

Chapter 2

Alternatives, Including The Proposed Action

A. INTRODUCTION

This chapter describes three alternatives for authorizing livestock grazing:

1. **Alternative A (Preferred Alternative) – Proposed Action: Healthy Rangelands Through Grazing at Proper Use:** Continue to authorize cattle grazing through the issuance and administration of term grazing permits on eight allotments within the Beaver Mountain Tushar Range analysis area: North-Indian Creek, Circleville, South Beaver, Marysvale, Pine Creek/Sulphurdale, Cottonwood, Ten Mile, and Junction. Grazing would be authorized in a manner that would continue to meet or satisfactorily move Forest resources toward desired condition and meet Forest Plan objectives. The proposal focuses on authorization of cattle grazing under prescribed utilization levels identified in the Forest Plan and implemented through an allotment management plan, which is incorporated under the terms and conditions of the grazing permit. The emphasis of this alternative is to continue to allow livestock grazing under prescriptions for proper use that would also provide for healthy rangeland ecosystems.
2. **Alternative B - No Grazing:** Livestock grazing would be phased out on this 178,000-acre area; within 5 years this area would not provide any grazing for domestic livestock.
3. **Alternative C – Sustainable Multiple Use-Grazing (SMU-G):** Livestock grazing would be excluded from certain rangelands determined to be critical to sustaining ecosystems. The emphasis of this alternative is to restore native biodiversity and ecosystem complexity at the fastest rate possible while continuing to allow concurrent, but restricted, livestock grazing.

This chapter concludes with a comparison of the effects of implementing the alternatives and their abilities to fulfill the purpose and need for this action. This information, along with the Chapter 4 disclosure of projected environmental consequences of each alternative, allows the deciding officer to make a reasoned choice between alternatives.

B. HOW THIS CHAPTER IS ORGANIZED

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C. CHAPTER DEFINITIONS

A number of terms commonly used in rangeland management and analysis documentation occur throughout this chapter. There are many terms that are specific to rangeland issues. A glossary of definitions is included at the end of the chapter and in the appendix to ensure proper understanding of terms used in rangelands and rangeland management.

D. CRITERIA FOR ALTERNATIVE DEVELOPMENT

When assessing the need for change that would result in alternatives to current grazing practices, the ID Team focused on specific allotment issues and differences between existing conditions and desired conditions and those actions that are necessary to maintain or achieve desired conditions. This process leads to the development of an alternative that prescribes action plans to be incorporated through current allotment management plans (AMPs).

Other criteria for alternative development include the following:

- Alternatives must be consistent with the Forest Plan or an amendment to the Forest Plan must be included as part of the decision selecting that alternative.
- Alternatives must be legal.
- Alternatives must be reasonable and implementable.
- Alternatives must not be duplicative of other alternatives.
- Alternatives must address the Purpose and Need.
- Alternatives must be designed to resolve a significant issue (e.g.: riparian resource damage).
- Substantial treatment must be afforded to each alternative considered in detail so that reviewers may evaluate their comparative merits.
- The range of alternatives must address the significant issues.
- Alternatives considered, but eliminated from detailed study, must be identified. They are part of the range of alternatives.

E. DESCRIPTION OF ALTERNATIVES CONSIDERED IN DETAIL

Three alternatives were considered in detail. The following discussion describes each alternative based on livestock grazing practices across the analysis area.

1. ALTERNATIVE A (Preferred Alternative/Proposed Action)--Grazing at Proper Use

The proposed action is to continue to authorize cattle grazing through the issuance and administration of term grazing permits. Grazing would be authorized in a manner that would continue to meet or satisfactorily move Forest resources toward desired condition and meet Forest Plan objectives. The proposal focuses on authorization of cattle grazing under prescribed utilization levels identified in the Forest Plan and implemented through an allotment management plan, which is incorporated under the terms and conditions of the grazing permit. Monitoring of forage utilization criteria would determine the need and frequency for administrative adjustments in permitted cattle numbers or season of use. Under the adaptive management provisions of this alternative, where livestock use is found to be leading to

unsatisfactory ecological conditions, grazing management will be changed, in order to meet or move toward desired conditions.

a. **Stocking Capacity:** This alternative proposes no change to the current stocking capacity, and will provide approximately 12,000 AUMs of grazing on National Forest System Lands (seasonal use by 2,531 cattle) within the eight-allotment project area. The Proposed Action relies on current stocking capacity determinations as calculated through previous range environmental analyses and adjusted over time as monitoring indicated the need. During these prior studies, conducted during the 1960’s and 1970’s, allotment and pasture-specific grazing capacity data was derived from “Tentative Grazing Capacity” worksheets, which relied on a percent allowable use of actual clipped forage weights by species. From these worksheets, stocking capacities were calculated for each vegetative type on suitable rangelands within each allotment. These capacities were then used to determine appropriate stocking and seasons of use. “Firming up” of these capacities, over the years, has been a matter of routine utilization monitoring and subsequent adjustments.

While current permitted numbers are parenthetically noted here, the use of a prescriptive allowable use does not depend on numbers. The stocking rate is, in effect, determined by the attainment of the defined use level. Through annual forage use monitoring, permit compliance monitoring, and/or long-term trend monitoring it may be determined that grazing capacities need to be adjusted. Decisions regarding any necessary changes in permitted AUMs will be administratively made.

Table 2-1 ALLOTMENT INVENTORIES

Allotment	Total Acres	Total Suitable Acres	Livestock Class	Permitted Number	Season	HMs	AUMs	Grazing System
North-Indian Creek	38,881	12173	Cow-calf	640	7/21-9/30	1472	1943	Deferred Rotation
Marysvale	7,103	3321	Cow-calf	147	6/1-9/30	588	776	Rest Rotation
Ten Mile	12,472	4104	Cow-calf	200	6/11-10/10	800	1056	Rest Rotation
Circleville	37,579	15204	Cow-calf	359	6/1-10/15	1615	2132	Rest Rotation
Pine Ck/Sulphurdale	30,212	21214	Cow-calf	600	6/16-9/30	2100	2772	Rest Rotation
Junction	5,817	598	Cow-calf	35	11/1-2/15	123	162	Winter
South Beaver	45,069	15282	Cow-calf	520	6/1-10/15	2340	3089	Rest Rotation
Cottonwood	423	350	Cow-calf	30	6/1-7/31	60	79	Seasonal Deferred
TOTAL	177,556	72,246		2,531		9,098	12,009	

b. **Grazing Systems:** This alternative proposes no changes to the current grazing systems. Allotments within the analysis area have historically been managed using prescribed grazing systems (generally rest rotation or deferred). Over this span of time, these grazing systems have been continually refined through changes in permitted AUMs, fence locations, and type of grazing system. On many allotments, monitoring indicates existing grazing systems are allowing vegetative conditions to reach, or move towards, desired conditions. Since these systems are in place and have achieved, or are achieving, the objectives expected of them, the ID team determined there is no need to consider changing these grazing systems. Any changes that are determined necessary will be made through normal permit administration and grazing management procedures.

c. **Suitable Rangeland:** The Forest Service, in analyzing rangelands, uses the term “suitability” to define land that is fit for livestock grazing. Suitable range is forage producing land which can be grazed on a sustained-yield basis under an attainable management system without damage to the basic soil resource of the rangeland area. Although only suitable rangelands are used in the determination of grazing capacity, suitability, in and of itself, does not necessarily mean that the area has any grazing capacity.

Determining suitability requires consideration of topography and slope, soil type, vegetation type, forage production, distance from water, and presence of poisonous plants. Over the years, these criteria have been consistently applied in determining rangelands appropriate for livestock grazing. One criterion that has changed is forage productivity; in the 1960's, when suitable rangelands were classified on the project area allotments, areas producing 50 pounds or more of forage per acre dry weight were considered to be suitable. Today, the forage productivity requirement is based on the potential to produce forage rather than actual production—today's standard is "producing more than, or having the potential to produce, an average of 200 pounds of forage/acre/year on an air dry basis".

The 1960's analyses provided the data for formulating grazing capacities, designing grazing systems, and developing allotment management plans. Acreage summaries derived from analysis data compilation tables were used in reporting total suitable rangeland for each allotment. When the Forest Plan was completed in 1986 it simply incorporated the suitable range data reported in the annual Range Management Information System. Since the time of inventories conducted prior to 1986, some of the allotment boundaries within the analysis area have changed. Prior to 1986, total allotment acreage for these 8 allotments was 208,422 compared to the current total of 177,556. 63,509 acres (30%) were considered suitable prior to 1986. Today, 72,246 acres (41%) are considered suitable.

In 1998, in connection with the Fishlake Forest Plan revision process, efforts were initiated to reclassify range suitability. For much of the planning period (1998-2005), implementing regulations of previous planning rules at 36 CFR §219.20 and Region 4 protocol required a determination, in forest planning, of rangeland potential capability and suitability "for producing forage for grazing animals...." Rangeland capability was largely defined by the physical and inherent "potential" to produce vegetative biomass. Site conditions, such as previously used in suitability determinations, were to be used in the determination of "capability". Suitability no longer had any reference to physical capability to be grazed on a sustained yield basis. Rather, suitability criteria included social, economic, and environmental factors, including unacceptable levels of environmental consequences, compatibility with existing uses or values, and land use allocation emphasis. All rangelands on the Forest were inventoried and mapped based on this direction, primarily for the purpose of making landscape-scale land use allocations (i.e.: is this rangeland generally appropriate for livestock use?).

After these exercises in separating criteria for determination of lands deemed appropriate for livestock grazing, the new planning regulations (36 CFR Part 219) (Final Rule effective January 5, 2005) have reverted to the sole use of "suitability" to determine general allocation of rangelands to livestock use. The Final Rule explains that "Suitability of areas is the identification of the general suitability of an area in an NFS unit for a variety of uses...(including livestock grazing)...and is neither a commitment nor a decision approving activities and uses. The suitability of an area for a specific use or activity is authorized through project and activity decision-making".

Under the Final Rule, both the previous definitions for "capability" (1998) and "suitability" (1960's) are combined to determine appropriate authorization of livestock grazing. For example; site-specific rangeland suitability is determined by considering the inherent ability of a rangeland to produce forage while considering site conditions such as climate, slope, landform, soils and geology, as well as an analysis of the economic and environmental consequences and alternative uses foregone. Note that this is not any different than what has always been done. Rangelands may be determined "unsuitable" at the site-specific level if they cannot be grazed by a kind of livestock because of unstable soils, inaccessibility,

lack of range improvements, steep topography, barrenness, inherent low potential for forage production, or administrative closures.

Soil-unit classifications, which are mapped according to vegetation productivity potential, form the foundation for determining range suitability. The four forage productivity classes are: over 2000 #, 1000-2000#, 500-1000# and over 250#. Note that the 250# limit exceeds the established 200# suitability criteria; this means that acres meeting the 200# standard are potentially more than those calculated in this table. Note also that allotment acreages are slightly different. This is due to allotment boundary realignments and the more accurate digitizing of GIS technology. Even though historic suitability criteria allowed allocation of lands producing as little as 50 #/acre, and Plan Revision criteria limits consideration to lands producing over 200#/acre, there is still a considerable difference in total suitable acres between the two standards: 63,509 acres historically versus 72,246 acres when considering the “potential to produce forage” rather than actual production (an increase of 8,737 acres—14%). This EIS uses all available information to disclose effects and compare alternatives, but it does not attempt to make changes in the suitability classification as determined through the Forest Planning process¹.

1986 Forest Plan Range Suitability			1998-2006 Forest Plan Revision Range Capability/Suitability	
Allotment	Total Acres	Suitable Acres	Total Acres	Capable/Suitable Acres
Circleville	37,581	17,846	38,881	12173
Marysville	7,103	3,406	7,103	3321
North Indian Creek	38,776	4,525	12,472	4104
Pine Creek - Sulphurdale	30,213	9,008	37,579	15204
South Beaver	45,070	17,657	30,212	21214
Ten Mile	12,472	1,734	5,817	598
Junction	5,817	2,777	45,069	15282
Cottonwood	31,390	6,556	423	350
Total	208,422	63,509	177,556	72,246

In the process of determining suitability, lines are drawn on maps and acreages are tabulated. The suitable areas are delineated, and consequently the map also displays areas that are “unsuitable”. Vegetation in these “unsuitable” areas is not included in calculations of grazing capacity. However, livestock are not prohibited from these “unsuitable” areas. For example, a forested area with insufficient forage to support livestock grazing may not be identified as suitable but the presence of livestock drifting from an adjacent suitable area would not be prevented or require removal if there are no conflicts that would necessitate exclusion of livestock. In this situation, it would not be necessary to physically prevent livestock access to the forested area, but there would be no forage allocation made (grazing capacity assigned). Typically, “unsuitable” rangelands have limited attractions that would concentrate livestock use. Some occasional, incidental use may occur as livestock drift across these lands in moving to more suitable range. As long as there is no conflict that would necessitate exclusion, livestock may incidentally graze areas classified as unsuitable. It should not be construed that livestock are to be removed or prevented from grazing on all unsuitable areas.

¹ The 1997 36 CFR (219.20-Grazing Resource) states: "In forest planning, the suitability and potential capability of National Forest System lands for producing forage for grazing animals...shall be determined....." Although the 1986 Forest Plan included statistics for total “suitable” rangeland within the Fishlake National Forest, it did not include the criteria for the determination of suitability. The Fishlake's 1986 Plan lists the acreage of suitable rangelands. In order to change that acreage requires an amendment to the Forest Plan.

d. **Allowable Forage Utilization:** The Proposed Action continues implementation of the allowable forage utilization criteria that were revised through a Forest Plan amendment in 2002. These revised forage utilization criteria prescribe allowable use levels for both upland and riparian sites. The description for riparian areas is a uniform 4” stubble height. Reaching the 4” stubble height triggers the time to move livestock, either between units or off the allotment. These criteria allow no manipulation to plan use of expected regrowth—once the 4” stubble height is reached, livestock are moved, without the opportunity for twice-over use. Livestock are moved to the next pasture or removed from the allotment when any utilization threshold (upland forage utilization, stream bank alteration, riparian forage utilization, riparian vegetation stubble height, or riparian woody browse utilization) is reached. Meeting or exceeding one of these threshold levels initiates a move of livestock.²

Vegetation Type	Stubble Height/Use	Comments
Riparian Hydric Species	4”	Triggers the time to move livestock between units or off the allotment
Riparian Emphasis Management Areas	6”	Triggers the time to move livestock between units or off the allotment
Non-hydric Sod-Forming Grass Species in Riparian Areas	1 ½ “	Primarily Kentucky bluegrass--Triggers the time to move livestock between units or off the allotment
Wheatgrass Seedings	60%	Management option to exceed 60% use to maintain healthy seedings
Riparian/Upland Browse Sprouts and Young-Aged Plants	Forest Plan Amendment ³	
Riparian/Upland Mature Browse	Forest Plan Amendment	
Upland Grass/Forb	40-60% of key species; varies by grazing sys & desired condition	% of current year’s growth
Riparian Ground Cover	Maintain ground cover of at least 70% within riparian areas	
Stream bank Cover	Maintain 40% or more of overhanging grasses, forbs, sedges and shrubs along banks of streams.	
Stream bank Stability	Forest Plan Amendment	
Macroinvertebrates	No more than 25% of stream substrate should be covered by inorganic sediment less than 3.2 mm in size where natural conditions allow. Maintain a Biological Condition Index (BCI) of 75 or greater.	
Goshawk Post Fledgling Family Areas (PFAs) in Ponderosa pine/ mixed conifer ⁴	Grass, forb: Average 30%, not to exceed 40%, by weight. Shrub: Average 40%, not to exceed 40%, by weight.	Applies in openings 2-acres or less in 600-acre PFAs.
Goshawk PFAs in spruce-fir	Grass, forb: Average 20%, not to exceed 40%, by weight. Shrub: Average 40%, not to exceed 50%, by weight.	Applies in openings one acre or less in 600-acre PFAs
Goshawk foraging areas in ponderosa pine and mixed conifer	Grass, forb: Average 20%, not to exceed 40%, by weight. Shrub: Average 40%, not to exceed 50% by weight.	Applies in openings four acres or less in 6,000-acre foraging area.
Goshawk foraging areas in spruce-fir	Grass, forb: Average 40%, not to exceed 40%, by weight. Shrub: Average 50%, not to exceed 50%, by weight.	Applies in openings one acre or less in 6,000-acre foraging area.

² Utilization standards have been developed based on scientific research on common rangeland species. They are based on ecological principals, management concerns, and averages for representative floristic life forms (grasses, grass-likes, and shrubs). Review of over 150 sources of current literature pertaining to vegetation and watershed management has been used in the determination of these utilization criteria. This is considered to be the best scientific information currently available. Refer to Appendix M for a complete review of “*Range Science – What Are Your Roots? A Treatise Focusing on the Theories of Forage Utilization*”.

³ Browse utilization and streambank stability standards are currently in the 1986 Forest Plan. However, there are no credible, repeatable methods currently recognized for monitoring either browse utilization or streambank disturbance. Cowley and Burton (2005) explained that “recent studies found that the methods (for measuring streambank disturbance) do not have adequate precision to set thresholds. In addition, there is little or no scientific data that provide a basis for establishing thresholds.” See Appendix L: “*Monitoring Streambanks and Riparian Vegetation—Multiple Indicators*”. To remove these criteria from the Forest Plan, pending the development of credible methodologies, requires a Forest Plan Amendment.

⁴ In March 2000, an environmental assessment was prepared that summarizes the analysis completed for a proposed change in programmatic management direction for the six National Forests in Utah, relative to management direction in northern goshawk habitat. The subsequent decision amended the Land and Resource Management Plans (forest plans) for each National Forest in Utah by adding management direction in the form of goals and objectives, standards and guidelines to be applied to management activities that could affect goshawk habitat. These amendments will remain in effect until each forest plan is revised.

Adaptive Management. This proposed action is designed to use adaptive management to ensure that grazing management is progressively adjusted until resources are in healthy condition and grazing management is sustainable. Adaptive management involves implementation of plan or project direction with monitoring to determine if the results are as expected. Environmental thresholds or triggers are essential in adaptive management. These are points established in adaptive management where management activities are altered in response to monitoring to ensure that management action is implemented properly and that it is achieving its intended result. Thresholds are established to trigger an adaptive management response. Triggers generally define when livestock should be moved. They are most often indicators of allowable use, and are designed to maintain livestock effects to rangeland resources and vegetation at acceptable levels. Identified triggers include:

- Timing of livestock use (season of use, range readiness). Elevation, temperate zone, predominance by cool or warm season forage plants, and seasonal danger periods with poisonous plants are factors considered in establishing season of use. If resource conditions (forage growth, saturated soils, etc.) are consistently not ready for livestock use, entry dates may need to be adjusted. Lack of movement toward achieving desired conditions may determine the need to place emphasis on winter, spring or fall use, rather than summer use. Large acreages of crested wheatgrass in a pasture could trigger the adjustment to spring use.
- Intensity of use (forage utilization, stubble height, browse use, streambank alteration). The main trigger for intensity of use is the point at which allowable use is reached. Reaching allowable use prompts the need to examine distribution tools (herding, salting, fencing, water availability), timing of cattle movement either between units or off the allotment, class of livestock, and stocking rate.
- Duration of use (entry dates, move dates, and exit dates). If allowable use levels are consistently exceeded, there is a need to examine each of these components to determine the need for change.
- Frequency of use (grazing system). Grazing systems should minimize adverse plant response to grazing intensity, frequency, and seasonality. If, over time, a grazing system (the length and timing of rest or deferment) is not restoring forage plant vigor and maintaining high vegetation condition, the grazing system may need to be modified.

e. **Range Improvements:** None of the project allotments currently require new structural range improvements (fences or water developments) to properly manage, distribute, and/or control livestock. However, the Proposed Action does include provision for maintenance of both existing structural and non-structural range improvements. Maintenance of existing structural improvements includes 113 miles of fences, 27 cattle guards, 48 developed springs, 48 stock ponds, 29 miles of pipeline, and 60 water troughs (See Range Structural Improvements Map in Appendix H). Vegetation type-conversions (sagebrush and pinyon-juniper to grass/forb types) are subject to periodic maintenance on the North-Indian Creek, Marysvale, Circleville, Ten Mile, Cottonwood, uncton, and Pine Creek/Sulphurdale Allotments (See Chainings Map in Appendix H and Table 3-15). New vegetation treatment projects (non-structural improvements), on previously un-treated sites, may be required to maintain proper functioning condition and management of vegetation ecosystems. These projects will be conducted through appropriate NEPA planning and analyses on a site-specific basis. Such actions are not a part of the current proposal. Thus, they are outside the scope of this document.

Allotment	# Springs	# Ponds	Mi. Pipeline	# Troughs	Mi. Fence	Cattle Guards	Veg Treatments
North Indian	10	9	4	10	16.5	4	727
Marysvale	4	0	5	8	9	3	1,115
Ten Mile	7	2	6	9	10	3	662
Circleville	6	12	2	9	20.8	5	2,048
PC/Sulphurbeds	18	7	3	16	24	7	2,296
Junction	0	0	0	0	1	0	436
South Beaver	2	16	8	6	28	4	0
Cottonwood	1	2	1	2	4	1	276
TOTAL	48	48	29	60	113.3	27	7,560

f. **Allotment Management Plans:** The Proposed Action focuses on the use of existing or revised AMP’s to prescribe the manner by which livestock operations would be conducted. The current AMP’s are old and, (even though changes to grazing strategies, boundaries, and permitted numbers have been refined over time through administrative procedures), revisions may be necessary to ensure proper use of the resource and to evaluate progress toward meeting desired conditions through attainment of resource management objectives identified in AMPs.

Allotment	North Indian	Marysvale	Ten Mile	Circleville	Pine Creek Sulphurdale	Junction	South Beaver	Cottonwood
AMP Year	1981	1994	1975	1985	1986	1978	1987	1987

If a current AMP is functioning and existing conditions are at or moving toward desired conditions there may be no need to revise the AMP. Where actions are needed to arrest deteriorating conditions or to move the existing condition toward the desired condition, the AMP would contain detailed, specific elements addressing objectives, action plans, improvements, cattle management (including number and class of cattle, grazing season, grazing system, and permittee management responsibilities), and monitoring. Existing conditions or AMP objectives, action plans, and monitoring needs form the framework for the Allotment Management Plan. The basic elements of an AMP are identified in FSH 2209.13-90 as: 1) management objectives in terms of the condition and trend of the rangeland resources, 2) required livestock management practices including maximum amount of use in terms of allowable use levels to achieve management objectives, 3) structural or non-structural improvements that are necessary and ripe for implementation, and 4) appropriate monitoring to determine if management objectives are being met or if adaptive management alterations are needed.

The AMP is prepared in consultation with affected grazing permittees. Public input is not involved⁵ and since AMP’s are simply operational “how to” documents, they are not subject to appeal.

⁵ AMPs are implementation documents of decisions for which public review has already been conducted. They are not decision documents (they are not the discretionary decisions to occupy and use National Forest System lands for which public review is required). Decisions relative to whether to reauthorize grazing, or allow any grazing at all, are based on an evaluation of the direct and indirect impacts of grazing on native resources made in the EIS process, which is subject to public review. Once the discretionary decision to authorize livestock grazing is made, a permit is issued which, by its definition, is subject to regulatory control and is very much subject to additional administrative decisions (project and activity level decision-making) made by Forest Officers. Although these administrative decisions are not subject to NEPA, they are appealable under 36 CFR 251, which allows the “interested parties” to be involved in this on-going management. In accordance with the FLPMA definition and 36 CFR 22.1(b)(2), AMP’s are: "documents prepared in consultation with the lessees or permittees involved, which applies to livestock operations on the public land or on lands within National Forests in the eleven contiguous Western States...."

g. **Design Features:** The following actions are intended to reduce or prevent undesirable effects to rangeland resources by livestock grazing and/or provide for the progression of existing conditions toward desired conditions.

1. Allowable use guidelines should be included in grazing permits and should be followed by all grazing uses on rangeland ecosystems. Utilization monitoring should be used to (a) establish and/or adjust grazing capacity, and (b) seasonally adjust numbers of livestock and duration grazed. Other factors that should be considered in determining grazing capacity include management objectives and long-term trend study data.
 - Annual use monitoring should be conducted, in accordance with FSH direction, to determine when livestock should be moved within units or off the allotment.
 - Long-term trend monitoring should be conducted to provide supplemental information to determine if the utilization criteria are correct in meeting desired conditions and if long-term resource capabilities are sustained over time.
 - On allotments where big game forage use is concentrated in sheep foraging areas and total allowable use levels are exceeded, utilization monitoring should be conducted to isolate relative forage use by big game. Additional evaluations should be made to determine habitat needs, population objectives, distribution needs, and impacts on range improvements.
 - Allotment grazing capacity should be confirmed or revised in accordance with utilization monitoring and/or other range monitoring data.
2. Allotment Management Plans should be prepared or updated, and/or grazing permits should be modified, when it is determined that existing management is not meeting or moving resources toward desired conditions.
 - Implement allotment specific objectives that will direct livestock management to either maintain desired conditions or improve rangelands to desired conditions within prescribed timeframes.
 - Develop a monitoring plan that describes a measurable means of determining whether goals and objectives are being met.
3. Authorize reconstruction or maintenance of structural and nonstructural improvements that will eliminate or minimize conflicts between livestock and other uses and result in meeting objectives.
 - On allotments with completed NEPA documentation and/or approved AMPs, (1) first priority for funding should be for connected actions necessary to permit livestock grazing and/or for improvements to improve suitable rangelands that are not meeting desired condition; (2) second priority for funding should be for re-treatment or reconstruction of existing range improvements needed to sustain stocking levels.
 - Water developments should meet the needs of wildlife by: (1) maintaining water availability at or near the water source, (2) providing access for wildlife, and (3) including escape ramps for small animals.

Although consultation with interested parties is involved, the AMP's, themselves, are not subject to a general public review process. While FLPMA is clear in its requirement that consultation is necessary during development of the AMP, it remains the sole responsibility of the Forest Service to determine how much grazing will be allowed on the national forests. As the court stated in *Natural Resources Defense Council v. Hodel* (618 F. Supp. 848.869 (D.C.Cal. 1985)), "the dominant message and command of [the Secretary's] Congressional mandate is that [the Secretary] shall prescribe the extent to which livestock grazing shall be conducted on the public lands." Thus, while some degree of consultation with permittees is required by FLPMA, the final decision with respect to grazing allotments is the Forest Service's alone to make.

- Fence maintenance and/or reconstruction should incorporate standards that allow movement of big game. Fences not needed for the management of livestock should be removed.
- The use and perpetuation of native species should be emphasized. Revegetation of disturbed sites with desirable non-native species may be appropriate on areas without an understory of desirable species or which are vulnerable to establishment or encroachment by invasive species. Following vegetation disturbance, livestock grazing use or timing of use should be modified to maintain or achieve desired condition.

h. **Monitoring:** A monitoring plan, specific to each particular allotment, should be incorporated into each AMP. Existing range conditions, management situations, and actions to move resources toward desired conditions should be evaluated on each range allotment and monitoring should be conducted as appropriate for each situation. Once it is determined which objectives and actions need to be monitored, then the specific monitoring activities are identified in the AMP monitoring plan. Monitoring activities may include: various utilization measurement methods, photo plots, use pattern mapping, compliance inspections, long-term trend studies, etc. See monitoring guidelines discussion in Appendix G.

2. ALTERNATIVE B - No Grazing

The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) requires that a “no action” alternative be analyzed in every EIS. Here, that means no grazing.

- a. Under this alternative, livestock grazing would be eliminated (with the exception of recreation stock use) on all allotments within the project area. While a minimum of two years notice would be required prior to cancellation of grazing permits (36 CFR 222.4(a)(1)), grazing use would be reduced over a three-year period (20-40-60%) resulting in a total cessation of grazing in the 4th year.
- b. After the three- year phase out period, there would be a need to remove existing improvements developed for livestock distribution and management, consisting of approximately 113 miles of fence, 60 troughs, 29 miles of pipeline, 48 ponds, and 48 spring developments. Some ponds or collection pits may be left in place.
- c. Monitoring would include periodic checks through the field season to determine if livestock are grazing the National Forest within the project area. If this occurred, action under 36 CFR 261.7 would be taken.

3. ALTERNATIVE C – Sustainable Multiple Use Grazing (SMU-G)

While taking “sustainable multiple use” as its basic premise, this alternative focuses on five management features: 1) modification of allowable forage utilization criteria, 2) re-determination of rangeland suitability, including forage production requisites, 3) consideration of threatened, endangered, proposed, candidate, and sensitive (TEPCS) plant and animal species, many for which there are potential habitat but no known occurrences, 4) loss of key ecosystem components, including mule deer fawning habitat, beaver populations, aspen regeneration, goshawk habitat, non-native forage species, and 5) monitoring⁶.

⁶ When the IDT analyzed this alternative, it concluded that four of its proposed five management elements are either outside the scope of this analysis or are adequately covered in the Proposed Action:

1. **Allowable forage utilization.** To consider additional revision of use criteria would require another amendment to the Forest Plan. While this is not impossible, it is impractical. The 2002 revised use criteria have been in place for only three grazing seasons, and the IDT considers this to be an inadequate test period for effectiveness of the criteria. Secondly, the Forest Plan is well into the Plan Revision process, which will include reconsideration of utilization criteria, and to recommend

The SMU-G Alternative emphasizes 1) the long-term health and recovery of understory native grasses, forbs, and shrubs, 2) the health and recovery of populations of all native, sensitive animals and plants, 3) protection and recovery of aquatic and riparian vegetation and systems, 4) prevention of invasive species, 5) proportionally reduced forage utilization during drought, 6) protection of plant growth and reproduction in light of cumulative “take” of plant vegetation and reproductive parts by both wildlife and cattle. Under this alternative, permitted livestock should be reduced as emphasis is placed on classing some lands as unsuitable for livestock grazing, determining stocking rates based on actual rather than potential forage production, and including more limiting forage utilization criteria.

a. Grazing Capacity: Livestock grazing will be permitted on those areas where grazing practices are demonstrated to not impair native productivity of the land or aquatic ecosystems. No more than 25% of desirable forage on suitable rangeland would be allocated to livestock for purposes of stocking capacity.

Allotment- and pasture-specific grazing capacity data for each of the allotments in the project area were originally derived from “Tentative Grazing Capacity” worksheets completed during range allotment analyses conducted during the 1960’s and 1970’s. From these worksheets, stocking capacities were calculated for each vegetative type on suitable rangelands within each allotment. Actual dry weight forage production per acre of Desirable and Intermediate (D&I) species were measured in each mapped vegetation type. A proper use of key species percentage was then assigned to each forage unit. These proper use percentages varied from 40-60%⁷. The SMU-G Alternative proposes to re-calculate these tentative grazing capacities based on 25% of total D&I production. Twenty-five percent total D&I production equates, on the regression curve to a value of 12 % utilization of total forage. **This would**

an amendment at this juncture would be untimely and inappropriate. The SMU-G Alternative proposes a maximum 50 percent forage use level (25% wildlife and 25% livestock). The Proposed Action incorporates revised forage utilization criteria that allow 40-60 percent use of upland forage species, regardless of type of grazer.

2. **Rangeland suitability.** Rangeland "suitability", as defined by law and regulation, is determined as part of the forest planning process. Re-determination of "suitability" requires an amendment to the Forest Plan.

3. **TEPCS Species.** This analysis provides a Biological Assessment (BA) for Threatened, Endangered, Proposed, and Candidate Species. In addition, a Biological Evaluation (BE) for Sensitive Plant Species and a BE for Sensitive Vertebrate Species is provided. This document provides an extensive and complex review (including scientific literature) of threatened and sensitive species occurring on the Forest. The IDT considered this analysis and concurrence from the F&WS to be adequate in addressing TEPCS species.

4. **Monitoring.** Monitoring procedures and techniques are provided in existing Forest Service Handbooks (FSH). SMU-G proponents argue that the Proposed Action’s monitoring protocol lacks a description of adequate binding points at which the AMPs will force grazing levels to be adjusted in response to monitoring data that shows over-utilization. The IDT recognizes that enforcement of AMP provisions is an administrative procedure for which direction is provided in existing FSHs. Although this EIS does not discuss administrative adjustments in permitted AUMs, it does recognize that there is a need to monitor stocking rates and seasons of use and to identify how grazing will continue and where changes in existing AMPs are needed. The Proposed Action provides for continued on-going monitoring that may result in changes in numbers and/or grazing seasons. “Firming up” grazing capacity, over the years, has been a matter of routine monitoring and adjustments.

⁷ When the % proper use was determined, a regression curve (1969 R-4 Range Analysis HB, exhibit 71.2B) was then used to calculate a relative percentage of total forage production. Total usable forage per acre was derived by applying the percent total forage available to the total dry weight production of D&I species. The number of cow days per acre tentative stocking rate was then determined by dividing the usable forage per acre by the dry weight allowance per cow day (32 lbs/day). The total tentative stocking capacity for each mapped vegetation type was calculated by multiplying the number of acres in the unit by the number of cow days forage available per acre. For example: Assume an area of 100 acres, a total D&I production of 1000 pounds and a 40% proper use level. From the regression curve, a value of 22% of total forage is determined. Therefore: $1000\# \times 22\% = 220 \#$ usable forage; $220\# \div 32\#/cow\ day = 6.9$ cow days/ac; 6.9×100 acres = 690 cow days; $690 \div 30$ days/month = 23 head months tentative stocking capacity for this 100-acre unit.

reduce the base tentative stocking capacity by roughly 57%. The current approximate 2275 cattle permitted for a 4-month season (9098 HMs) would be reduced to 986 cattle for the same season (3944 HMs). **This would be the indicated capacity without any additional areas excluded from stocking capacity determinations** (See Alternative C Stocking Capacity Calculation Table for 25% Allowable Use in Appendix O). However, additional areas are proposed for exclusion (see following section).

Current Permitted Headmonths/Animal Unit Months		Alternative C HMs/AUMs Stocking Capacity		
Allotment	Permitted HMs	Permitted AUMs	HMs Stocking Cap	AUMs Stocking Capacity
North Indian Creek	1472	1943	608	803
Junction	123	162	33	44
Marysvale	588	776	139	184
Pine Creek/Sulphur	2100	2772	854	1126
Circleville	1615	2132	1249	1648
Ten Mile	800	1056	221	291
South Beaver	2340	3089	821	1084
Cottonwood	60	79	19	25
Total	9098	12009	3944	5205

b. **Suitable/Unsuitable Rangeland⁸:** Suitability criteria identify which rangelands will and will not be used to determine grazing capacity. Unsuitable rangelands are those areas identified as critical to ecosystem retention or restoration. These areas do not necessarily have fencing or other measures to prevent entry of cattle; however vegetation in these areas is not included in calculations of grazing capacity so as to reduce cattle dependence on them. The purpose of identifying unsuitable rangeland is to reduce impacts from cattle grazing, thereby protecting sensitive areas or improving the rate of ecosystem recovery. The following areas would be considered unsuitable, or use-restrictive, for cattle grazing and would not be used for calculating stocking capacity. The direct effect would be a reduction in the number of cattle permitted to graze:

UNSUITABLE/USE RESTRICTIVE RANGELAND	AREA AFFECTED
Administrative sites, developed recreation sites, range enclosures, research natural areas, some special interest areas and ecological reference areas.	These sites are presently withdrawn from livestock grazing. No Research Natural Areas are located within the project area.
Core mule deer fawning and rearing habitat.	Includes 40% of the suitable range within the project area as determined from Utah Division of Wildlife Resources high value deer summer habitat designation for Beaver Unit deer herd #22. Total fawning/rearing habitat within suitable rangeland = 28,780 acres. See Deer Summer Range Habitat map in Appendix N.
Watersheds for domestic water supply.	Already excluded ⁹
Riparian lands (150 foot buffer on each side of a water body, seep, spring, or water course).	There are approximately 30 miles of perennial streams within the project area and outside of the high value deer summer habitat. This totals 544 acres excluded from stocking capacity. See Deer

⁸ The Fishlake's 1986 Plan lists the acreage of suitable rangelands. In order to change that acreage requires an amendment to the Forest Plan.

⁹ Four municipal watersheds include: City Creek, Cottonwood Creek, Oak Basin, and Pine Creek. The City Creek MWS is on the Ten Mile Allotment and provides culinary water for Junction City and the City Creek CG. Sources are fenced to exclude livestock. The Cottonwood and Oak Basin MWS occur on the Circleville Allotment. The Cottonwood MWS is fenced to exclude cattle and provides culinary water for Circleville City. The Oak Basin MWS is inaccessible to cattle and is used for pressurized irrigation only. The Pine Creek MWS occurs on the Marysvale Allotment and provides culinary water to Marysvale City. The source is fenced and cattle are not allowed into Bullion Canyon.

	Summer Range Habitat map in Appendix N.
Meadows of greater than 15% increase in bulk density over that soil type's potential for infiltration. (Washington Office Forest Service Handbook 2509.18).	There are 1872 acres of meadow on the 34,537 acres inventoried on REA compilation sheets; subjectively, for the 50,785 acres of suitable range there would be about 2750 acres of meadow. These areas are mutually exclusive with high value deer summer range.
Aspen stands if young stems are within elk/deer/sheep browse height (below 7 feet) and native grass and forb biomass is less than 50% of reference area aspen stands and ground cover is less than 85% of reference area aspen stands.	There are 2,270 acres of suitable aspen = 3% of suitable base. These areas are mutually exclusive with high value deer summer range.
Archaeological sites that would be impacted by grazing.	None known—see SHPO MOU
Potential nesting and brood-rearing habitat for sage grouse if residual grass height is not 18 cm (6 inches during nesting and brood-rearing season).	There are 8,100 acres of sagebrush—15% of the suitable base.
Habitat for management indicator species and species of special concern that is not meeting the reproductive, structural, or functional needs of that species.	No MIS or special interest habitat is known to be not meeting the reproductive, structural, or functional needs of the affected species; see life histories.
One-half of suitable beaver habitat.	Considered as a riparian dependent obligate in riparian exclusions; no additional exclusion is required
Where livestock grazing significantly impairs other multiple uses.	None identified

c. **Stocking Capacity:** The following stocking capacity figures indicate reductions in capacity from currently permitted HMs. These adjustments are not in addition to the 57% reduction indicated by the adjustment to 25% use (which equates to a 12% value) of total D&I production. The application of the 12% value is used in calculations for these stocking capacity scenarios and therefore the results are total capacity estimates. If there were no areas excluded as “unsuitable”, the 12% value would still indicate a 57% reduction in permitted HMs. With areas excluded, the reduction in each scenario increases.

- **Scenario 1—Based on Potential Forage Production.** High value deer summer range covers 40% of suitable rangeland within the project area and mutually excludes most of the other areas determined under this alternative to be unsuitable; i.e. aspen, riparian, sage grouse, beaver, etc. There are, however, 544 acres of riparian area that extend into capable rangelands¹⁰ outside the high value deer habitat. When these two areas are excluded, only 42,941 of the total 72,248 acres of capable rangelands remain available for stocking capacity determinations. Based on the acreages in each soil productivity class, these remaining suitable rangelands have the potential to produce approximately 28,713,648 pounds of forage on an annual basis. Only 1% (598 acres) of the total suitable area is producing more than 1000 pounds of forage per acre¹¹.

Allotment	Forage Productivity Class								
	>2000		1000-2000		500-1000		250-500		
Average Production	>2000		1500		750		375		
	Acres	Prod	Acres	Prod	Acres	Prod	Acres	Prod	Tot Prod
Circleville	23	46,720	91	136,710	5,508	4,131,000	2,607	977,685	5,292,115
Junction	27	53,420			131	98,438	392	146,876	245,314

¹⁰ For the purposes of determining a relative stocking rate, capable (now suitable under the Final Rule) rangeland classification is used so that the most current information and classifications that will be used for future management are reflected in the comparison. Since the Capability maps have been mapped into a GIS layer to which the high value deer habitat map and the perennial stream map can also be layered, the remaining capability base can be displayed and acreages calculated.

¹¹ Refer to the Alternative C Suitable Range Map and Acreage Compilation table in Appendix O.

Marysvale	32	63,160			950	712,193	1,860	697,313	1,409,506
North-Indian	80	160,120	97	145,125	5,792	4,343,985	1,800	675,023	5,324,253
Pine Ck-Sulphurdale	45	89,980			12,449	9,336,705	1,294	485,273	9,821,978
South Beaver	58	115,600	22	32,895	6,097	4,572,908	1,605	601,980	5,323,383
Ten Mile	64	127,860	60	89,970	1,220	915,323	288	107,828	1,240,981
Cottonwood							350	131,393	131,393
Total Production	328	656,860	270	122,865	32,147	24,110,552	10,196	3,823,371	28,788,923

The SMU-G Alternative proposes to calculate tentative grazing capacity on these remaining 43,000 acres of suitable grazing area, based on 25% of total D&I production, which equates, on the regression curve⁹, to 12 % utilization of total forage. 12% of 28,788,923 pounds production = 3,454,671 #'s of available forage. 3,454,671# ÷ 32#/cow day = 107,958 cow days; 107,958 ÷ 30 days/month = 3,599 HMs stocking capacity, compared to the 9,098 currently permitted. **This would be a 60% reduction in permitted capacity.**

Table 2-9 Alternative C (SMU-G Alternative) Total Forage Production By Allotment							
Circleville	Junction	Marysvale	North-Indian	PC-Sulphurdale	South Beaver	Ten Mile	Cottonwood
5,292,115	245,314	1,409,506	5,324,253	9,821,978	5,323,383	1,240,981	131,393
x 12% = # Available Forage And Alternative C Stocking Capacity							
635,054	29,438	169,141	638,910	1,178,637	638,806	148,918	15,767
662 HMs	31 HMs	176 HMs	666 HMs	1,228 HMs	665 HMs	155 HMs	16 HMs
Current Permitted HMs And % Reduction							
1615/59%	123/75%	588/70%	1472/65%	2100/42%	2340/72%	800/81%	60/73%

Note: The spatial layers used for this EIS are based on soil unit classifications which include potential forage production figures. All maps have been created using this base layer. When high value deer habitat is mapped for exclusion, the remaining acreages are delineated within soil capability units. Using potential forage production figures may inflate the total possible production and yield a potentially higher stocking capacity under Alternative C. In other words, the percent reduction from current permitted head months might be considerably more (i.e.: 29 million pounds production yields a capacity of 3600 HMs; if actual production is significantly lower, then the capacity is less and the % reduction is higher).

- **Scenario 2—Based on Tentative Grazing Capacity Average Actual Forage Production.** A more accurate comparison might be presented by calculating the number of acres remaining in each allotment after exclusion of “unsuitable” areas and basing capacity on the average pounds of actual production per acre derived from the original tentative grazing capacity data:

Table 2-10	Acres Not Excluded	Project Area Avg Prod/Ac	#’s Prod	% Proper Use	% Use Total Forage	#’s Avail Forage	HMs Stocking Capacity	AUMs Stocking Capacity
Circleville	8229	657	5406453	25%	12%	648744	676	892
Junction	550	434	238700	25%	12%	28644	30	39
Marysvale	2842	336	954912	25%	12%	114589	119	158
North-Indian	7769	377	2928913	25%	12%	351470	366	483
Pine Ck-Sulphurdale	13788	347	4784436	25%	12%	574132	598	789
South Beaver	7782	430	3346260	25%	12%	401551	418	552
Ten Mile	1631	430	701330	25%	12%	84160	88	116
Cottonwood	350	430	150500	25%	12%	18060	19	25
Total	42941		18511504			2221350	2314	3054

Under this scenario, Alternative C would provide a capacity of 2314 HMs compared to the currently permitted 9098 HMs. **This would be a 75% reduction of 6784 HMs.**

• **Scenario 3—Based on Adjustments To Decrease The Amount Of “Critical” Deer Habitat And Allowing Exclusion of Remaining “Unsuitable” Areas.** The Utah Division of Wildlife Resources has not mapped any “critical mule deer fawning habitat”. UDWR makes no distinction between high value deer summer habitat and critical fawning habitat. They consider the entire summer range to be important, if not “critical” fawning/rearing habitat. However, UDWR has not indicated or documented any conflicts between livestock and mule deer or their summer habitat. Considering this, it seems impractical to exclude such a large area from grazing capacity estimates. In order to provide a more meaningful alternative comparison, while providing for the exclusionary requirements of this proposal, this scenario “buffers” the Alternative C “unsuitability” criteria and results in only 6471 acres excluded from grazing capacity estimates. This scenario provides for a reduction in capacity of 348 HMs, which would be a further reduction to the grazing capacity of 3944 HMs calculated under the provisions for 25% total use of D&I species (see paragraph 3b). Under this option, the total grazing capacity would be approximately 3596 HMs or 899 cattle for a 4-month season. **This would be a 60% reduction of 5502 HMs.** Under the provisions for exclusion of the high value deer summer fawning/rearing habitat, we indicated that most other “unsuitable” areas were mutually excluded. However, when adjustments are made to decrease the amount of “critical” deer habitat and allowance is made for the remaining “unsuitable” areas, there is no difference in the resulting reduction in capacity.

Unsuitable Range Restrictive Use	Area	Acres Excluded	Project Area Avg Prod/Acre	Total Prod	% Use Total Forage	#’s Avail Forage	HMs Capacity Reduced	AUMs Capacity Reduced
Special Areas	None or Withdrawn	0	430	0	12%	0	0	0
Deer Habitat	28,700 acres of summer range at est. 10% “critical”	2870	430	1234100	12%	148092	154	204
Watersheds	Already Excluded	0	430	0	12%	0	0	0
Riparian Areas	30 miles x 300’	1091	430	469130	12%	56296	59	77
Meadows	2750 acs of meadows. No data on soil density. Guess: 50% of acreage.	1375	430	591250	12%	70950	74	98
Aspen	2270 acres of aspen. No data available on browse heights. Guess: 50% of acres	1135	430	488050	12%	58566	61	81
Archeological Sites	By MOU	0	430	0	12%	0	0	0
MIS Habitat	In Accordance with Forest Plan	0	430	0	12%	0	0	0
Beaver Habitat	Considered a riparian dependent obligate in riparian exclusions	0	430	0	12%	0	0	0
Total Excluded		6471				333904	348	460

d. **Allowable Forage Utilization¹²:** Term Grazing Permits and AOPs for livestock grazing for an allotment will include the following standards. Standards are use levels at the end of the grazing season. Livestock grazing in a pasture shall end when conditions reach any of the following criteria (note MOB provided criteria with N&C comments on October 18, with an updated version on December 24, 2004):

¹² Since these proposed criteria differ from those in the Forest Plan, an amendment to the Forest Plan would be required.

Table 2-12 Alternative C (SMU-G Alternative) Allowable Forage Utilization

Utilization Indicator	Standard
Riparian Greenline Grass and Forbs	6" Stubble Height (of riparian forage that grows above 6" in the absence of grazing).
Riparian graminoids above greenline	25% of current year's growth
Upland Grass/Forb	<ul style="list-style-type: none"> • 25% if forage production of desirable species is good or excellent (e.g., = 50% of reference area) • 15% if grazing outside growing season and forage production of desirable species is fair or poor (e.g., =50% of reference area) • None if during growing season and forage production of desirable species is fair or poor (=50% of reference area)
Riparian Shrubs and Upland Browse	≤30% of current year's shrub twig ends (willows, dogwoods, currant, aspen, alder and other desirable shrubs and trees)
Streambank Trampling	Streambank trampling ¹³ ≥15%, including trampling by ORVs, of any given 200 feet of stream length (i.e., this equals 400 feet by counting both stream sides).
Meadows ¹⁴	Soil bulk density =15% higher at end of grazing season compared to a reference meadow (Washington Office Forest Service Handbook 2509.18).
Aspen	Can be grazed if 1) young stems are growing above elk/deer/cattle browse height (~ 7 ft); AND 2) grass/forb biomass =50% and ground cover =85% of a reference area
Upland Grass/Forb	<ol style="list-style-type: none"> 1. 25% if forage production of desirable species is good or excellent (≥50% of reference area) 2. 15% if grazing outside growing season and forage production of desirable species is fair or poor (≤50% of reference area) 3. None if during growing season and forage production of desirable species is fair or poor (≤50% of reference area)
Sage Grouse Habitat	Residual grass height must be 6 inches during nesting and brood-rearing season.
Goshawk Home Range	=20% (ave.) combined wildlife/livestock utilization within 5,400-acre home range.
Burned areas or areas reseeded or planted to native vegetation	Can be utilized after vegetation has recovered to good condition (i.e., 50% of reference area).
Habitat of MIS and TEPCS	Can be utilized if the reproductive, structural and functional needs of that species are being met.

e. **Lands Excluded from Cattle Grazing:** Cattle would not be allowed to graze within Research Natural Areas, range exclosures, or reference areas¹⁵ (including areas designated as future reference areas, i.e., areas that will eventually serve as reference areas, but which have been grazed by livestock within the

¹³ Streambank trampling includes compaction, pugging, shearing, flattening of banks (including loss of undercut banks), tension cracking, slumping, banks with less than 70% vegetative and ground cover, and eroding banks

¹⁴ Measuring soil bulk density is mechanically "do-able" if there are adequate reference sites to establish baseline data. In the 12/24/04 new SMU-G alternative the soil bulk density requirement was changed to ≤15% from ≤10%, based on a "Forest Service Standard". This reference to a FS Standard is found in the 9/3/1991 FSH [FS 2509.18 (Table 2.2-Exhibit 1—Examples of Soil Quality Standards)]. Compaction is listed as a soil disturbance threshold in this table with a footnote that says, "The values and descriptions used in this table are examples and not intended to be standards". The text in this chapter directs that "soil quality standards should be established in the Forest Plan". Table 2.2-Exhibit 1 was revised in the 1/21/2003 update of the Handbook. It is now titled: Indicators and Methods for Measuring Detrimental Soil Compaction". The reference to ≤% bulk density has been replaced with "significant change in the distribution of Bulk Density". The text in the revised handbook discusses soil compaction in terms of one of the many soil properties for which "guidelines" can be established for monitoring the effects of management activities.

¹⁵ Reference areas are sites of 100-1,000 acres, each representing a major vegetation or habitat type, which are as free as possible of anthropogenic disturbances (e.g., roads, ORV routes, water diversions, recent chaining); and not grazed by livestock =10 years. Reference areas can be managed for control of invasive species, and treated for restoration of natural fire regimes. Reference areas assist in understanding potential natural productivity, and environmental values that may be foregone by particular Forest uses.

past ten years). Within ten years, cattle grazing would be excluded from 150-foot riparian areas in half of suitable beaver habitat.

f. Range Improvements:

1. Only genetically-local native seed and seedlings will be used in revegetation. If native seeds/plants are not available, revegetation projects will be undertaken only in an emergency, using only non-persistent non-native plants, and only as an intermediate step to accomplish native plant restoration.
2. Vegetation conversions are not undertaken to increase cattle forage.
3. Structures are developed as needed for protection of sensitive species or habitats (e.g., headwaters, springs).

h. Monitoring:

1. **Condition:** Documented annually on 1/5 of allotments in major vegetation types:
 - a. Adherence to allotment's upland and riparian utilization criteria
 - b. Presence of exotic or invasive plant species considered most threatening to the District
 - c. Condition of habitat of relevant species of concern
 - d. Livestock impacts to identified archaeological sites
 - e. Burned sites are monitored until forage has attained suitable use status
2. **Trend:** The following will be monitored annually on 1/5 of the allotments, on permanent representative transects:
 - a. Upland and riparian plant communities based on the proportion present as compared to the appropriate reference area and including but not limited to measures of
 - b. Species composition and production
 - c. Ground cover
 - d. Canopy cover
 - e. Bare ground, rock (>3/4"), biological soil crust, litter.
 - f. Riparian area condition of streams, seeps, springs, and wetlands through Level II Riparian Inventories or equivalent wetlands inventories.
 - g. Soil bulk density

i. **Allotment Management Plans:** Allotment management plan provisions could only exceed, and not reduce, requirements of the term permit and Forest Plan. The renewal of permits and development of allotment management plans that affect the season of grazing use, the number of animals grazed, and livestock-related projects will be decided in a public environmental impact analysis process. Once a decision has been made in the Final EIS as to how cattle grazing will occur and be managed in each of the eight allotments, allotment management plans (AMPs) should then be revised for each allotment. As the public will have a continuing interest in the environmental impacts of the grazing on these allotments, the development of these AMPs should involve the Forest managers, the permittees, and interested public members. At no point would grazing of livestock on a national forest, given livestock's impacts on so many other natural resources, uses and visitors, be determined only by the private, commercial permittees and the Forest Service¹⁶.

¹⁶ AMPs are implementation documents of decisions for which public review has been conducted. They are not decision documents. In accordance with the FLPMA definition and 36 CFR 22.1(b)(2), they are: "documents prepared in consultation with the lessees or permittees involved, which applies to livestock operations on the public land or on lands within National Forests in the eleven contiguous Western States....", and therefore they are not subject to a general public review process.

j. **Design Features:** The following actions would be implemented to reduce or prevent potential undesirable effects to rangeland resources by livestock grazing and/or provide for the progression of existing conditions toward desired conditions.

1. Annual operating permits and/or allotment management plans would acknowledge and indicate corrective action for problems detected or documented by monitoring.
2. A site below half of its forage production potential must be rested sufficiently to recover so that its production is not chronically or irreparably reduced.
3. Allotments are placed in an Allotment Decision Matrix to determine whether the allotment or a portion of it should be open, closed, available for permit relinquishment, or extended rest, and are rated for: (a) ecological conflicts, (b) ecological values foregone, (c) conflicts with other desired uses of the area, (d) level of demand for cattle use.
4. All enclosures and range projects such as fences and water developments must be maintained prior to livestock turnout. Enclosure function must be monitored and maintained throughout the grazing season.
5. Salt or supplements are placed no closer than .25 mile to any water source, sensitive habitat, or sensitive cultural site.
6. Burned sites or sites seeded/planted to native vegetation are rested from grazing until vegetation has attained good condition (50% of appropriate reference area)
7. Immediate, effectively deterrent action will be taken, following administrative procedures, for all known permit non-compliance and/or unauthorized use, including potential loss of a year's use, or permit revocation.
8. Turn-on/off schedules and permitted AUMs for all pastures and allotments will be posted annually on the Forest website prior to the grazing season.
9. Regular coordination will be maintained with the Utah Division of Wildlife Resources to address observed combined wild ungulate/cattle browsing or grazing that exceeds criteria (e.g., exceeds 50% use by wild ungulates and cattle; or prevents riparian willow reproduction or aspen sapling growth above browse height).
10. Forage production and utilization monitoring will be used to adjust permitted AUMs and seasons.
11. Maintenance of range structures will be completed before livestock are allowed on allotments, unless conditions warrant and the District Ranger allows in a written memo that maintenance may be delayed until prior to entry into grazing units.
12. Water developments will meet the needs of wildlife by: (a) protecting headwaters and springs from trampling; (b) providing access for wildlife; and (c) including escape ramps for small animals.
13. Limit grazing in areas where recreation use is concentrated. If conflicts with developed recreation use can not be avoided, fence developed recreation sites to separate livestock from recreation use.
14. Improvements assigned to permittees will be maintained annually to standards adequate for public safety, access, control, and proper distribution of livestock.
15. Fence construction and reconstruction will incorporate standards that allow movement of wildlife. If feasible, use let-down fence design when constructing new fences. Fences not needed for the management of livestock will be removed.
16. Any hay or straw used in association with grazing permits on the Fishlake National Forest will be certified and tagged as noxious weed free or noxious weed-seed free.
17. Prior to construction of new range improvements, each site will be surveyed for sensitive plants. If endangered, threatened, proposed, or sensitive plants are found, projects will be redesigned to avoid adverse effects to plant populations or habitats.
18. Cultural resource sites known within these allotments will be protected. Prior to activities or operations to effect range improvement activities, such as water developments or fencing, the appropriate

archeological inventories and consultation under the supervision of the Forest archeologist will occur. If a site is located during management improvement operations, activities will cease until the site is evaluated by the Forest archeologist (or qualified designate).

F. ALTERNATIVES CONSIDERED BUT NOT GIVEN DETAILED STUDY

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). CEQ does not require that “all reasonable alternatives” be evaluated in detail, but it does require that *“for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated”*. A reasonable range of alternatives is a range that achieves the Purpose and Need and responds to the issues that are identified. CEQ requires the inclusion of the Proposed Action and the No Action alternatives in the reasonable range of alternatives [40 CFR 1502.14(b, d)]. The answer to question number 1 of CEQ’s Forty Most Asked Questions clarifies that *“The phrase ‘range of alternatives’...includes all reasonable alternatives which must be rigorously explored and objectively evaluated as well as those other alternatives which are eliminated from detailed study, with a brief discussion of the reasons for eliminating them”*.

The following alternatives, provided through scoping, are briefly described along with the reasons for not considering them further.

1. **The Status Quo Alternative (Revert to Pre-2002 Allowable Use Criteria).** The display of this alternative has been precluded by the recent implementation of revised forage utilization criteria. To consider this alternative, the Forest would have to revert to historical utilization criteria. As discussed in Chapter 1, a Forest Plan amendment incorporating new forage use criteria was completed during 2001 and the revised criteria were included in all Term Grazing Permits in February 2002. The existing conditions described in Chapter 3 of the FEIS are the result of decades of grazing administration prior to the implementation of revised utilization criteria in 2002. These existing conditions do not reflect management under the Proposed Action. However, the Proposed Action is, in effect, described as continuing current livestock management operations, and it is easily assumed that the Proposed Action is a “No Action” alternative, representing continuation of existing management. However, the intent of the Proposed Action is to capitalize on the implementation of the revised use criteria as a major change in livestock administration, making it significantly different from a “do nothing” alternative.

The true “No Action” alternative was the status quo of allotment management, under previous use criteria, prior to the implementation of the revised criteria. In this analysis, in order to present a true “No Action” alternative, the Proposed Action would necessarily have to be viewed as if the revised criteria were yet proposed and had not been implemented. Thus the “status quo” or “No Action” alternative would be the continuation of administrative management with the previous use standards. This was the situation in the EA process for which the decision was withdrawn in June 2000. With the subsequent amendment to the Forest Plan and implementation of the revised use criteria, the existing condition or status quo situation of the allotments is one that includes the new criteria. This creates a circumstance in which current management represents, at the same time, no change (status quo) and change (revised use criteria). The opportunity to present the situation of existing conditions being represented by the decades of use under previous use prescriptions was pre-empted. This alternative would revert to previous use standards and eliminate design features, management intensity provisions, opportunities to revise AMPs, and enforcement measures. Therefore it would not comply with the Forest Plan.

- No new AMPs would be prepared. The 8 allotments would be managed under the management prescriptions of current management plans, some of which are nearly 30 years old.
- In some instances, riparian communities that meet or are moving toward the desired condition could be moved away from the desired condition, unless there are changes in Permit Terms and Conditions.
- Over time, this alternative may not sustain current permitted livestock numbers and seasons of use.
- No new structural improvements would be constructed. Existing range improvements that would be maintained include approximately 113 miles of fence, 48 ponds, 48 developed springs, 29 miles of pipeline, 60 troughs, and 27 cattleguards.
- The standard method of determining utilization prior to 2002 was to measure or estimate the amount of annual herbage removed by weight. Measurement of forage utilization was stratified by management type, rangeland ecosystem conditions, and by broad groups including riparian, upland, browse, crested wheatgrass seedings, and alpine ecosystems. The standard time for completing utilization measurement and mapping use zones was at the end of the growing season.

3. **Reduced Numbers of Cattle Alternative.** Since the turn of the century, "extensive changes" have been made in livestock numbers and seasons of use. The most recent "high" in livestock use was during World War II when 75,616 sheep AUMs and 148,572 cattle AUMs were permitted (totaling 224,188 AUMs) on the Fishlake National Forest. These numbers have steadily declined and in 1984 there were only 18,811 sheep AUMs and 118,089 cattle AUMs permitted for a total of 136,900 AUMs. In 1997, sheep use had declined significantly to 8,938 AUMs, with some sheep use converted to cattle grazing. Cattle AUMs totaled 123,015 in 1997, for a total of 131,953 AUMs of livestock use--a 41 percent decrease since 1943 and a 5,000 AUM decrease since 1984. Notwithstanding the intent of this analysis to maintain that changes in cattle numbers, seasons of use, and grazing systems are functions of administration, continual review of stocking capacities has resulted in modifications to permitted numbers of cattle on several allotments. Displaying varying levels of permitted numbers is, in fact, an on-going process that is integral to any selected alternative.

4. **Grazing on Some Allotments; No Grazing on Others.** This alternative, has been precluded by previous actions to close some areas to livestock grazing. Periodic reviews have determined that some areas, within or adjacent to the project area and historically grazed by livestock, were not suitable for livestock grazing or that livestock use was not consistent with Forest Plan goals. As a result, these areas were administratively removed from livestock grazing.

5. **Eliminate all grazing from areas infested with noxious weeds.** Livestock grazing on the Fishlake National Forest is not a significant contributing factor to the introduction and establishment of noxious weeds. The appropriate implementation of weed prevention measures through AMP revisions would better address this need.

6. **Fence all riparian areas.** This alternative was derived from the suggestion that there be a reduction in grazing levels to provide improvements to riparian ecosystems and wildlife and fish habitat. It is unreasonable to expect to construct and maintain fence around every perennial stream.

G. COMPARISON OF ALTERNATIVES

This section provides a summary of key differences between the alternatives. For a detailed description of the alternatives, refer to sections E. This section also presents a comparison of alternatives using the

key issues and purpose and need identified in Chapter 1. The intent of these tables is to present the environmental effects of the alternatives so that they can be easily and efficiently compared. Readers are cautioned that this section displays only a summary of the environmental consequences. Detailed descriptions of existing conditions are disclosed in Chapter 3, and detailed descriptions of expected environmental consequences are disclosed in Chapter 4.

Table 2-13 — Key Differences Between Alternatives

Indicator	Alternative A—Preferred Alt Proposed Action	Alternative B--No Grazing	Alternative C – Sustainable Multiple Use-Grazing
Acres Grazed	178,000; 72,246 acres suitable	0	178,000; 42,941 acres suitable
Permitted #	2,531	0	830
Permitted AUMs	12,009 AUMs. AUMs will be monitored; may vary over time.	0 AUMs: 20% reduction per year until no AUMs permitted	3,944 AUMs
Forage Produced	On suitable grazing areas, 67,039,375 #’s of forage produced per year. 24% of total production = 16,089,450 pounds of available forage. As seral stages move from very early to mid and late, sites are more productive--greater use is allowed	Initially, 16,089,450 pounds of forage available. This would be reduced by 20% per year until no forage is available.	On suitable areas (less excluded areas), 28,713,648 pounds of forage produced per year. 12% of total production = 3,454,671 pounds of available forage.
Available Forage	Static to slow increase	All forage produced is available for wildlife	25% of forage is allocated to wildlife; 25% for livestock. A change in allowable use would require an amendment to the Forest Plan.
Upland Forage Use	40-60% of key species	No use by livestock	25% of key species
Riparian Forage Use	4-6” stubble height	No use by livestock	6” stubble height
Upland Seral Condition	Mix of early to late seral conditions, providing an appropriate level of ecological diversity, with a majority in mid to late seral.	Late Seral	Late Seral
Riparian Seral Condition	Early to Late Seral	Late Seral	Late Seral
Structural Improvements	No new structural improvements. Existing improvements that would be maintained includes 113 miles fence, 48 ponds, 48 developed sp rings, 29 miles pipeline, 60 troughs, 27 cattleguards.	Remove 113 miles of fence, 60 troughs, 29 miles of pipeline, 48 ponds, and 48 spring developments.	Provides for maintenance of existing structural improvements and new improvements are allowed as needed for protection of sensitive species.
Nonstructural Improvements	Nonstructural revegetation improvements are assigned to permittees for maintenance.	NS range improvement treatment areas will be allowed to revert to original vegetation communities.	No new treatments are allowed and no re-treatment of existing non-structural improvements is allowed.
Structural Improvement Maintenance	Implementation and enforcement of AMPs will strengthen range improvement maintenance responsibilities and compliance with stubble height requirements will encourage maintaining fences to prevent twice-over grazing. Meets intent of Forest Plan G&O’s.	Range improvements needed for livestock management would be removed. No maintenance would be necessary. Meets intent of Forest Plan G&O’s .	Range improvements needed for livestock management would be maintained. Meets intent of Forest Plan G&O’s .
Rx Fire Level	Moderate	Moderate to High	None
Permittee Compliance	Permit terms & conditions, AMP provisions, utilization criteria compliance are required.	Generally down for 10-year phase-out period; may be adversarial.	Generally down due to reductions in livestock numbers; may be adversarial.
Local Economy	Contributes \$183,803 to local economy. Meets Forest Plan G&O’s.	Results in a loss to local communities of \$415,692. Does not meet LRMP G&O’s	Results in a loss to local communities of \$290,973. Does not meet LRMP G&O’s.

Table 2-14—Ability to Meet Purpose & Need

Indicator	Alternative A—Preferred Alt Proposed Action	Alternative B—No Grazing	Alternative C – Sustainable Multiple Use-Grazing
Complies with Rescission Act	Yes, reflects implementation of a discretionary decision regarding authorization of livestock grazing	Yes, reflects implementation of a discretionary decision regarding authorization of livestock grazing	Yes, reflects implementation of a discretionary decision regarding authorization of livestock grazing
Improves range condition and trend and moves toward desired conditions	Static to slow improvement on upland ranges; in degraded riparian sites, measurable improvement occurs within 10 years. Meets Forest Plan G&O's for rangeland health since AMPs will include action plans to improve deteriorated sites to fair or better condition with stable to upward trends.	Static to moderate improvement on upland ranges; in degraded riparian sites, measurable improvement occurs within 5 years. Meets Forest Plan G&O's for rangeland health since all areas would improve to fair or better condition with stable to upward trends.	A 70% reduction in numbers will result in limited use of uplands, which will show moderate improvement in 10 years. A reduction in cattle numbers will not significantly reduce concentration in riparian areas; however, the significance of the reduction should result in measurable improvement of degraded riparian sites within 5-10 years. Meets Forest Plan G&O's for rangeland health since some areas are excluded from grazing capacity thereby reducing stocking and allowing for more rapid improvement of deteriorated sites.
Incorporates design criteria and adaptive management provisions	Yes, design criteria are provided and the provision for adaptive management.	No, periodic checks would be made to confirm livestock exclusion	Mitigation measures, intended to reduce adverse environmental effects of livestock grazing are included, but no provisions for adaptive management are described.

Table 2-15—Riparian Issue

Indicator	Alternative A—Preferred Alt Proposed Action	Alternative B—No Grazing	Alternative C – Sustainable Multiple Use-Grazing
Seral Status	Mid to Late Seral	Late Seral	Late Seral
Late Season Use on Willows	Light to moderate	No use by livestock, elk use may increase	No use by livestock, elk use may increase
Fall Stubble Heights	2" non hydric to 6" hydric	No use by livestock	No use by livestock
Riparian area size/width	Stabilize or minor increase	Moderate Increase	Moderate Increase
Stream width/depth ratios	At degraded sites, measurable improvement in 10 years	At degraded sites, measurable recovery in 5 years	At degraded sites, measurable recovery in 5 years
Channel degradation	At degraded sites, measurable improvement in 10 years	At degraded sites, measurable recovery in 5 years	At degraded sites, measurable recovery in 5 years
Soil erosion and compaction	Most of sites show measurable improvement in 10 years	Most sites show measurable improvement in < 5 years	Most sites show measurable improvement in < 5 years
Pool/riffle ratios	Moderate increase in 10 years	Moderate increase in 10 years	Moderate increase in 10 years

Table 2-16—T&E Species Viability Issue

Indicator	Alternative A—Preferred Alt Proposed Action	Alternative B—No Grazing	Alternative C – Sustainable Multiple Use-Grazing
Livestock impacts	Minor. Compliance with ESA and Conservation Agreements and Recovery Plans required	None	Minor. Compliance with ESA and Conservation Agreements and Recovery Plans required
Season of use	As per Conservation Agreements/Recovery Plans	None	As per Conservation Agreement/Recovery Plans
Livestock exclusion	As per Conservation Agreements/Recovery Plans	Complete exclusion within 10 years	As per Conservation Agreements/Recovery Plans
Duration of use	Generally seasonal 6/1-10/15	None within 10 years	Generally seasonal 6/1-10/15
Compliance with Conservation Strategies	Compliance required; actions taken for non-compliance	Livestock have no impact on Conservation Strategies	Compliance required; actions taken for non-compliance

Indicator	Alternative A—Preferred Alt Proposed Action	Alternative B—No Grazing	Alternative C – Sustainable Multiple Use-Grazing
Permitted #	2,531	0	830
Permitted AUMs	12,009 AUMs. AUMs will be monitored; may vary over time.	0 AUMs; 20% reduction per year until no AUMs permitted	3,944 AUMs
Economic Viability	Minor economic loss in economic value (based on estimated early removal 10% of the time)	Complete loss of economic viability for some; a loss of summer forage may result in a significant reduction in total ranch operations.	Significant loss in economic value (based on 70% reduction in stocking capacity and additional exclusion of areas from capacity estimates).
Operational Costs	Up \$18,734	\$165,964; \$0 in 4 years	\$116,161
Loss in Permit Value	\$47,520	\$960,720	\$672,480
Annual Loss in Calving Operation	\$0	\$1,417,251	\$992,237
Total Increased Costs	\$66,254	\$2,212,007	\$1,780,878
Annual County Losses	\$231,889	\$7,742,025	\$6,233,073
Net Value	\$118,769	-\$118,769	-\$83,135
Contribution to Local Economy	\$415,692 – \$231,889 = \$183,803	-\$415,692	-\$290,973

Chapter 2 Definitions

Administrative Site: All Forest Service-owned and -occupied buildings, building equipment, or space used by the unit.

Allowable Use: The degree of utilization considered desirable and attainable on various parts of a ranch or allotment considering the present nature and condition of the resource, management objectives and level of management. The degree of use estimated to be proper until proper use is known. A baseline utilization percentage established in a Forest Plan.

Biological diversity (biodiversity): The full range of variability within and among living organisms and the ecological complexes in which they occur. Biological diversity encompasses ecosystem or community diversity, species diversity, and genetic diversity.

Biological evaluation: The legal record of finding for U.S. Forest Service Region One sensitive species.

Biotic Condition Index (BCI): The BCI is an index that measures the macroinvertebrate community of a stream against its own potential. It is based on the tolerance of different species to different environmental factors. A low BCI indicates lower water quality and a macroinvertebrate community that is not as healthy as its potential.

Climax Community: The final or stable biotic community in a successional series; it is self-perpetuating and in equilibrium with the physical habitat. The assumed end point in secondary succession. Determined primarily by climate but also influenced by soil, topographic, vegetative, fire and animal factors.

Community: A general term for an assemblage of plants and/or animals living together and interacting among themselves in a specific location.

Conservation Agreement: A voluntary agreement between USFWS and other Federal or non-Federal landowners that identifies specific conservation measures that the participants of the agreement will undertake to 1) bring any endangered species or threatened species to the point at which the measures provided under the ESA are no longer necessary. or 2) conserve species covered by the agreement, none of which are listed under the Endangered Species Act, with the intention of preventing any need to list the species.

Cultural Resource Site: Archaeological and cultural sites are places of prehistoric and historic human activity including aboriginal mounds, forts, buildings, earth works, village locations, burial grounds, ruins, caves, petroglyphs, pictographs, or other locations which are the source of prehistoric cultural features and specimens.

Cumulative effect: The impact on the environment resulting from the incremental impact of the action added to other past, present or future actions. They can also result from individually minor but collectively significant actions taking place over a period of time.

Deciding officer: The Forest Service official who has the authority to select and/or carry out a specific planning action.

Deferment: Delay of livestock grazing on an area for an adequate period of time, to provide for plant reproduction, establishment of new plants, or the restoration of vigor in existing plants. Generally defined as delay of grazing until the seed of the key forage species is mature.

Desirable Plant Species: These are defined as species and percentage occurrence of the species common to pristine plant communities. They are usually good forage plants and generally are first to show adverse effects of excessive grazing use. The species are generally good soil binders, especially in natural mixtures of desirable species.

Desired Plant Community: The plant community that has been determined through a land use or management plan to best meet the plan's objectives for a site. A real, documented plant community that embodies the resource attributes needed for the present or potential use of an area, the desired plant community is consistent with the site's capability to produce the required resource attributes through natural succession, management intervention, or a combination of both.

Ecological Diversity: The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan (National Forest Management Act Planning Regulation).

Ecological Reference Area. An ecological reference area (ERA) is a landscape unit in which ecological processes are functioning within a normal range of variability and the plant community has adequate resistance to and resilience from most disturbances. An ERA is the visual representation of the characteristics and variability of the components found in the ecological site description. These areas do not need to be pristine, historically unused lands (e.g., climax plant communities or relict areas).

Ecological succession: An ecosystem's gradual evolution to a stable state. If, through the ability of its populations and elements, an ecosystem can absorb changes, it tends to persist and become stable through time.

Ecosystem: Organisms together with their abiotic environment, forming an interacting system, inhabiting an identifiable space.

Ecosystem management: The use of an ecological approach that blends social, physical, economic, and biological needs and values to assure productive, healthy ecosystems. A process of land and resource management that emphasizes the care and stewardship of an area to ensure that human activities will be carded out to protect natural processes, natural biodiversity, and ecological integrity.

Effects: The results expected to be achieved from implementation of actions relative to physical, biological, and social (cultural and economic) factors resulting from the achievement of outputs. Examples of effects are tons of sediment, pounds of forage, person-years or employment, and income. There are direct effects, indirect effects, and cumulative effects.

Environmental Consequences: A situation that naturally or logically follows as a result of an action. Commonly used in environmental impact statements for discussions about how the human environment, which includes the natural and physical environment and the relationship of people with that environment, is influenced by the government as actions.

Ephemeral Stream: Ephemeral (stormwater) stream means a feature that carries only stormwater in direct response to precipitation with water flowing only during and shortly after large precipitation events. An ephemeral stream may or may not have a well-defined channel, the aquatic bed is always above the water table, and stormwater runoff is the primary source of water.

Erosion: The wearing away of the land's surface by water, wind, ice, or other physical processes. It includes detachment, transport, and deposition of soil or rock fragments.

Erosion Pavement. A layer of coarse fragments (1/8 inch to 3/4 inch in diameter) remaining on the soil surface after removal of fine particles by erosion. Erosion pavement is not considered ground cover.

Excess Use: Grazing livestock in greater numbers or at times or places other than authorized by the permit or the bill for collection.

Exlosures: Fenced structures that "exclude" animals from a specific area.

Forage Utilization Regression Curve: a smooth curve fitted to a set of paired data (% use of total forage and % use of key species) in regression analysis

Goshawk Foraging Area: Areas where prey are searched for, pursued by, and captured by goshawks.

Graminoid: Grasses (family Gramineae or Poaceae) and grasslike plants such as sedges (family Cyperaceae) and rushes (family Juncaceae).

Greenline: The first perennial vegetation from the water's edge. Riparian areas that are in high seral status with stable stream banks will exhibit a continuous line of vegetation at the bankfull discharge level. Rocky stream types may have a significant amount of rock causing breaks in the vegetation. This rock is considered part of the green line. Other breaks may occur in the first perennial band of vegetation (watercourses or bare ground). The amounts of these (perennial vegetation, rock, and bare ground) should be recorded.

Ground Cover: The percentage of material, other than bare ground and erosion pavement, covering the land surface. It may include live vegetation, standing dead vegetation, litter, cryptogams, and rock over 3/4 inch. Ground cover plus bare ground would total 100 percent.

Growing season: Generally, the period of the year during which the temperature of vegetation remains high enough to allow plant growth. The most common measure of this period is the number of days between the last frost in the spring and the first frost in the fall.

Head Month: Tenure of one herbivore on National Forest for a period of one month.

Healthy Rangelands. Functioning rangelands that meet current and future needs of people for desired levels of values, uses, products, and services.

Indigenous: Born, growing, or produced naturally (native) in an area, region, or country.

Indirect effects: Secondary effects which occur in locations other than the initial action, significantly later in time, or to one resource that in turn, affects another resource. i.e.: effects to vegetation that may reduce prey species for a raptor.

Intermediate Species: These are also species common to the pristine plant community, but which are not as adversely affected by grazing use as are the "Desirables." They may be less palatable to grazing animals or be more resistant to grazing use. As a result, they either hold their own in the stand or they may increase in proportion to other species or even replace the most desirable species that are lost or reduced as a result of selective grazing use.

Intermittent Stream: Intermittent stream means a well-defined channel that contains water for only part of the year, typically during winter and spring when the aquatic bed is below the water table. The flow may be heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and hydrological characteristics commonly associated with the conveyance of water.

Introduced (non-native) species (also known as an exotic species): An organism that is not indigenous to the place or area where it is considered introduced and instead has been accidentally or deliberately transported to the new location by human activity. Introduced species can often be damaging to the ecosystem it is introduced to.

Invasaders: Plant species that were absent or present in very small amounts in undisturbed portion of the original vegetation of a specific range site and will invade following disturbance or continued overuse

Invasive species: The term invasive species refers to a subset of those species defined as introduced species or non-indigenous species. Invasive species can alter ecological relationships among native species and can affect ecosystem function, economic value of ecosystems, and human health. A species is regarded as invasive if it has been introduced by human action to a location, area, or region where it did not previously occur naturally (i.e., is not native), becomes capable of establishing a breeding population in the new location without further intervention by humans, and spreads widely throughout the new location.

Macroinvertebrate: An invertebrate animal (animal without a backbone) large enough to be seen without magnification.

Mitigation measures: Planning actions taken to avoid an impact altogether, to minimize the degree or magnitude of the impact, reduce the impact over time, rectify the impact, or compensate for the impact (40 CFR 1508.20). Mitigation is defined as “measures designed to reduce or prevent undesirable effects” and is used to reduce adverse environmental effects below the “significance” level and resolve issues and concerns raised by the public and the ID team.

Multiple Uses: Use of range for more than one purpose, grazing of livestock, wildlife production, recreation, watershed and timber production. Not necessarily the combination of uses that will yield the highest economic return or greatest unit output.

Native species: Species that are a part of the original fauna or flora of an area.

No action alternative: An alternative where no activity would occur, or where current management practices would continue unchanged. The development of a no action alternative is requested by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The no action alternative provides a baseline for estimating the effects of other alternatives.

Non-indigenous (non-native) species: with respect to a particular ecosystem, any species that is not found in that ecosystem. Species introduced or spread from one region of the US to another outside their normal range are non-indigenous, as are species introduced from other continents. non-native species includes plants, vertebrates, invertebrates, and pathogenic organisms that affect plants, animals, and humans, and are defined as organisms that are not indigenous to the ecosystem to which they were introduced and which are capable of surviving and reproducing without human intervention.

Noxious Weed: the term “weed” includes all plants defined as “noxious weeds” by Forest Service policy: “plants designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.” (FSM 2080.5)

Noxious Weed Free: "Weed free" means to be free from propagative plant parts and seed from plants listed on the State noxious weed list.

Percent Use: The percentage of current year's forage production that is consumed or destroyed by grazing animals.

Perennial Stream: Perennial stream means a well-defined channel that contains water year round during a year of normal rainfall with the aquatic bed located below the water table for most of the year. Groundwater is the primary source of water for a perennial stream, but it also carries stormwater runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.

Poisonous Plant: One containing or producing substances that cause animal sickness, death or deviation from a normal state of health.

Post Fledgling Family Area: Area of concentrated use by the goshawk family after the young leave the nest.

Prescribed Fire: Prescribed fire (Rx fire) is defined as fire applied in a knowledgeable manner to forest fuels on a specific land area under selected weather conditions that produce the fire behavior and fire characteristics required to attain planned fire treatment and resource management objectives to accomplish predetermined, well-defined management objectives.

Range or Rangeland: All land-producing or capable-of-producing native forage for grazing and browsing animals and lands that have been revegetated naturally or artificially to provide a forage cover that is managed like native vegetation. It includes all grasslands, shrublands,

and those forest lands which continually or periodically, naturally or through management, support an understory of herbaceous or shrubby vegetation that provides forage for grazing or browsing.

Range Condition: A generic term relating to present status of a unit of range in terms of specific values or potentials. Specific values or potentials must be stated. Also defined as the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site.

Range Condition Trend: Direction of change, whether stable, toward (upward) or away (downward) from the site's potential. The change in direction could be in vegetation, ground cover, or noxious plants, non-native invasive plant species features over time. Most of the time trend should be described as "meeting", "moving toward", or "not meeting" a desired plant community. Trend in condition is a total result of grazing use and management. It is the final determinant of proper use. Other measurements and observations are only the best approximations and final interpretations must eventually be tied to trend.

Range Environmental Analysis: The systematic acquisition and evaluation of range resource data needed for planning allotment management and overall land management. It consists of identifying and mapping range vegetative types, range suitability, and range condition. It provides for the periodic measurement of trend and the collection of essential information on range improvements, range readiness, and season of use. A completed analysis includes: 1) the resource inventory, including data compilation; 2) a narrative evaluation of the resource data, management alternatives, and other information relevant to management of the grazing area.; and 3) maps illustrating vegetation types, range condition and trend, and suitability.

Range Enclosure. These areas consist of fenced enclosures combined with permanent vegetation monitoring plots but may also include abandoned grazing areas and sites which have never been grazed. When established on sites that have reached PNC, they are intended to provide solid evidence of the climax species composition on grassland and forested range types that exhibit similar site conditions. They are subject to the same year-to-year climatic fluctuations as adjacent managed grasslands thus allowing for direct comparisons of changes over time. In range ecosystems where no examples of PNC remain, Range Enclosures are established in the most advanced seral stage available. These sites may typically require 5 to 15 years to reach PNC but, in areas where only early-seral grasslands exist, Range Enclosures may require up to 70 years or longer to reach full PNC

Range Improvement. Any activity or program on or relating to rangelands which is designed to improve production of forage; change vegetative composition; control patterns of use; provide water; stabilize soil and water conditions; and provide habitat for livestock and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical means to accomplish the desired results (Public Rangelands Improvement Act of 1978, 43 U.S.C. 1902). The following types are included:

- **Nonstructural.** Practices and treatments undertaken to improve range or facilitate livestock management, excluding structural improvements. such as seeding, spraying, and chaining
- **Structural.** Improvements requiring construction or installation to improve the range or facilitate livestock management. such as fences, wells, reservoirs, pipelines, and stock tanks

Range Inventory: The systematic acquisition and analysis of resource information needed for planning and for management of rangeland. Methodologies vary widely, ranging from simple visual comparisons to exhaustive quantitative measurements.

Range Readiness: The defined stage of plant growth at which grazing may begin under a specific management plan without permanent damage to vegetation or soil. Range readiness takes into account: 1) stage of plant growth; 2) the management plan to be used; and 3) permanent damage to vegetation and soil. that grazing readiness be based on the development stage of the most common or key grass species in the pasture or range. The recommended plant development stage for beginning spring grazing of both native and tame grass species is when the plants have three to four leaves.

Rangeland Reference Area. Rangeland reference areas serve as benchmark levels of land condition within specific land types. They are located in areas unaffected by grazing, and are used for comparison of grazed areas of the same land type. The absence of grazing allows the effect of grazing and the influence of seasonal conditions to be analyzed objectively. Comparisons between grazed and ungrazed areas often form the basis of judgments on land condition in the grazed areas. In range ecosystems where no examples of PNC remain, Range Reference Areas are established in the most advanced seral stage available. These sites may typically require 5 to 15 years to reach PNC but, in areas where only early-seral grasslands exist, Range Reference Areas may require up to 70 years or longer to reach full PNC. Comparisons between reference areas and grazed areas can be made in many different ways.

Recovery Plan: A document drafted by the US Fish & Wildlife Service or other knowledgeable individual or group, that serves as a guide for activities to be undertaken by Federal, State, or private entities in helping to recover and conserve endangered or threatened species. Recovery plans typically include a listed species life history and current status, habitat requirements and availability, factors which limit the species survival, conservation measures currently in place, and specific management objectives that will facilitate recovery of the species.

Research Natural Area. Part of a national network of reserved areas that include protected areas representative of the full array of North American ecosystems; biological communities, habitats, phenomena, and geological and hydrological formations and conditions.

Rest: Leaving an area ungrazed, thereby foregoing grazing of a forage crop. Normally, rest implies absence of grazing for a full growing season.

Rest Rotation: A system in which one part of the range is ungrazed for an entire grazing year or longer, while other parts are grazed for a portion, or perhaps all, of a growing season.

Riparian dependent obligate: An organism that requires riparian habitat to complete some portion of its life cycle. Obligate riparian plants should be found in riparian areas 91-100% of the time.

Sediment: Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site or origin by air, water, gravity, or ice.

Selected Alternative : The alternative chosen for implementation by the selecting official. The selected alternative is identified in the Record of Decision.

Seral: Pertaining to the successional stages of biotic communities.

Seral Community: The relatively transitory communities which develop under ecological succession (synonym - seral stage).

Seral Stages: The developmental stages of an ecological succession.

Sere: The whole series of communities which develop in a given situation during ecological succession.

Soil productivity: the capacity of a soil, in its normal environment, to support plant growth.

Soil Bulk Density: The mass of undisturbed or disturbed dry soil per unit bulk volume. The bulk volume is determined before drying to a constant weight at 105 c. The value is expressed in grams per cubic centimeter (g/cc).

Soil Compaction: A physical change in soil properties that results in a decrease in porosity and an increase in soil bulk density and soil strength.

Species of concern: An informal term referring to a species documented by scientific research and inventory to have a naturally restricted range or habitat in the state, to be at a low population level, to be in such high demand by man that its unregulated taking would be detrimental to the conservation of its population, and be in need of conservation action. This may range from a need for periodic monitoring of populations and threats to the species and its habitat, to the necessity for listing as threatened or endangered. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing. A similar term is "species at risk", which is a general term for listed species as well as unlisted ones that are declining in population. "Imperiled species" is another general term for listed as well as unlisted species that are declining.

Stream Substrate: The mineral and/or organic material that forms the bed of the stream. The composition of the streambed (substrate) is an important factor in understanding how a stream functions. It influences channel form and hydraulics, erosion rates, sediment supply, and habitat conditions for fish and other aquatic organisms. Simply put, steep mountain streams with beds of boulders and cobbles will act differently than low-gradient streams with beds of sand or silt. Therefore, measurement of every sample point should include a basic characterization of bed material.

Streambank alteration: Physical alteration of the streambank. As used in the Lewis and Clark National Forest handbook direction, the amount of damage caused by livestock during the current season. The overriding concept behind the measure is making sure that the integrity of the streambank remains. Most often, the best indicator of the reduction in bank integrity is the hoof prints of livestock along the bank/water interface.

Twice-Over Grazing (re-grazing): Twice-over grazing is the practice of grazing early (from the 4-6 inch leaf length to boot stage) and then grazing the re-growth in late summer or early fall after curing. Often this practice is employed as livestock are sequentially moved through lower elevation spring/fall range to higher-elevation summer ranges and then reversing the pattern and allowing repeated grazing in the spring/fall range.

Unauthorized Use: Unauthorized livestock means any cattle, sheep, goat, hog, or equine not defined as a wild free-roaming horse or burro at 36 CFR 222.20(b)(13), which is not authorized by permit to be upon the land on which the livestock is located and which is not related to use authorized by a grazing permit; provided, that noncommercial pack and saddle stock used by recreationists, travelers, other Forest visitors for occasional trips, as well as livestock to be trailed over an established driveway when there is no overnight stop on Forest Service administered land do not fit under this definition (36 CFR 261.2). (Note: Unauthorized use by a permittee is technically called excess use; it is billed at the unauthorized use rate.)

Unsatisfactory Range Condition: Unsatisfactory Range Condition exists when the desired condition is not being met and short term objectives are not being achieved to move the range toward the desired condition.

Usable Forage: That portion of the forage that can be grazed without damage to the basic resources; may vary with season of use, species and associated species.

Vegetation: Plants in general, or the sum total of the plant life above and below ground in an area.

Vegetation community type: An aggregation of all plant communities distinguished by floristic and structural similarities in both overstory and undergrowth layers. A unit of vegetation within a classification.

Vegetation management: Activities designed primarily to promote the health of forested and non-forested vegetation for multiple-use purposes.

Vegetation Types: A kind of existing plant community with distinguishing characteristics described in terms of the present vegetation that dominates the aspect or physiognomy of the area.

Vegetative: Relating to nutritive and growth functions of plant life, in contrast to reproductive functions. Should not be confused with vegetation.

Vigor: Relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing.

Warm-Season Plant: One that makes most of its growth during the spring and summer and sets seed in the late summer or early fall. It is normally dormant in winter.

Watershed: A topographically discrete unit or stream basin that includes the headwaters, main channel, slopes leading to the channel, tributaries and mouth area.

Wild Ungulate: Hoofed animals such as deer, big horn sheep and elk)