CHAPTER 3. LANDSCAPE DISTURBANCES

Livestock and Rangeland Management – Gunnison Basin

Domestic livestock grazing has been a major use on the GMUG since Euro-American settlement occurred in the area in 1874. 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 Gunnison Basin Geographic Area.

Conditions and Trends

Historic

Only livestock owned by the Utes grazed in this area prior to Euro-American settlement of the Gunnison Basin Geographic Area. Cattle grazing was unregulated from the late 1870s to 1905. Grazing was limited to the Gunnison Basin valley, until settlement transformed these lower areas into farms and communities (beginning in 1874). Grazing shifted to the higher elevations during the summer seasons. Information on numbers of livestock during this early period is not available. Efforts to control grazing began once the Cochetopa 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.

Domestic sheep were first introduced into the Gunnison Basin in 1916 (Kerr 1980). Disputes over division of the range between cattle and sheep occurred. Sheep use was allowed in the high unutilized timber and above timberline areas beginning in 1917. Large bands of sheep were herded across portions of the Gunnison Basin GA. Several stock driveways were heavily used when moving sheep onto and off of the National Forest. Livestock pressure remained high through the 1940s.

The 1950s through the 1980s can be characterized as the period of rangeland development on the Gunnison Basin. Fences, stock ponds, and spring developments were gradually installed to provide better control of livestock. Extensive areas of sagebrush were treated (e.g., sprayed, disked, burned) and reseeded to palatable forage species to

increase carrying capacities for livestock and improve livestock distribution (see Vegetation assessment for additional information).

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

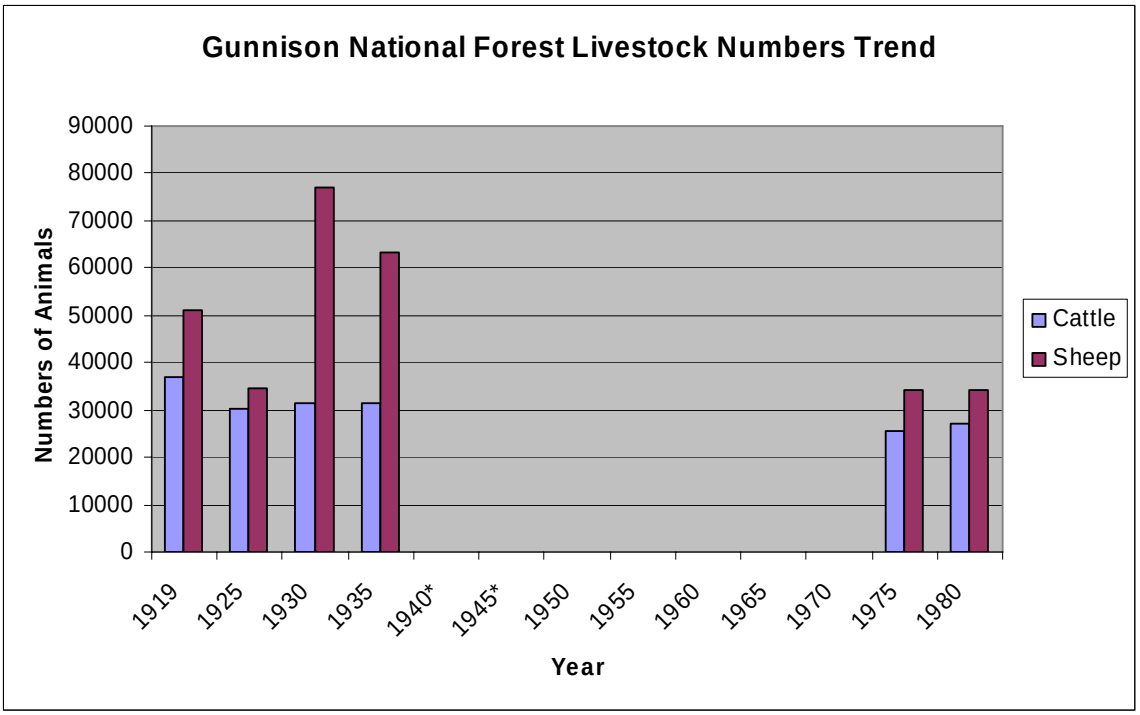

Figure 1. Permitted Livestock Numbers for the entire Gunnison National Forest (1908 – 1980).

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, allotments have been vacated or closed in areas where resource conflicts exist, or class of livestock has been changed. Figure 2 displays the current allotments on the Gunnison Basin Geographic Area. Not all NFS lands on the Gunnison Basin GA are included in grazing allotments. Private lands within the Forest boundary are excluded from allotments, with few exceptions. There are currently 70 allotments on the Gunnison Basin GA, including 88 percent of the NFS lands. Only 57 of the allotments are currently active: 53 are permitted for cattle, and four are permitted for sheep. Three allotments are being managed as forage reserves – livestock use permitted on other allotments may be temporarily shifted to these reserves. Currently 10 allotments are vacant – there is no livestock use permitted. These allotments were vacated for many different reasons (e.g., permittees went out of business, allotments were combined, conflicts between livestock and recreation use, conflicts between livestock and wildlife use (bighorn sheep)).

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 Gunnison Basin GA.

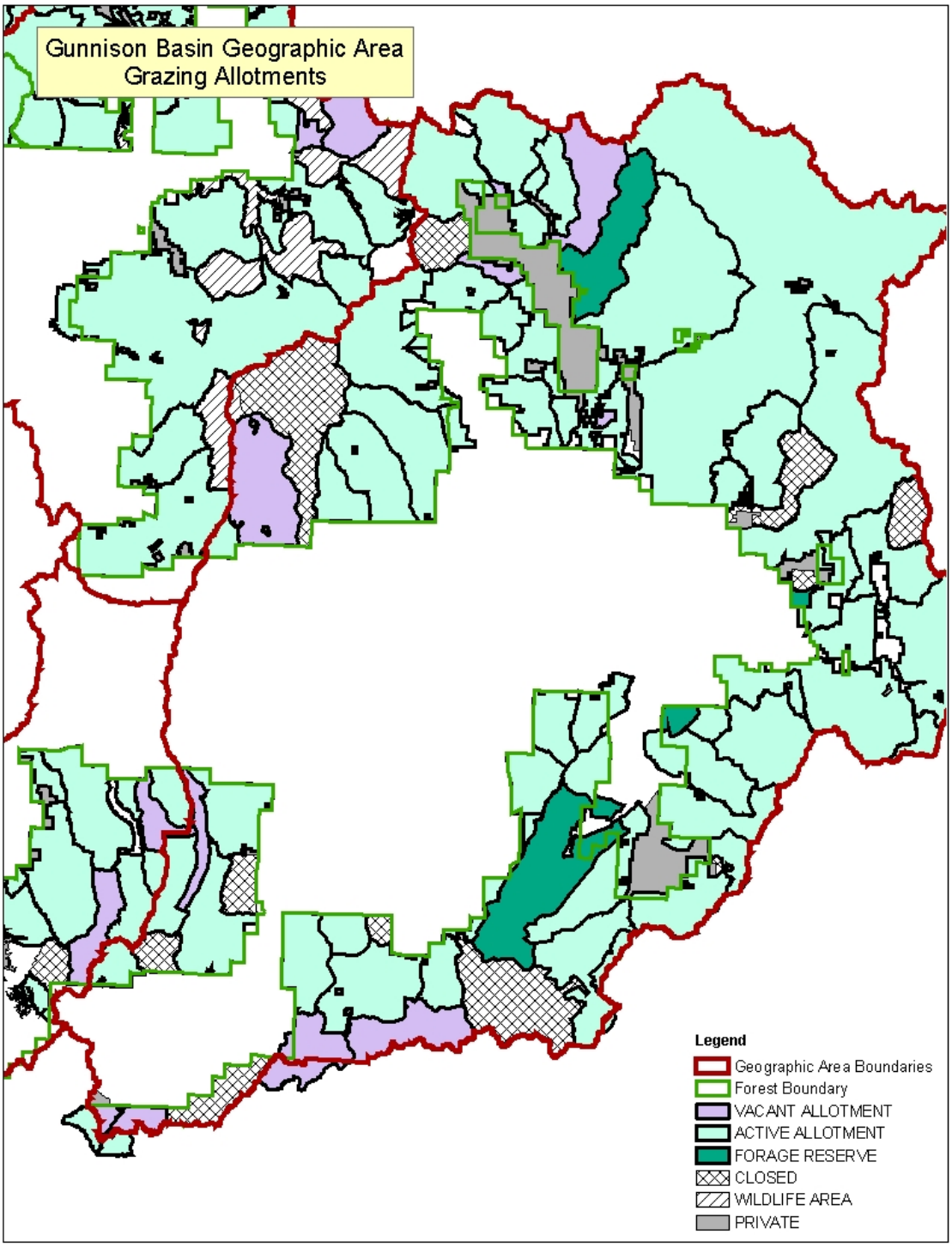

Figure 2. Current Grazing Allotments, Gunnison Basin Geographic Area

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 Gunnison Basin GA. Areas outside of vacant allotments displayed with no condition on the Gunnison Basin GA are not considered to be suitable for livestock grazing.

Table 2 displays the acres of rangeland condition classes by vegetation type. On the Gunnison Basin GA the majority of the rangeland suitable for grazing occurs in grass/forb (36 percent), and aspen (32 percent) cover types. The majority of the rangeland unsuitable for grazing occurs in spruce/fir (35 percent) and lodgepole pine (28 percent). Of the rangeland areas suitable for grazing, four percent is in poor condition, 39 percent is in fair condition and 57 percent is in good condition. Most of the poor condition rangeland is in grass/forb, aspen and sagebrush (due to species composition – more annuals and non-native species). Most of the fair condition rangeland is in these same cover types. The majority of good condition rangeland is in grass/forb and aspen cover types. The majority of the grass/forb, mixed mountain shrub, cottonwood, aspen and ponderosa pine cover types are in good condition. Most of the remaining shrub and conifer 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 3 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 Gunnison Basin GA, areas that do not show trend are not suitable for grazing.

On the Gunnison Basin GA the majority of the rangeland suitable for grazing is in a static trend (70 percent), and the majority of most cover type is in a static trend. Only a small amount of area of suitable rangeland are in a downward trend (three percent). The majority of areas in upward trend occur in aspen.

A comparison of condition and trend is presented in Table 4. The majority of the suitable rangeland on the Gunnison Basin GA is in fair condition with a static trend. Most of the suitable rangeland in an upward trend is in good condition. Most of the areas in a downward trend are in fair condition.

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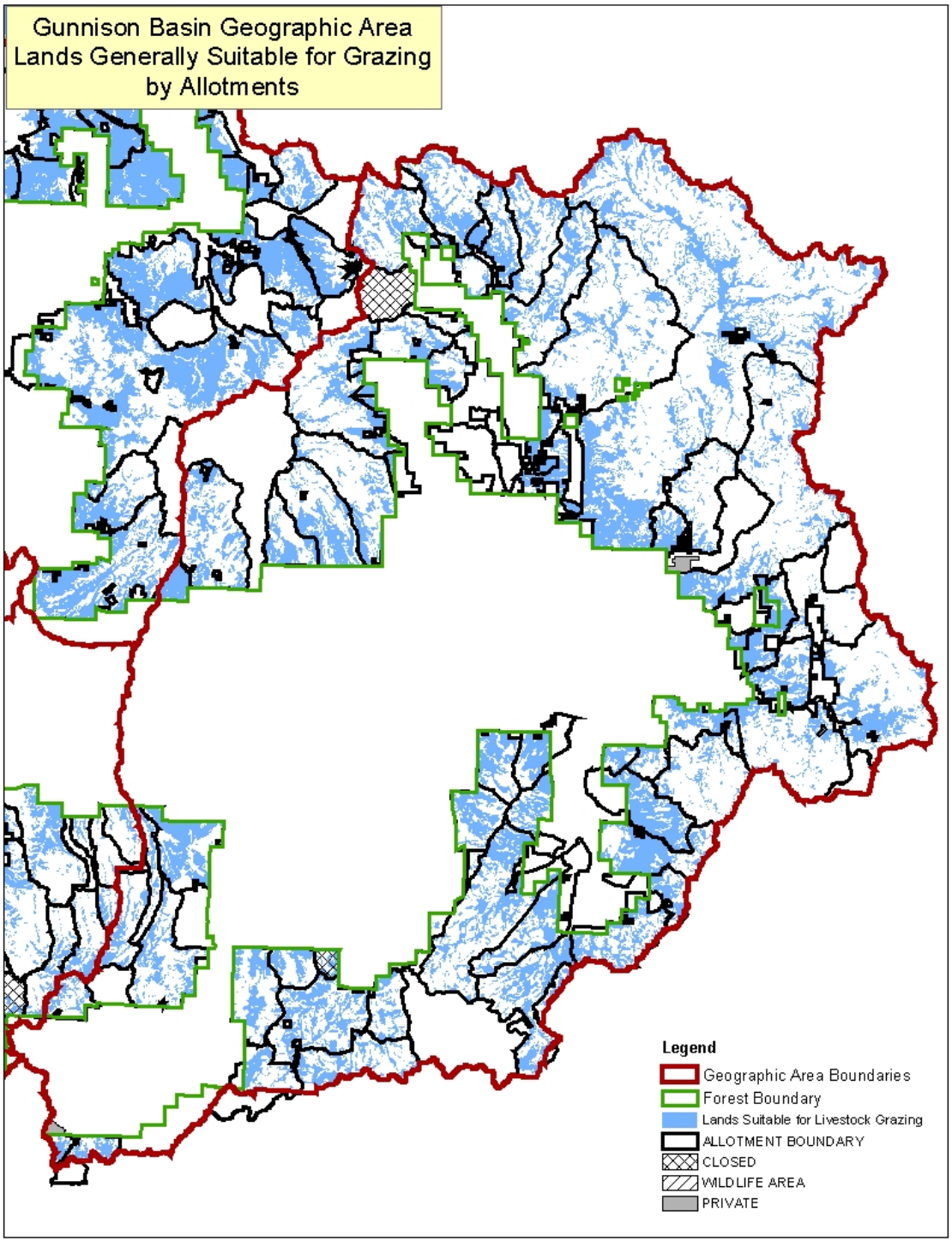

Figure 3. Lands Generally Suitable for Grazing, Gunnison Basin Geographic Area

Table 2. Rangeland Condition by Cover Type for the Gunnison Basin 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	7,349	5	52,085	34	94,527	61	153,962	36	107,328	11
Sagebrush	3,330	7	30,730	67	11,799	26	45,860	11	18,788	2
Gambel Oak			149	100			149	0	1,591	0
Mixed Mountain Shrub	1,339	22	1,825	30	2,966	48	6,130	1	5,247	1
Snowberry			51	100			51	0	340	0
Willow	947	2	22,998	49	22,667	49	46,612	11	16,450	2
Cottonwood			115	46	133	54	248	0	540	0
Aspen	3,692	3	43,717	32	89,008	65	136,417	32	58,326	6
Pinon/Juniper			25	100			25	0	289	0
Ponderosa Pine	226	5	2,048	42	2,605	53	4,878	1	6,582	1
Lodgepole Pine	58	0	6,767	58	4,897	42	11,722	3	267,870	28
Limber Pine									585	0
Douglas-fir			3,138	74	1,115	26	4,253	1	31,434	3
Blue Spruce			99	11	839	89	938	0	1,396	0
Spruce/Fir	590	5	3,729	29	8,579	67	12,899	3	338,014	35
Bristlecone Pine			602	15	3,328	85	3,930	1	3,320	0
Bare/Rock*	50	2	127	4	3,047	95	3,224	1	94,047	10
Water*			5	8	58	92	64	0	3,000	0
Unclassified			101	99	1	1	102	0	1,594	0
Total	17,581	4	168,313	39	245,568	57	431,462		956,741	

* 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.

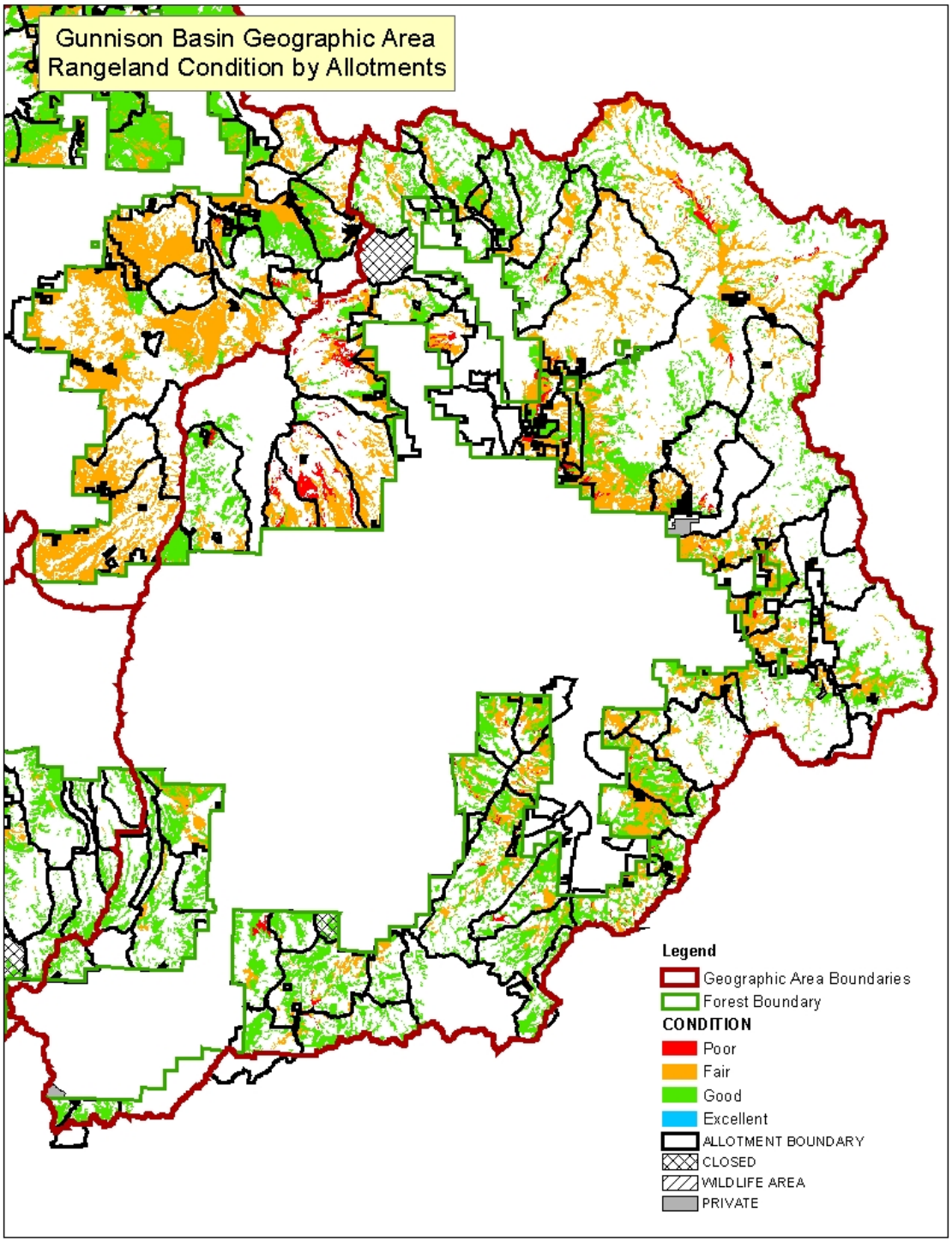

Figure 4. Rangeland Condition, Gunnison Basin Geographic Area

Table 3. Trend in Rangeland Conditions on the Gunnison Basin 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	4,207	3	122,948	78	30,074	19	157,229	34	104,060	11
Sagebrush	2,731	6	35,099	76	8,656	19	46,485	10	18,162	2
Gambel Oak		0	161	100		0	161	0	1,579	0
Mixed Mountain Shrub	587	9	4,096	64	1,702	27	6,385	1	4,992	1
Snowberry					51	100	51	0	340	0
Willow	989	2	35,436	75	10,819	23	47,244	10	15,817	2
Cottonwood	59	19	248	81		0	307	0	480	0
Aspen	3,017	2	78,628	55	60,347	43	141,992	31	52,752	6
Pinon/Juniper		0	126	100		0	126	0	188	0
Ponderosa Pine	478	9	1,969	38	2,720	53	5,168	1	6,293	1
Lodgepole Pine	33	0	20,597	86	3,367	14	23,996	5	255,596	28
Limber Pine									585	0
Douglas-fir	224	4	3,518	62	1,944	34	5,687	1	30,000	3
Blue Spruce			966	72	375	28	1,341	0	993	0
Spruce/Fir	580	3	12,703	76	3,374	20	16,658	4	334,255	36
Bristlecone Pine			1,072	26	2,986	74	4,058	1	3,192	0
Bare/Rock*	50	1	5,650	79	1,446	20	7,146	2	90,124	10
Water*			66	100			66	0	2,997	0
Unclassified	118	20	447	74	36	6	600	0	1,096	0
Total	13,074	3	323,731	70	127,897	28	464,702		923,501	

* 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.

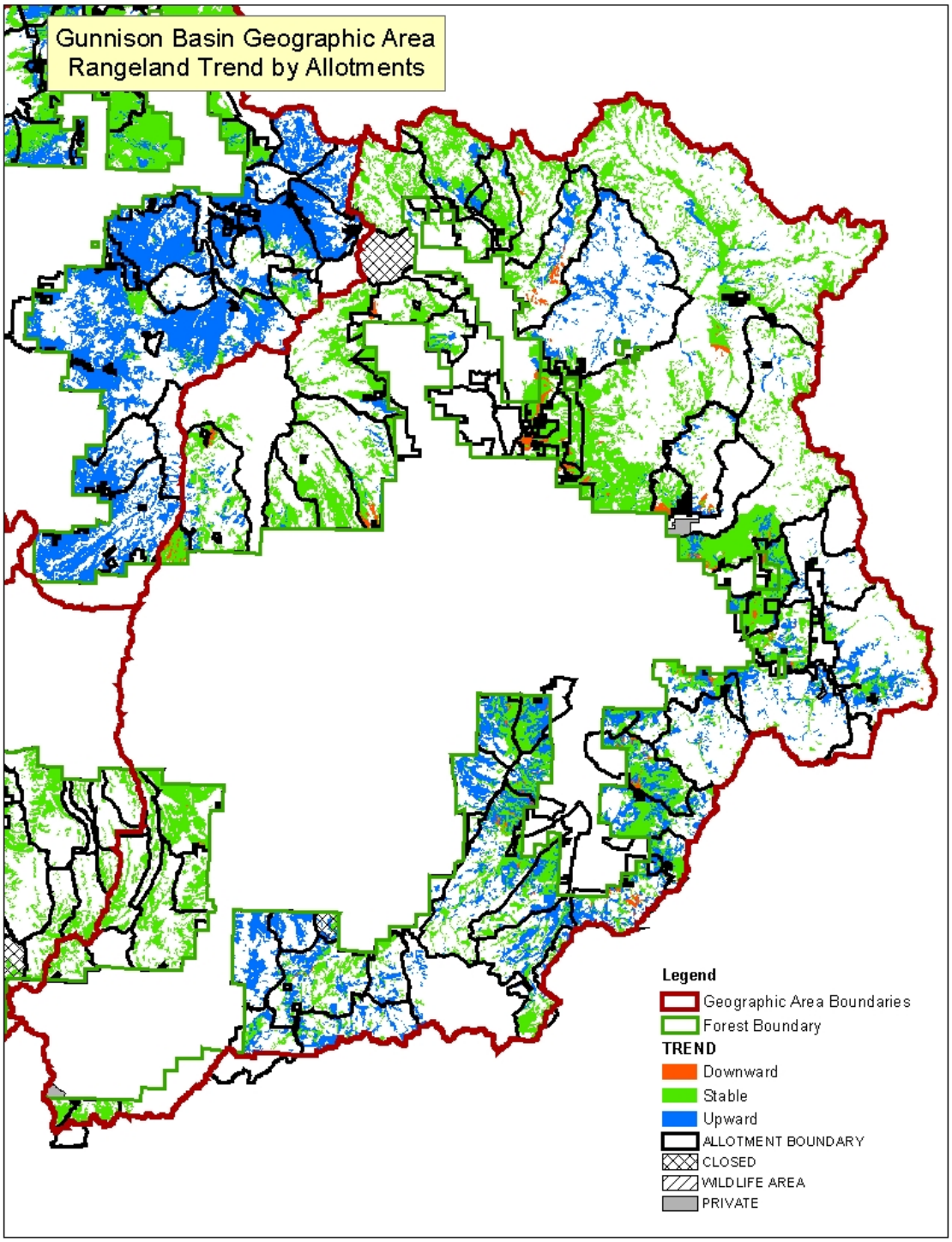

Figure 5. Rangeland Trend, Gunnison Basin Geographic Area

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

	Trend							
	Downward		Static		Upward			
Condition	**Acres**	**% of Condition**	**Acres**	**% of Condition**	**Acres**	**% of Condition**	**Total Acres**	**% of Total**
Poor	4,366	25	10,937	62	2,278	13	17,581	4
Fair	5,705	3	120,790	72	41,791	25	168,285	39
Good	2,284	1	162,537	66	80,747	33	245,568	57
Total	12,354	3	294,264	70	124,816	28	431,435	

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 Gunnison Basin GA over the next several years. These EAs need to consider current rangeland condition and trend, evaluate current allotment configurations and determine whether vacant allotments should be restocked or closed, and evaluate the compatibility between recreation and livestock grazing.

An additional issue that needs to be addressed in the Gunnison Basin GA is the existing and potential future conflict between domestic sheep and rocky mountain bighorn sheep. Forest reports from the early 1900s describe abundant occurrences of bighorn sheep. Wild bighorn sheep populations dramatically decreased during the late 1800s and early 1900s due to pressures from hunting and disease transmission from domestic sheep. The Colorado Division of Wildlife (CDOW) has reintroduced bighorn sheep into historic ranges within the San Juans GA. The Forest Service has also implemented habitat improvement projects designed to improve bighorn sheep ranges. The CDOW would like to see bighorn sheep populations increase and expand within this Geographic Area. There is a need for the Forest Service and CDOW to closely coordinate wildlife and livestock grazing management within this area.

All of the active grazing allotments on the Gunnison Basin 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) on the Gunnison Basin GA.

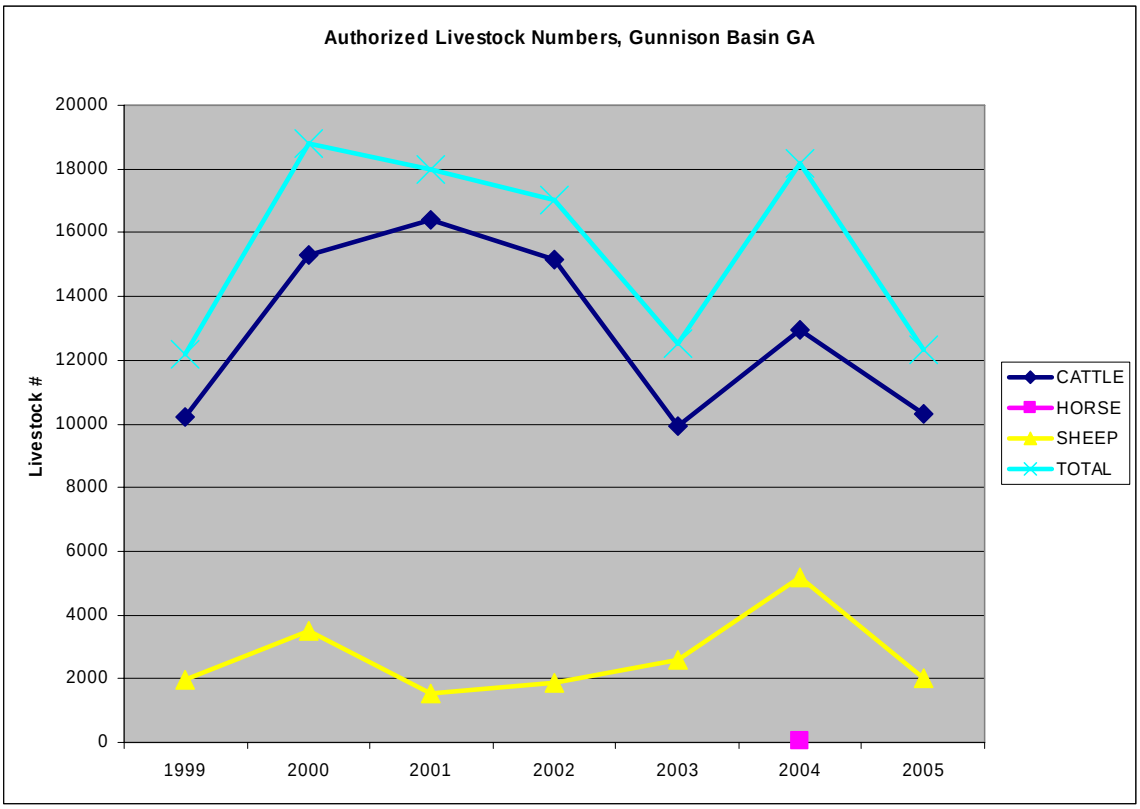

Figure 6. Authorized Livestock Number (1999-2005), Gunnison Basin GA

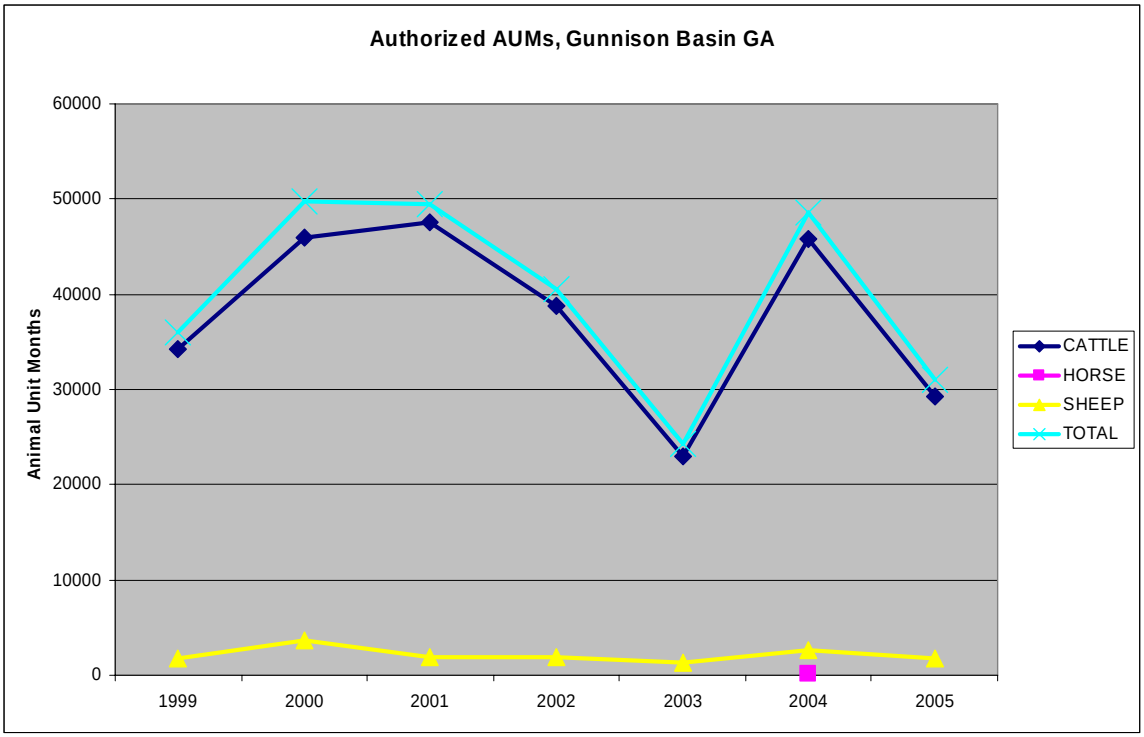

Figure 7. Authorized Animal Unit Months (1999-2005) Gunnison Basin GA

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 Gunnison Basin 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 Gunnison Basin Geographic Area and the GMUG (2004). These studies found that of the 34 permittees on the Gunnison Basin GA, 25 of them also have grazing permits on public land (administered by the BLM). These 34 permittees also own approximately 40,420 acres of private land in a five county region (Delta, Gunnison, Mesa, Montrose, and San Miguel counties), in 211 different parcels. Figure 8 displays the private land owned by grazing permittees on the Gunnison Basin, and the areas with incomplete data. Table 5 displays the number of parcels and acres

owned by permittees on the Gunnison Basin, 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 Gunnison Basin GA.

	Delta	**Gunnison**	**Mesa**	**Montrose**	**San Miguel**
# Parcels	3	141	7	53	7
Acres	281	29,091	358	8,758	1,932

Table 6 displays the private land owned by Gunnison Basin 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 Gunnison Basin GA own property in five different counties, and contribute a large amount of the open space related to federal grazing permits in Gunnison County.

Table 6. Percent of Private Land within each county owned by Gunnison Basin 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	0.5	9.7	0.1	2.1		0.3
% 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.

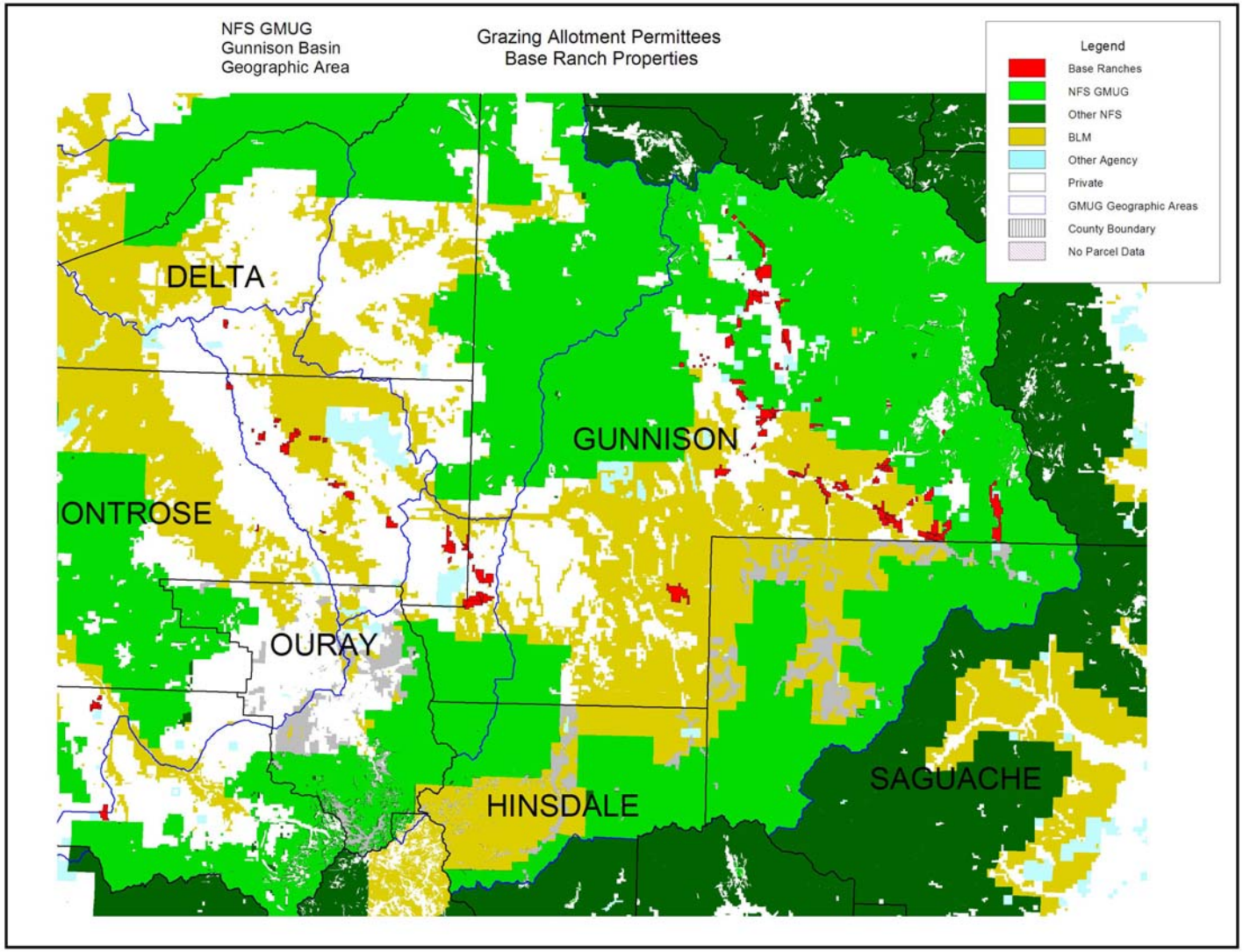

Figure 8. Private Lands owned by Grazing Permittees on the Gunnison Basin GA

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.

Due to the concern of overlapping ranges between bighorn sheep and domestic sheep, the Forest Service and CDOW need to closely coordinate wildlife and livestock management efforts within the Gunnison Basin GA. During the landscape level analyses to identify future desired conditions in rangeland and livestock management, the Forest Service should consider options such as changing the class of livestock permitted to graze within bighorn sheep range, adjusting grazing strategies and/or allotment boundaries so that domestic livestock can be grazed in areas that do not overlap bighorn range.

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.

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 should 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.

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