CHAPTER 3. LANDSCAPE DISTURBANCES

Road and Trail Distribution – Gunnison Basin

This section evaluates the pattern of road and trail distribution on the Gunnison Basin Geographic Area and the associated influences of this transportation network on vegetation and habitat. Both direct and indirect effects of roads and trails are discussed.

Existing Roads and Trails

Initial travel management planning efforts were completed on the Gunnison Basin Geographic Area in 2000, as part of the Gunnison National Forest Travel Plan. As a result, inventories of existing roads and trails are relatively complete. Route by route determinations to identify which roads and trails will be maintained as part of the transportation system, what types of use will be allowed on those routes, and which routes will be eliminated, or decommissioned have not yet been made for the Gunnison National Forest (North Fork Valley and Gunnison Basin Geographic Areas). Only the decision to limit motorized and mechanized travel to existing routes has occurred.

All existing roads and trails known to occur on the Gunnison Basin Geographic Area were considered in this evaluation. For roads, this includes both classified or system roads (National Forest System Roads, county roads, state highways, federal highways, privately owned roads, Forest Service authorized roads) and unclassified roads (roads not currently identified as part of any of the above referenced systems). Roads are further categorized by maintenance level which relates to the type of road surface and type of vehicle: Level 1 – closed more than one year or administrative use only, level 2 – rough, high clearance vehicles, level 3 – native to gravel surface, passenger vehicles, level 4 – smooth gravel surface, passenger vehicles, level 5 – dust-free-possibly paved, passenger vehicles. The majority of roads on the Gunnison Basin Geographic Area are Level 2 roads.

Trails are also divided between classified (or system) and unclassified trails. Trail use can be separated by motorized (ATV and motorcycle) and non-motorized (mountain bike, pack animal, hiker) uses. All trails within Wilderness areas are non-motorized and most trails outside of wilderness are open to some type of motorized use (ATV or motorcycle).

On the Gunnison National Forest, unclassified roads and trails have yet to be evaluated to determine which ones will be included in the road system and which will be decommissioned. Currently all unclassified roads and trail on the Gunnison National Forest remain open to public travel.

To evaluate the direct influence roads and trails have on vegetation, the existing transportation inventory was compared to the existing vegetation cover. The following map (Figure 1) displays the road and trail transportation network. The following tables list the miles of roads (Tables 1 and 2) and trails (Table 3) that occur in the different cover types on the Gunnison Basin Geographic Area.

Figure 1. Map of Existing Roads and Trails, Gunnison Basin Geographic Area

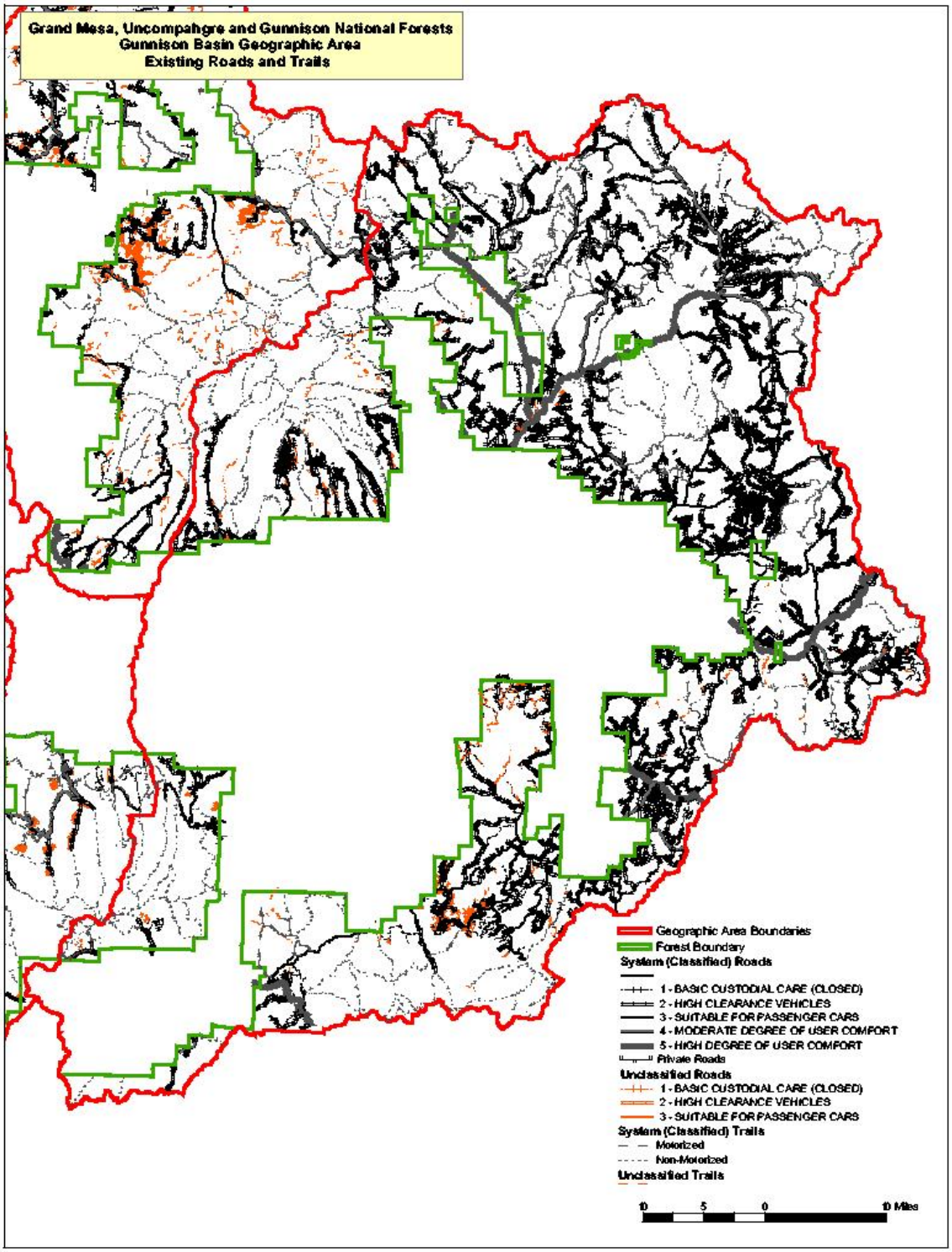

Table 1. Miles of Existing Roads within Different Cover Types, Gunnison Basin Geographic Area (System miles in unshaded rows, unclassified miles in shaded rows)

Cover Type	1 - BASIC CUSTODIAL CARE (CLOSED)	2 - HIGH CLEARANCE VEHICLES	3 - SUITABLE FOR PASSENGER CARS	4 - MODERATE DEGREE OF USER COMFORT	5 - HIGH DEGREE OF USER COMFORT	SubTotals*	Grand Total
Grass/Forb	64	357	118	23	40	603	**614**
	4	7				11	
Sagebrush	13	194	28	20	8	263	**266**
	1	2				2	
Gambel Oak	1	2	1	1		6	**6**
	0	0				0	
Mixed Mountain Shrub	3	12	1	3	3	21	**21**
	0	0				0	
Snowberry		0	1			2	**2**
Willow	19	91	44	12	4	170	**171**
		0				0	
Cottonwood	0	0	0	0	1	2	**2**
Aspen	40	199	34	2	2	277	**287**
	6	5				11	
Pinyon/Juniper							
Ponderosa Pine	2	12	3	0	0	17	**17**
	0	0				0	
Lodgepole Pine	42	274	52	13	16	396	**403**
	4	3				7	
Limber Pine		2			0	2	**2**
Douglas-fir	2	15	3	1	3	25	**26**
	0	1				1	
Blue Spruce	0	1	1			3	**3**
Spruce/Fir	99	208	65	3	6	380	**408**
	13	15				28	

Cover Type	1 - BASIC CUSTODIAL CARE (CLOSED)	2 - HIGH CLEARANCE VEHICLES	3 - SUITABLE FOR PASSENGER CARS	4 - MODERATE DEGREE OF USER COMFORT	5 - HIGH DEGREE OF USER COMFORT	SubTotals*	Grand Total
Bristlecone Pine	0	6	2	1		9	**9**
Bare/Rock	9	10	7	3	6	34	**36**
	2					2	
Water	0		0	0	1	1	**1**
Subtotal	294	1,384	360	81	91	2,210	
	31	33				64	
Grand Total	**325**	**1,417**	**360**	**81**	**91**	**2,274**	**2,274**

Table 2. Miles of Existing Roads within Different Cover Types, Gunnison Basin Geographic Area

Cover Type	**System Roads**		**Unclassified Roads**		**Total Road**	
	Miles	%	Miles	%	Miles	%
Grass/Forb	603	27	11	17	614	27
Sagebrush	263	12	2	4	266	12
Gambel Oak	6	0	0	1	6	0
Mixed Mountain Shrub	21	1	0	0	21	1
Snowberry	2	0		0	2	0
Willow	170	8	0	0	171	8
Cottonwood	2	0		0	2	0
Aspen	277	13	11	17	287	13
Pinyon/Juniper		0		0	0	0
Ponderosa Pine	17	1	0	0	17	1
Lodgepole Pine	396	18	7	11	403	18
Limber Pine	2	0		0	2	0
Douglas-fir	25	1	1	2	26	1
Blue Spruce	3	0		0	3	0
Spruce/Fir	380	17	28	44	408	18
Bristlecone Pine	9	0		0	9	0
Bare/Rock	34	2	2	3	36	2
Water	1	0		0	1	0
Total	2,210		64		2,274	

More miles of roads occur in grass/forb (27 percent) than in any other cover type on the GMUG, followed by lodgepole pine (18 percent), then spruce/fir (18 percent) cover types. For system roads, the breakdown is similar to that for total roads. For unclassified roads, most are found in spruce/fir (44 percent), then grass/forb (17 percent), and aspen (17 percent).

Table 3. Miles of Existing Trails within Different Cover Types, Gunnison Basin Geographic Area

	System Trails				Unclassified Trails		Total Trail	
Cover Type	**Motorized**	**Non-Motorized**	**Miles**	**%**	**Miles**	**%**	**Miles**	**%**
Grass/Forb	83	185	268	28	44	33	313	29
Sagebrush	8	4	12	1	9	6	21	2
Gambel Oak	0	1	1	0	0	0	1	0
Mixed Mountain Shrub	3	8	11	1	2	2	13	1
Snowberry			0	0		0	0	0
Willow	37	42	78	8	8	6	86	8
Cottonwood			0	0		0	0	0
Aspen	45	79	124	13	30	23	154	14
Pinyon/Juniper			0	0		0	0	0
Ponderosa Pine	0	3	3	0	1	1	4	0
Lodgepole Pine	97	22	120	13	9	6	128	12
Limber Pine	0		0	0		0	0	0
Douglas-fir	2	26	28	3	3	2	31	3
Blue Spruce			0	0	0	0	0	0
Spruce/Fir	89	172	261	28	22	17	283	26
Bristlecone Pine		1	1	0	0	0	1	0
Bare/Rock	5	30	35	4	5	3	40	4
Water	0	0	0	0		0	0	0
Total	370	573	942		133		1,075	

More miles of trails occur in grass/forb (29 percent) than in any other cover type, followed by spruce/fir (26 percent), then aspen (14 percent) cover types. The distribution is similar for both system and unclassified trails.

Currently 88 percent of the existing trails are classified as system trails, and most of the system trails (61 percent) of the system trails are non-motorized, primarily because they are within designated Wilderness areas. The size and composition of the trail system may change once route-by-route travel management decisions have been made.

Table 4 displays a comparison of the percentages of total road miles and total trail miles by cover type, to the percentages that each cover type occurs on the Gunnison Basin Geographic Area.

Table 4. Comparison of Distribution of Roads and Trails to Distribution of Cover Types, Gunnison Basin Geographic Area

Cover Type	% of Roads within Cover Type	% of Trails within Cover Type	Cover Type % of GMUG
Grass/Forb	27	29	19
Sagebrush	12	2	5
Gambel Oak	0	0	0
Mixed Mountain Shrub	1	1	1
Snowberry	0	0	0
Willow	8	8	5
Cottonwood	0	0	0
Aspen	13	14	14
Pinyon/Juniper	0	0	0
Ponderosa Pine	1	0	1
Lodgepole Pine	18	12	20
Limber Pine	0	0	0
Douglas-fir	1	3	2
Blue Spruce	0	0	0
Spruce/Fir	18	26	25
Bristlecone Pine	0	0	1
Bare/Rock	2	4	7
Water	0	0	0

There are proportionately more roads in grass/forb, sagebrush, and willow than would be expected if roads were equally distributed across all cover types. In contrast, there are proportionately less roads in lodgepole pine, Douglas-fir, spruce/fir and bare/rock cover types. The proportion of roads in aspen is approximately equal to the percent of aspen on the Gunnison Basin landscape. Lower elevations and lower elevation cover types have more roads. A large percent of the higher elevations are included in designated Wilderness areas, where roads do not occur.

For trails, proportionately more trails occur in grass/forb and willow cover types, while less occur in sagebrush, lodgepole pine and bare/rock cover types than would be expected if trails were equally distributed across all cover types. As mentioned before, the majority of the trails on the Gunnison Basin Geographic Area occur in Wilderness areas, which contain large alpine meadows, riparian areas and the majority of the spruce/fir forests.

Areas Influenced by Existing Roads and Trails

Direct and indirect effects from transportation networks and the use of those networks have been shown to influence areas up to ½ mile away from a given road or trail. To evaluate the amount of area potentially affected by existing roads and trails on the Gunnison Basin Geographic Area, the existing transportation network was buffered by ½ mile on either side. Figure 2 shows the extent of area within ½ mile of an existing road, Figure 3 shows the extent of area within ½ mile of an existing trail, and Figure 4 shows the combined area of the Gunnison Basin Geographic Area that is within ½ mile of either an existing road or trail.

Table 5 lists the acres by cover type that are within ½ mile of an existing road or trail on the Gunnison Basin Geographic Area. This table also shows the percentage of the total buffer area that is comprised by each given cover type, the percentage of the total cover type that occurs within ½ mile of an existing route, as well as the acres and percentage of the total cover type that is not within ½ mile of an existing route.

Seventy-eight percent of the Gunnison Basin Geographic Area is within ½ mile of an existing road or trail. This is slightly less than the 80 percent for the entire GMUG. Spruce/fir, lodgepole pine and grass/forb cover types make up the bulk of the acres within the buffer around existing transportation routes (25, 20, and 19 percent, respectively). However, the majority of all cover types on the Gunnison Basin Geographic Area lie within ½ mile of an existing road or trail, ranging from a low of 56 percent for bare/rock to a high of 100 percent of the cottonwood cover type.

Spruce/fir, lodgepole pine, and grass/forb cover types also make up the bulk of the acreage that is outside the ½ mile buffer around existing roads and trails (27, 20 and 18 percent, respectively). Converse to the above situation, the minority of all cover types on the Gunnison Basin Geographic Area are outside the area of influence from roads and trails, ranging from a low of 0 percent of the cottonwood cover type, to a high of 44 percent of the bare/rock cover type. Most of the bare/rock cover type is above timberline, in Wilderness areas.

Figure 2. Area Within ½ Mile Of An Existing Road, Gunnison Basin Geographic Area

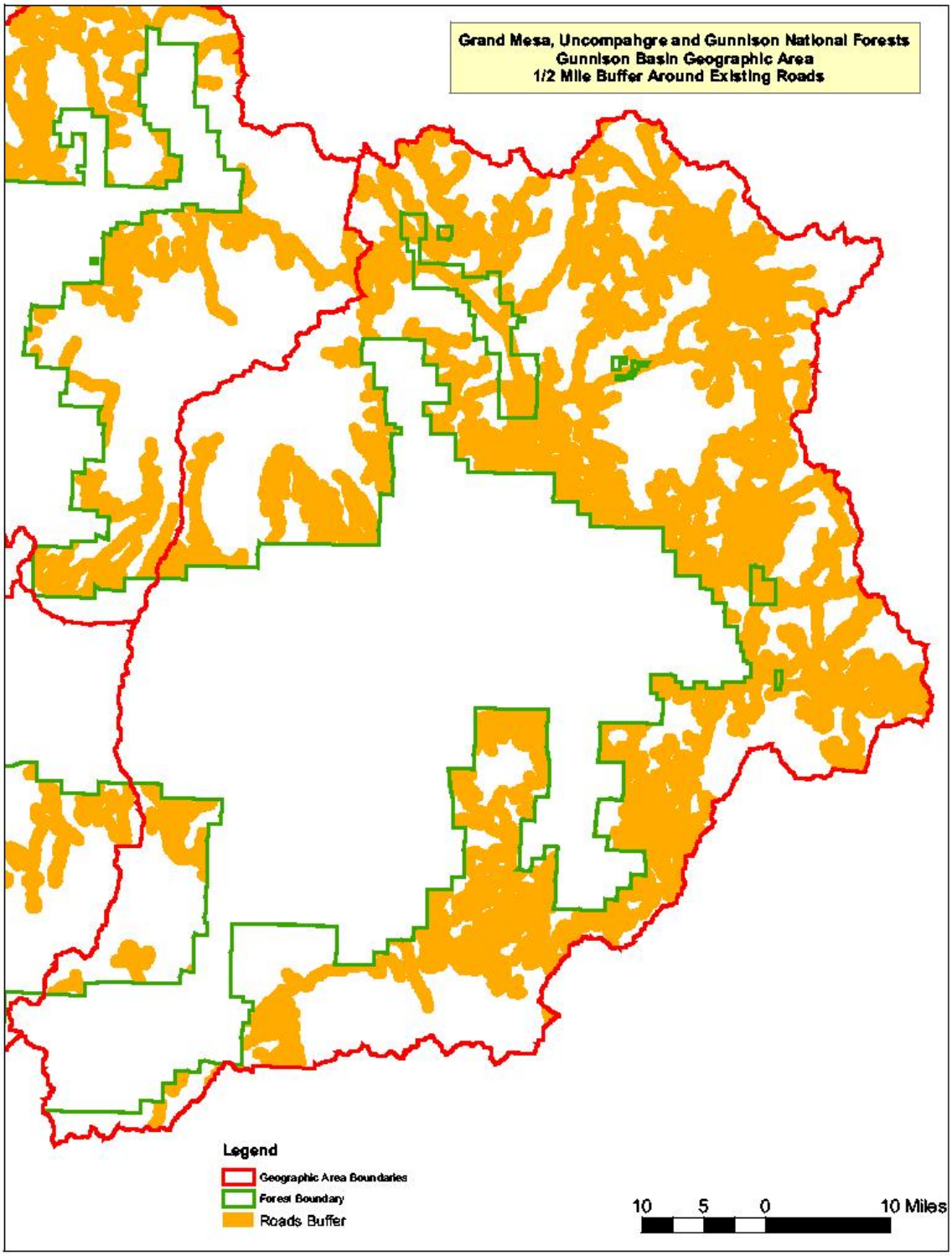

Figure 3. Area Within ½ Mile Of An Existing Trail, Gunnison Basin Geographic Area

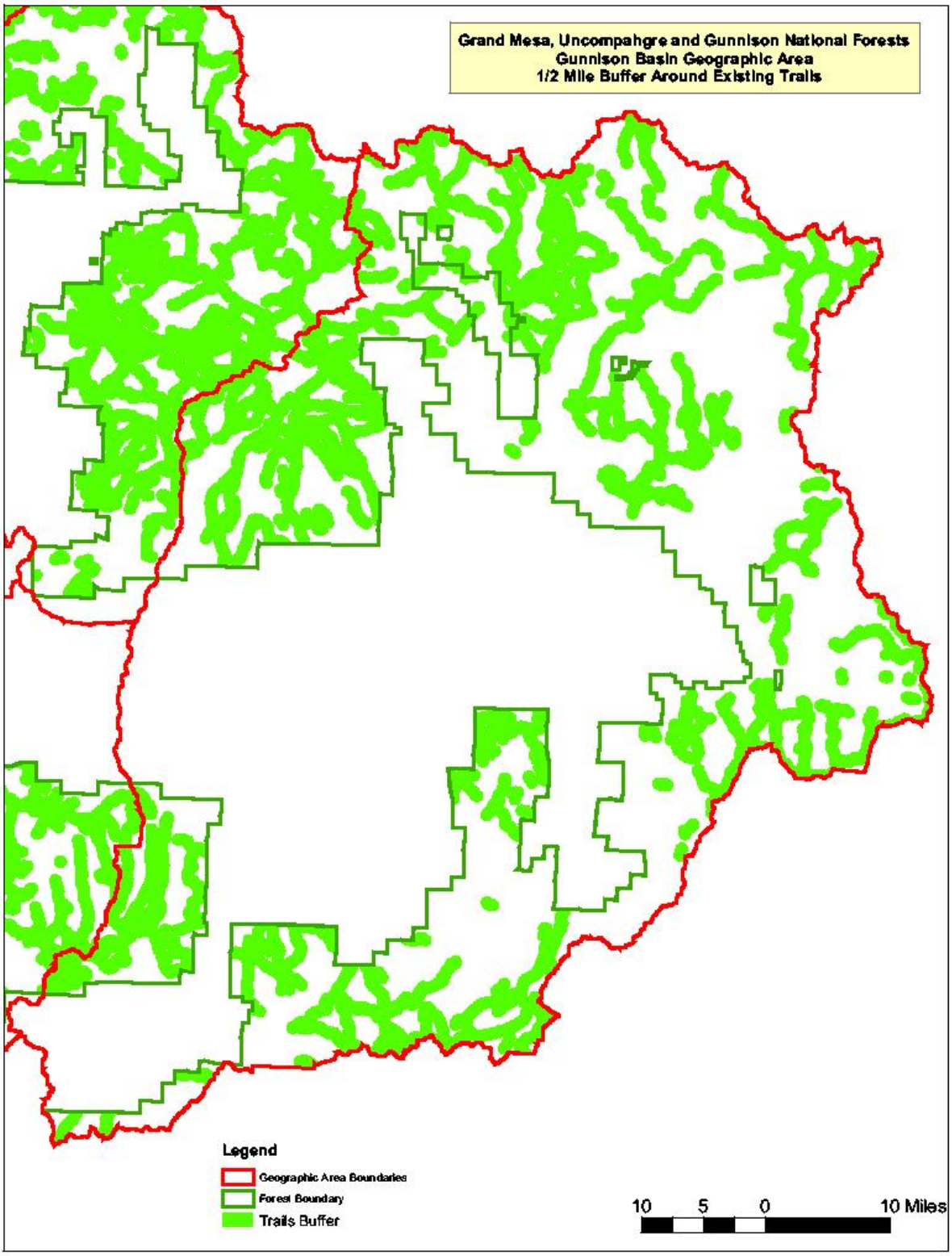

Figure 4. Area Within ½ Mile Of An Existing Road or Trail, Gunnison Basin Geographic Area

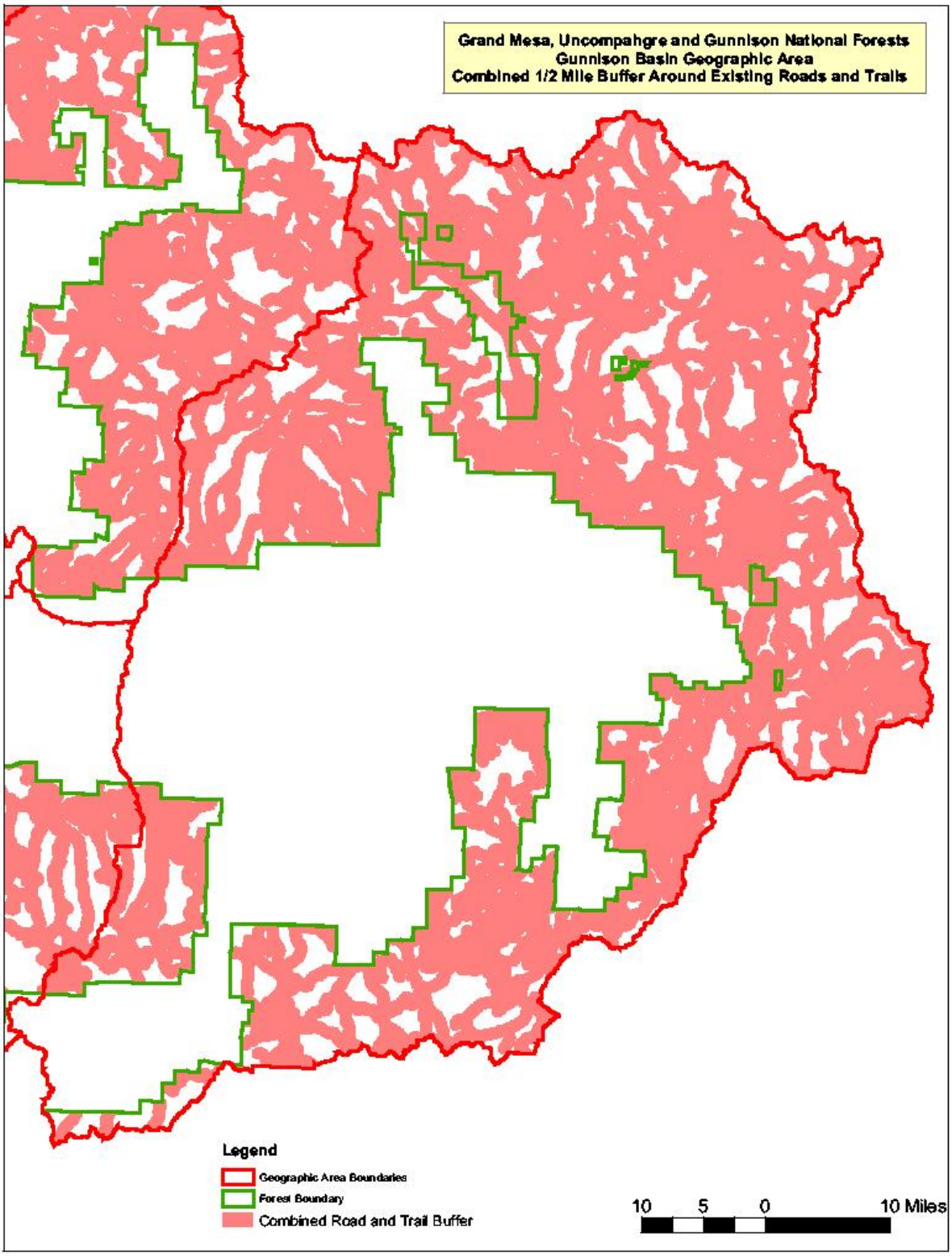

Table 5. Relative Amounts Of Acres In Cover Type, Inside And Outside Of ½ Mile Buffer Around Existing Routes, Gunnison Basin Geographic Area.

Cover Type	Total Acres (GMUG)	Acres in Buffer	% of Buffer	% of Total Cover Type in Buffer	Acres Outside 1/2 mile Buffer	% of Area Outside of Buffer	% of Total Cover Type Outside Buffer
Grass/Forb	263,379	209,103	19	79	54,276	18	21
Sagebrush	64,596	61,378	6	95	3,218	1	5
Gambel Oak	1,741	1,575	0	90	166	0	10
Mixed Mountain Shrub	11,306	8,513	1	75	2,793	1	25
Snowberry	391	370	0	95	21	0	5
Willow	62,998	51,788	5	82	11,211	4	18
Cottonwood	729	729	0	100	0	0	0
Aspen	195,428	161,702	15	83	33,726	11	17
Pinyon/Juniper	0	0	0			0	
Ponderosa Pine	11,215	9,438	1	84	1,776	1	16
Lodgepole Pine	279,733	218,657	20	78	61,077	20	22
Limber Pine	585	487	0	83	98	0	17
Douglas-fir	34,352	26,983	2	79	7,369	2	21
Blue Spruce	2,288	2,085	0	91	203	0	9
Spruce/Fir	352,624	272,023	25	77	80,602	27	23
Bristlecone Pine	7,636	6,896	1	90	740	0	10
Bare/Rock	97,533	54,802	5	56	42,731	14	44
Water	3,063	2,698	0	88	366	0	12
Grand Total	1,389,598	1,089,227		78	300,371		22

Key Findings

- Miles of existing (known) road network on the Gunnison Basin Geographic Area

System	Unclassified	Total
2,210	64	2,274

- Roads occur mostly in grass/forb (27 percent), lodgepole pine (18 percent), spruce/fir (21 percent), and aspen (19 percent) cover types.

- Miles of existing (known) trail network on the Gunnison Basin Geographic Area

SystemTrails			Unclassified Trails	Total Trail Miles
Motorized	Non-motorized	System Subtotal		
370	573	942	133	1,075

- Trails occur mostly in grass/forb (29 percent), spruce/fir (26 percent), aspen (14 percent), and then lodgepole pine (12 percent) cover types.

- Seventy-eight percent of the Gunnison Basin Geographic Area is within ½ mile of an existing road or trail.
- Seventy-five percent or more of most cover types on the Gunnison Basin Geographic Area occur within the ½ mile buffer.

Trends

- Because the existing road network is so extensive, the potential for future road development is low. Any new road construction that does occur will be associated with either oil and gas development or timber management, and these new roads will only be open to administrative traffic and/or temporary in nature.

Management Implications

- Travel management decisions (route-by-route) need to be made and implemented to reduce the density and impact of existing roads and trails.
- Several key habitat types (cover types) on the Gunnison Basin Geographic Area are almost entirely within ½ mile of an existing road or trail. These include: cottonwood 100 percent, sagebrush 95 percent, snowberry 95 percent, Gambel oak 90 percent. Reduction in road and trail densities in these habitats should be a management priority because these habitats are very important to many species and/or are limited in extent.