CHAPTER 3. LANDSCAPE DISTURBANCES

Livestock and Rangeland Management – San Juans

Domestic livestock grazing has been a major use on the GMUG since Euro-American settlement occurred in the area in 1875. 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 San Juans Geographic Area.

Conditions and Trends

Historic

Only limited livestock owned by the Utes grazed in this area prior to Euro-American settlement of the San Juans Geographic Area. Grazing was unregulated from the late 1870s to 1905. Information on numbers of livestock during this early period is not available. Efforts to control grazing began once the Uncompahgre, Montezuma and Ouray National Forests were established beginning in 1905, focusing on adjusting livestock numbers and season of use.

Prior to the creation of the National Forests, cattle and sheep grazed on different areas, with sheep use occurring at higher elevation. Disputes over division of the range between cattle and sheep, large operators and small occurred (Spencer 1909). This separation was recognized and continued by the Forest Service. Consequently, areas were not always grazed by the class of livestock best suited for the forage or terrain. 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 San Juans GA. Several stock driveways were heavily used when moving sheep onto and off of the National Forest. A 1915 Forest report commented that due to the open herding of sheep the sheep range was in good shape. Some overlap of sheep and cattle grazing occurred where sheep were grazed in allotments to remove larkspur on their way to higher allotments before cattle use occurred. Livestock pressure remained high (peaking in 1919 to support meat production during World War I) through the 1940s.

The 1950s through the 1980s can be characterized as the period of rangeland development on the San Juans. Fences, stock ponds, and spring developments were gradually installed to provide better control of livestock.

Figure 1 shows the trend in cattle and sheep numbers permitted on the entire Uncompahgre National Forest (includes the San Juans and Uncompahgre Plateau Geographic Areas). Note: Data is not available for all years. Most of the sheep use occurred on the San Juans Geographic Area.

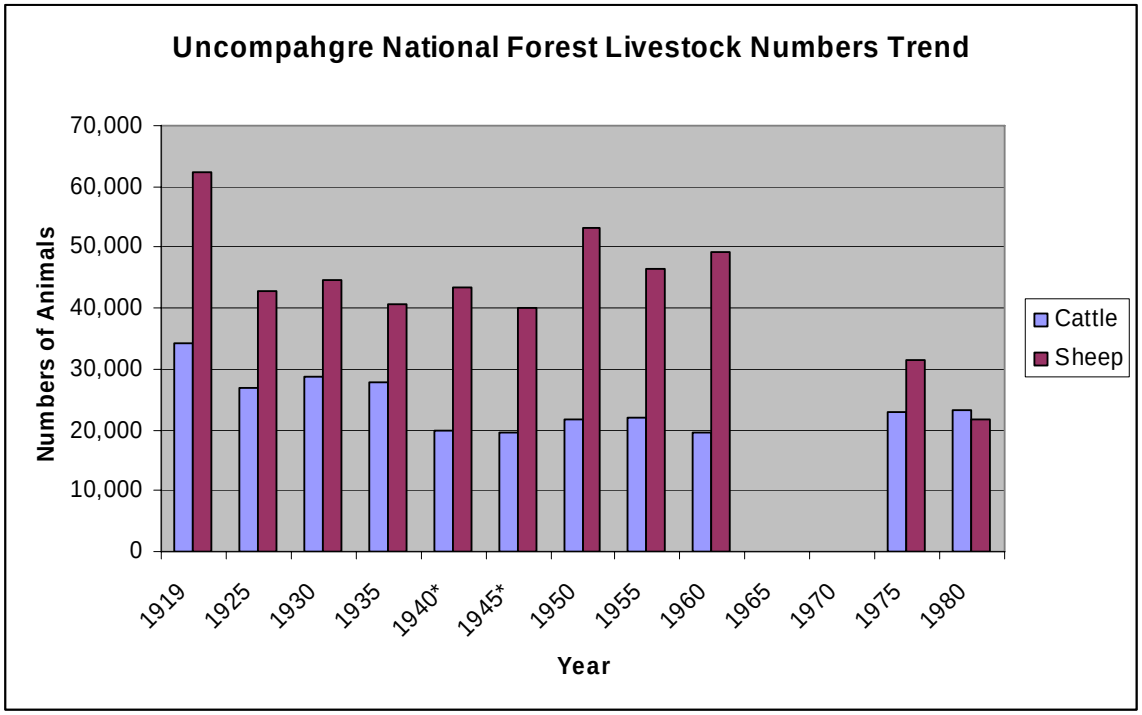

Figure 1. Permitted Livestock Numbers for the entire Uncompahgre National Forest (1908 – 1980)

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. Approximately one third of the sheep use on the GMUG occurred on the San Juans GA.

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 San Juans Geographic Area. Not all NFS lands on the San Juans GA are included in grazing allotments. Private lands within the Forest boundary are excluded from allotments, with few exceptions. There are currently 38 allotments on the San Juans GA, including 81 percent of the NFS lands. Only 22 of the allotments are currently active: 19 are permitted for cattle, and 3 are permitted for sheep. Currently 16 allotments are vacant – there is no livestock use permitted. Most of the vacant allotments surround the Telluride area. Many were once sheep allotments. These allotments were vacated for many different reasons (e.g., permittees went out of business, allotments combined, conflicts between livestock and recreation use, conflicts between livestock and wildlife use [bighorn sheep], allotment size). Many have been vacant since the 1980s, a few in the Dallas area just recently became vacant.

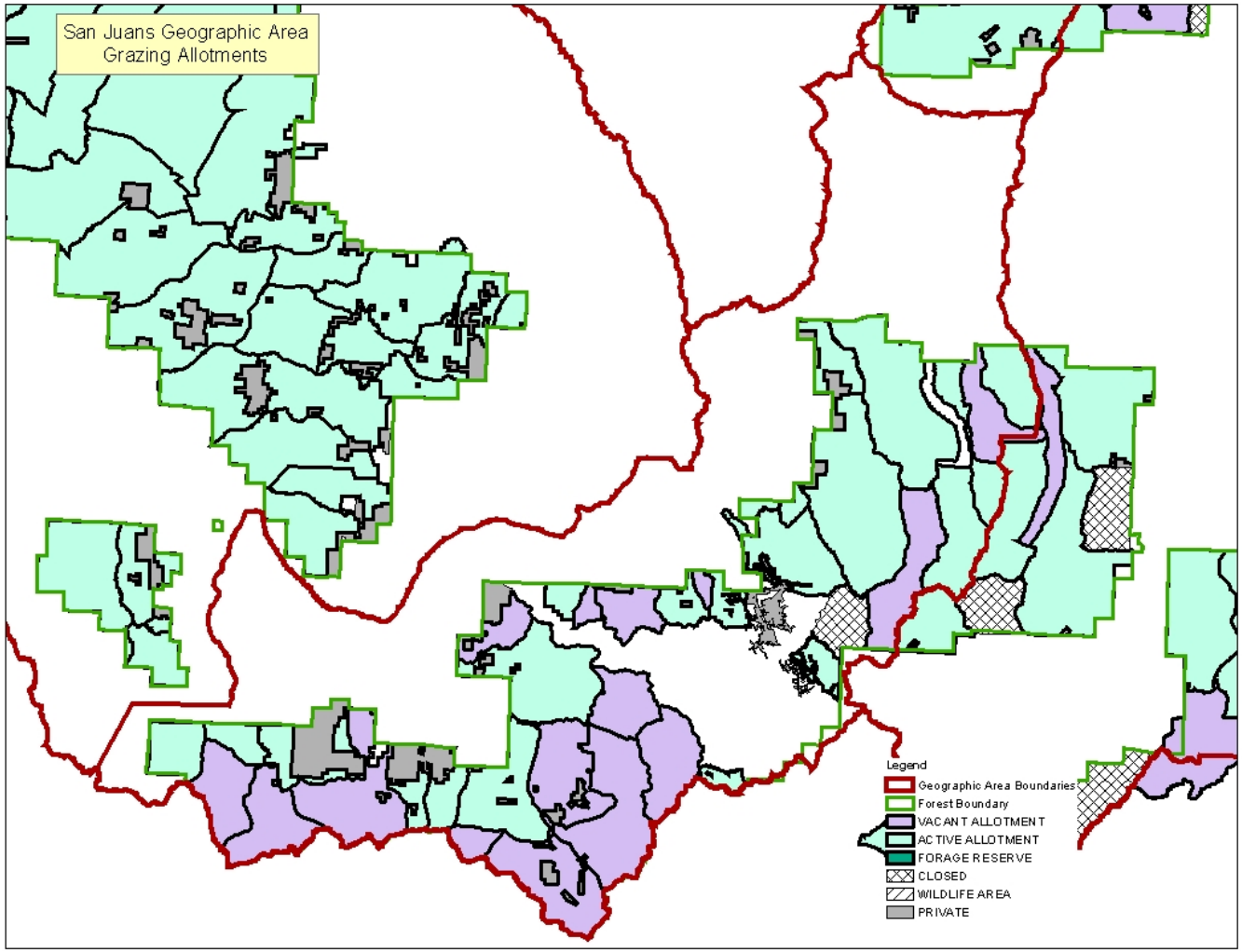

Figure 2. Current Grazing Allotments, San Juans Geographic Area

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.

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.

Figure 3. displays the lands generally suitable for livestock grazing on the San Juans GA. (Note: Information is currently not available for vacant allotments on the Norwood District of the San Juans GA. This information will be added as it becomes available.)

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 San Juans GA. Areas outside of vacant allotments displayed with no condition on the San Juans GA are not considered to be suitable for livestock grazing. Note: Data is not currently available for vacant allotments on the Norwood District portion of the GA.

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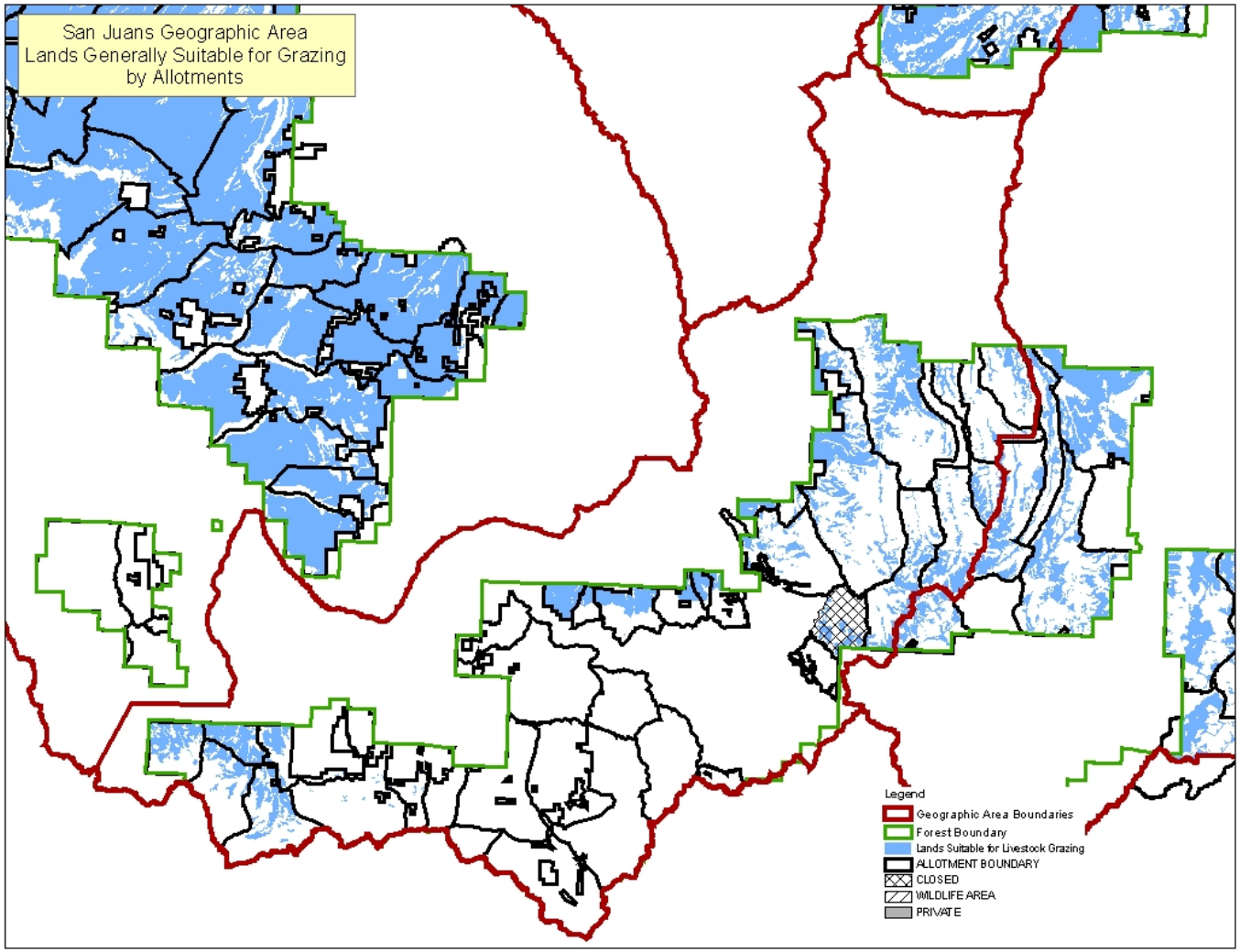

Figure 3. Lands Generally Suitable for Grazing, San Juans Geographic Area

Table 2 displays the acres of rangeland condition classes by vegetation type. On the San Juans GA the majority of the rangeland suitable for grazing occurs in aspen (50 percent), and grass/forb (36 percent) cover types. The majority of the rangeland unsuitable for grazing occurs in spruce/fir (42 percent) and bare/rock areas (23 percent). Of the rangeland areas suitable for grazing, 3 percent is in poor condition, 18 percent is in fair condition and 79 percent is in good condition. A trace amount of areas has been identified in excellent condition. Most of the poor condition rangeland is in spruce-fir (due to lack of forage under mature canopied stands) and grass/forb (due to species composition – more annuals and non-native species). Most of the fair condition rangeland is in Gambel oak, spruce/fir, grass/forb and aspen. The majority of good condition rangeland is in aspen and grass/forb cover types and is a function of the dominance of these cover types in suitable rangeland on the San Juans GA. The majority of the grass/forb, willow and aspen cover types are in good condition. Most of the remaining shrub types, cottonwood and spruce/fir are in fair condition. Most of the sagebrush, pinyon-juniper and Douglas-fir cover types are in poor condition; however there are very limited amounts of these cover types on the San Juans GA 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 San Juans GA, areas that do not show trend are not suitable for grazing.

On the San Juans GA the majority of the rangeland suitable for grazing is in a static trend (82 percent), and the majority of each cover type is in a static trend. No areas of suitable rangeland are in a downward trend. 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 4. The majority of the suitable rangeland on the San Juans GA is in good conditions with a static trend. Most of the suitable rangeland in an upward trend is in good condition. No areas are in a downward trend.

Table 2. Rangeland Condition by Cover Type for the San Juans Geographic Area *

Cover Type	Poor		Fair		Good		Excellent		Total Suitable		Unsuitable	
	Acres	% of suitable 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	439	3	1,762	10	14,727	87	31	0	16,959	36	47,881	15
Sagebrush	88	81	21	19					109	0	242	0
Gambel Oak			2,494	98	55	2			2,549	5	3,531	1
Mixed Mountain Shrub			237	87	35	13			272	1	429	0
Snowberry			119	100					119	0	86	0
Willow			47	8	551	92			598	1	6,239	2
Cottonwood			109	100					109	0	234	0
Aspen			1,527	6	22,045	94			23,571	50	46,521	15
Pinon/Juniper	108	100							108	0	549	0
Ponderosa Pine											458	0
Lodgepole Pine			96	49	99	51			195	0	8	0
Douglas-fir	127	100							127	0	2,052	1
Blue Spruce											34	0
Spruce/Fir	522	19	2,060	76	117	4			2,699	6	130,601	42
Bare/Rock**					71	100			71	0	71,022	23
Water**											859	0
Total	1,284	3	8,472	18	37,699	79	31	0	47,487		310,744	

*Data for vacant allotments on the Norwood District portion of the GA is not currently available and is not included in table.

** 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.

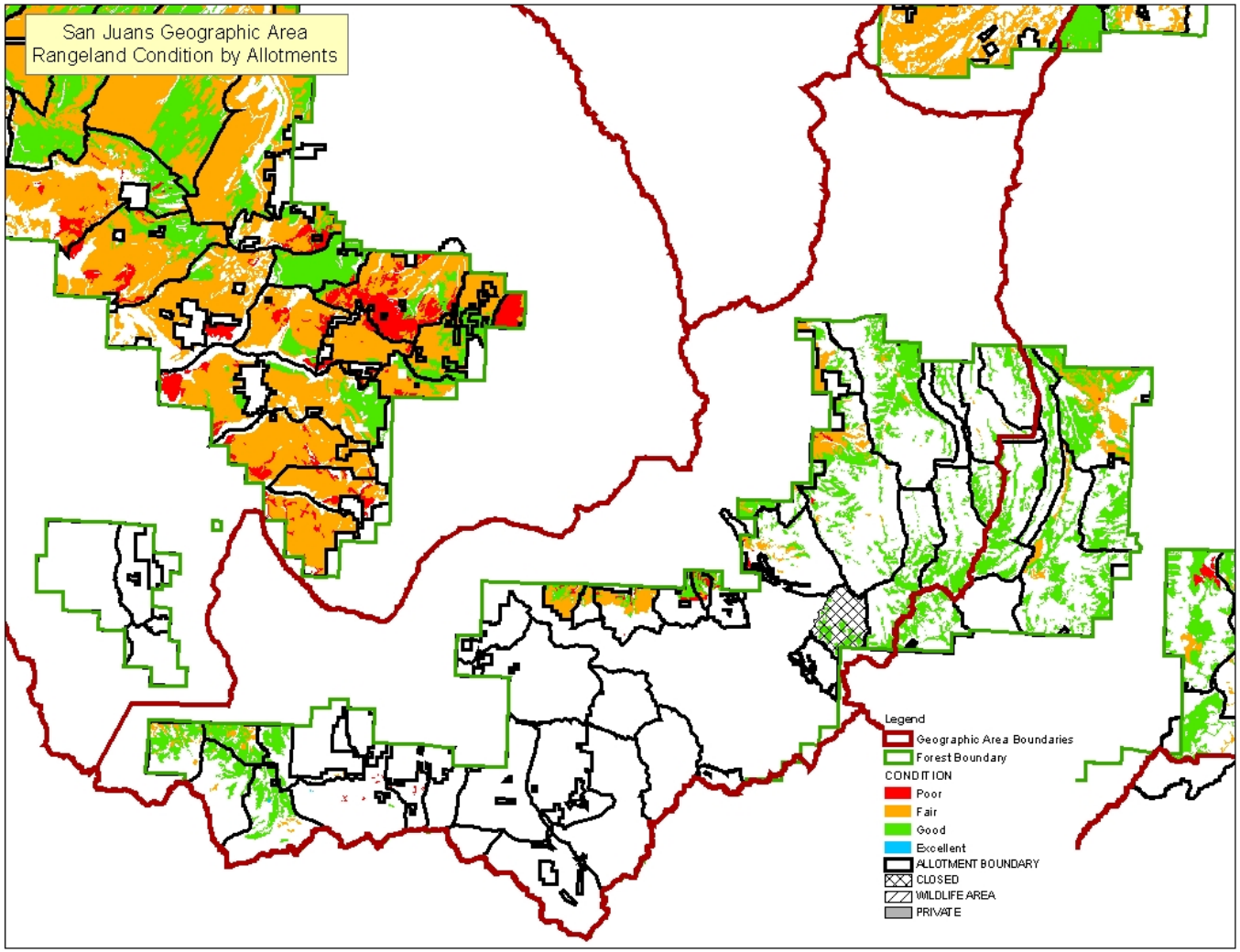

Figure 4. Rangeland Condition, San Juans Geographic Area

Table 3. Trend in Rangeland Conditions on the San Juans 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			16,395	97	568	3	16,964	36	47,876	15
Sagebrush			109	100			109	0	242	0
Gambel Oak			2,494	98	55	2	2,549	5	3,531	1
Mixed Mountain Shrub			272	100			272	1	429	0
Snowberry			119	100			119	0	86	0
Willow			611	100			611	1	6,225	2
Cottonwood			109	100			109	0	234	0
Aspen			15,736	67	7,852	33	23,588	50	46,504	15
Pinon/Juniper			108	100			108	0	549	0
Ponderosa Pine								0	458	0
Lodgepole Pine			195	100			195	0	8	0
Douglas-fir			127	100			127	0	2,052	1
Blue Spruce								0	34	0
Spruce/Fir			2,699	100			2,699	6	130,601	42
Bare/Rock*			71	100			71	0	71,022	23
Water*								0	859	0
Total	0	0	39,046	82	8,475	18	47,521		310,709	

*Data for vacant allotments on the Norwood District portion of the GA is not currently available and is not included in table.

** 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.

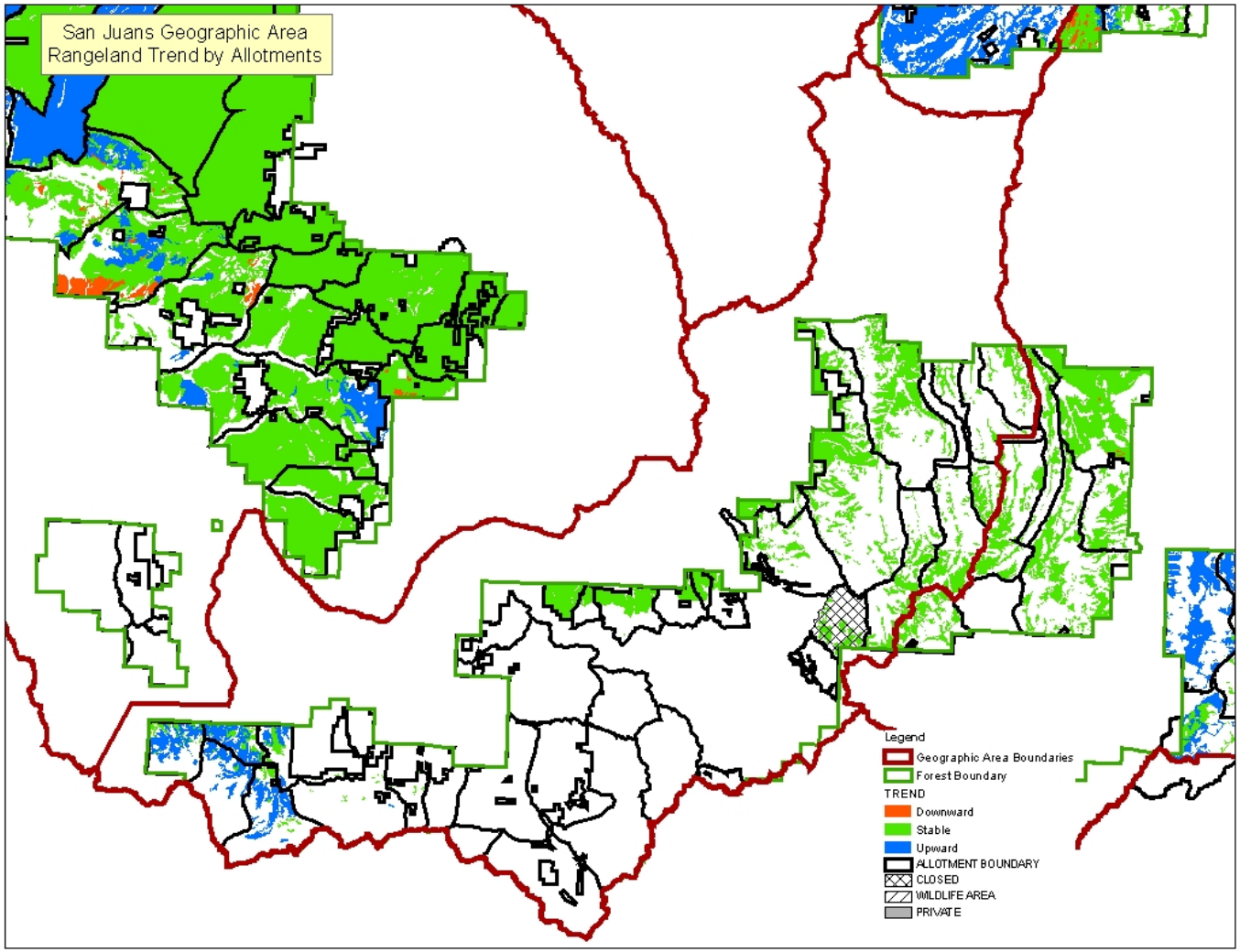

Figure 5. Rangeland Trend, San Juans Geographic Area

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

Condition	Trend						Total Acres	% of Total
	Downward		Static		Upward			
	Acres	% of Condition	Acres	% of Condition	Acres	% of Condition		
Poor			1,284	100			1,284	3
Fair			10,089	99	117	1	10,206	18
Good			29,341	78	8,358	22	37,699	79
Excellent			31				31	
Total	0	0	40,746	82	8,475	18	49,221	

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 San Juan GA in 2008. 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 San Juans GA is the existing and potential future conflict between domestic sheep and rocky mountain bighorn sheep. Forest reports from the early 1900s 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. One allotment was permanently closed to reduce conflict between domestic and wild sheep. 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 San Juans 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.

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).

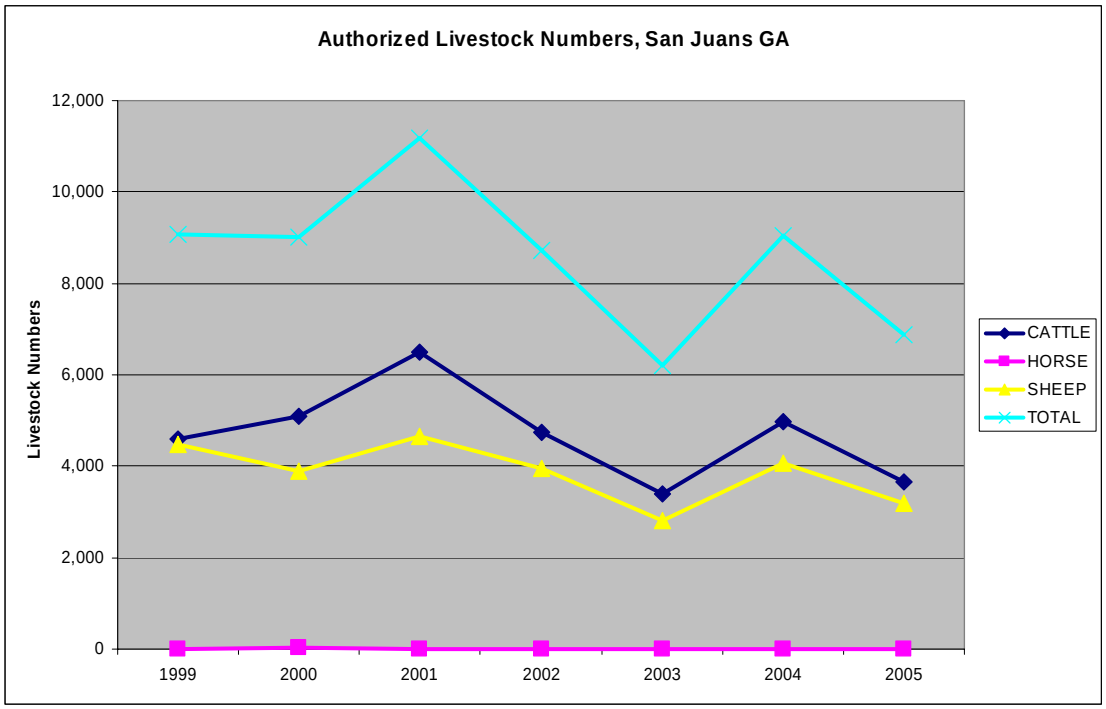

Figure 6. Authorized Livestock Number (2000-2005), San Juans GA.

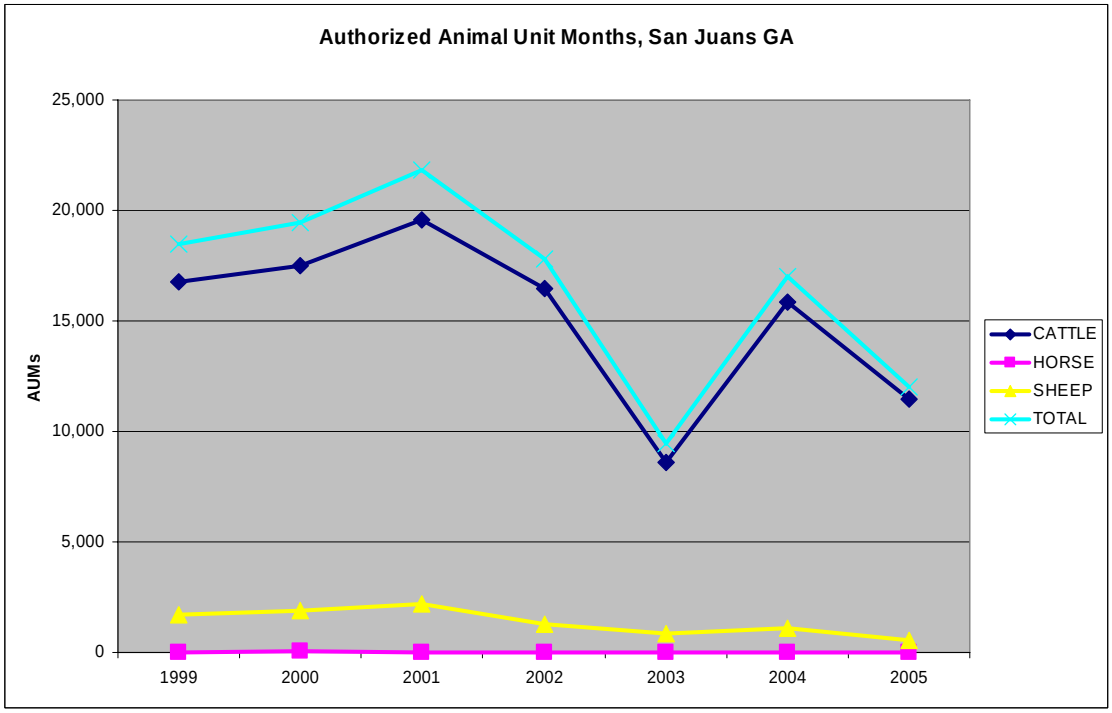

Figure 7. Authorized Animal Unit Months (2000-2005) San Juans GA.

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 San Juans 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 San Juans 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 19 permittees on the San Juans GA, 7 of them also have grazing permits on public land (administered by the BLM). These 19 permittees also own approximately 57,700 acres of private land in a three county region (Montrose, San Miguel and Ouray counties), in 181 different parcels. (Note: Note all parcel data was available for Ouray County, so these numbers are below what is known to occur in this county.) Figure 8 displays the private land owned by grazing permittees on the San Juans, and the areas with incomplete data. Table 5 displays the number of parcels and acres owned by permittees on the San Juans, 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 San Juans GA.

	Montrose	**Ouray***	**San Miguel**
# Parcels	86	24	71
Acres	10,265	15,327	32,091

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

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

Table 6. Percent of Private Land within each county owned by San Juans 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				2.5	12.0	5.5
% 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.

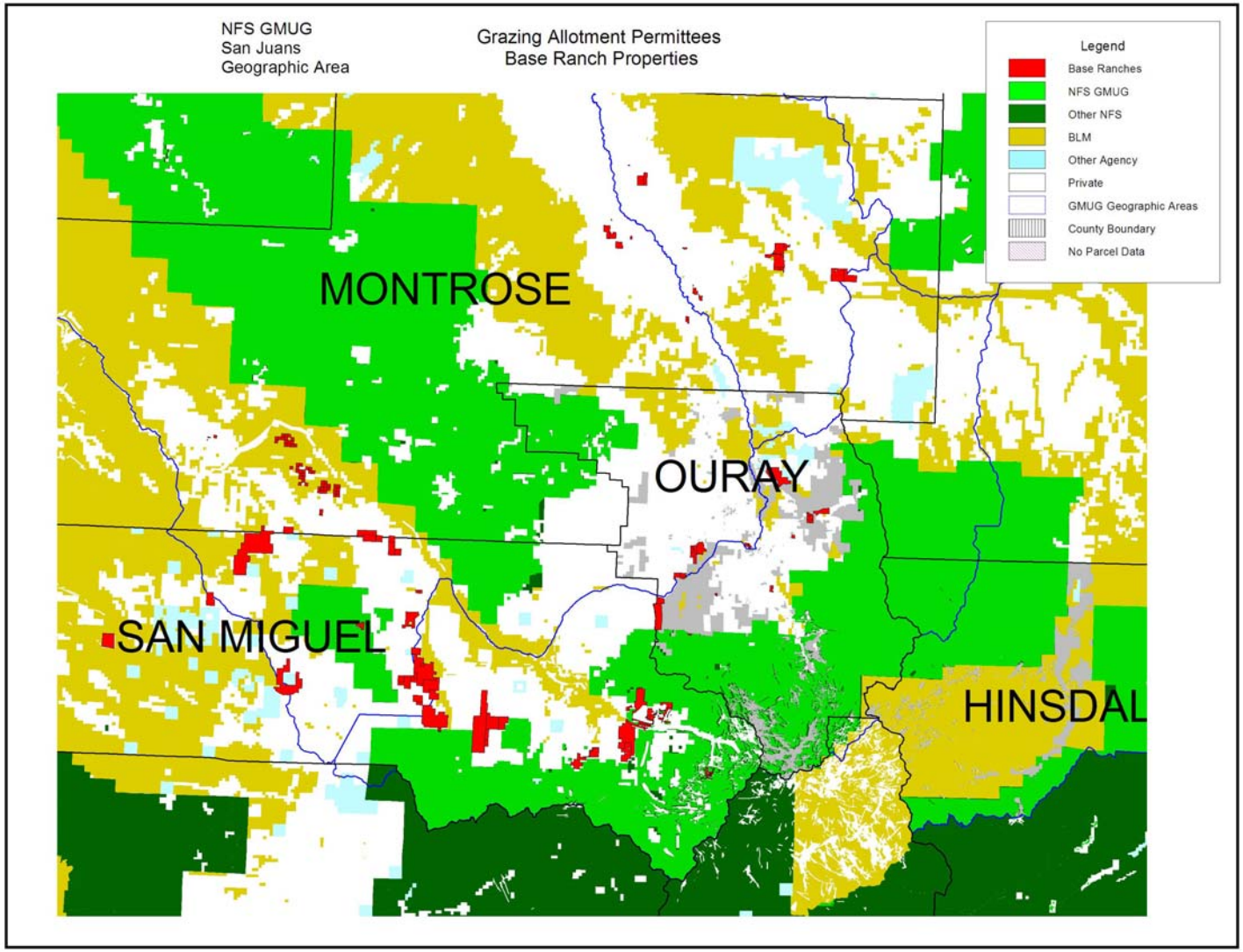

Figure 8. Private Lands owned by Grazing Permittees on the San Juans GA

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 San Juans 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.

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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