CHAPTER 3. LANDSCAPE DISTURBANCES

Livestock and Rangeland Management – North Fork Valley

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, length of season of 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 North Fork Valley Geographic Area.

Conditions and Trends

Historic

Only livestock owned by the Utes grazed in this area prior to Euro-American settlement of the North Fork Valley 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) and Gunnison National Forests were 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. Upland sites did not receive much cattle use. Large bands of sheep were herded across portions of the North Fork Valley GA. Livestock pressure remained high through the 1940s. Cattle use peaked in 1919 to support meat production during World War I; sheep use peaked in 1930.

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.

Table 1 displays the changes in livestock numbers and animal unit months from1924 to 2004. Complete information is not available for what is now the Paonia Ranger District for all years.

Table 1. Paonia Ranger District Grazing Statistics

Year	Number of Cattle	Number of Horses	Number of Sheet	Number of Livestokc	AUMs
1924*	3,562		28,704	32,262	37,700
1936**	7,628		58,373	66,001	78,376
1940***	2,774		26,612	29,386	32,145
1945**	6,087		43,722	49,809	50,100
1966	7,446	N/A	32,045	39,491	44,880
1970	8,298	N/A	27,922	36,220	44,301
1977	7,067	60	24,123	31,250	53,687
1980 +	8,307	25	27,422	35,754	58,687
1985	8,148	66	19,330	27,544	55,007
1990	8,186	73	19,945	31,250	53,687
1992	8,014	78	19,245	27,337	59,402
1995	7,186	63	17,395	24,644	54,676
1997	7,866	64	17,395	25,325	57,740
1998	8,089	59	15,795	23,943	51,274
2001	8,097	52	16,733	24,882	61,662
2002	9,155	79	19,230	28,464	58,272
2003	8,670	74	12,782	21,452	54,036
2004	8,986	91	14,420	23,497	52,043

* Paonia RD only, no figures available for Muddy RD.
** Muddy RD and Paonia RD figures.
*** Muddy RD figures only.
\+ Change in how Animal Unit Month (AUMs) are calculated. A cow/calf pair is considered 1.32 AUMs – resulting in an increase in AUMs reported, not necessarily an increase in actual AUMs.

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

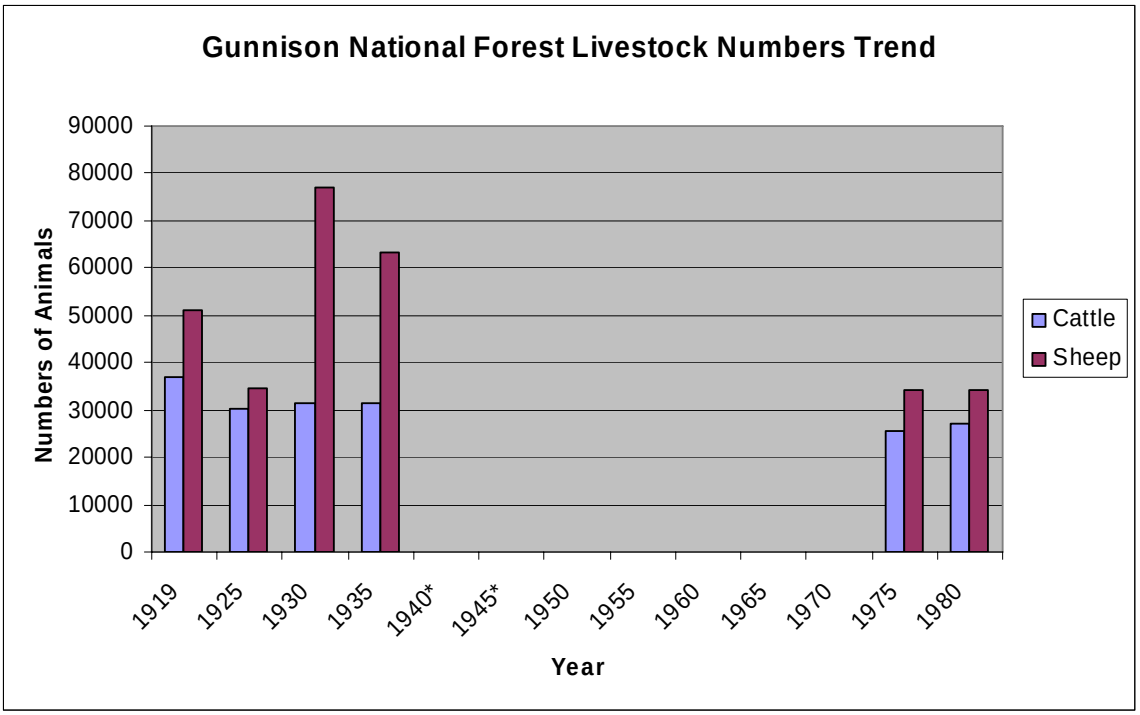

Figure 1. Permitted Livestock Numbers for the entire Uncompahgre National Forest (1908 – 1980)

For comparison, Table 2 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. Approximately a third of the total number of sheep grazed on the GMUG have been grazed on the North Fork Valley GA.

Table 2. 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, allotments have been vacated in areas where resource conflicts exist, or class of livestock has been changed. Figure 2 displays the current allotments on the North Fork Valley Geographic Area. Not all NFS lands on the North Fork Valley GA are included in grazing allotments. Private lands within the Forest boundary are excluded from allotments, with few exceptions. Areas have been identified for wildlife and are not included in livestock allotments. There are currently 27 allotments on the North Fork Valley GA, including 81 percent of the NFS lands. Only 25 of the allotments are currently active: 14 are permitted for cattle, 6 are permitted for sheep, and 5 have both sheep and cattle use permitted. Currently 2 allotments are vacant – there is no livestock use permitted. The vacant allotments are in the Raggeds Wilderness. These allotments were vacated in the late 1980s and early 1990s. The recent Raggeds Landscape Environmental Assessment and Decision Notice (2006) kept these allotments vacant.

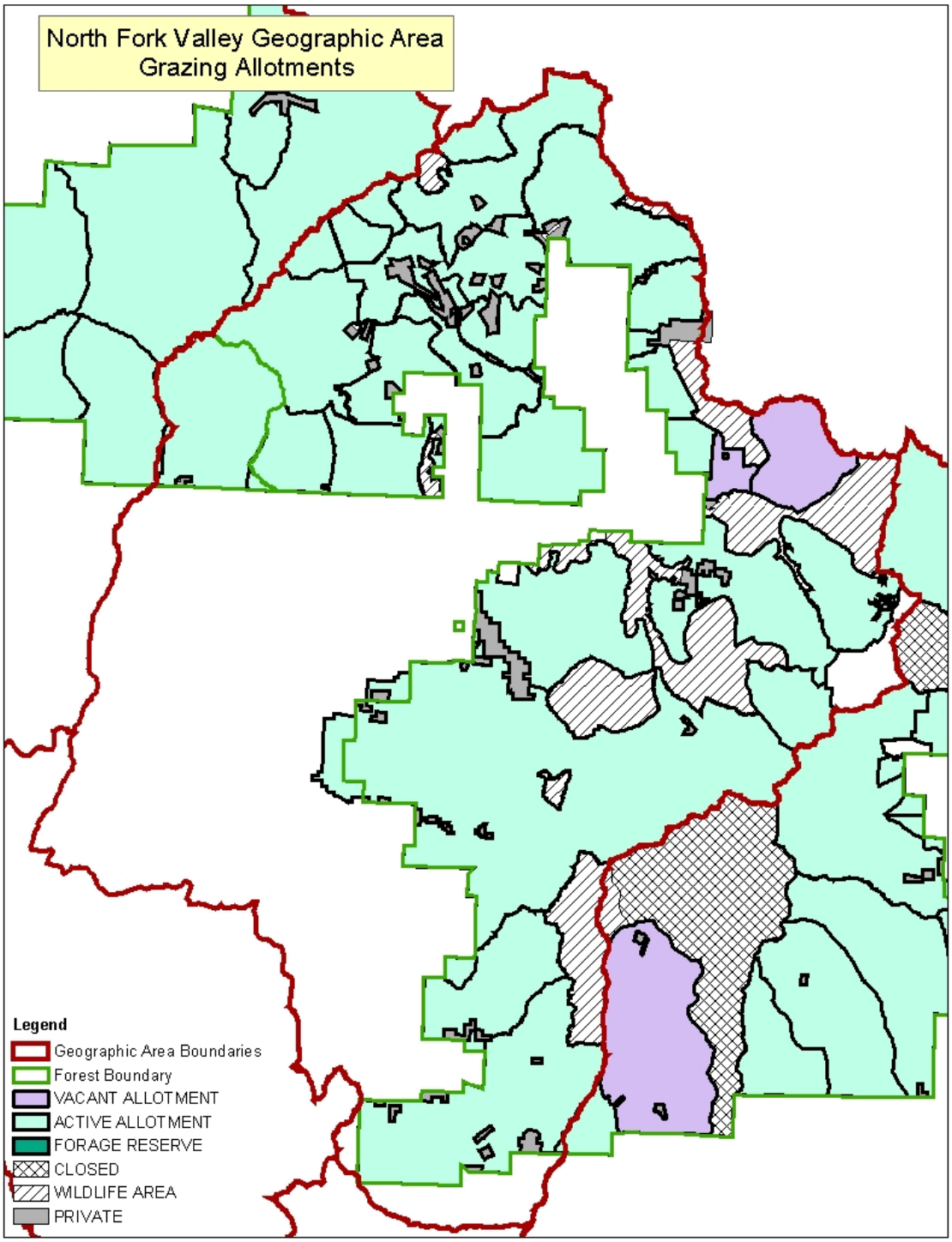

Figure 2. Current Grazing Allotments, North Fork Valley Geographic Area

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 North Fork Valley 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 North Fork Valley GA. Areas with no condition on the North Fork Valley GA are not considered to be suitable for livestock grazing.

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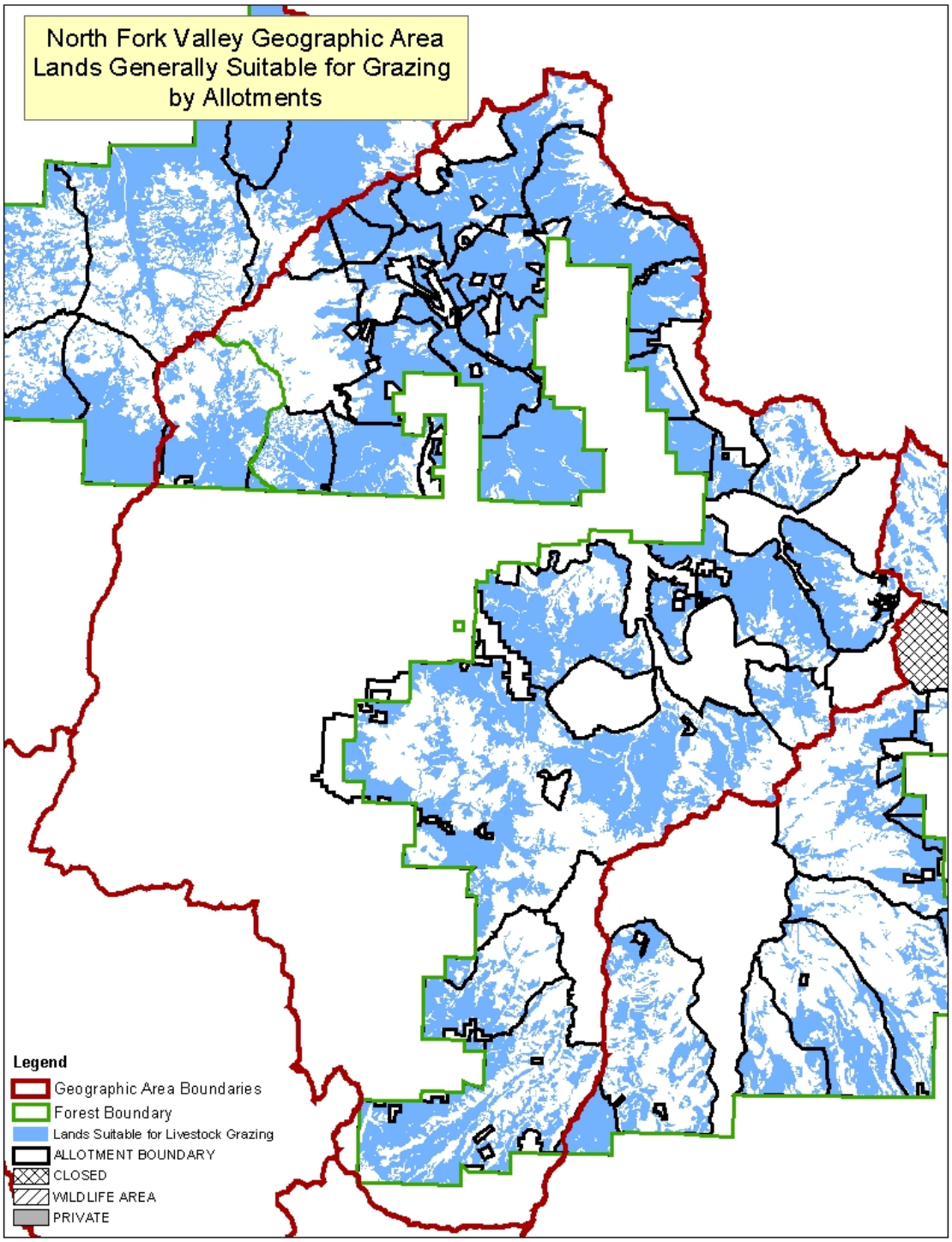

Figure 3. Lands Generally Suitable for Grazing, North Fork Valley Geographic Area

Table 3 displays the acres of rangeland condition classes by vegetation type. On the North Fork Valley GA the majority of the rangeland suitable for grazing occurs in aspen (65 percent), and Gambel oak (17 percent) cover types. The majority of the rangeland unsuitable for grazing occurs in spruce/fir (50 percent). Of the rangeland areas suitable for grazing, 1 percent is in poor condition, 48 percent is in fair condition and 51 percent is in good condition. Most of the poor condition rangeland is in grass/forb areas (due to species composition – more annuals and non-native species). Most of the fair condition rangeland is in aspen and Gambel oak, as is the majority of good condition rangeland. This is a function of the dominance of these cover types in suitable rangeland on the North Fork Valley GA. The majority of the aspen cover type is in good condition. Most of the remaining cover types are in fair condition. 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 4 and in Figure 5. As mentioned before, trend data is not available for the vacant allotments on the Norwood District portion of the GA. Elsewhere on the North Fork Valley GA, areas that do not show trend are not suitable for grazing.

On the North Fork Valley GA the majority of the rangeland suitable for grazing is in an upward trend (61 percent), and the majority of each cover type, except snowberry, is in an upward trend. A small amount of suitable rangeland is in a downward trend (less than 100 acres). The majority of areas in upward trend occur in aspen – again partly a function of the dominance of these cover types on this landscape.

A comparison of condition and trend is presented in Table 5. The majority of the suitable rangeland on the North Fork Valley GA is in fair conditions with an upward trend. Most of the suitable rangeland in a static trend is in good condition. The few areas in a downward trend are in a poor condition.

Table 3. Rangeland Condition by Cover Type for the North Fork Valley 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	894	4	18,925	76	5,200	21	25,018	9	12,927	6
Sagebrush	133	3	3,929	88	418	9	4,480	2	1,019	0
Gambel Oak	116	0	32,430	71	12,963	28	45,509	17	15,050	7
Mixed Mountain Shrub	185	2	8,702	84	1,512	15	10,399	4	12,767	6
Snowberry	22	2	407	36	690	62	1,119	0	149	0
Willow	138	5	2,075	73	625	22	2,837	1	7,045	3
Cottonwood			357	98	9	2	366	0	380	0
Aspen			60,581	35	114,069	65	174,650	65	30,784	13
Pinon/Juniper			1,890	99	15	1	1,905	1	840	0
Ponderosa Pine									259	0
Douglas-fir					8	100	8	0	1,171	1
Spruce/Fir			132	24	416	76	548	0	114,749	50
Bare/Rock*			22	7	279	93	301	0	30,904	13
Water*			48	69	22	31	70	0	1,100	0
Total	1,488	1	129,498	48	136,225	51	267,211		229,144	

* 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.

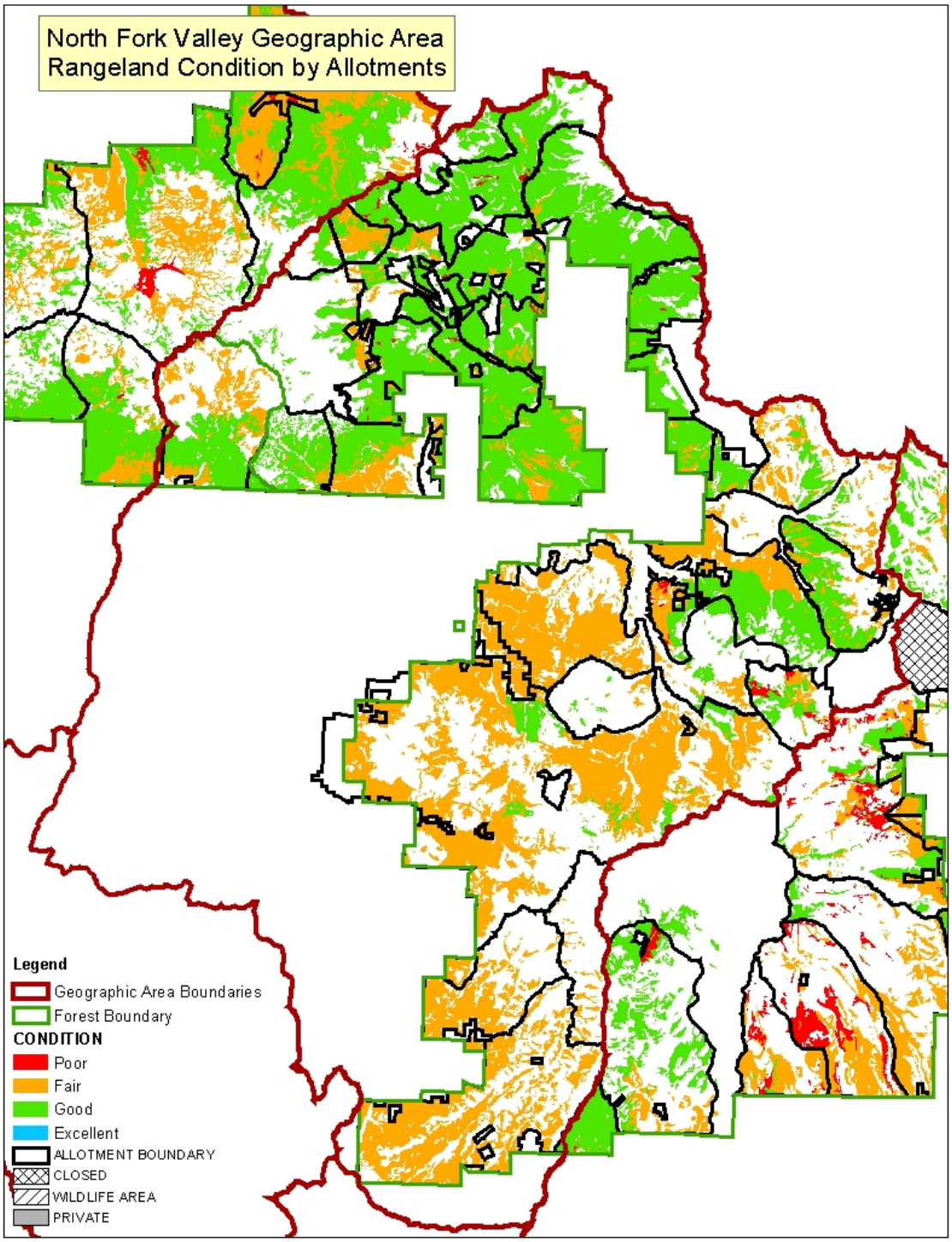

Figure 4. Rangeland Condition, North Fork Valley Geographic Area

Table 4. Trend in Rangeland Conditions on the North Fork Valley Geographic Area

Cover Type	Downward		Static		Upward		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	82	0	4,584	16	23,149	83	27,815	10	10,131	5
Sagebrush			448	10	4,032	90	4,480	2	1,019	0
Gambel Oak			13,772	28	36,295	72	50,067	17	10,492	5
Mixed Mountain Shrub			1,395	9	13,841	91	15,237	5	7,930	4
Snowberry			727	65	392	35	1,119	0	149	0
Willow			801	18	3,688	82	4,489	2	5,394	3
Cottonwood			9	2	363	98	372	0	374	0
Aspen			89,821	50	91,401	50	181,221	63	24,212	12
Pinon/Juniper			34	2	2,026	98	2,060	1	684	0
Ponderosa Pine									259	0
Douglas-fir	8	100					8	0	1,171	1
Spruce/Fir			414	67	202	33	616	0	114,681	55
Bare/Rock*			136	45	167	55	303	0	30,902	15
Water*					70	100	70	0	1,100	1
Total	90	0	112,142	39	175,625	61	287,857		208,498	

* 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.

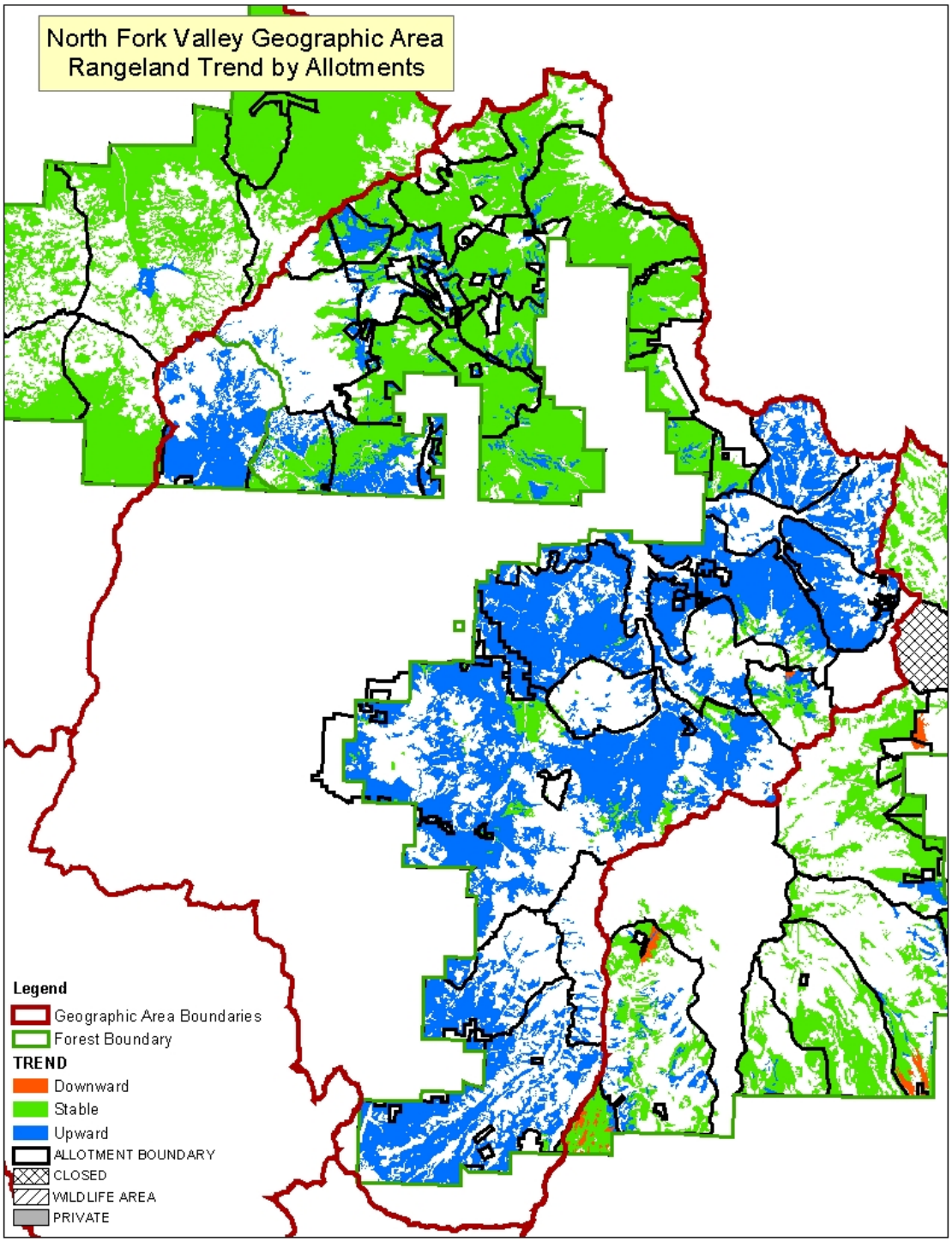

Figure 5. Rangeland Trend, North Fork Valley Geographic Area

Table 5. Relationship of Rangeland Condition and Trend on Rangeland Suitable for Grazing on the North Fork Valley Geographic Area.

	Trend							
	Downward		Static		Upward			
Condition	**Acres**	**% of Condition**	**Acres**	**% of Condition**	**Acres**	**% of Condition**	**Total Acres**	**% of Total**
Poor	82	6	149	10	1,256	84	1,488	1
Fair		0	2,772	2	126,605	98	129,377	48
Good	8	0	108,335	80	27,882	20	136,225	51
Total	90	0	111,256	39	155,743	61	267,089	

The 1995 Recission Act required the completion of environmental analysis for each allotment with a grazing permit. As a result four landscape level Environmental Assessments (EA) have been completed on the North Fork Valley GA. An EA for the West Elk Allotment was completed in 1995, and did not need to be redone. The primary concerns addressed in these EAs included: maintenance or improvement of rangeland health and productivity, providing for wildlife habitat, maintenance or improvement of riparian area conditions, reducing perceived recreation and livestock interactions, and maintaining social and economic relationships between grazing and local communities.

All of the active grazing allotments on the North Fork Valley 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 and sheep 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).

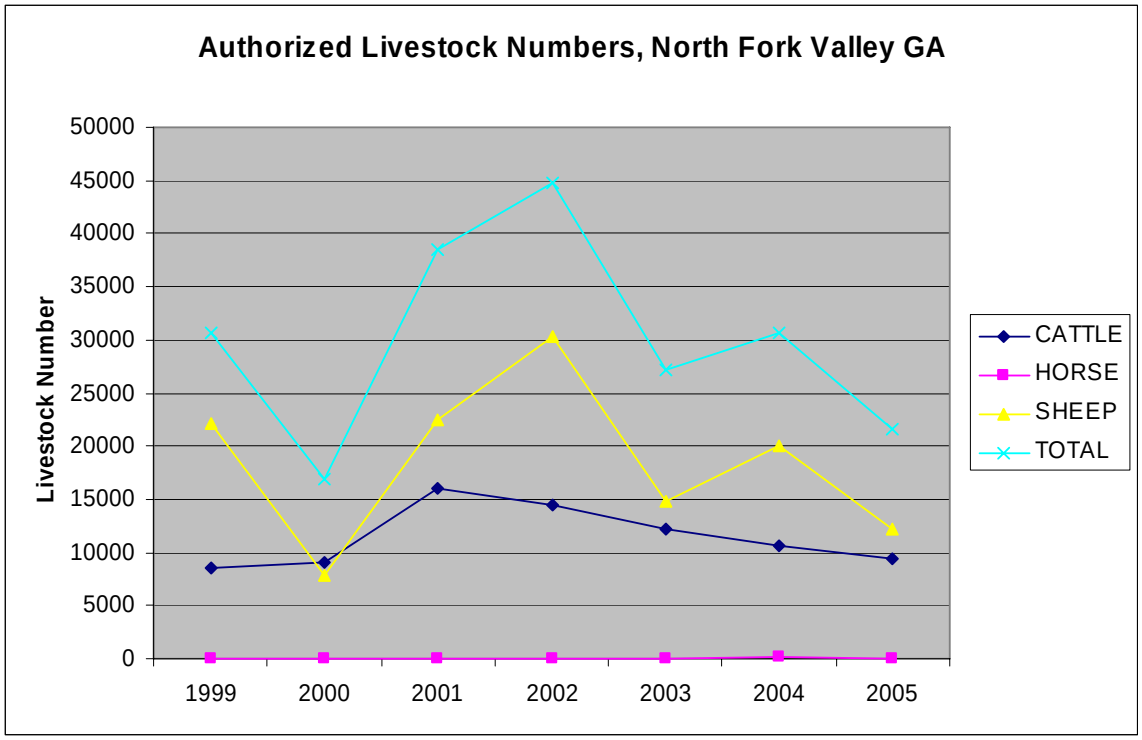

Figure 6. Authorized Livestock Number (1999-2005), North Fork Valley GA

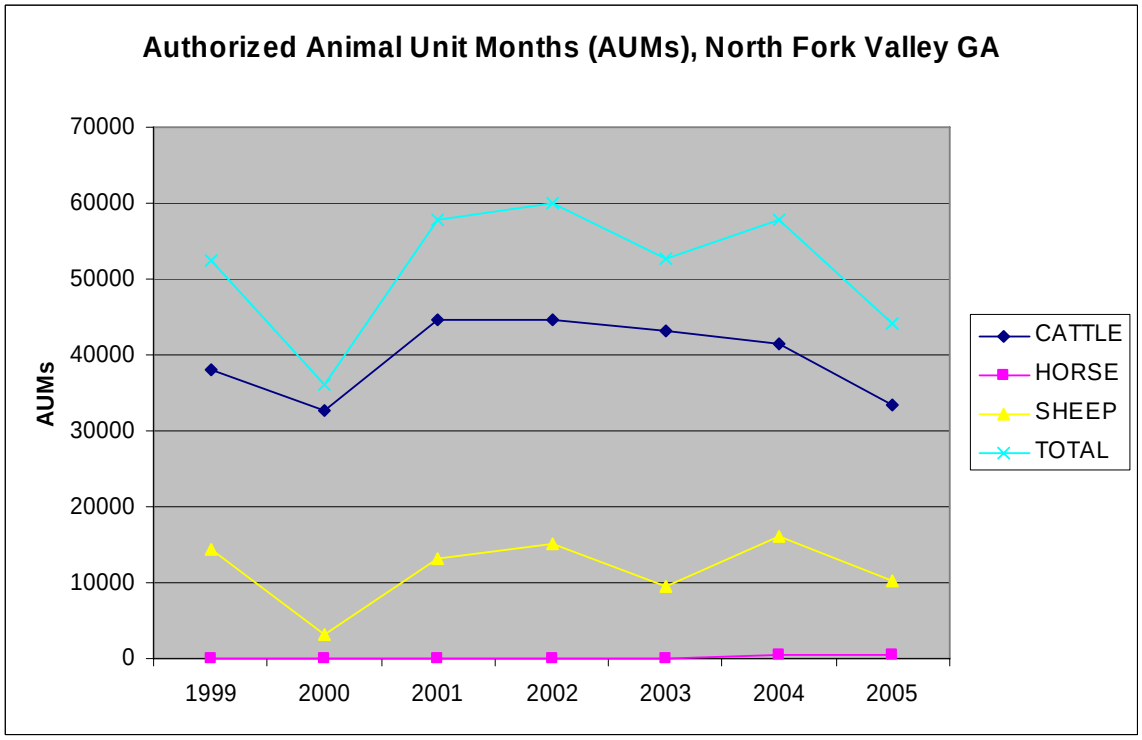

Figure 7. Authorized Animal Unit Months (1999-2005) North Fork Valley GA

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 North Fork Valley 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 North Fork Valley Geographic Area and the GMUG (2004). (NOTE: County parcel data was used for these studies.) These studies found that of the 41 permittees on the North Fork Valley GA, 19 of them also have grazing permits on public land (administered by the BLM). These 19 permittees also own approximately 50,200 acres of private land in a four county region (Delta, Gunnison, Mesa, and Montrose counties), in 239 different parcels. Figure 8 displays the private land owned by grazing permittees on the North Fork Valley, and the areas with incomplete data. Table 6 displays the number of parcels and acres owned by permittees on the North Fork Valley, and the county in which the private land occurs.

Table 6. Number of Parcels and Acres of Private Land owned by NFS Permittees on the North Fork Valley GA.

	Delta	**Gunnison**	**Mesa**	**Montrose**
# Parcels	162	20	9	48
Acres	24,058	9,964	1,090	15,085

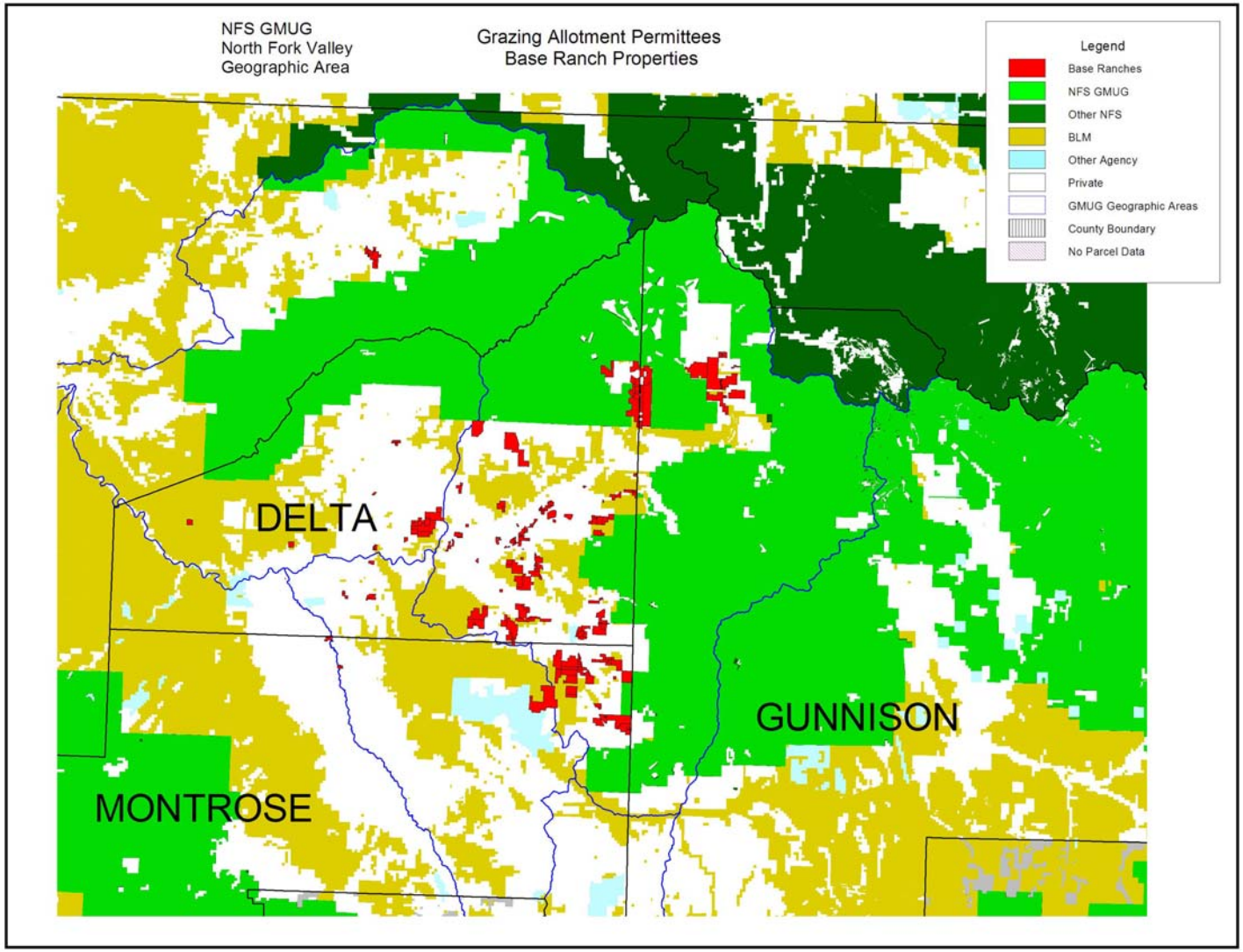

Figure 8. Private Lands owned by Grazing Permittees on the North Fork Valley GA

Table 7 displays the private land owned by North Fork Valley 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 North Fork Valley GA own property in four different counties, and contribute a large amount of the open space related to federal grazing permits in Delta County.

Table 7. Percent of Private Land within each county owned by North Fork Valley 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	7.3	3.3	0.2	3.6		
% 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.

Livestock grazing strategies also need to be designed to reduce or eliminate potential influences on other wildlife species such as Gunnison sage-grouse, or other ground nesting birds. Sufficient residual vegetation needs to be left or allowed to regrow following livestock grazing to provide necessary cover for many bird species. To prevent nest trampling, timing of grazing may need to be adjusted to avoid periods when birds are on the nest. Management guidance provided in the Gunnison sage-grouse Rangewide Conservation Plan (2005) should be incorporated into livestock management.

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 analyses and planning for rangeland 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.

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Gunnison Sage-grouse Rangewide Steering Committee. 2005. Gunnison sage-grouse rangewide conservation plan. Colorado Division of Wildlife. Denver, CO.