CHAPTER 3. LANDSCAPE DISTURBANCES

Road and Trail Distribution – Grand Mesa

This section evaluates the pattern of road and trail distribution on the Grand Mesa 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

Travel management planning efforts have been ongoing on the Grand Mesa Geographic Area over the past fifteen years. As a result, inventories of existing roads and trails are relatively complete. Route by route determinations have been made identifying 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.

All existing roads and trails known to occur on the Grand Mesa 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 Grand Mesa 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.

On the Grand Mesa National Forest, which includes the Grand Mesa Geographic Area, unclassified roads and trails will be or have recently been decommissioned as the Travel Management Plan decisions are implemented. Because these routes are mostly still visible on the ground and habitat is or has recently been affected, all unclassified roads and trails are considered in this evaluation.

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 Grand Mesa Geographic Area.

Figure 1. Map of Existing Roads and Trails, Grand Mesa Geographic Area

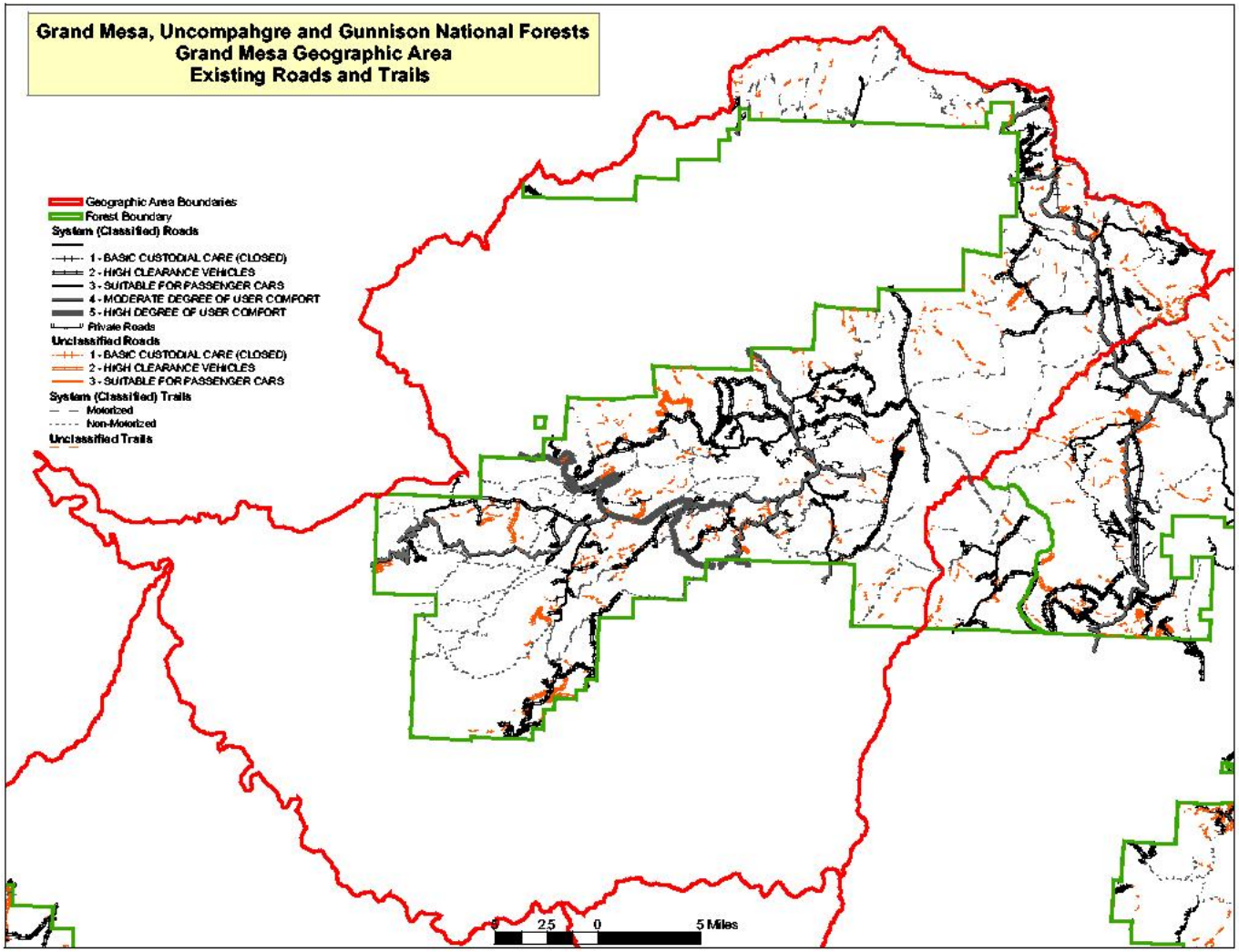

Table 1. Miles of Existing Roads within Different Cover Types, Grand Mesa Geographic Area (System miles in unshaded rows, unclassified miles in shaded rows)

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	11	51	12	13	3	90	**94**
	<1	4	<1	---	---	4	
Sagebrush	---	1	4	<1	---	5	**5**
	---	---	---	---	---	---	
Gambel Oak	7	23	6	9	2	47	**51**
	---	4	---	---	---	4	
Mixed Mountain Shrub	2	12	3	8	1	27	**31**
	---	4	---	---	---	4	
Snowberry	2	13	2	5	---	22	**24**
	---	2	---	---	---	2	
Willow	<1	6	1	3	1	12	**12**
	---	<1	---	---	---	<1	
Cottonwood	<1	<1	---	---	---	<1	**<1**
	---	---	---	---	---	---	
Aspen	4	39	8	10	9	70	**78**
	<1	7	<1	---	---	8	
Pinyon/Juniper	<1	4	---	5	---	10	**11**
	---	1	---	---	---	1	
Ponderosa Pine	---	---	---	---	---	---	**---**
	---	---	---	---	---	---	
Lodgepole Pine	---	---	---	---	---	---	**---**
	---	---	---	---	---	---	
Limber Pine	---	---	---	---	---	---	**---**
	---	---	---	---	---	---	
Douglas-fir	---	---	---	1	---	1	**1**
	---	---	---	---	---	---	
Blue Spruce	---	<1	<1	---	---	<1	**<1**
	---	---	---	---	---	---	
Spruce/Fir	18	30	11	15	6	80	**86**

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
	<1	5	<1	---	---	6	
Bristlecone Pine	---	---	---	---	---	---	---
	---	---	---	---	---	---	
Bare/Rock	---	<1	<1	2	4	8	**8**
	---	<1	---	---	---	<1	
Water	<1	<1	<1	<1	<1	1	**1**
	---	<1	---	---	---	<1	
Subtotal	45	181	47	71	28	373	
	1	27	1	---	---	29	
Grand Total	**46**	**208**	**48**	**71**	**28**		**402**

Table 2. Miles of Existing Roads within Different Cover Types, Grand Mesa Geographic Area

Cover Type	**System Roads**		**Unclassified Roads**		**Total Road**	
	Miles	%	Miles	%	Miles	%
Grass/Forb	90	24	4	16	94	24
Sagebrush	5	1			5	1
Gambel Oak	47	13	4	13	51	13
Mixed Mountain Shrub	27	7	4	15	31	8
Snowberry	22	6	2	7	24	6
Willow	12	3	0	0	12	3
Cottonwood	0	0			0	0
Aspen	70	19	7	26	78	19
Pinyon/Juniper	10	3	1	3	11	3
Ponderosa Pine						
Lodgepole Pine						
Limber Pine						
Douglas-fir	1	0			1	0
Blue Spruce	0	0			0	0
Spruce/Fir	80	22	6	20	86	21
Bristlecone Pine						
Bare/Rock	8	2	0	0	8	2
Water	1	0	0	1	1	0
Total	373		29		402	

More miles of roads occur in grass/forb (24 percent) than in any other cover type on the Grand Mesa, followed by spruce/fir (21 percent), then aspen (19 percent) cover types. For system roads, the breakdown is similar to that for total roads. For unclassified roads, most are found in aspen (26 percent), then spruce/fir (20 percent) and grass/forb (16 percent).

Table 3. Miles of Existing Trails within Different Cover Types, Grand Mesa Geographic Area

	System Trails				Unclassified Trails		Total Trail	
Cover Type	**Motorized**	**Non-Motorized**	**Total System Miles**	**%**	**Miles**	**%**	**Miles**	**%**
Grass/Forb	51	6	57	22	38	19	95	20
Sagebrush	1	0	1	0	1	0	2	0
Gambel Oak	18	22	40	15	24	12	64	14
Mixed Mountain Shrub	4	9	13	5	15	7	28	6
Snowberry	13	0	13	5	8	4	22	5
Willow	3	0	4	1	4	2	8	2
Cottonwood	0	1	1	1	0	0	1	0
Aspen	50	22	73	28	61	30	133	29
Pinyon/Juniper	0	8	8	3	2	1	9	2
Ponderosa Pine	0	0	0	0	0	0	0	0
Lodgepole Pine	0	0	0	0	0	0	0	0
Limber Pine	0	0	0	0	0	0	0	0
Douglas-fir	0	0	0	0	0	0	0	0
Blue Spruce	0	0	0	0	0	0	0	0
Spruce/Fir	24	26	50	19	47	24	97	21
Bristlecone Pine	0	0	0	0	0	0	0	0
Bare/Rock	2	2	4	1	1	0	4	1
Water	0	1	1	0	1	0	2	0
Total	166	97	263		201		464	

More miles of trails occur in aspen (29 percent) than in any other cover type, followed by spruce/fir (21 percent), then grass/forb (20 percent) cover types. For system trails, the situation is similar with 28 percent occurring in aspen, 22 percent in grass/forb and 19 percent in spruce/fir. For unclassified trails, most are found in aspen (30 percent), then spruce/fir (24 percent).

On the Grand Mesa Geographic Area, approximately 57 percent of the existing trails have been designated as system trails and the remaining trails have been or will be decommissioned. Most of the system trails are open to motorized use (63 percent).

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 GMUG.

Table 4. Comparison of Distribution of Roads and Trails to Distribution of Cover Types, Grand Mesa Geographic Area

Cover Type	% of Roads within Cover Type	% of Trails within Cover Type	Cover Type % of Grand Mesa GA
Grass/Forb	24	20	11
Sagebrush	1	0	1
Gambel Oak	13	14	11
Mixed Mountain Shrub	8	6	5
Snowberry	6	5	3
Willow	3	2	1
Cottonwood	0	0	0
Aspen	19	29	28
Pinyon/Juniper	3	2	6
Ponderosa Pine		0	0
Lodgepole Pine		0	0
Limber Pine		0	0
Douglas-fir	0	0	1
Blue Spruce	0	0	0
Spruce/Fir	21	21	29
Bristlecone Pine		0	0
Bare/Rock	2	1	4
Water	0	0	1

There are proportionately more roads in grass/forb, Gambel oak, mixed mountain shrub, snowberry, and willow than would be expected if roads were equally distributed across all cover types. In contrast, there are proportionately less roads in aspen, pinyon/juniper, spruce/fir, bare/rock and water cover types. More roads have been created in the more open cover types on the Grand Mesa, than in the dense timber stands.

For trails, there are proportionately more trails in grass/forb, Gambel oak, snowberry and aspen than would be expected if trails were equally distributed across all cover types. There are fewer trails in sagebrush, pinyon/juniper, spruce/fir and bare/rock cover types. Trails have also been developed in the more open cover types on the Grand Mesa.

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 Grand Mesa 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 Grand Mesa 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 Grand Mesa 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.

Eighty-one percent of the Grand Mesa Geographic Area is within ½ mile of an existing road or trail. (This is slightly more than the Forest-wide amount of 80 percent.) Spruce/fir and aspen cover types make up the bulk of the acres within the buffer around existing transportation routes (30 and 29 percent, respectively). The majority of all cover types on the Grand Mesa GA except pinyon/juniper (43 percent) and Douglas-fir (20 percent) lie within ½ mile of an existing road or trail. Most cover types have 84 percent or more occurring within the ½ mile buffer.

Spruce/fir, aspen, and pinyon/juniper cover types make up the bulk of the acreage that is outside the ½ mile buffer around existing roads and trails (25, 21 and 17 percent, respectively). Converse to the above situation, the minority of most cover types on the Grand Mesa GA are outside the area of influence from roads and trails. The majority of both pinyon/juniper and Douglas-fir cover types occur outside the ½ mile buffer, in very steep areas (Sunnyside and just below the mesa rim).

Figure 2. Area Within ½ Mile Of An Existing Road, Grand Mesa Geographic Area

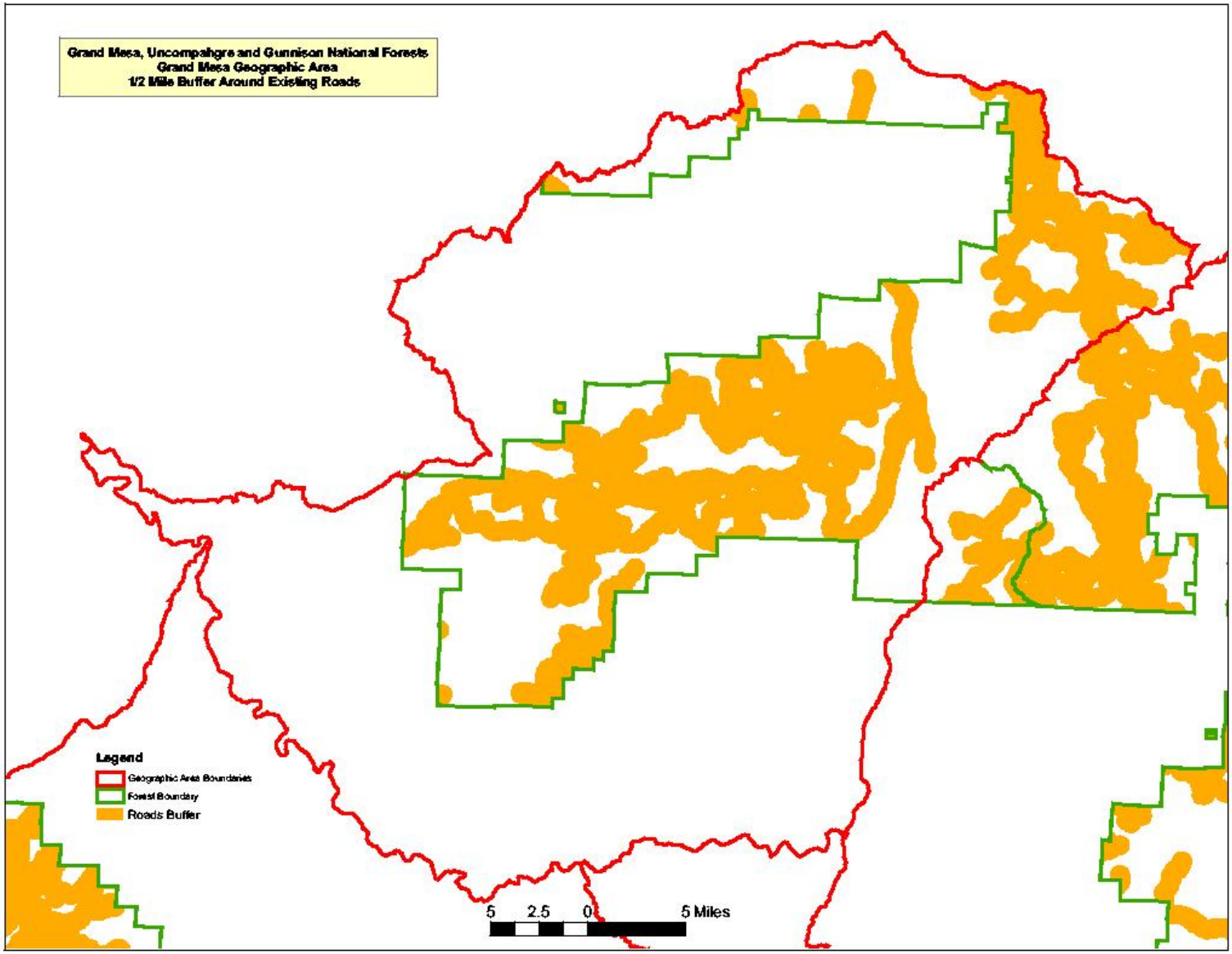

Figure 3. Area Within ½ Mile Of An Existing Trail, Grand Mesa Geographic Area

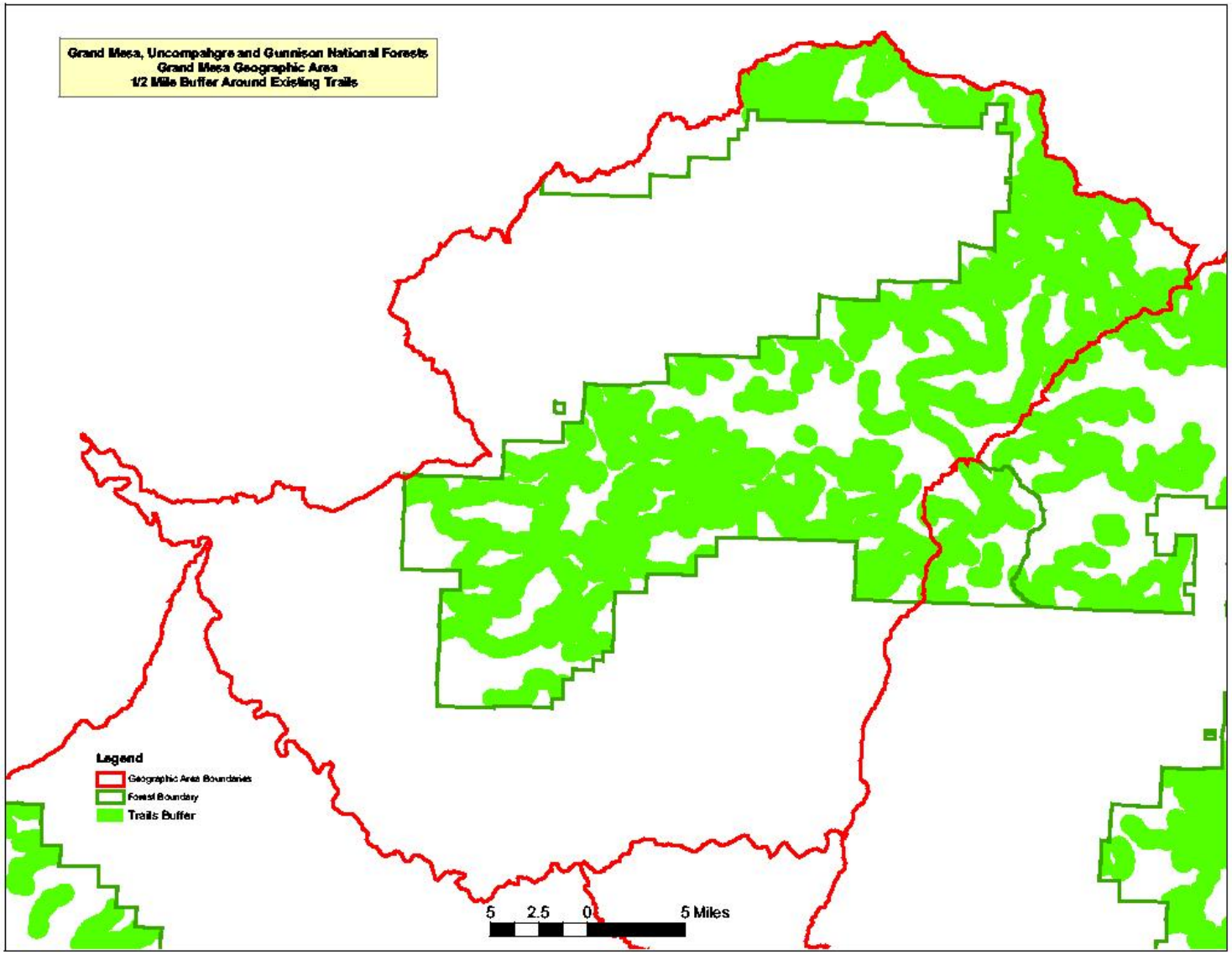

Figure 4. Area Within ½ Mile Of An Existing Road or Trail, Grand Mesa Geographic Area

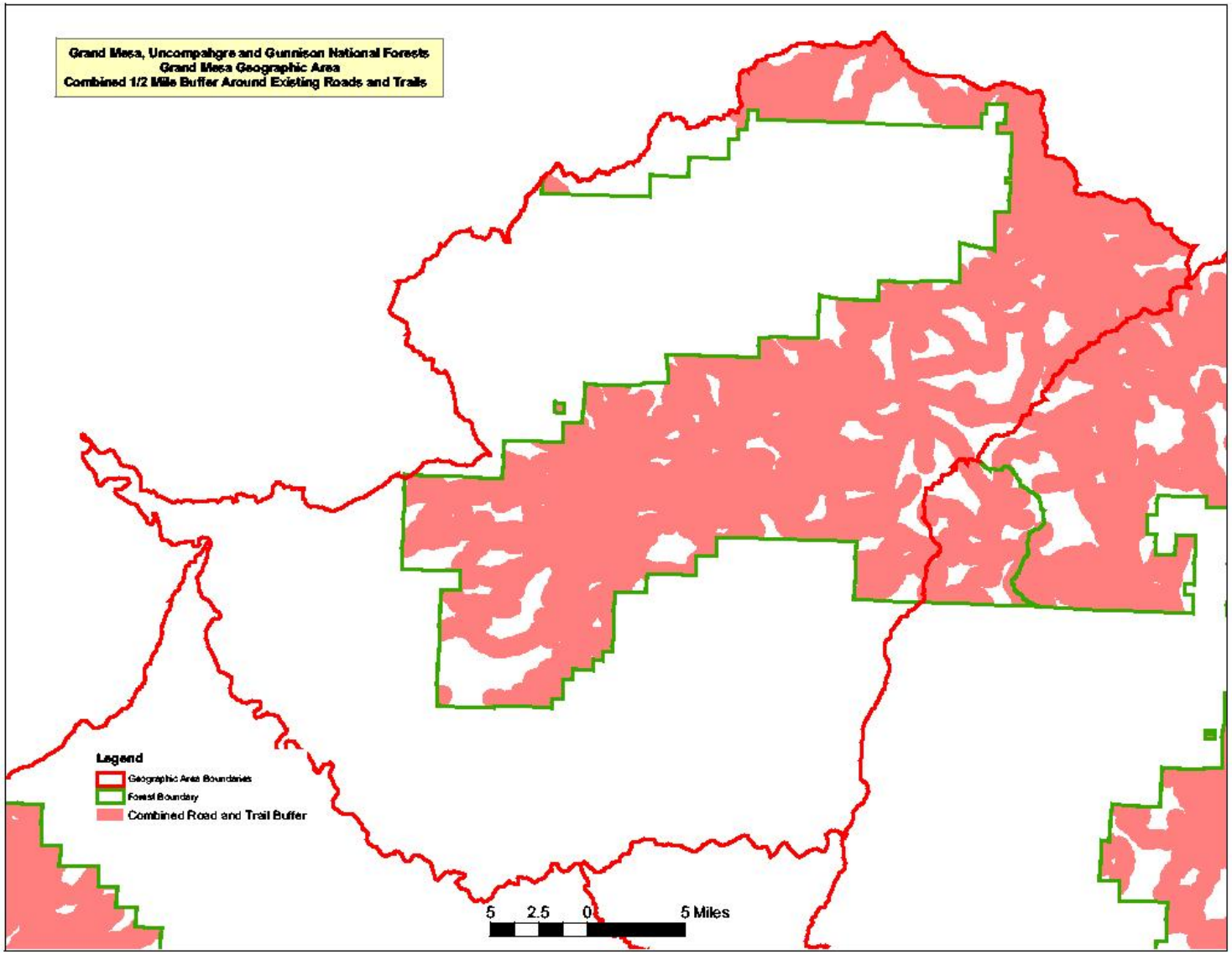

Table 5. Relative Amounts Of Acres In Cover Type, Inside And Outside Of ½ Mile Buffer Around Existing Routes, Grand Mesa Geographic Area.

Cover Type	Total Acres (Grand Mesa)	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	35,335	31,143	12	88	4,192	7	12
Sagebrush	1,940	1,731	1	89	209	0	11
Gambel Oak	36,064	30,532	12	85	5,532	9	15
Mixed Mountain Shrub	15,023	12,627	5	84	2,396	4	16
Snowberry	8,909	7,980	3	90	928	2	10
Willow	3,469	3,386	1	98	83	0	2
Cottonwood	399	389	0	97	10	0	3
Aspen	88,789	76,182	29	86	12,607	21	14
Pinyon/Juniper	18,256	7,816	3	43	10,440	17	57
Ponderosa Pine	0		0			0	
Lodgepole Pine	0		0			0	
Limber Pine	0		0			0	
Douglas-fir	3,316	679	0	20	2,637	4	80
Blue Spruce	55	55	0	100		0	0
Spruce/Fir	92,445	77,211	30	84	15,234	25	16
Bristlecone Pine	0		0			0	
Bare/Rock	11,839	6,336	2	54	5,503	9	46
Water	4,294	4,246	2	99	48	0	1
Grand Total	320,133	260,312		81	59,821		19

Key Findings

- Miles of existing (known) road network on the Grand Mesa Geographic Area

System	Unclassified	Total
373	29	402

- Roads occur mostly in grass/forb (24 percent), spruce/fir (21 percent), and aspen (19 percent) cover types.

- Miles of existing (known) trail network on the Grand Mesa Geographic Area

SystemTrails			Unclassified Trails	Total Trail Miles
Motorized	Non-motorized	System Subtotal		
166	97	263	201	464

- Trails occur mostly in aspen (29 percent), spruce/fir (21 percent), and then grass/forb (20 percent) cover types.

- Eighty-one percent of the Grand Mesa Geographic Area is within ½ mile of an existing road or trail.

- Eighty-four percent or more of most cover types on the Grand Mesa 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 implemented to reduce the density of existing roads and trails. While the area of influence will not be changed, reducing route density will reduce the amount of disturbance that can occur on these transportations routes, especially during hunting season, and as a result enhance habitat effectiveness.

- Because route-by-route decisions have been made which considered both resource management needs and recreation opportunities, opportunities for new roads and/or trails may be restricted by route density limitations.