CHAPTER 3. LANDSCAPE DISTURBANCES

Livestock and Rangeland Management – Grand Mesa

Domestic livestock grazing has been a major use on the GMUG since Euro-American settlement occurred in the area in 1881. Heavy livestock grazing use was a major disturbance factor altering rangeland vegetation quantity, quality and species composition; which in turn, influenced other ecosystem processes such as fire frequency, erosion, and wildlife species habitat and occurrence. Livestock management has constantly been changing, through reductions in livestock numbers, season and use, and improvements in rangeland vegetation condition and trend. This section briefly describes these changes, current conditions, and management implications of livestock and rangeland management for the Grand Mesa Geographic Area.

Conditions and Trends

Historic

Only livestock owned by the Utes grazed in this area prior to Euro-American settlement of the Grand Mesa Geographic Area. Grazing was unregulated from 1882 to 1905. Information on numbers of livestock during this early period is not available. Efforts to control grazing began once the Battlement (now Grand Mesa) National Forest was established in 1905, focusing on adjusting livestock numbers and season of use.

Early livestock management was simple. Cattle were turned out in the spring (approximately April or May depending on the amount of snow) and collected in the fall (November). Animals concentrated in preferred areas, typically valley bottoms, resulting in overgrazing. Highly desirable plants were eliminated and replaced by undesirable species. Ground cover was reduced and accelerated erosion occurred in many of these areas (Sudworth 1900). Upland sites did not receive much cattle use. Large bands of sheep were herded across portions of the Grand Mesa GA. Livestock pressure remained high (peaking in 1919 to support meat production during World War I) through the 1940s.

Rotational grazing systems were introduced in the 1950s and 1960s. Reductions in season of use and numbers of livestock continued to be implemented to improve rangeland conditions. Range improvements, fences, water developments, trails to enable livestock movement between ranges, were constructed to achieve improved livestock distribution. Over time smaller allotments were consolidated into larger ones.

Figure 1 shows the trend in cattle and sheep numbers permitted on the entire Grand Mesa National Forest (includes the Grand Mesa Geographic Areas). Note: Data is not available for all years.

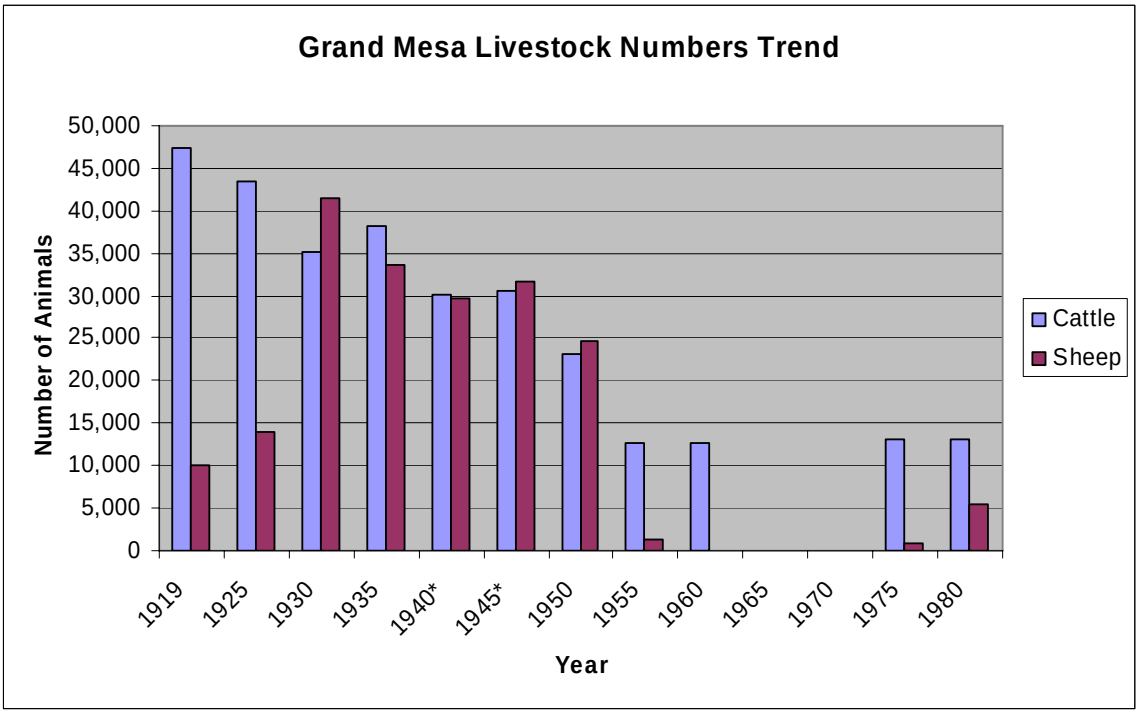

Figure 1. Permitted Livestock Numbers for the entire Grand Mesa National Forest (1908 – 1980).

For comparison, Table 1 displays the number of livestock permitted to graze the total GMUG in 1983 and 1991 when the first Forest Plan and significant amendment were completed. Current permitted numbers are also displayed.

Table 1. Permitted Livestock, GMUG National Forests

Year	Cattle	Horse	Sheep
1983	65,000	5,300	61,000
1991	64,000	5,000	53,000
2005	57,000	300	29,000

Permitted numbers are only part of the picture. The length of the season of use is an additional indicator of intensity of use. During the early 1900s the season of use was seven to eight months long (April or May until November). From the 1930s to 1950 the season of use was six months long (May until October). After 1950 the season of use was adjusted to be four and one-half to five months long (June to October). By 1983 grazing seasons were adjusted so the majority of cattle were permitted from mid May to mid October, and sheep were permitted from mid July to mid September. Season of use has been further reduced so that most cattle grazing does not begin until June. Various grazing systems have been implemented over time, further adjusting the timing, intensity and duration of livestock grazing within a given area.

Current

Livestock grazing is permitted within established allotments. The size and number of allotments have varied over time. Changes in the number and configuration of allotments have occurred over time because allotments have been combined to improve livestock

management, or class of livestock has been changed. Figure 2 displays the current allotments on the Grand Mesa Geographic Area. Not all NFS lands on the Grand Mesa GA are included in grazing allotments. Private lands within the Forest boundary are excluded from allotments, with few exceptions. There are currently 15 allotments on the Grand Mesa GA, including 92 percent of the NFS lands. All 15 allotments are currently permitted for cattle.

Not all areas within an allotment are considered to be suitable for livestock grazing. Lands generally suitable for grazing are those lands that produce the forage for grazing allocation. Slopes below 40 percent are generally considered suitable for cattle grazing. Slopes below 60 percent are generally considered suitable for sheep grazing. Areas not suitable for grazing include but are not limited to: bare and rocky areas; lakes, reservoirs, rivers, and perennial streams; very wet soils; areas with mass movement risk; roads and trails; slopes greater than 60 percent; dense timber stands with canopy closure greater than 70 percent and limited understory forage; areas not capable of producing forage (nutrient-poor soils, shallow soils, alkali flats); areas without water sources or the potential to develop water; areas fenced to keep livestock use out (e.g., developed recreation sites, administrative sites). Lands that do not produce adequate forage, or fail to meet the other requirements for suitability within an allotment are labeled unsuitable. Figure 3. displays the lands generally suitable for livestock grazing on the Grand Mesa GA.

Unsuitable rangelands are not used to determine carrying capacity for livestock. However, unsuitable rangelands within an allotment may still be used by livestock for such purposes as shade, loafing, trailing, bedding, incidental grazing, and movement between areas of suitable forage throughout the grazing season.

Rangeland condition is based on the ecological condition of a site, by comparing existing vegetation composition and cover to potential composition and cover that would be appropriate for a given location. Current rangeland vegetation condition was determined by local rangeland management specialists based on their knowledge of the ground combined with results of range analysis. Figure 4 displays the current rangeland vegetation condition for the Grand Mesa GA. Areas displayed with no condition on the Grand Mesa GA are not considered to be suitable for livestock grazing.

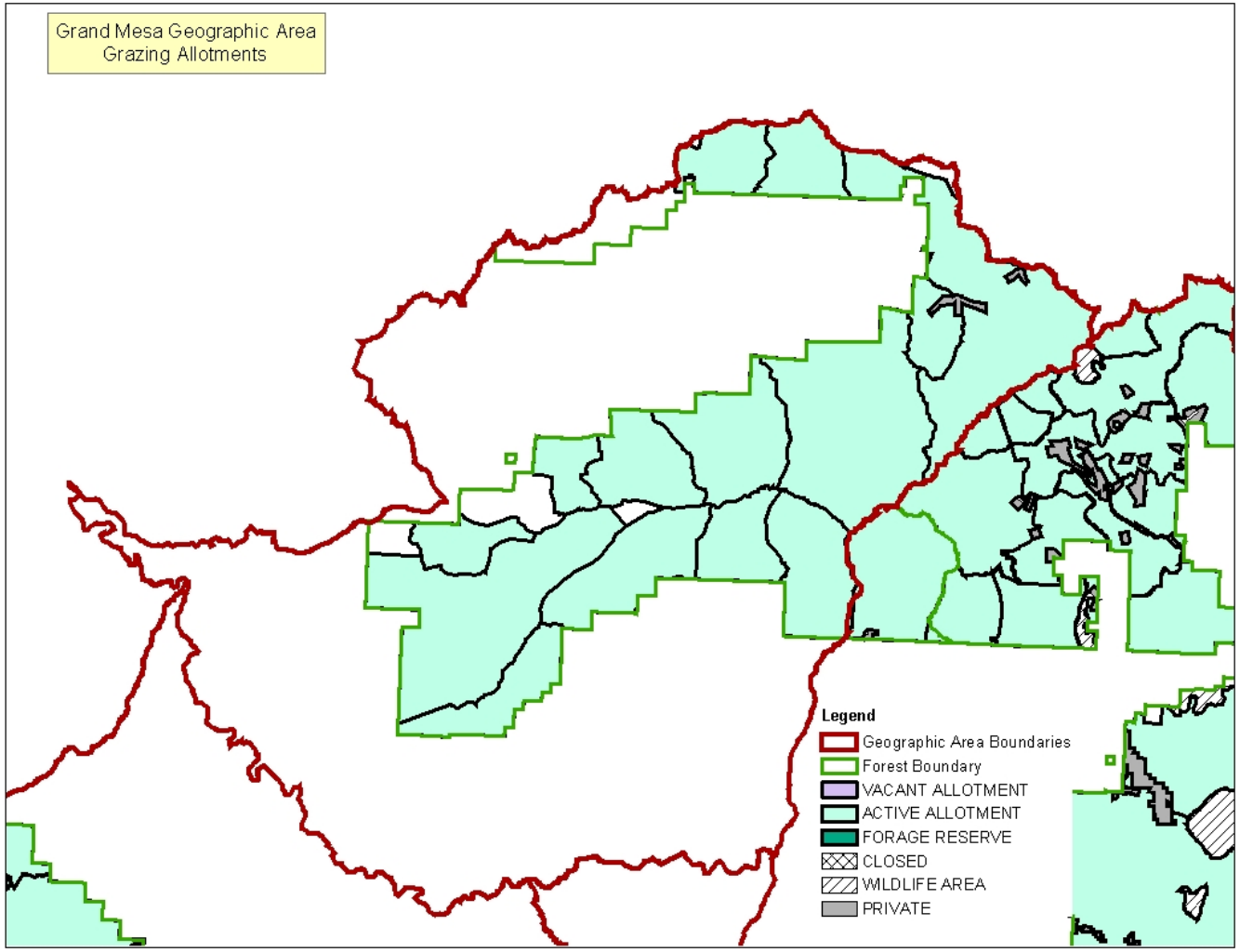

Figure 2. Current Grazing Allotments, Grand Mesa Geographic Area

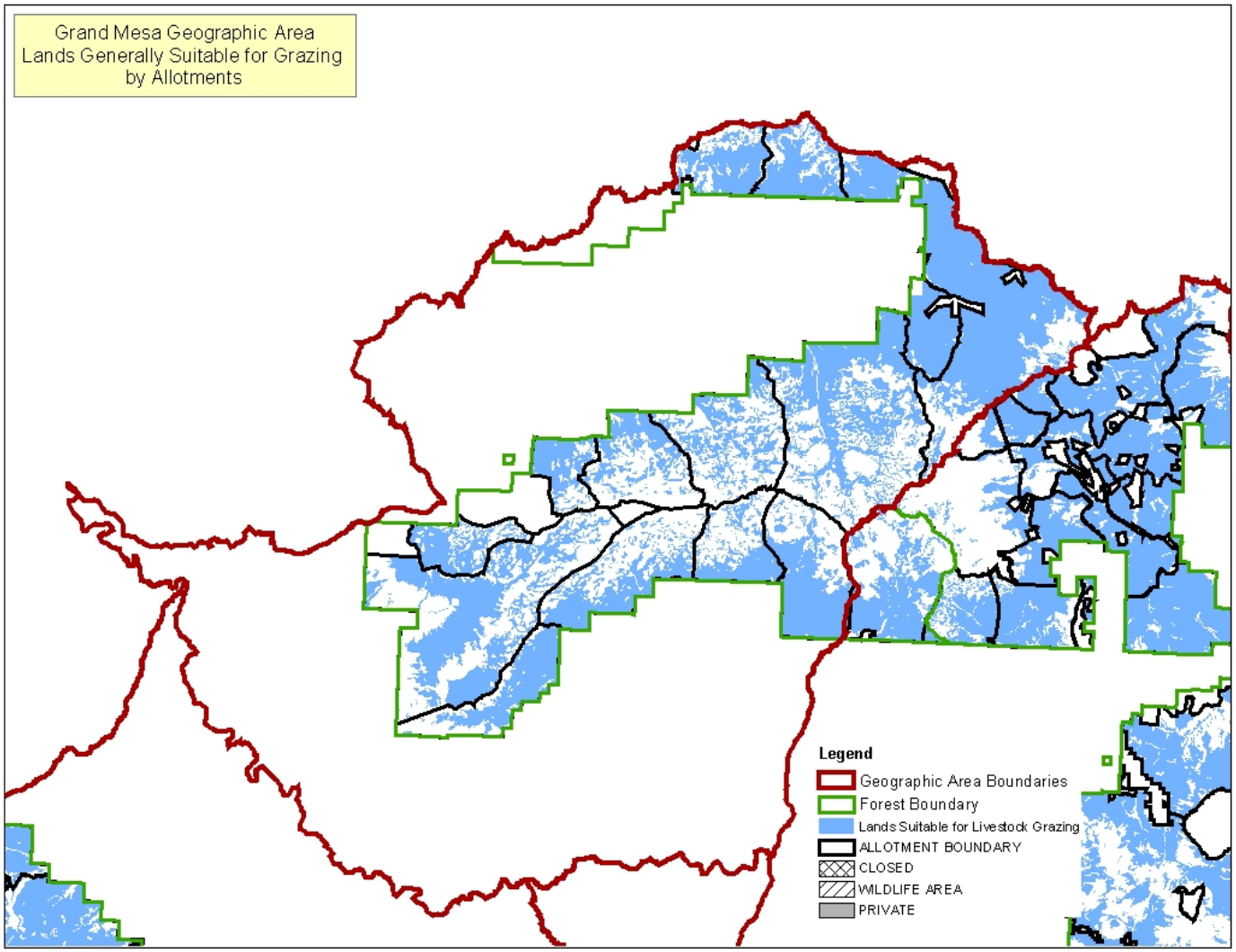

Figure 3. Lands Generally Suitable for Grazing, Grand Mesa Geographic Area.

Table 2 displays the acres of rangeland condition classes by vegetation type. On the Grand Mesa GA the majority of the rangeland suitable for grazing occurs in aspen (47 percent), and grass/forb (19 percent) cover types. The majority of the rangeland unsuitable for grazing occurs in spruce/fir (67 percent) and pinyon-juniper areas (13 percent). Of the rangeland areas suitable for grazing, 1 percent is in poor condition, 34 percent is in fair condition and 65 percent is in good condition. Most of the poor condition rangeland is in grass/forb (due to species composition – more annuals and non-native species). Most of the fair condition rangeland is in grass/forb, Gambel oak, and aspen. The majority of good condition rangeland is in aspen and Gambel oak cover types and is a function of the dominance of these cover types in suitable rangeland on the Grand Mesa GA. The majority of the mixed mountain shrub, aspen, and Gambel oak cover types are in good condition. Most of the remaining shrub types, cottonwood, spruce/fir and grass/forb suitable rangeland areas are in fair condition. A small percent of grass/forb makes up most of the poor condition, localized in areas that have been used as gathering areas for decades. Figure 4 displays this rangeland condition

Trend in rangeland vegetation is an evaluation of whether current conditions are moving towards desired conditions (upward), are remaining static (no change), or moving away from desired conditions (downward). Current trend was also determined by local rangeland management specialists based on measured trend transects and knowledge of on-the-ground conditions. Trend in rangeland conditions is displayed in Table 3 and in Figure 5. As mentioned before, areas that do not show trend are not suitable for grazing.

On the Grand Mesa GA essentially all of the rangeland suitable for grazing is in a static trend (100 percent), and the majority of each cover type is in a static trend. No areas of suitable rangeland are in a downward trend. A trace of grass/forb areas are in upward trend.

A comparison of condition and trend is presented in Table 4. The majority of the suitable rangeland on the Grand Mesa GA is in good conditions with a static trend. Most of the suitable rangeland in an upward trend is in poor condition. No areas are in a downward trend.

Table 2. Rangeland Condition by Cover Type for the Grand Mesa Geographic Area

Cover Type	Poor		Fair		Good		Total Suitable		Unsuitable	
	Acres	% of suitable cover type	Acres	% of suitable cover type	Acres	% of suitable cover type	Acres	% of Total Suitable	Acres	% of Total Unsuitable
Grass/Forb	1,563	5	23,143	68	9,295	27	34,001	19	1,339	1
Sagebrush			1,876	100			1,876	1	64	0
Gambel Oak	300	1	13,936	42	18,723	57	32,959	18	3,217	2
Mixed Mountain Shrub	8	0	713	5	12,823	95	13,545	7	1,470	1
Snowberry			7,555	87	1,127	13	8,682	5	226	0
Willow			2,333	68	1,113	32	3,447	2	22	0
Cottonwood			355	90	40	10	396	0	3	0
Aspen			11,352	13	74,525	87	85,877	47	2,934	2
Pinon/Juniper									18,259	13
Douglas-fir									3,318	2
Blue Spruce									55	0
Spruce/Fir			1	49	1	51	3	0	92,347	67
Bare/Rock*			548	100			548	0	11,266	8
Water*			16	40	24	60	41	0	4,254	3
Total	1,871	1	61,830	34	117,672	65	181,374		138,775	

* Areas are classified as a cover type is the dominant cover occupies more than 25 percent of area. Areas identified as Bare/Rock and Water cover types include areas with terrestrial vegetation.

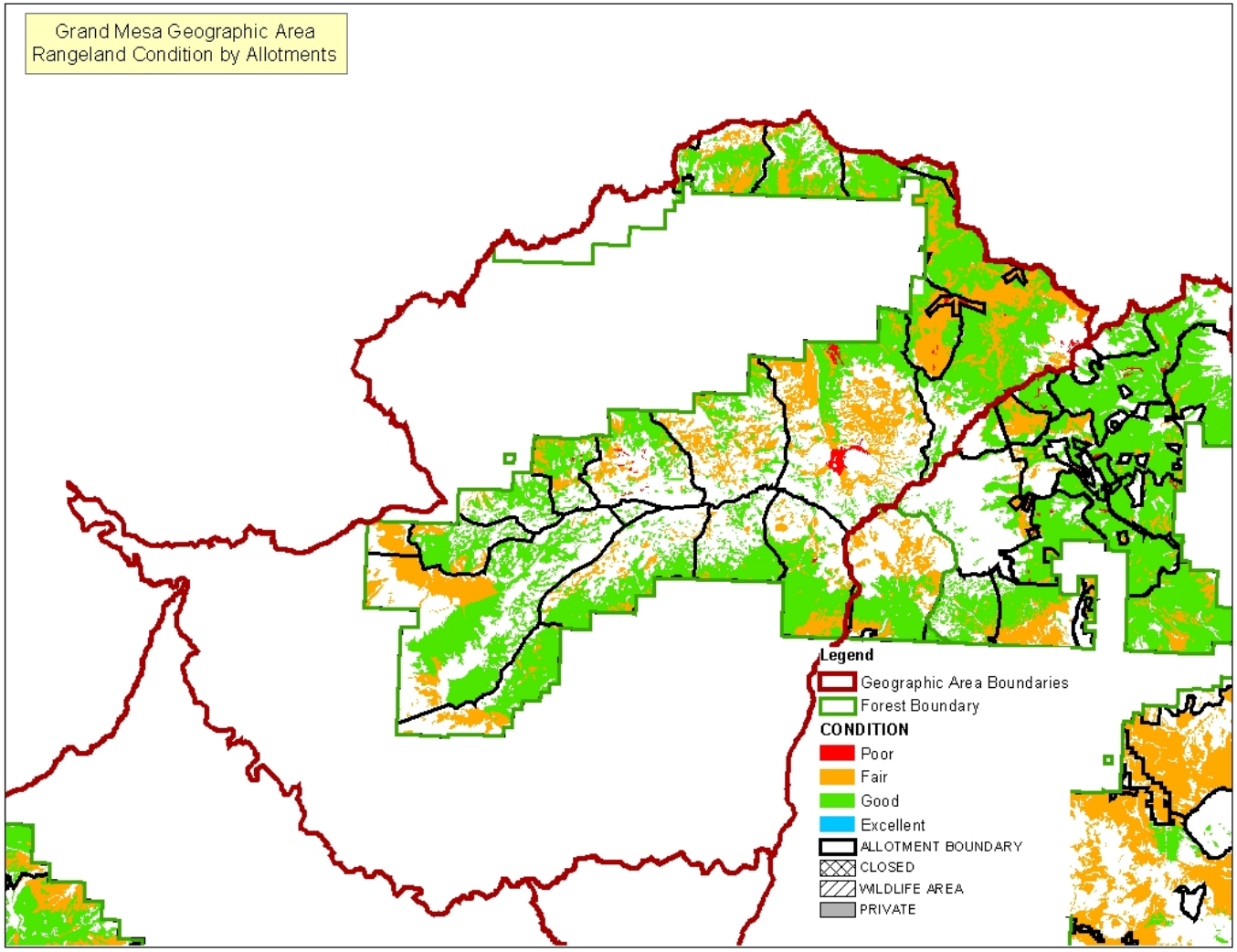

Figure 4. Rangeland Condition, Grand Mesa Geographic Area.

Table 3. Trend in Rangeland Conditions on the Grand Mesa Geographic Area

	Downward		Static		Upward		Total Suitable		Unsuitable	
Cover Type	**Acres**	**% of suitable cover type**	**Acres**	**% of suitable cover type**	**Acres**	**% of suitable cover type**	**Acres**	**% of Total Suitable**	**Acres**	**% of Total Unsuitable**
Grass/Forb			33,713	97	872	3	34,585	19	755	1
Sagebrush			1,876	100			1,876	1	64	0
Gambel Oak			34,506	100			34,506	19	1,670	1
Mixed Mountain Shrub			13,626	100			13,626	7	1,389	1
Snowberry			8,840	100			8,840	5	69	0
Willow			3,451	100			3,451	2	18	0
Cottonwood			396	100			396	0	3	0
Aspen			87,669	100			87,669	47	1,142	1
Pinon/Juniper									18,259	14
Douglas-fir									3,318	2
Blue Spruce									55	0
Spruce/Fir			7	100			7	0	92,343	69
Bare/Rock*			594	100			594	0	11,221	8
Water*			41	100			41	0	4,254	3
Total	0	0	184,718	100	872	0	185,590		134,559	

* Areas are classified as a cover type is the dominant cover occupies more than 25 percent of area. Areas identified as Bare/Rock and Water cover types include areas with terrestrial vegetation.

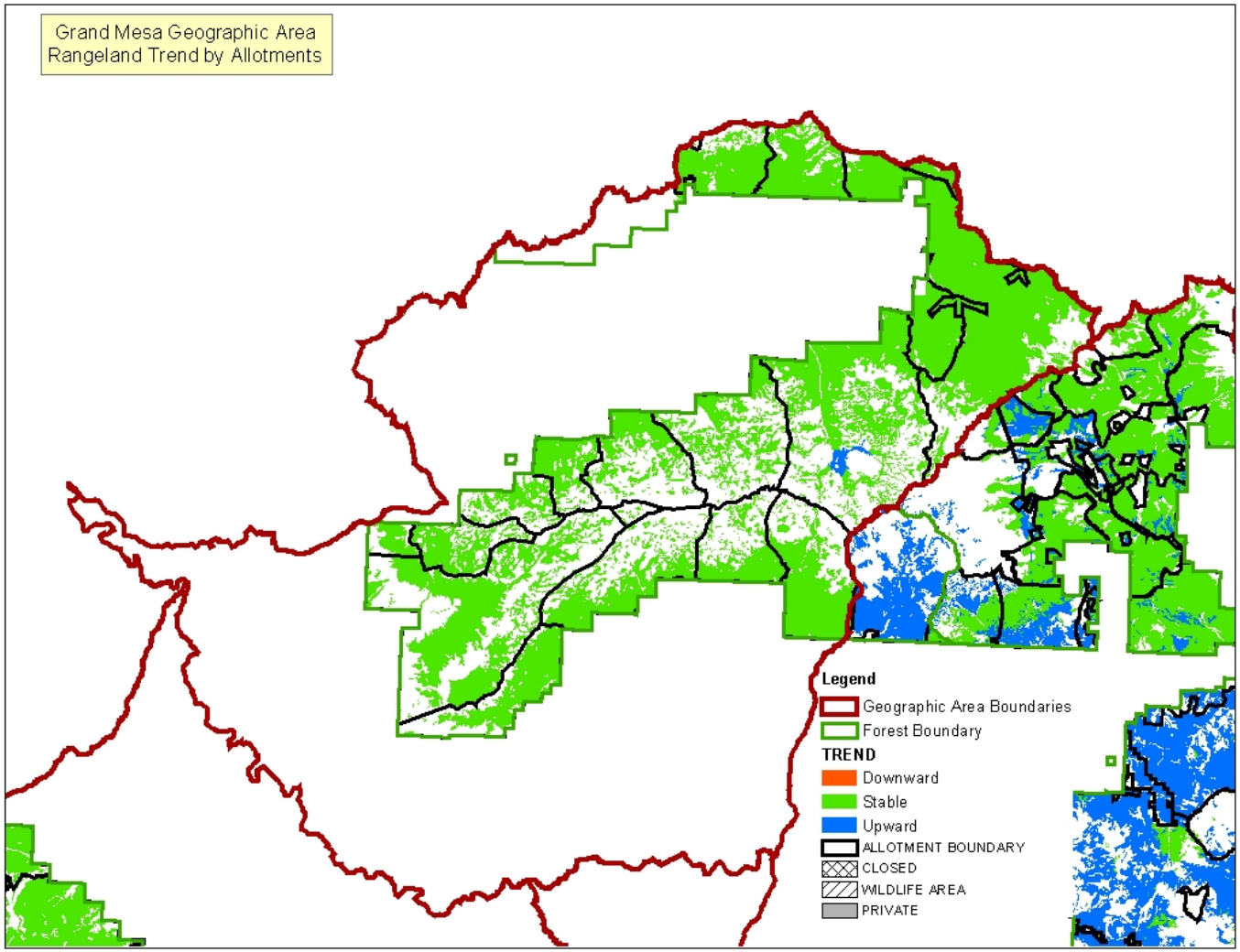

Figure 5. Rangeland Trend, Grand Mesa Geographic Area.

Table 4. Relationship of Rangeland Condition and Trend on Rangeland Suitable for Grazing on the Grand Mesa Geographic Area.

	Trend							
	Downward		Static		Upward			
Condition	**Acres**	**% of Condition**	**Acres**	**% of Condition**	**Acres**	**% of Condition**	**Total Acres**	**% of Total**
Poor		0	1,028	55	843	45	1,871	1
Fair		0	61,801	100	29	0	61,830	34
Good		0	117,672	100		0	117,672	65
Total	0	0	180,501	100	872	0	181,374	

The 1995 Recission Act required the completion of environmental analysis for each allotment with a grazing permit. Several landscape level Environmental Assessments (EA) are planned to be completed on the Grand Mesa GA over the next several years. These EAs need to consider current rangeland condition and trend; current class of livestock grazed, permitted numbers, season of use, evaluate current allotment configurations, and evaluate the compatibility between recreation and livestock grazing.

Moose have recently been reintroduced on the Grand Mesa. The Forest Service needs to work cooperatively with the Colorado Division of Wildlife to determine what effects the additional moose use is having on riparian and wetland habitats. As moose populations increase the two agencies also need to collaborate on developing population objectives for moose that, in combination with livestock use and other wild ungulates will maintain desired rangeland conditions.

All of the active grazing allotments on the Grand Mesa GA are managed under some form of planned grazing program. Each allotment is reviewed annually in company with the grazing permittees. Annual Operating Instructions (AOI) are agreed upon, based on an assessment of how the allotment was used the previous year, the objectives contained in the allotment management plan, and any new concerns that may have developed. In recent years, some AOIs have been altered to use livestock as a vegetative management tool. In some cases, careful timing of cattle use can be used to reduce less desirable plant species, while improving conditions for more desirable plant species. Livestock grazing is also being used to treat some species of noxious weeds, enhance winter game range forage conditions, and to aid in the establishment of desirable forage species following disturbances.

The current drought has forced major changes on the grazing program for this area. Numbers of livestock and timing of grazing use have been altered to insure range forage plants meet their physiological needs in light of greatly reduced availability of moisture and nutrients. The primary focus of the grazing program during the drought is careful monitoring of use by grazing animals, both domestic and wild, to guard against overuse of vegetation. Figures 6 and 7 display the recent trends in authorized livestock numbers and authorized animal unit months (AUMs).

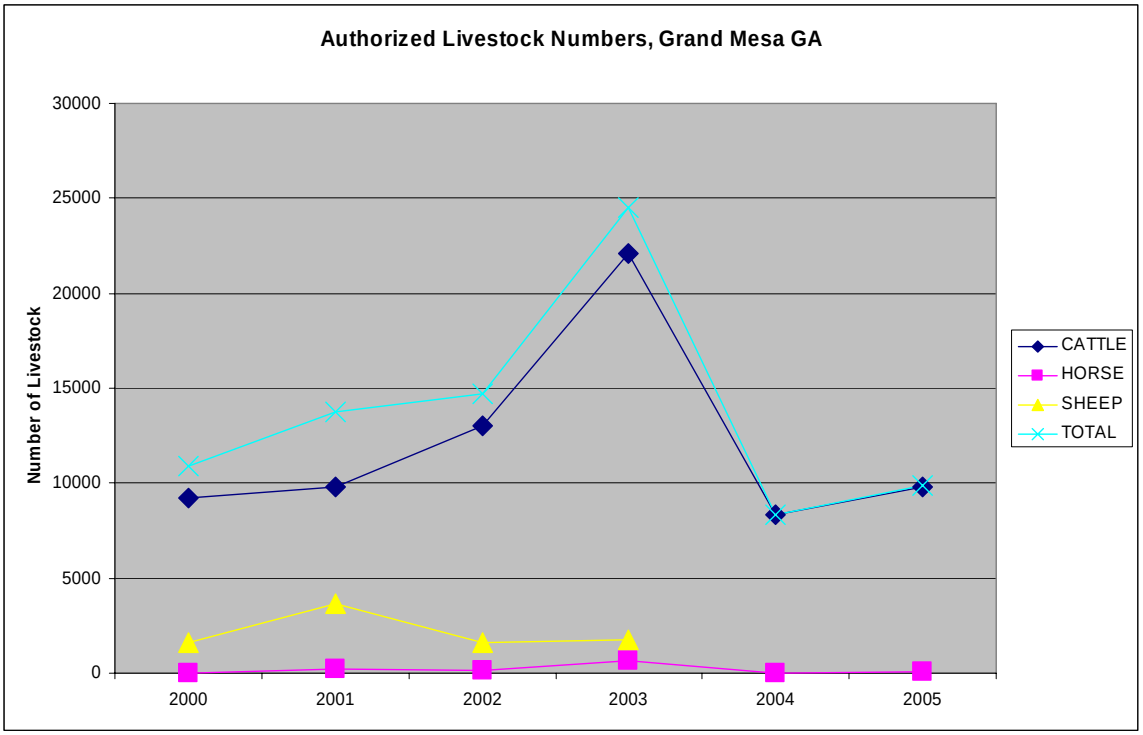

Figure 6. Authorized Livestock Number (2000-2005), Grand Mesa GA

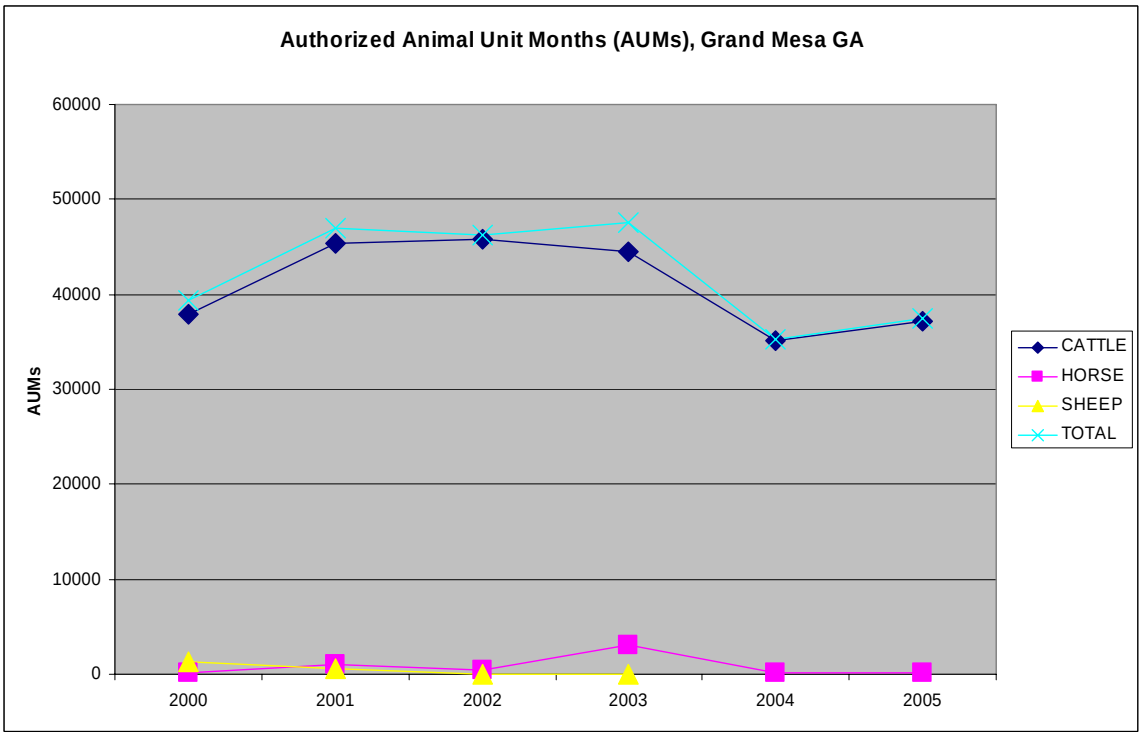

Figure 7. Authorized Animal Unit Months (2000-2005) Grand Mesa GA

Relationship between Federal Livestock Grazing and Local Communities

There is a relationship between permitted livestock grazing on federal lands (NFS and BLM) and private land holdings in the Grand Mesa Geographic Area. Permittees on both the NFS and BLM are required to own base property (land owned and used by the permittee for a farm or ranch operation, must include the basic facilities necessary to conduct a ranching operation and the capability to produce a part of the annual forage crop needed to support the permitted livestock over a yearlong period (FSH 2209.13, 12.21)). Most livestock permittees own land in addition to what they declare as base property; land which they also manage as part of their ranching operations.

In addition to providing forage for livestock, much of this private land also provides habitat for wildlife, especially big game species. The relatively undeveloped nature of the majority of this private land also provides open space to the surrounding communities.

Ferriday conducted a study to determine how much private land is associated with permitted livestock grazing on the Grand Mesa Geographic Area and the GMUG (2004). (NOTE: County parcel data was used for these studies. Incomplete data was available for Ouray County.) These studies found that of the 55 permittees on the Grand Mesa GA, 24 of them also have grazing permits on public land (administered by the BLM). These 55 permittees also own approximately 44,500 acres of private land in a three county region (Delta, Mesa, Montrose counties), in 309 different parcels. Figure 8 displays the private land owned by grazing permittees on the Grand Mesa. Table 5 displays the number of parcels and acres owned by permittees on the Grand Mesa, and the county in which the private land occurs.

Table 5. Number of Parcels and Acres of Private Land owned by NFS Permittees on the Grand Mesa GA.

	Delta	**Mesa**	**Montrose**
# Parcels	80	208	1
Acres	17,500	26,890	64

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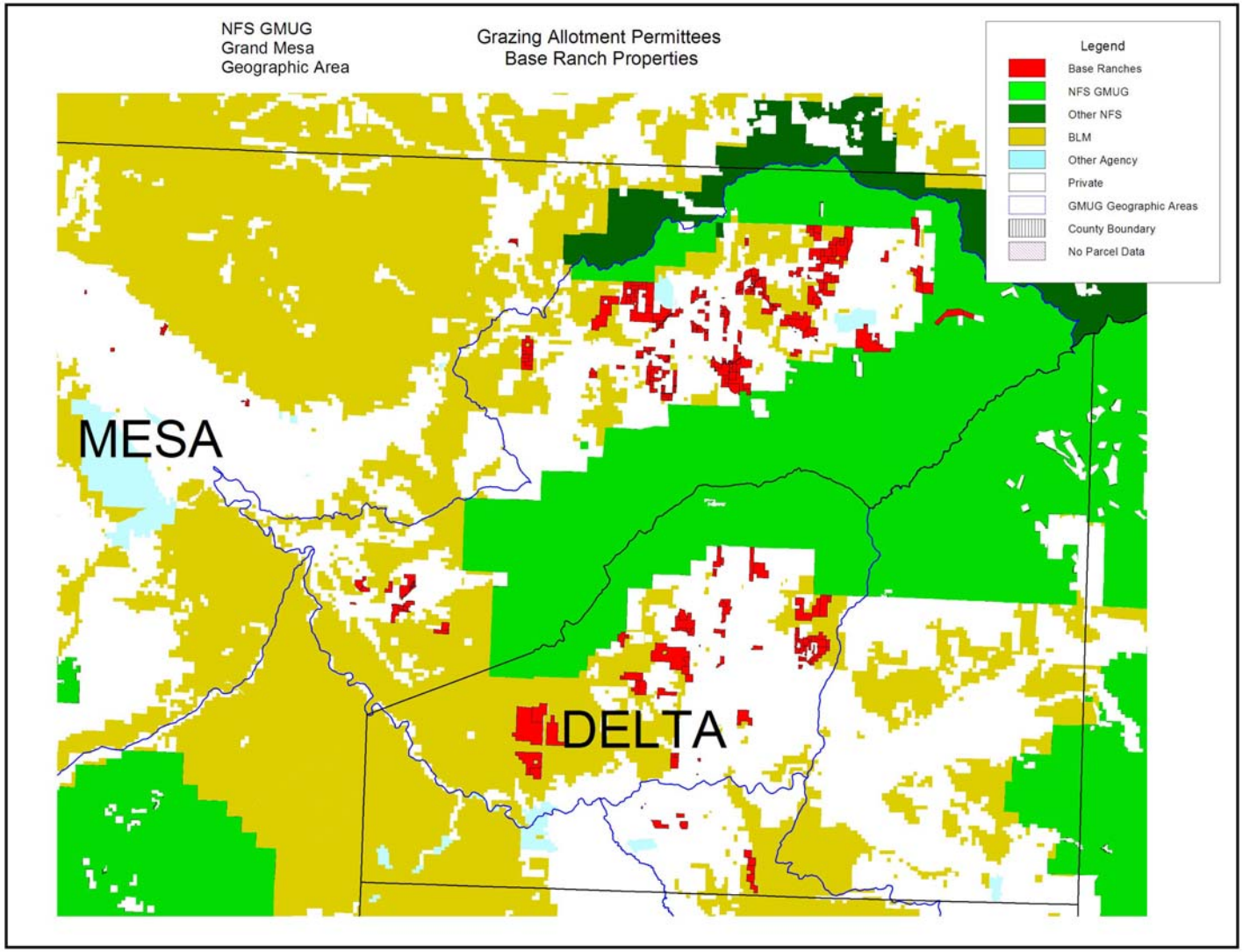

Figure 8. Private Lands owned by Grazing Permittees on the Grand Mesa GA

Table 6 displays the private land owned by Grand Mesa GA permittees as a percent of the private land in the various counties, and a comparison of the private land owned by all GMUG NF permittees as a percent of the private land within each county, and the private land owned by all federal permittees (GMUG NF and BLM). Livestock permittees on Grand Mesa GA own property in three different counties, and contribute to the amount of open space related to federal grazing permits.

Table 6. Percent of Private Land within each county owned by Grand Mesa GA Permittees, private lands owned by GMUG NF Permittees, and private lands owned by all federal (GMUG NF and BLM) Permittees..

	Delta	**Gunnison**	**Mesa**	**Montrose**	**Ouray***	**San Miguel**
% of Private owned by UP GA Permittees	5.3		5.0	0.1		
% of Private owned by GMUG NF Permittees	13.8	16.3	11.4	19.4	12.4	18.5
% of Private owned by all Federal Permittees	20.7	27.1	32.3	22.0	20.0	19.0

*Note: Incomplete parcel data was available for Ouray County when the study was completed.

Implications

Past changes in livestock management have resulted in improvements in rangeland condition and trend. Livestock management will continue to be the primary tool used to continue to maintain or achieve desired changes in condition and trend. However; due to the intensity of past livestock grazing, some areas of suitable rangeland no longer have the potential to achieve good conditions with stable or upward trend. Loss of top soil and native seed sources will not allow historic rangeland conditions to be restored. Some areas never had the potential to achieve good conditions with stable or upward trend (e.g., pinyon-juniper sites with very drought conditions).

Past fire suppression efforts have allowed shrubby and woody species to increase over time, reducing available forage in areas where dense overstories occur. Management activities that increase the diversity of seral or structural stages in rangeland vegetation types can result in increases in available forage in areas that are opened up or reset to earlier seral conditions.

Areas preferred by livestock tend to coincide with areas that have higher susceptibility to invasive plant species (deeper soils, better soil moisture conditions, more solar radiation reaching the ground). Livestock management needs to be implemented so that suitable habitat for invasive plant species is not created. Where feasible, livestock management can be used as a tool to reduce existing infestations of invasive plant species.

Future livestock management activities should be coordinated with wildlife habitat management. Competition between wild and domestic ungulates has been occurring in localized areas. This should be reduced where it is currently occurring and preventing the achievement of desired vegetation conditions (e.g., exceeding moderate amounts of utilization, preventing aspen regeneration following harvest). The Forest Service and Colorado Division of Wildlife should cooperate in identifying and maintaining wild

ungulate populations within objective levels that when combined with permitted livestock use result in desired forage utilization.

The compatibility of livestock grazing and the high levels of summer recreation and increasing development on private lands within the Forest need to be carefully evaluated during the landscape level analyses, also. If it is determined that these uses are not compatible in some areas, these areas may need to be permanently closed to livestock grazing.

Needs for Change

The current Forest Plan contains direction related to range utilization and livestock management that are no longer current with range management science and practice. Plan standards and guidelines set percent utilization limits based on the type of grazing system used. There are no standards related to improving rangeland health. Current livestock management is focused on adjusting the length of time, season of grazing use, intensity of use, and duration to allow forage plants to grow prior to use or to regrow after use. In some case high intensity, short duration grazing is used, which exceed existing plan standards, but achieves improved range conditions. The revised forest plan needs to include standards that relate to elements of rangeland health, such as maintaining riparian areas, wetlands, and stream channels in proper functioning condition, desired plant community composition, and wildlife habitat conditions.

The current Forest Plan contains very limited direction related to livestock management or range improvements, both structural and non-structural. The revised Forest Plan needs to contain guidelines to integrate livestock management and range improvements with other resource objectives.

Recent NEPA analysis and planning for range management has been based on adaptive management, which relies on monitoring to determine if desired objectives are being achieved. If monitoring results indicate that things are not working, adjustments in management can be made, and the adjustments are monitored. The revised forest plan needs to address adaptive management concepts.

References

Ferriday, J. 2004. Base Ranch Mapping of the GMUG Region. Submitted to US Forest Service, Delta, CO.

Sudworth, G. 1900. The White River Plateau and Battlement Mesa Forest Reserves. Government Printing Office, Washington, D.C.