19/2022	S Grazed	F	11.1	9.2	1.9
Upper Green	Lower Gypsum	GL - 3	Upland - Mesic Meadow	10/19/2022	Cage	G	82	9.2	72.8
Upper Green	Lower Gypsum	GL - 3	Upland - Mesic Meadow	10/19/2022	N Grazed	G	51.9	9.2	42.7
Upper Green	Lower Gypsum	GL - 3	Upland - Mesic Meadow	10/19/2022	S Grazed	G	26.3	9.2	17.1
Upper Green	Lower Teepee	TL - 6	Upland - Big sage	9/8/2022	Cage	F	102.4	47.5	54.9
Upper Green	Lower Teepee	TL - 6	Upland - Big sage	9/8/2022	N Grazed	F	12.3	9.2	3.1
Upper Green	Lower Teepee	TL - 6	Upland - Big sage	9/8/2022	S Grazed	F	11.8	9.2	2.6
Upper Green	Lower Teepee	TL - 6	Upland - Big sage	9/8/2022	Cage	G	23.5	9.2	14.3
Upper Green	Lower Teepee	TL - 6	Upland - Big sage	9/8/2022	N Grazed	G	13.2	9.2	4
Upper Green	Lower Teepee	TL - 6	Upland - Big sage	9/8/2022	S Grazed	G	18.2	9.2	9
Upper Green	Mosquito NE	MNE - 8	Riparian - Meadow/Greenline	9/8/2022	Cage (1)	C	88.8	47.5	41.3
Upper Green	Mosquito NE	MNE - 8	Riparian - Meadow/Greenline	9/8/2022	Cage (2)	C	114.1	47.5	66.6
Upper Green	Mosquito NE	MNE - 8	Riparian - Meadow/Greenline	9/8/2022	Dn Grazed	C	26.6	9.2	17.4
Upper Green	Mosquito NE	MNE - 8	Riparian - Meadow/Greenline	9/8/2022	Up Grazed	C	25.7	9.2	16.5
Upper Green	Mosquito NW	MNW - 9	Riparian - Meadow/Greenline	9/8/2022	Cage (1)	C	197	47.5	149.5
Upper Green	Mosquito NW	MNW - 9	Riparian - Meadow/Greenline	9/8/2022	Cage (2)	C	161.4	47.5	113.9
Upper Green	Mosquito NW	MNW - 9	Riparian - Meadow/Greenline	9/8/2022	Up Grazed	C	105.3	47.5	57.8
Upper Green	Mosquito NW	MNW - 9	Riparian - Meadow/Greenline	9/8/2022	Dn Grazed	C	75.1	47.5	27.6
Upper Green	Mosquito SE	MSE - 7	Upland - Big sage	10/10/2022	Cage	F	36.1	9.2	26.9
Upper Green	Mosquito SE	MSE - 7	Upland - Big sage	10/10/2022	N Grazed	F	9.9	9.2	0.7
Upper Green	Mosquito SE	MSE - 7	Upland - Big sage	10/10/2022	S Grazed	F	12.3	9.2	3.1
Upper Green	Mosquito SE	MSE - 7	Upland - Big sage	10/10/2022	Cage	G	64	9.2	54.8
Upper Green	Mosquito SE	MSE - 7	Upland - Big sage	10/10/2022	N Grazed	G	16.4	9.2	7.2
Upper Green	Mosquito SE	MSE - 7	Upland - Big sage	10/10/2022	S Grazed	G	13.2	9.2	4
Upper Green	River Bottom	RB - 4	Upland - Big sage	10/13/2022	Cage	F	16.5	9.2	7.3
Upper Green	River Bottom	RB - 4	Upland - Big sage	10/13/2022	N Grazed	F	9.8	9.2	0.6
Upper Green	River Bottom	RB - 4	Upland - Big sage	10/13/2022	S Grazed	F	10.3	9.2	1.1
Upper Green	River Bottom	RB - 4	Upland - Big sage	10/13/2022	Cage	G	44	9.2	34.8
Upper Green	River Bottom	RB - 4	Upland - Big sage	10/13/2022	N Grazed	G	12.9	9.2	3.7
Upper Green	River Bottom	RB - 4	Upland - Big sage	10/13/2022	S Grazed	G	12.8	9.2	3.6
Upper Green	Tosi	TT - 5	Upland - Big sage	10/10/2022	Cage	F	13.1	9.2	3.9
Upper Green	Tosi	TT - 5	Upland - Big sage	10/10/2022	E Grazed	F	14.5	9.2	5.3
Upper Green	Tosi	TT - 5	Upland - Big sage	10/10/2022	S Grazed	F	12.8	9.2	3.6
Upper Green	Tosi	TT - 5	Upland - Big sage	10/10/2022	Cage	G	33.5	9.2	24.3
Upper Green	Tosi	TT - 5	Upland - Big sage	10/10/2022	E Grazed	G	19.8	9.2	10.6
Upper Green	Tosi	TT - 5	Upland - Big sage	10/10/2022	S Grazed	G	18.2	9.2	9



Fisherman Creek Site FC-1, July 29, 2022. Overview of transects and cage location at time of clipping. Ungrazed sedges. grasses and forbs in the cage were 2017.7 lb/acre, grazed plot residuals averaged 899.9 lb/acre for a utilization of 55.4%.

Fisherman Creek Site FC-1, July 29, 2022. Upper photo of cage plot prior to clipping, lower photo of two grazed plots prior to clipping.

Fisherman Creek Site FC-2, July 29, 2022. Overview of transects and cage location at time of clipping. Ungrazed sedges, grasses and forbs in the cage were 2809.7 lb/acre, grazed plot residuals averaged 570.8 lb/acre for a utilization of 79.7%

Fisherman Creek Site FC-2, July 29, 2022. Upper photo of cage plot prior to clipping, lower photo of two grazed plots prior to clipping.

Fisherman Creek Site FC-3, August 8, 2022. Overview of transects and cage location at time of clipping. Ungrazed sedges, grasses and forbs in the cage were 2748.2 lb/acre, grazed plot residuals averaged 203.9 lb/acre for a utilization of 92.6%

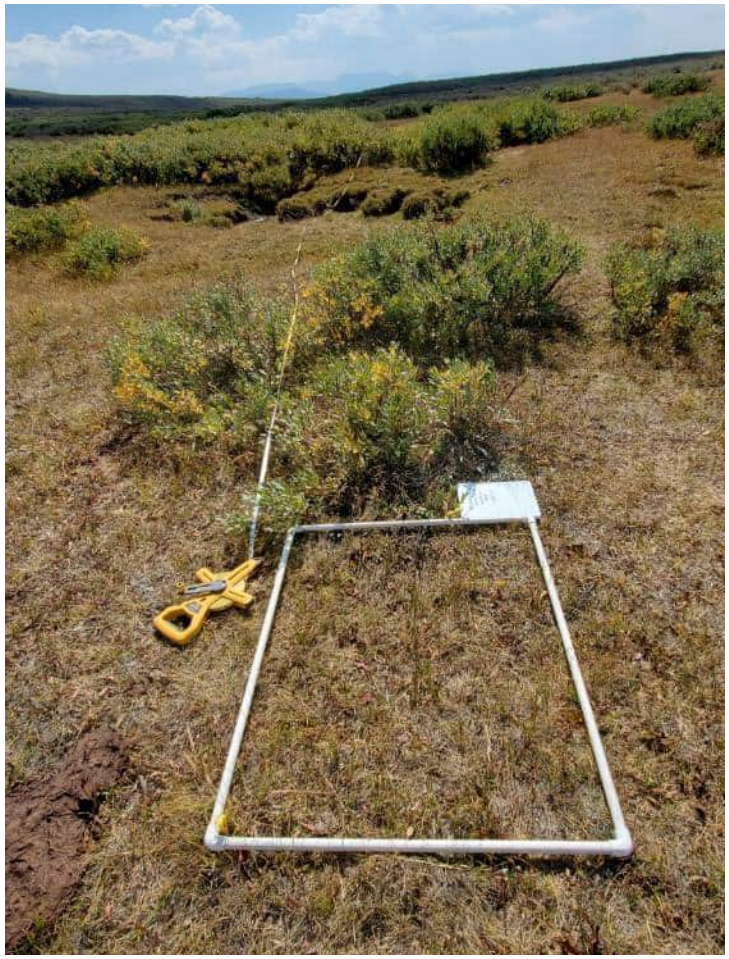
Fisherman Creek Site FC-3, August 8, 2022.
Upper photo of cage plot prior to clipping, lower photo of two grazed plots prior to clipping.

Fisherman Creek Site FC-4, October 5, 2022. Overview of transects and cage location at time of clipping. Ungrazed grasses and forbs in the cage were 1926 lb/acre with 1864.5 lb/acre being grasses. Grazed plot grass and forb residuals averaged 220.1 lb/acre, with 168.2 lb/acre being grasses. Utilization was 88.6% on combined grasses and forbs, while utilization for grasses only was 91%. This plot was biased with smooth brome occurring in the cage but not in the grazed plots.

Fisherman Creek Site FC-4, October 5, 2022. Upper photo of cage plot prior to clipping, lower photo of two grazed plots prior to clipping.

Mosquito Lakes SE Site MSE-7, October 10, 2022. Overview of transects and cage location at time of clipping. Ungrazed grasses and forbs in the cage were 881.5 lb/acre with 591.3 lb/acre being grasses. Grazed plot grass and forb residuals averaged 80.9 lb/acre, with 60.4 lb/acre being grasses. Utilization was 90.8% on combined grasses and forbs, while utilization for grasses only was 89.8%. This site produced 24.5% of potential. However, it appears to be misclassified as sub-irrigated and likely is producing a greater percent of potential if reclassified into Loamy Foothills and Mountains West in which it would be producing 48.9% of potential.

Mosquito Lakes SE Site MSE-7, October 10, 2022. Upper right photo of cage plot prior to clipping, left photo of two grazed plots prior to clipping.



Mosquito Lakes NE Site MNE-8, September 8, 2022. Upper right photo of transect overview, at left, photos of two grazed plots prior to clipping. A photo of the caged plot was not taken. Ungrazed sedges, grasses and forbs in the cage were 1164.2 lb/acre, grazed plot residuals averaged 183.4 lb/acre for a utilization of 84.3%. This site produced 32.3% of potential.

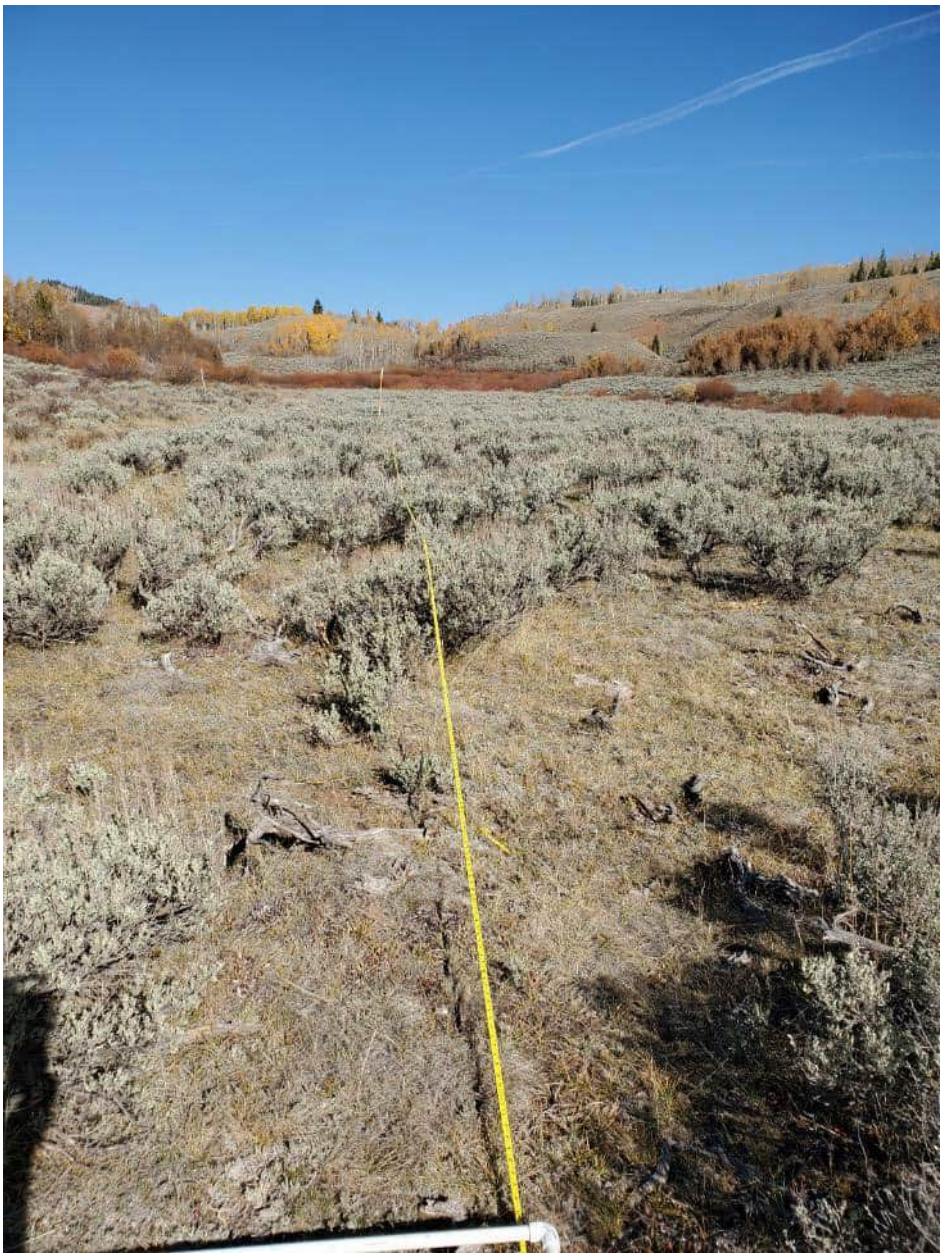
Mosquito Lakes NE Site MNE-8, September 8, 2022. Photos of hummocks, hoof shear, and head cut in intermittent channel. The ESD for this site notes channel development is a degraded state. Channel development will gradually dewater the meadow leading to a loss in productivity and change to more xeric species.

Mosquito Lakes NW Site MNW-9, September 8, 2022. Overview of transect at time of clipping. Ungrazed sedges, grasses and forbs in the cage were 2842.1 lb/acre, grazed plot residuals averaged 460.7 lb/acre for a utilization of 84.3%. This site produced 78.9% of potential.

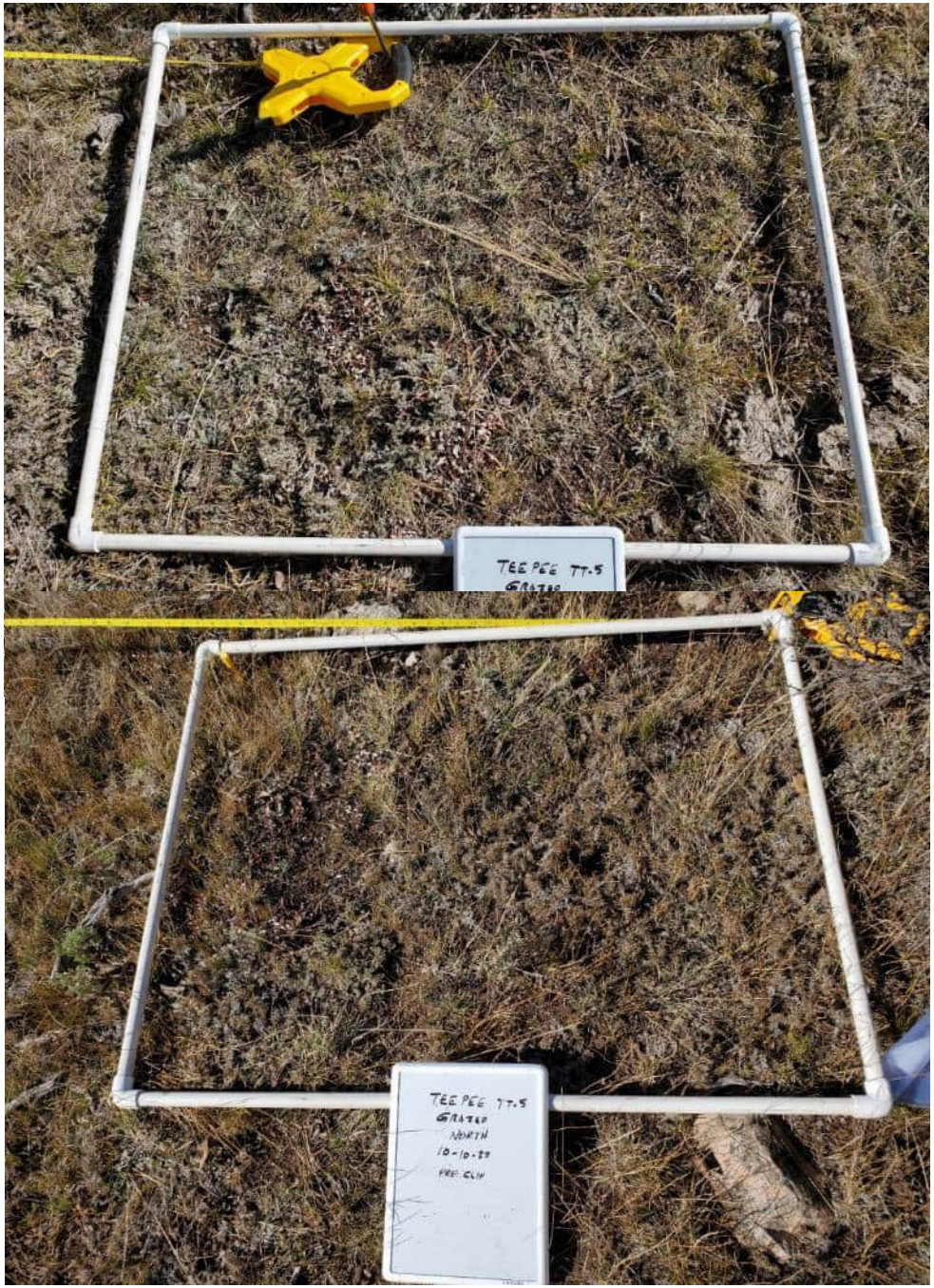
Mosquito Lakes NW Site MNW-9, September 8, 2022. Upper right photo of cage plot, lower left, and upper photos of grazed plots prior to clipping

Lower Teepee Site TL-6, September 8, 2022. Overview of transect at time of clipping. Ungrazed grasses and forbs in the cage were 746.7 lb/acre with 154.3 lb/acre being grasses. Grazed plot grass and forb residuals averaged 101.4 lb/acre, with 70.1 lb/acre being grasses. Utilization was 86.4% on combined grasses and forbs, while utilization for grasses only was 54.5%.

Lower Teepee Site TL-6, September 8, 2022.
Upper photo of cage plot, lower photos of grazed plots before clipping.



Tosi Pasture Site TT-5, October 10, 2022. Overview of transect at time of clipping. Ungrazed grasses and forbs in the cage were 304.3 lb/acre with 262.2 lb/acre being grasses. Grazed plot grass and forb residuals averaged 154.3 lb/acre, with 105.7 lb/acre being grasses. Utilization was 49.3% on combined grasses and forbs, while utilization for grasses only was 59.7%. This site produced 16.9% of potential.

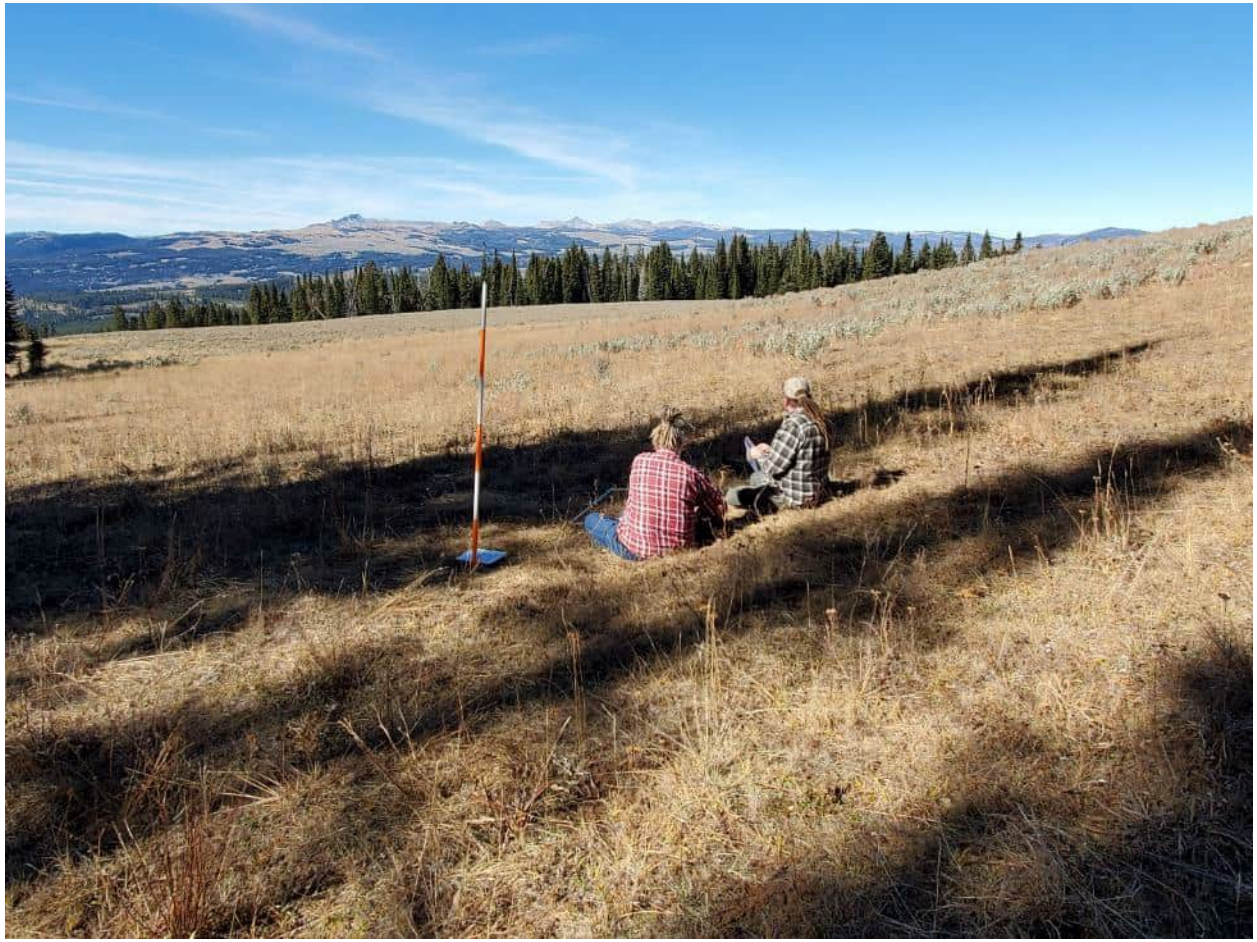


Tosi Pasture Site TT-5, October 10, 2022. Upper right photo of cage plot left photos of grazed plots prior to clipping.

River Bottom Pasture Site RB-4, October 13, 2022. Overview of transect at time of clipping. Ungrazed grasses and forbs in the cage were 454.3 lb/acre with 375.5 lb/acre being grasses. Grazed plot grass and forb residuals averaged 101.4 lb/acre, with 70.1 lb/acre being grasses. Utilization was 86.4% on combined grasses and forbs, while utilization for grasses only was 54.5%. The site produced 24.4% of potential.

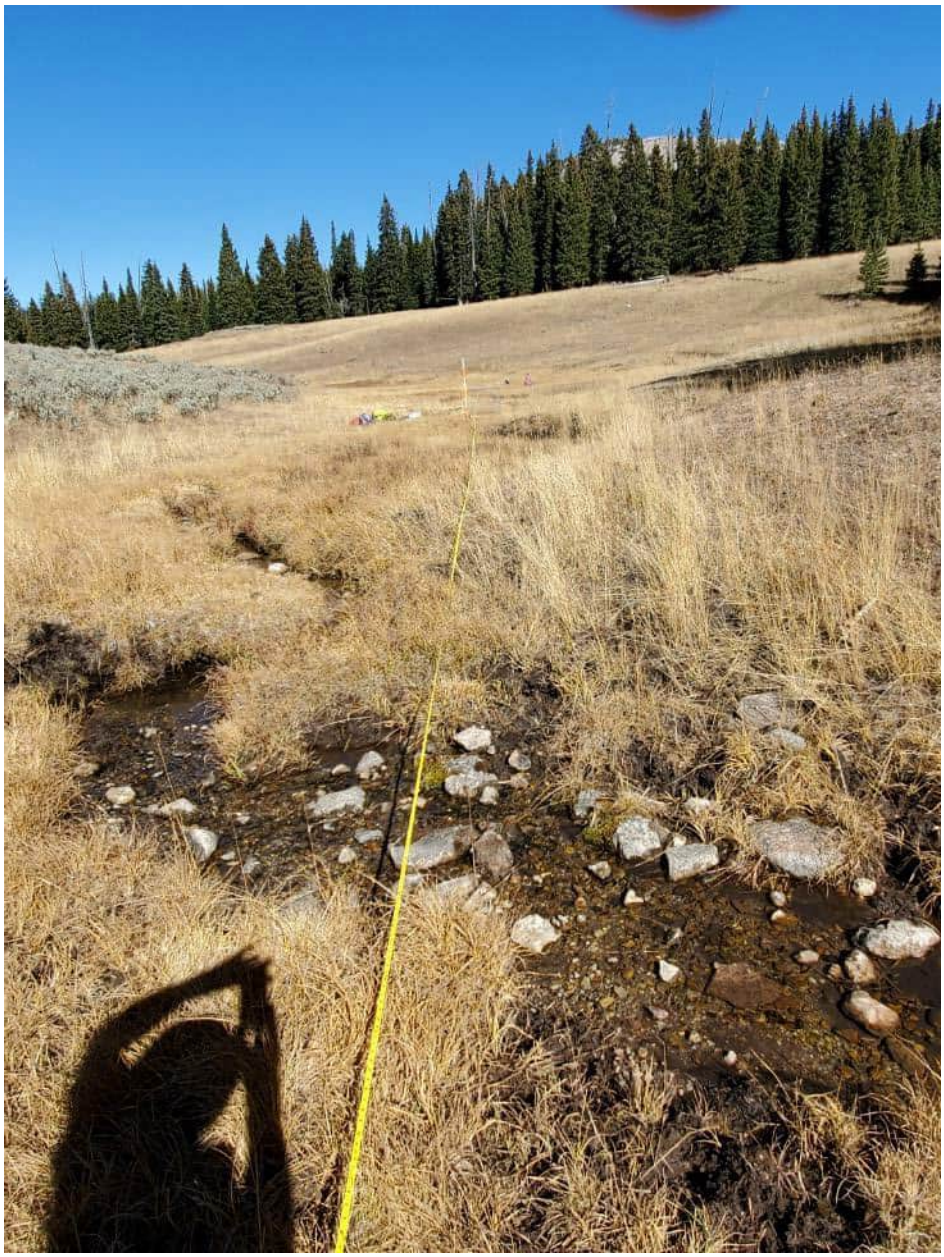



River Bottom Pasture Site RB-4, October 13, 2022. Upper left photo of cage plot, middle and right photos of grazed plots prior to clipping



Lower Gypsum Pasture Site GL-1, October 19, 2022. Overview of transect at time of clipping. Ungrazed grasses and forbs in the cage were 752.1 lb/acre with 419.7 lb/acre being grasses. Grazed plot grass and forb residuals averaged 274.1 lb/acre, with 112.2 lb/acre being grasses. Utilization was 63.6% on combined grasses and forbs, while utilization for grasses only was 73.3%.

Lower Gypsum Pasture Site GL-1, October 19, 2022. Upper right photo of cage plot, middle and left photos of grazed plots before clipping.



Lower Gypsum Pasture Site GL-2, October 19, 2022. Overview of transect at time of clipping. Ungrazed sedges, grasses and forbs in the cage were 878.3 lb/acre, grazed plot residuals averaged 378.7 lb/acre for a utilization of 56.9%.

Lower Gypsum Pasture Site GL-2, October 19, 2022.
Upper right photo of cage, left and lower right photos of grazed plots before clipping.

Lower Gypsum Pasture Site GL-3, October 19, 2022. Overview of transect at time of clipping. Ungrazed grasses and forbs in the cage were 843.8 lb/acre with 785.5 lb/acre being grasses. Grazed plot grass and forb residuals averaged 339.9 lb/acre, with 322.6 lb/acre being grasses. Utilization was 59.7% on combined grasses and forbs, while utilization for grasses only was 58.9%.

Lower Gypsum Pasture Site GL-3, October 19, 2022. Upper right photo is of cage plot, left photos of grazed plots before clipping.

Exhibit 6
Correspondence With BTNF
Proposed Monitoring
WWP and Y2U

March 17, 2022

Gregory Brooks, District Ranger
Big Piney Ranger District
10418 South US Highway 189
Big Piney, WY 83113

Ivan Geroy, District Ranger
Pinedale Ranger District
Bridger-Teton National Forest
29 East Fremont Lake Rd.
P.O. Box 220
Pinedale, WY 82941

Cc: Elise Boeke, Patricia O'Connor, Deborah Oakeson, Terry Padilla, Lois Shoemaker

VIA email

Re: Request to Place Utilization Cages in Upper Green and Fisherman Creek allotments

Greg and Ivan:

Congratulations on your new positions.

It is hard to start this process over after nearly a year of correspondence, emails, phone meetings with Patricia, Rob Hoelscher, and the Region regarding our request to place a few utilization cages in the subject allotments. In our past correspondence (attached), we have addressed the need for doing this study to fill information gaps in the current monitoring effort by the permittees and their agents. Our request has been either denied with the reason that monitoring is already in place, or we are being forced to go back and forth from Region to Supervisor to District Ranger levels, with no reasonable outcome. We have had permission and carried out similar studies in the Caribou NF, Salmon-Challis NF, BLM Salt Lake Field Office, BLM Rock Springs Field Office, and BLM Lander Field Office.

Our proposed study is designed to collect data for herbaceous retention in riparian and upland areas and to compare the results with greenline stubble height measurements and upland key species residuals. We plan to begin the study in the early summer of 2022. This would help inform monitoring efforts on the BTNF. We have proposed to provide the cages, do the work, and provide a report to the BTNF. Agency staff are of course welcome to observe, take part and make suggestions. The idea was to acknowledge you have a lot to do and this would not be a staff burden or expense for the BTNF.

In her recent email[1], Patricia pointed out that you have specific monitoring protocols in place and we should work with you on the request. Rob Hoelscher had indicated to us that there were no issues with monitoring because "monitoring plans on many of our allotments were established in cooperation with the University of Wyoming Range Extension, the grazing permittees, and the Forest Service."[2] This leaves a glaring omission and that is that the public is not mentioned. If you look at the recent monitoring reports for the Upper Green allotment complex, these are "Prepared for: Upper Green River Cattlemen's Association" and "Prepared by: Sublette County Conservation District". There is no mention of the public or citizens in these reports.

We have made many requests to obtain the GPS points for the monitoring locations on these allotments and have been shuttled back and forth from the Range staff to the Sublette County Conservation District, with each referring us to the other but never receiving the data. Even our FOIA to the BTNF for the information did not provide it because you apparently don't possess the information. We provide all the data, maps, coordinates and methods when we do studies.

In our prior correspondence[3], we have reminded the BTNF that the Forest Service Handbook FSH 2209.10 Chapter 10 stresses the involvement of the interested publics in managing range allotments, securing the necessary inventory, and monitoring information, and establishing criteria for determining allowable use levels. The Handbook also spells out the following:

- "Public Participation. Public participation should be a key element of the NFMA process as well as the NEPA process. Close consultation, cooperation, and coordination with grazing permittees is essential to help them understand the differences between existing and desired vegetation on their allotment and in identifying possible practices that will achieve desired future conditions for vegetation as well as the permittees livestock operation. Other interested parties should be involved as well to identify possible practices that will be responsive to potential concerns or issues they may express. Not only is public participation good business from the standpoint of identifying opportunities and possible practices to achieve desired conditions and reduce controversy later in the planning process, but it is a requirement of law…. Furthermore, in FLPMA's declaration of policy, Congress specifically requires the Secretary of Agriculture to consider the views of the general public, and to allow for adequate third party participation exercising his discretionary authority. (43 USC (1701(a) (5)))." (Par. 15.7).

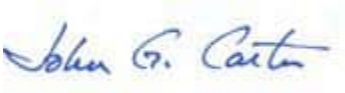
- "Benchmark areas should be selected and/or approved by the most experienced and qualified personnel available and agreed upon or coordinated with permittees and in some cases other interested agencies, individuals or groups." (Chapter 40 Par. 40.41).

[1] Email from Patricia O'Connor dated Marcy 15, 2022.
[2] Email from Rob Hoelscher dated May 24, 2021.
[3] Letter to Patricia O'Connor dated January 3, 2022.

In the attached letters we have previously sent regarding this proposal, we have outlined some of the issues with the current monitoring program. These include the acceptability of key species being used, monitoring locations, and the absence of riparian zone monitoring. Rather than repeat this here, you can review these for yourselves.

We would like to place these cages before turnout in late May or early June and will provide a map of locations and description of methods. Please review this correspondence and let's have an in-person or phone conference if needed to resolve any details so we can proceed with the public's monitoring effort this spring.

Respectfully,



John Carter, Ecologist
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P.O. Box 464
Bondurant, WY 82922
Jcoyote23@gmail.com

Jonathan Ratner - Wyoming and Utah Director
Western Watersheds Project
P.O. Box 171
Bondurant, WY 82922

May 17, 2021

Rob Hoelscher, District Ranger
Pinedale Ranger District
Bridger-Teton National Forest
29 East Fremont Lake Rd.
P.O. Box 220
Pinedale, WY 82941

Patricia O'Connor, Forest Supervisor
Bridger-Teton National Forest
340 N. Cache
P.O. Box 1888
Jackson, WY 83001

Re: Cooperative Range Monitoring

Dear Rob:

I appreciated being on the call last Friday for the discussion on monitoring, particularly on key species and methods. As I mentioned at the end of the call, I have questions. This appears to be a controversial issue and is a QA/QC problem needing to be addressed. I have been reviewing various reports such as the Upper Green River 2019 Cooperative Monitoring Report[1] and AOIs for the Upper Green allotments.

I note that the 2020 AOI for Upper Green allotments implemented the allowable use standards from the Upper Green FEIS/ROD.[2] [3] Allowable levels for upland and riparian areas are generally 50%, with exceptions for higher levels in certain areas as presented in Table 1 of the ROD. A greenline stubble height of 4 inches is to be retained for most riparian areas with exceptions for some areas being 6" as presented in Table 1 of the ROD. The FEIS/ROD describe the riparian and upland monitoring methods as occurring on key areas and on key species and offers the opportunity to adjust or monitor additional key areas if necessary.

Our discussion raised issues of: (1) appropriateness of selected key species such as Idaho fescue which may understate utilization, (2) whether greenline stubble height represents

[1] Sublette County Conservation District. 2019. Upper Green River 2019 Cooperative Monitoring Report. Prepared for Upper Green River Cattlemen's Association.
[2] USDA Forest Service. 2017. Upper Green River Rangeland Project Final Environmental Impact Statement. Bridger-Teton National Forest.
[3] USDA Forest Service. 2019. Record of Decision Upper Green River Area Rangeland Project. Bridger-Teton National Forest.

riparian utilization in the Aquatic Influence Zone, (3) suitability of key area locations, (4) plant vigor related to the low stature of Idaho fescue (5) use of Wyethia and certain tall forbs as key species. While other points were discussed, these appeared to me to be the principal ones.

I have had a separate brief discussion with Gary Hayward regarding visiting some of the monitoring sites this summer and the need for location data for the monitoring sites. He furnished me with the Elk Ridge Allotment Complex Allotment Monitoring Book which addresses monitoring in the closed and vacant allotments in the Elk Ridge complex.[4]

Resolution of the Issues

1. It is my intent to submit a FOIA for certain information regarding these and perhaps, other allotments, but I would like to know if the Bridger-Teton maintains an electronic database with coordinates of its monitoring locations and water developments. To make my visits to the Upper Green, Elk Ridge Complex and other areas in the Forest productive it would help to know if this information is available so that I may request it and easily find these locations. Time is of the essence here, so hopefully this question can be answered right away, and if the data is open and accessible, I could obtain it without a FOIA.

2. To address the question of whether Idaho fescue is representative of overall plant community utilization in uplands, I suggest we select an early, late and closed or vacant pasture to establish a comparison of the key species utilization by the Utilization Gauge method and that determined by the Paired Plot method by setting up one or more cages in the vicinity of the normal key area. At those locations we would collect grazed and ungrazed grasses and forbs, measure their weights (all grasses combined and all forbs combined) and compare to the result by the Utilization Gauge. This could be done on site and would be a relatively easy comparison to accomplish. If the Forest Service is willing, we should coordinate this very soon so that cages can be set prior to livestock entry into the pastures of interest.

3. To address the question as to whether the greenline stubble height represents riparian utilization, we would also select riparian sites in the same pastures and at or near your normal stubble height monitoring location, set a utilization cage in the Aquatic Influence Zone between the greenline and adjacent upland. Similar to the uplands, all vegetation would be clipped in the cage for the ungrazed plot and the previously selected grazed plot would be clipped and weighed for the residual. This would be compared to the sedge

[4] Sublette County Conservation District. 2021. Elk Ridge Allotment Complex Allotment Monitoring Book. Prepared for U.S.F orest Service.

utilization determined by Utilization gauge based on the greenline stubble height. The cages need to be set prior to livestock entry.

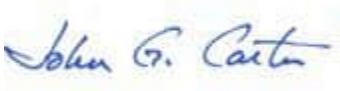
4. Suitability of key locations is something we can determine from the key area location coordinates if they are available and do site visits. This is a goal of mine for summer visits to the Upper Green and something we can also discuss during monitoring visits, some of which I plan to attend. Accordingly, I need to be informed of the schedule and provided an opportunity to do so.

5. The issue of the low vigor/stature of Idaho fescue can be addressed by a joint site visit to look at currently grazed locations and then visit the Elk Ridge Complex where the allotments have been vacant for several years. Aside from drought induced low vigor, the literature indicates recovery of vigor of Idaho fescue requires several years of rest from grazing.

6. The issue of using Wyethia and other tall forbs which are normally considered not palatable could be addressed by jointly visiting some of these monitoring sites and pastures to determine if there are other alternatives. (locations or species).

I suggest an in-person meeting in the next couple of weeks as I expect most of us are vaccinated at this point and we could determine the parameters and get organized in a timely manner if the Forest Service is willing to engage in this process.

Thank you again for your consideration,



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Cc: Jonathan Ratner, Western Watersheds Project
Jason Christensen, Yellowstone to Uintas Connection

Patricia O'Connor, Forest Supervisor
Bridger-Teton National Forest
340 N. Cache
P.O. Box 1888
Jackson, WY 83001

Re: Upper Green Allotment Complex Monitoring Locations

Dear Ms. O'Connor:

This past Monday, July 12, I attended a "joint monitoring" foray into the Upper Green Allotment Complex. In a later report, I will give you my impressions of this effort and also reply to your June 23, 2021 letter regarding drought. This letter addresses my ongoing attempt to obtain GIS/GPS coordinates for the monitoring locations for the Upper Green Allotment Complex. I have communicated with Gary Hayward (BTNF), Rob Hoelscher (BTNF), Mike Henn (Sublette County Conservation District) and submitted FOIAs for monitoring locations. At the request of Anita DeLong, I abbreviated my request for Forest-wide data to include only the Upper Green Allotment Complex.

I understand that the Sublette County Conservation District under the leadership of Mike Henn is conducting monitoring on these allotments for the Upper Green River Cattlemen's Association. See the Upper Green River 2019 Cooperative Monitoring Report prepared for the Upper Green River Cattlemen's Association by Sublette County. I have merely wanted the actual coordinates for the sites monitored on these allotments, which should exist in a spreadsheet or electronic database as they show up on maps in the referenced report. When I asked Gary Hayward for these, he did not have them and referred me to Mike Henn. When I asked Mike, he referred me to the Forest Service.

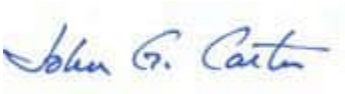
When I received your June 23, 2021 response to my FOIA requesting the monitoring locations, it included several types of locations. These were:

D7 Range Sites
EUI sites
Veg Monitoring Sites
Ground Cover Sites
SG Veg Monitoring sites

I mapped these and overlaid the location I visited on last Monday's joint monitoring effort. That location did not correspond either in location Name or coordinates to any of the provided location data points. The Sublette County person who was guiding us to the location in the Teepee Tosi pasture had these coordinates in her computer and was using them to find the monitoring location. Clearly, since Sublette County prepared the Upper Green 2019 Cooperative Monitoring Report, they have them.

I have expressed the need for these location data in order that we be able to visit the monitoring locations for these allotments this summer to evaluate them. After months of trying, I still do not have them. The Forest Service is allowing this monitoring and participating in it, so why are you unable to provide the data? I am now repeating my request for the location data for the monitoring sites used in the Upper Green Allotment Complex and referenced in the 2019 Monitoring Report. These should be provided in electronic format that is translatable into GIS mapping software, i.e. Excel, a shapefile, or geodatabase.

Thank you,



July 18, 2021

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January 3, 2022

Patricia O'Connor, Forest Supervisor
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P.O. Box 1888
Jackson, WY 83001

Re: Upper Green Cooperative Range Monitoring

Dear Patricia:

This is to follow up on our letter to your office dated May 17, 2021. That is to engage in a cooperative effort to validate the current monitoring carried out by the BTNF, Permittees and Sublette County Conservation District (SCCD). That letter was a follow-up to our telephone meeting of May 14 in which Jonathan presented a Power Point about these issues. Our May 17 letter identified the issues as:

- Selected key species such as Idaho fescue may understate utilization
- Greenline stubble height does not represent riparian utilization
- Key area locations are suspect as not representing most used areas
- Low stature of Idaho fescue results from heavy use and lack of rest
- Wyethia and certain tall forbs used as key species are not forage species

There were emails back and forth with Rob Hoelscher and yourself in which the BTNF denied any problem with monitoring as currently conducted. Rob stated that the cooperative monitoring addressed the issues, technical references were followed, and using cages to test the data was too labor intensive. This ignored that we were proposing to do the work and only at four sites, two in riparian areas and two in uplands. The Forest Service has guidance on cooperative monitoring which shows the current situation is not in accordance with that guidance.

1. Cooperative Monitoring

It was suggested we participate in the 2021 Upper Green cooperative monitoring effort. We signed up to participate and were told to meet at the Forest Boundary on July 12, 2021. Apparently, the trip was organized in Pinedale, and when the others (BTNF, SCCD, Permittees) showed up, everyone piled into UTVs and bailed for points unknown. There was no attempt to brief us on the schedule or any other particulars.

Instead, Rob and the SCCD representative said to follow them. We did, but it was more like a race than an organized monitoring event.

We managed to get to the first site near Teepee Creek. Rob and the SCCD person conducted a line point intercept which identifies species along a transect. It is a method for monitoring trend. We noted this monitoring location was near the top of a ridge well above Teepee Creek in elevation and did not seem to represent areas nearer the stream that were normally used by cattle. We discussed this with Rob and pointed out the significantly more degraded vegetative conditions just downslope, closer to water, and he agreed that conditions declined as we walked downslope. This and further observations in the Upper Green that day have indicated to us there is a bias in selection of key areas so that those places regularly used (near water and in valleys) are not monitored.

After that transect was done, they took off for the next location. We had no coordinates for that location, and we had a hard time keeping up not knowing where the site was located. Finally, they headed off across country through waist high sagebrush and disappeared. There was no road or atv trail. We decided that driving a UTV cross country thru sagebrush was not something we were prepared to do, so were not able to continue.

The Upper Green River 2020 Cooperative Monitoring Report lists the participants for each site monitored.[1] The participants included BTNF, SCCD, and Permittees. No members of the public were involved. Perhaps no one asked. Our experience in 2021 was not a "cooperative" monitoring effort that involved the public. It was predetermined by the BTNF, SCCD and Permittees.

The Forest Service Handbook FSH 2209.10 Chapter 10 describes public involvement. It is supposed to:

- "Involve the permittee and interested publics in management of the range allotment." (Par. 11.3).
- "Obtain ID team, interested publics, and permittee assistance in securing the necessary inventory and monitoring information and establish criteria for determining allowable use levels." (Par. 12.2).

[1] Sublette County Conservation District. 2020. Upper Green River 2020 Cooperative Monitoring Report. Prepared for Upper Green River Cattlemen's Association.

- " The interdisciplinary (ID) team, the permittee, and interested publics should assist in the rangeland inventory and analysis and in the preparation of environmental documents." (Par. 13).
- "Public Participation. Public participation should be a key element of the NFMA process as well as the NEPA process. Close consultation, cooperation, and coordination with grazing permittees is essential to help them understand the differences between existing and desired vegetation on their allotment and in identifying possible practices that will achieve desired future conditions for vegetation as well as the permittees livestock operation. Other interested parties should be involved as well to identify possible practices that will be responsive to potential concerns or issues they may express. Not only is public participation good business from the standpoint of identifying opportunities and possible practices to achieve desired conditions and reduce controversy later in the planning process, but it is a requirement of law…. Furthermore, in FLPMA's declaration of policy, Congress specifically requires the Secretary of Agriculture to consider the views of the general public, and to allow for adequate third party participation exercising his discretionary authority. (43 USC (1701(a) (5)))." (Par. 15.7).
- "Benchmark areas should be selected and/or approved by the most experienced and qualified personnel available and agreed upon or coordinated with permittees and in some cases other interested agencies, individuals or groups." (Chapter 40 Par. 40.41).

This guidance fully supports our request to work with the Forest Service and others to validate the current monitoring methods and location of key areas as well as determining allowable use levels.

2. Key Areas in the Upper Green allotments

After reviewing past years' monitoring data for the Upper Green allotments, we were puzzled how such low levels of utilization were occurring. For example, when we reviewed the utilization data from the Upper Green River 2020 Cooperative Monitoring Report, we found average utilization for uplands was 9% using Idaho fescue as a key species. This raised two questions. First, is the BTNF monitoring where the actual use is occurring, i.e. in areas near water and in areas of more level terrain accessible to that water? Second, is the method of measuring utilization accurately reflecting actual use?

To address the first question of monitoring locations relative to areas of regular use by cattle, we based an initial look at the 2020 Upper Green Monitoring Report referenced above to see where monitoring locations occurred. We used the coordinates for the

upland monitoring locations provided in the report and mapped those. Then we examined the topography and water sources relative to these points. Two pastures are shown below in Figures 1 and 2. These are the Mud Lake East and West Pastures.

In these two pastures, the water sources are Crow Creek and small lakes, the latter of which we assumed have water. The estimated distances to water and other characteristics of the monitoring locations are shown in Table 1. As can be seen, the distances to water are very large in most instances and in others there are large elevation differences. In the case of MLW-04, steep slopes hinder access to the nearest water. Based on the propensity of cattle to remain in areas near water and gentle terrain, these monitoring locations are not capturing the areas where most use is occurring. For example, a Wyoming study found that 77% of use by cattle occurred within 366 meters of water and 79% of use was on slopes less than 7%.[2]

Table 1. Estimated Distance from Water to Monitoring Location, meters.

Location	Distance, m	Notes
MLE-01	1832	Location about 100 feet higher than lake
MLE-02	279	Location on ridge about 100 feet higher than lake
MLE-03	2102	Location several hundred feet higher than stream
MLW-02	1323	Location about same elevation as lake
MLW-02	1890	Location about same elevation as lake
MLW-04	3330	Location about 1,000 feet lower than lake
MLW-04	494	Location about 300 feet higher than stream, steep slopes intervene

What is most clear from this analysis is that key areas are not properly selected. "**Key areas are usually five acres or more and are selected as sites where prescribed use will occur first. Also included are sites where use must be closely monitored because of management plan requirements, such as riparian areas or areas where threatened, endangered, or sensitive species may occur.**"[3]

The Forest Service Handbook also defines a Critical Area as "**A portion of rangeland which has a critical issue related to it, such as a threatened or endangered or sensitive**

[2] Pinchak, W., Smith, M., Hart, R., and Waggoner, J. 1991. Beef cattle distribution on foothill range. Journal ofRange Management 44(3).

[3] USDA Forest Service. 1996. Rangeland Analysis and Management Training Guide. Rocky Mountain Region, Denver, Co.

species, a high use recreation area, a key wildlife habitat, or water quality limited reach. The area serves as a monitoring and evaluation site for the critical issue." (FSH 2209.21 Zero Code 05-Definitions).

The current monitoring locations do not meet these criteria due to their distance from water or being placed on ridges which avoids monitoring the valley bottoms or riparian areas used first as the FSH describes. While the BTNF monitors greenline stubble height on sedges, it does not monitor riparian areas which are located between the greenline and uplands. These riparian areas are critical to amphibians, migrant birds, and small mammals, some of which are sensitive species.

The key areas and utility of Idaho fescue as the key species to represent utilization needs to be validated using the method we identified. That is, placing cages in riparian and upland areas that are grazed first. The Paired Plot method would be used.[4] Following cessation of grazing in the pasture, these caged plots and grazed plots would be clipped and weighed. These results would be compared to the key species and greenline stubble height monitoring results. This would also be compared to the herbaceous retention needed for amphibians and other wildlife which the current allowable use standards do not meet.[5] [6] [7] [8]

The second aspect of this has to do with the use of Idaho fescue as a key species in uplands. We note that in the 2020 Upper Green Monitoring Report, average ungrazed Idaho fescue was 6.9 inches with a grazed height of 2.8 inches. As Jonathan pointed out in our May 14, 2021 telephone discussion, it is difficult for cattle to make use of the lower parts of a short stature grass such as Idaho fescue as it is occurring in the Upper Green area. The difficulty comes due to cattle being either unable or unwilling to graze the plants to the level that would correspond to 50% use if other more accessible or desirable plants are available (such as riparian areas). Figure 3 shows a utilization gage set at 6 inches for an ungrazed plant. At 50% utilization, the grazed height would have to be 5/8 inches, which is not usable by cattle.

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[4] USDA and DOI. 1996 (Revised 1997 and 1999). Utilization Studies and Residual Measurements. Interagency Technical Reference. TR-1734-3.

[5] DeLong, D. 2016. Upper Green Allotment Management Planning EIS Supplemental Wildlife Specialist Report Migratory Birds. Bridger-Teton National Forest. 183p

[6] DeLong, D. 2015. Summary Basis for Building Wildlife Habitat-Needs & Protection into Forage Utilization Limits. West Zone Wildlife Biologist, Bridger-Teton National Forest. 8 p.

[7] DeLong, D. 2015b. Literature Review and Analysis of Scientific Information for the Conservation Assessment for Columbia Spotted Frogs and Boreal Toads on the Bridger-Teton National Forest

[8] DeLong, D. 2021. Forest Plan Direction & Other Wildlife. PowerPoint. 115p.

3. Conclusion

There are clear problems with the BTNF "cooperative monitoring" which does not involve the public in the design and carrying out of monitoring. As a result, selection of allowable use standards, selection of key areas and key species are not representative of grazing use nor are they protective of sensitive species.

This can be corrected by following the intent of the Forest Service Handbook and monitoring manual we have cited. A first step would be to carry out the monitoring validation test we have requested. This would include selecting riparian and upland key areas in which to place cages to collect quantitative data for grazed vs ungrazed grasses and forbs. These would be compared to utilization measured as greenline stubble height along the selected stream reaches and Idaho fescue in uplands.

We are requesting an initial call with you to first discuss this proposition and agree on setting a meeting to engage with yourself, the Pinedale District Ranger, and Range Staff to discuss this effort. We will need to work out the details needed to initiate this effort prior to livestock grazing in 2022.

Respectfully,

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Jonathan Ratner - Wyoming and Utah Director
Western Watersheds Project
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Bondurant, WY 82922

Figure 1. Forest Service and SCCD monitoring locations in Mud Lake East Pasture

Figure 2. Forest Service and SCCD monitoring locations in Mud Lake West Pasture

Figure 3. Utilization Gauge set for Idaho Fescue 6 inch ungrazed height. Read at 50% utilization results in 5/8-inch residual grass height.

January 27, 2022

Patricia O'Connor, Forest Supervisor
Bridger-Teton National Forest
340 N. Cache
P.O. Box 1888
Jackson, WY 83001

Re: Utilization Cage Study Proposal

Dear Patricia:

This is to follow up on prior correspondence (5/17/21 and 1/3/22) regarding placement of utilization cages on BTNF allotments to do some comparisons between upland key species measurements and upland utilization, and determine the correspondence between green line stubble height measurements with overall riparian zone utilization. This data would be of use to the BTNF in application of its monitoring data to grazing management. We are proposing to furnish and install the cages, collect the data, and present the results in a report to the BTNF. BTNF would be welcome to inspect the sites, observe the data collection and provide their input.

With this letter, we are requesting your approval to proceed with our preparations, including acquiring the materials, constructing the cages, and providing the BTNF with a study plan and map(s) showing proposed locations for the data collection. Our goal is to place the cages prior to livestock entry into the selected pastures in 2022.

Thank you for your help in this matter,

John G. Carter

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Exhibit 7

DeLong Summary Basis of 70% Retention

Summary Basis for Building Wildlife Habitat-Needs & Protection into Forage Utilization Limits

Don DeLong, West Zone Wildlife Biologist – BTNF, September 9, 2015

Forest Plan Direction and Migratory Bird Requirements

Two requirements of the Forage Utilization Standard are (1) to prescribe, during allotment management planning, site-specific utilization limits needed to meet Forest Plan objectives; and (2) establish site-specific utilization limits on key wildlife ranges. As such, utilization limits must be purposely designed to meet the following Forest Plan objectives for wildlife, among other Forest Plan objectives, relative to DFC direction:

- Objective 2.1(a) — Provide suitable and adequate habitat to support game and fish population objectives established by the WGFD.
- Objective 3.3(a) — Protect sensitive species and provide an adequate amount of suitable habitat to ensure activities do not cause: (1) long-term or further declines in populations or habitats supporting these populations; and, (2) trends toward federal listing."
- Objective 4.7(d) — An adequate amount of suitable forage and cover are retained for wildlife and fish.

The onus is on Biologists to be able to demonstrate that a maximum utilization limit would result in suitable forage and cover being retained for sensitive species, big game, migratory birds, and other affected wildlife; if this cannot be done, a lower utilization limit needs to be considered.

During allotment management planning, the Standard does not allow deference to be given to current utilization levels until monitoring data shows they are inadequate to meet wildlife needs. The standard is stated deliberatively and in the affirmative, both in terms of "prescribe" utilization limits and "to meet" objectives.

As explained in the ROD for the Bridger-Teton National Forest Land and Resource Management Plan (Forest Plan), "…the first and most important part of the [Forest] Plan is…. Goals and Objectives" (USFS 1990a:6-7). The purpose of standards in the Forest Plan is to support the attainment of Forest Plan goals and objectives, with standards being subordinate to Forest Plan goals and objectives (Forest Plan 1990a:6).

To further implement the Migratory Bird Treaty Act, Executive Order 13186 requires the following of all federal agencies, to the extent permitted by law and agency missions:

- Integrate bird conservation principles and practices into agency plans like allotment management plans, and ensure that agency plans promote recommendations of migratory bird conservation plans.
- Restore and enhance migratory bird habitat, and avoid or minimize adverse effects on migratory birds and their habitat.
- Minimize the unintentional taking of migratory birds. Unintentional take includes the inadvertent killing, wounding, or capturing of migratory birds, eggs, or nests.

Related Principles of Wildlife Conservation

The practice of adjusting utilization limits to ensure that habitat needs of wildlife are met on livestock allotments is well recognized in the wildlife conservation literature, but in practice it remains difficult to carry out.

In herbaceous plant communities (e.g., wet meadow, moist meadow, grassland, forbland), herbaceous vegetation *IS* wildlife habitat and, in shrub-herb communities (e.g., shrubby cinquefoil, silver sagebrush, willow-herb communities), herbaceous vegetation is a major component of wildlife habitat. Because livestock eat herbaceous vegetation, the intensity of livestock grazing use has major ramifications on the ability to provide suitable wildlife habitat in herbaceous-dominated plant communities.

Habitat and Survival Elements Tied to Herbaceous Vegetation

Retained herbaceous vegetation serves two distinct roles with respect to meeting Forest Plan Objectives 2.1(a), 3.3(a), and 4.7(d); Sensitive Species Management Standard; Forage Utilization Standard; and migratory bird requirements. Percent retention of total herbaceous vegetation provides (I) direct measures of herbaceous habitat conditions, and (II) indicators of other factors directly related to the intensity of grazing use (Figure 1).

Wildlife that depend on or are associated with herbaceous vegetation respond to the elements in the category I and elements 1, 3, and 4 in category II (Figure 1); and all elements in categories I and II can affect survival. Trampling by livestock is the only direct form of mortality.

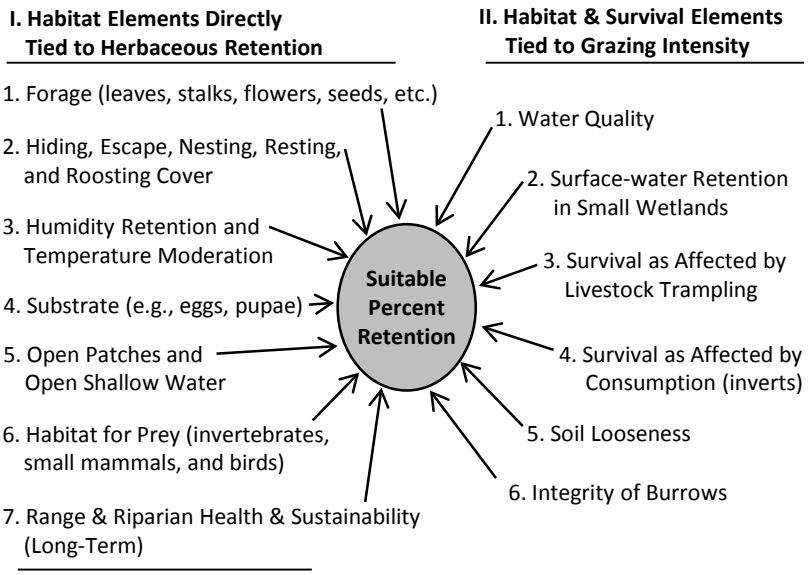


Figure 1. Herbaceous habitat elements and other habitat and survival elements tied to grazing intensity, which indirectly ties to herbaceous retention.

Minimum Retention Threshold for the Provision of Suitable Habitat

Detailed examinations and syntheses of more than 500 scientific studies, papers, and textbooks from a wide range of disciplines demonstrated that 70% herbaceous retention has a reasonable likelihood of (1) retaining enough herbaceous vegetation to provide suitable conditions for the habitat elements outlined in Figure 1 for most dependent wildlife, and (2) providing sufficient protection from direct impacts of livestock use (DeLong 2009, DeLong 2012, DeLong 2015a, DeLong 2015b).

There is moderate scientific support for this conclusion even though there are relatively few scientific studies *directly* showing that ≥70% herbaceous retention is sufficient to maintain suitable forage and cover for particular wildlife species and to protect particular species from direct impacts like trampling (Figure 2). Given limited direct evidence, drawing scientific information from a wide range of disciplines and geographic locations was needed to be able to demonstrate that a low-end threshold of 70% is suitable for a range of species and for native wildlife-communities. Having only moderate support for a low-end threshold of 70% should not be surprising given the relatively large reductions in herbaceous habitat attributes (Fig. 2). It is far from optimum conditions.

It is being argued that there is too little scientific support for a minimum herbaceous retention level of 70%. There is less support showing that ≥60% herbaceous retention will (1) retain enough vegetation to provide suitable habitat and (2) protect wildlife, and even less support for ≥50% retention.

There are fewer studies directly showing that ≥60% herbaceous retention is sufficient to maintain suitable habitat for particular wildlife species, and fewer yet directly showing that ≥50% herbaceous retention is sufficient to maintain suitable habitat for wildlife species. There are no studies showing that 60% or 50% herbaceous retention maintains suitable habitat for a range of wildlife species. The large pool of scientific information reviewed for the reports cited above, when looked at comprehensively (and individually), provides no more than minimal support for 60% or 50% herbaceous retention as low-end thresholds and shows there to be substantive negative impacts. This corresponds to the minor amount of herbaceous vegetation retained above about 2 inches (Fig. 2).

Attributes of pre-grazed herbaceous habitat are nearly gone by about 50% herbaceous retention and are virtually eliminated by about 40% herbaceous retention (Figure 2). Similarly, there is virtually no support for a 4-inch stubble height (away from stream channels) as a low-end threshold for suitable conditions for wildlife.

The examination and synthesis of scientific information revealed no more than minimal support for a maximum 50% utilization of *key forage species* retaining suitable forage and cover for wildlife, and the preponderance of scientific information shows there to be substantive negative impacts across a wide range of wildlife species at this utilization level.

Therefore, 70% herbaceous retention is the lowest retention level that can be supported as Wildlife Program input into the process of prescribing utilization limits during allotment management planning (as per the Forage Utilization Standard). For wildlife species that forage on key forage species for livestock, 60% use of key forage species is the lowest supportable limit.

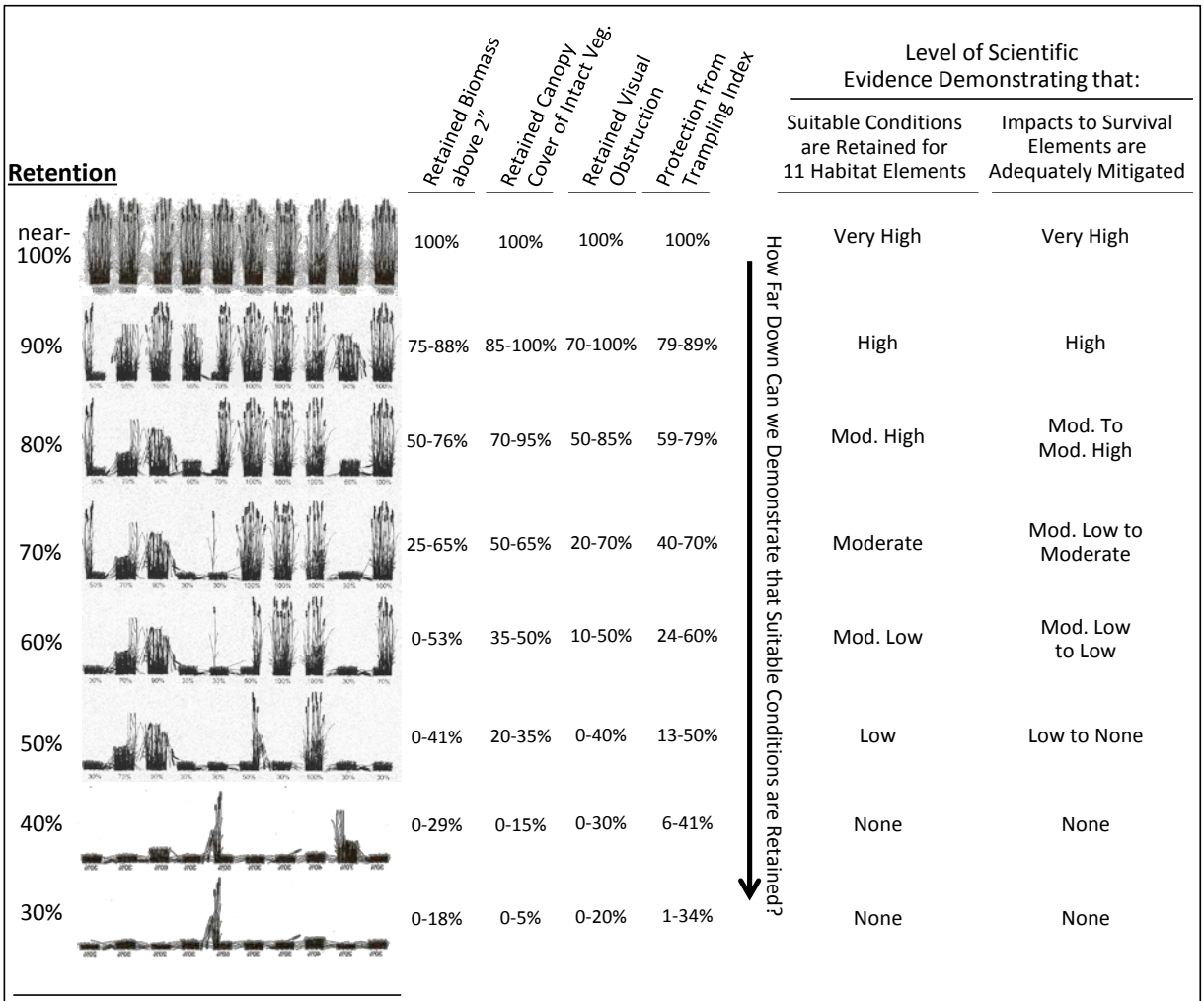


Figure 2. Summaries of several key herbaceous-habitat and survival indices for incrementally lower herbaceous retention levels, and summaries of level of scientific support for these retention levels.

Relationship to Utilization Limits for Retaining Rangeland Health

A minimum herbaceous retention level of 70% fits completely within utilization limits currently recommended by range experts and currently in use in livestock management programs (Figure 3).

It is noteworthy that the previous District Ranger on the Pinedale District — who has a range background — characterized a maximum 35% use of key forage species as reflecting "…the contemporary understanding of the needs of the land and wildlife and livestock grazing operations" (letter dated February 12, 2015). This level of grazing translates to an estimated 65-80% retention of total herbaceous vegetation.

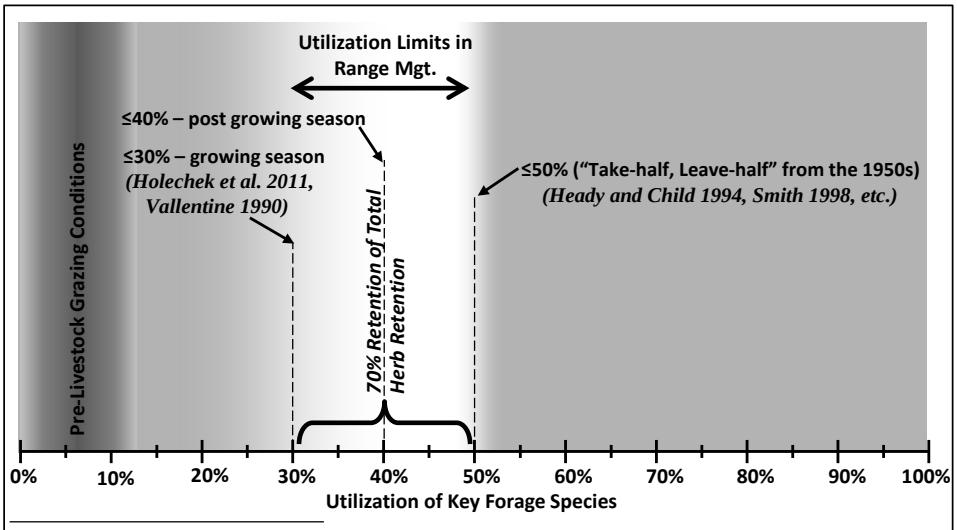


Figure 3. Conceptual illustration showing the relationship between 70% retention of total herbaceous vegetation and (1) approximated pre-livestock-grazing conditions (i.e., near 0% utilization as measured in the fall), and (2) utilization limits being applied today by range managers in the Rocky Mountains.

A maximum 50% use of key forage species represents an *absolute* maximum since use above this level clearly sets the stage for declining rangeland conditions (all range texts). This "take-half, leave-half" limit was devised in the 1950s to protect plant health and did not take into account wildlife needs.

Holechek et al. (2011:140) assessed that a maximum 50% use of key forage species results in deterioration of rangelands in the coniferous forest belt of the Intermountain West. They and Vallentine (1990) recommended maximum key-forage use levels of 30% (growing season) and 40% (post-growing season) as management controls for maintaining herbaceous species composition and other aspects of rangeland health (Figure 3).

A maximum 70% herbaceous retention falls at the low end of suitable conditions for wildlife and near the low end of utilization limits recommended by range management experts (i.e., max. 30-40% use of key forage species). A maximum 30-40% use of key forage species fits within the limits of 70% herbaceous retention (Figure 3).

Until recently, the needs of wildlife had not been seriously addressed in setting utilization limits on livestock allotments of the BTNF, but meeting wildlife objectives is now part of discussions. This transition has been causing some angst in range management on the Bridger-Teton National Forest in recent years.

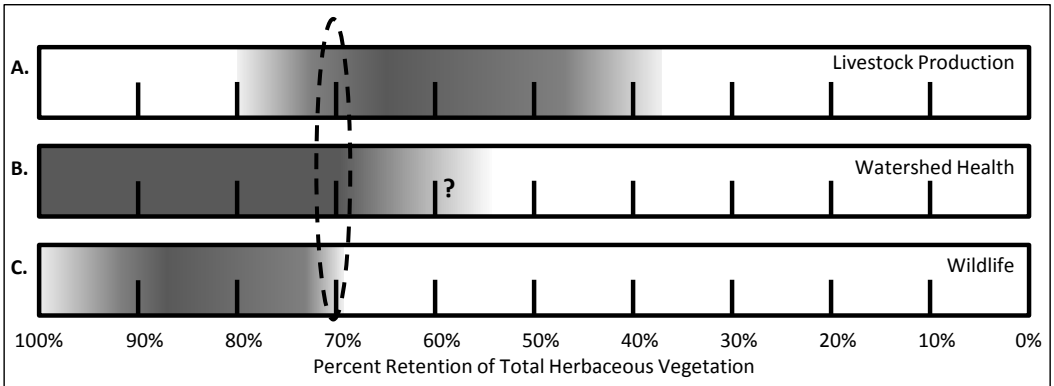


Figure 4. Depiction of the relationship between the range of "desired" utilization levels (expressed as herbaceous retention levels) from the standpoint of livestock production and resource-related constraints in the form of minimum herbaceous retention levels. The dotted line shows an approximate location of overlap; i.e., the low end of suitable conditions for wildlife and low end of maximum utilization levels for livestock grazing.

Additional Information

A large amount of scientific and ecological information supports a minimum herbaceous retention level of 70%. A small portion of the information in the referenced reports is summarized on the following pages.

How are Different Parts of Plants Used by Wildlife?

Different parts of plants contribute differently to wildlife habitat (Figure 5) and this has implications to livestock grazing because grazing removes different parts at different rates and because plant parts lowest to the ground, which are most important to maintaining plant health, are least important as wildlife habitat. Different herbivorous wildlife species favor or require different plant parts, different herbivorous wildlife prefer different plant species, many insect species have specific host plant-species and it is common for them to only use specific parts of these plants (e.g., flowers, base of the plant, leaves high on the plant).

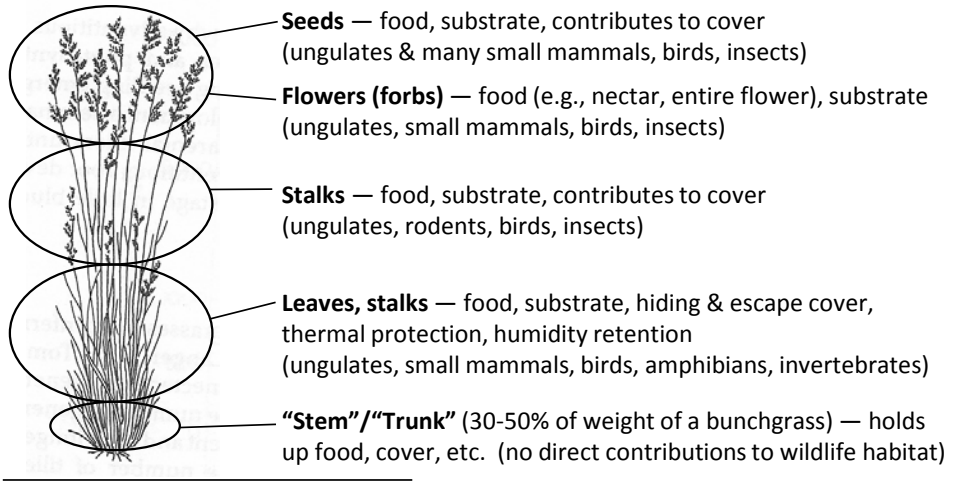


Figure 5. Some of the key direct uses of herbaceous vegetation by wildlife.

Contributions of Herbaceous Structure and Canopy to Wildlife Habitat

Figure 6 illustrates the culmination of all of the functions of herbaceous vegetation that contribute to the habitat of small vertebrate wildlife and invertebrate wildlife in herbaceous communities that naturally are relatively dense, such as in moist meadows (see also Figure 2). By the time 50% of the biomass of herbaceous vegetation has been removed, a major proportion of pre-grazed habitat attributes have been eliminated, and when 70% has been removed, habitat attributes of pre-grazed conditions are gone for the remainder of the season. Making a statement that 50% herbaceous retention maintains most meadow habitat attributes for wildlife does not pass the "straight-face test," when considering Figures 2 and 6.

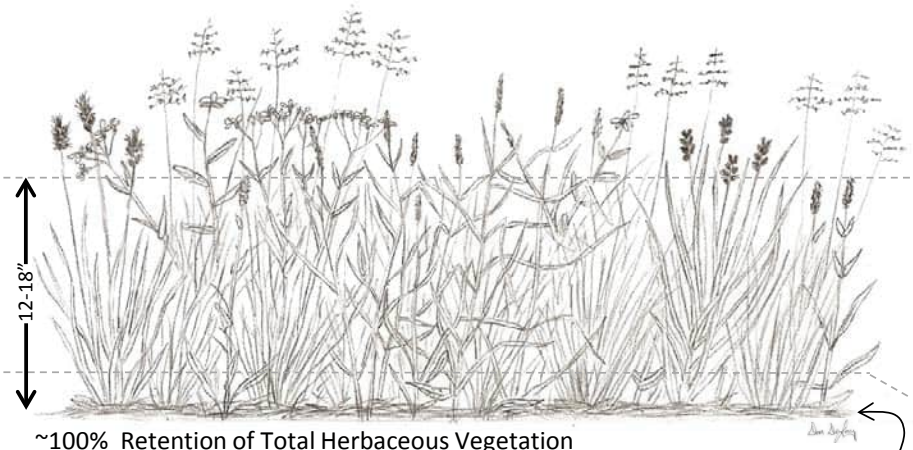
It is widely accepted that moderate and larger alterations to the structure of forestlands impact wildlife diversity, and it should not be surprising that the same is true of meadow habitat (Figure 7). Many of the same physical principles and wildlife-habitat relationships apply, just at much smaller scales.

Food Webs, Energy Flow, and Ecosystem Functions

Assessments of the suitability of different herbaceous retention levels need to be done in consideration of food webs and energy flow. Herbaceous vegetation is a major foundation of ecosystems. It comprises THE habitat for wildlife in herbaceous plant communities and is a major part of wildlife habitat in shrub-herb communities, and livestock nearly exclusively feed on (and remove) herbaceous vegetation. Functional plant species composition and canopy cover after the livestock grazing season — from the standpoint of wildlife habitat — does not include any plant material that was removed through grazing; it is defined only by what remains.

Not only are invertebrates, small mammals, and birds considered wildlife in their own right, they also are prey of predatory wildlife and many species play key functions in ecosystems (e.g., pollinators). A wide variety of invertebrate species and abundance of invertebrates are central to maintaining healthy populations of migratory birds, bats, insectivorous small mammals, reptiles, and amphibians. Many invertebrate species contribute to ecosystem functions through pollination and decomposition of dead animals and plants. The Forest Service is increasingly recognizing the central role of pollinators and the importance of conserving these invertebrates.

The only missing native herbivore in many parts of the BTNF is bison and available information indicates that, prior to Euro-American settlement, bison sporadically or periodically grazed parts of the BTNF (e.g., lower elevations, wide valley bottoms). However, there is no indication that they heavily grazed more than a minor portion of the BTNF on an annual or regular basis.



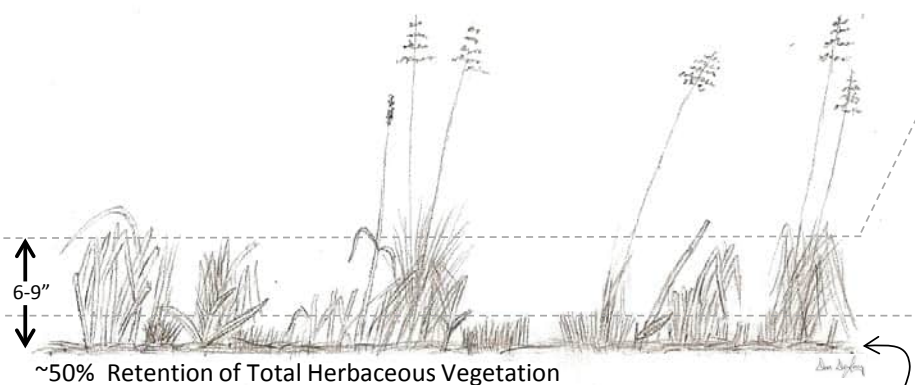
~100% Retention of Total Herbaceous Vegetation

Upper Layer
- Fully exposed to ambient climate
- High light, virtually no shade
- Low Visual Obstruction
- Abundance of Flower and Seed Forage
- Species composition fully realized
- Abundance of Substrate

Middle Layer
- Moderate humidity, little wind
- Somewhat moderated temperatures
- Reduced light, moderate shade
- Moderately high visual obstruction
- Meets behavioral attachment to dense overhead canopy
- Abundance of leaf forage and substrate
- Large variety of forage types

Bottom Layer
- High humidity, moderated temperature
- No wind
- Deep shade, little light
- High visual obstruction
- Some basal leaf forage

Litter Layer
- Well developed
- Good moisture retention



~50% Retention of Total Herbaceous Vegetation

Upper Layer — *Greatly Expanded*
- Fully exposed to ambient climate
- High light, no shade
- Negligible Visual Obstruction
- Minimal flower and seed forage
- Minimal leaf forage and substrate

Middle Layer — *Little Remaining*
- Near ambient humidity and temp.
- Near ambient wind
- Little reduction in light, minimal shade
- Low visual obstruction
- Does not meet behavioral attachment to dense overhead canopy
- Low amount of leaf forage and substrate
- Low variety of forage types

Bottom Layer
- Near ambient humidity & temperature
- Near ambient temperature
- Near ambient wind
- Mod. to high light, low to mod. shade
- Low visual obstruction
- Small amount of leaf forage

Litter Layer
- Moderately developed
- Moderate moisture retention

~30% Retention of Total Herbaceous Vegetation (approx. 2-inch stubble)

Upper and Middle Layers
Effectively Absent
- Fully exposed to ambient climate
- High light, no shade
- No visual obstruction
- Does not meet behavioral attachment to dense overhead canopy
- Virtually no leaf forage
- No flower and seed forage

Bottom Layer
- Near ambient humidity and temp.
- Ambient wind
- Ambient light, no effective shade
- Virtually no visual obstruction
- Virtually no leaf forage

Litter Layer
- Nearly absent
- Virtually no moisture retention

Figure 6. Contributions of meadow vegetation to wildlife habitat and changes relative to retention levels.

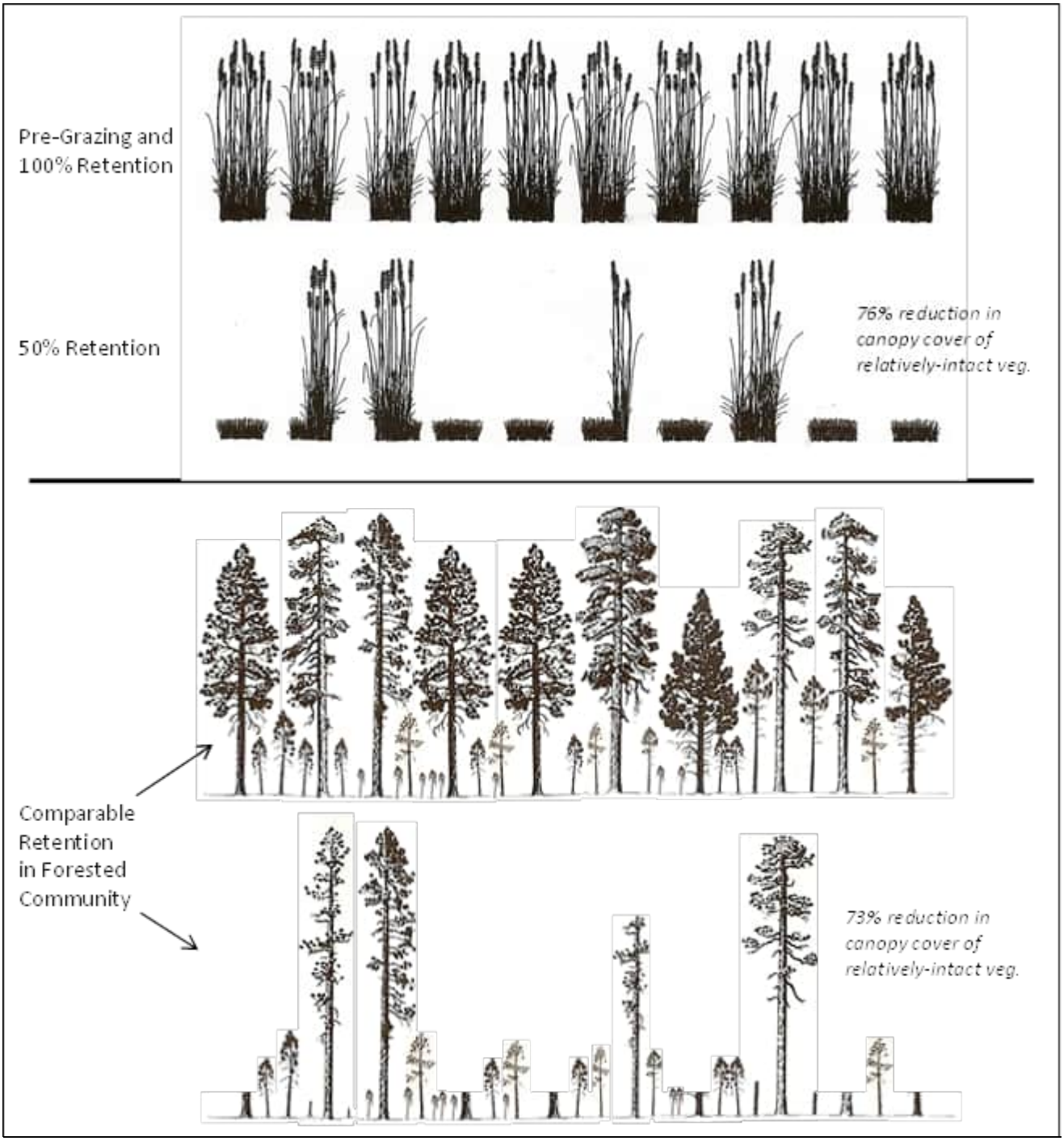


Figure 7. Comparison of 50% retention of herbaceous vegetation in a meadow to a comparable relatively-intact canopy cover in a forestland situation.

Native Wildlife-Communities

Retaining a minimum 70% herbaceous retention is not just about one, two, or even a handful of wildlife species; it is about entire wildlife communities. Some wildlife species depend on or favor relatively-tall, dense herbaceous vegetation, others favor moderate heights and densities, and only a small number require or favor short or sparse herbaceous vegetation (Figure 8). As an example, only 4 small mammal species on the BTNF are associated with or favor short or sparse herbaceous vegetation in contrast with 13 species of small mammal species that require or favor relatively-tall, moderately-dense to dense herbaceous cover.

This is particularly relevant given the underrepresentation of herbaceous vegetation and herbaceous communities on and around the BTNF, due a wide range of reasons.

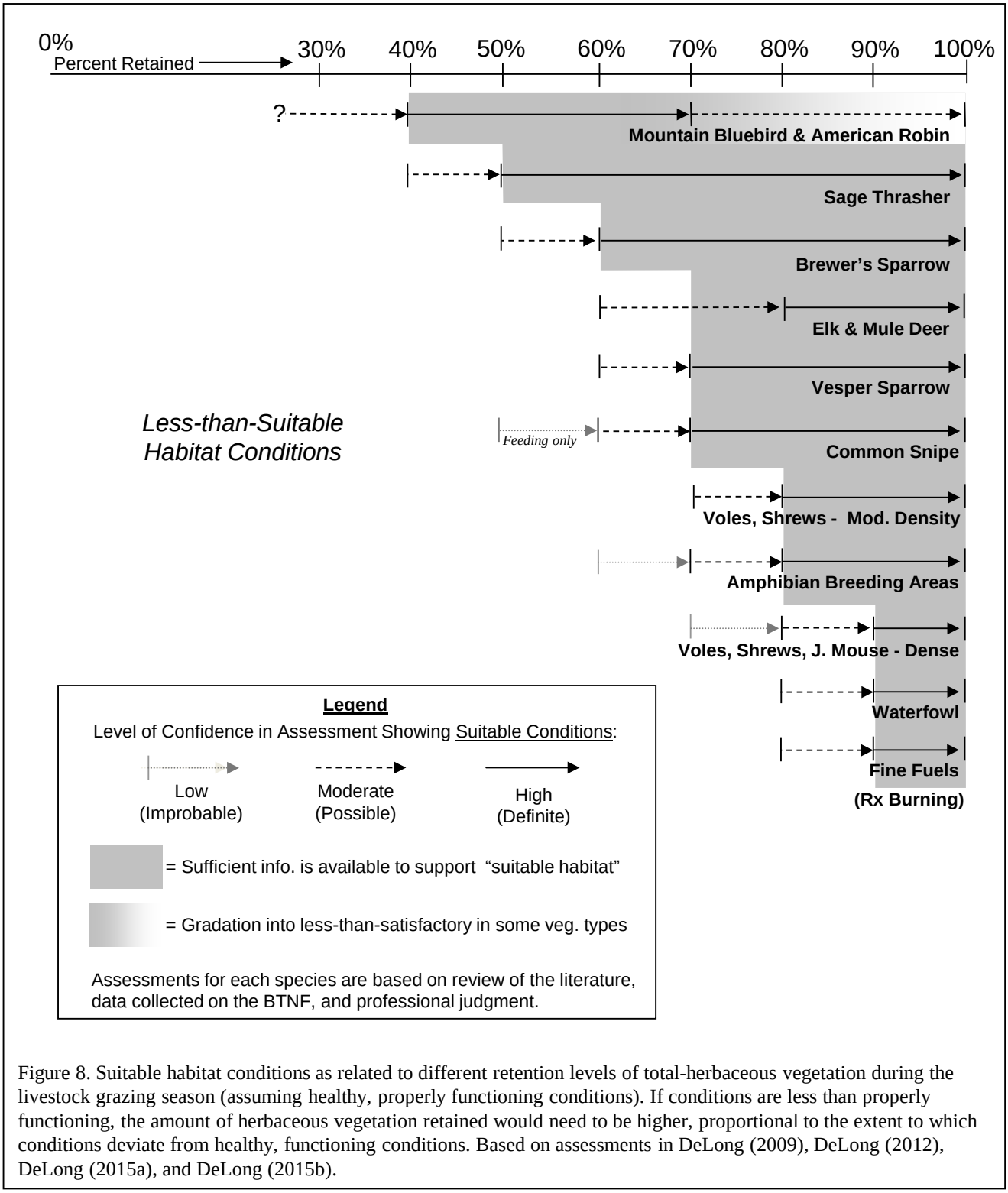


Figure 8. Suitable habitat conditions as related to different retention levels of total-herbaceous vegetation during the livestock grazing season (assuming healthy, properly functioning conditions). If conditions are less than properly functioning, the amount of herbaceous vegetation retained would need to be higher, proportional to the extent to which conditions deviate from healthy, functioning conditions. Based on assessments in DeLong (2009), DeLong (2012), DeLong (2015a), and DeLong (2015b).