

Recreation and Scenery Specialist Report

Motorized Travel Plan  
Dixie National Forest

Prepared by  
Kirk Flannigan, Recreation Staff, Pine Valley Ranger District  
and  
Noelle L. Meier, Forest Landscape Architect/Developed Recreation Program Manager

May 2008

Updated March 2009

Recreation.....	3
Chapter 3: Affected Environment.....	3
3.1. Introduction .....	3
3.2. Analysis Area .....	3
3.3. Existing Condition .....	4
3.3.1. Recreation Opportunity Spectrum and Forest Plan Direction .....	4
3.3.2. Resource Review .....	6
3.3.3. Recreation Use and Demand.....	7
Chapter 4: Environmental Consequences .....	15
4.1. Introduction .....	15
4.2. Direct and Indirect Effects.....	15
4.2.1. Features Common to All Alternatives.....	15
4.2.2. Alternative A.....	17
4.2.3. Alternative B.....	18
4.2.4. Alternative C .....	19
4.2.5. Alternative D .....	20
4.2.6. Alternative E.....	22
4.2.7. Open Routes by ROS Class .....	23
4.2.8. Distance from Motorized Routes.....	25
4.2.9. Dispersed Camping and Effects Across All Alternatives.....	26
4.2.10. Conclusions: Motorized and Non-motorized Opportunity.....	27
4.3. Cumulative Effects .....	27
4.3.1. Cumulative Effects Area .....	27
4.3.2. Recreation.....	28
4.3.3. Fire and Fuels .....	32
4.3.4. Vegetation Treatments.....	32
4.3.5. Wildlife and Fisheries.....	32
4.3.6. Noxious Weeds.....	32
4.3.7. Oil and Gas .....	32
4.3.8. Livestock Grazing .....	33

4.4. Project Design Features ..... 33  
4.5. Consideration of Available Science ..... 33  
Scenery ..... 35  
Chapter 3: Affected Environment ..... 35  
3.1. Introduction ..... 35  
3.2. Concern Levels ..... 36  
3.3. SMS Forest Plan Amendment (2000) ..... 36  
3.4. Resource Review ..... 37  
Chapter 4: Effects Analysis ..... 38  
4.1. Introduction ..... 38  
4.2. Direct and Indirect Effects ..... 38  
    4.2.1. Route T34070 ..... 40  
    4.2.2. Route U24028A ..... 41  
    4.2.3. Conclusions ..... 42  
4.3. Cumulative Effects ..... 43  
    4.3.1. Cumulative Effects Area ..... 43  
    4.3.2. Cumulative Effects ..... 43  
4.4. Project Design Features ..... 44  
4.5. Consideration of Best Available Science ..... 45  
Literature Cited ..... 46

## Recreation

### Chapter 3: Affected Environment

Affected Environment section written by:

- Kirk Flannigan, Recreation Staff, Pine Valley Ranger District,
- Nick Glidden, Wilderness, Trails, and Dispersed Recreation Program Manager, and
- Noelle L. Meier, Forest Landscape Architect/Developed Recreation Program Manager (through July 2007).

#### 3.1. Introduction

For the purposes of this document, the term ATV will refer to All-terrain Vehicles 50 inches and less in width. The terms OHV (Off-highway Vehicle) and ORV (Off-road Vehicle) are often used interchangeably to describe a broad class of vehicles that include over-snow vehicles, ATVs, side-by-side utility vehicles, motorcycles, full sized high-clearance 4x4s, or other vehicles capable of travel over unimproved terrain. The 1986 Forest Plan uses the term ORV to describe this category of vehicle use as it pertains to recreational opportunities. 36 CFR Parts 212, 251, 261, and 295 Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule (hereinafter referred to as the Travel Rule) uses the term "OHV." In this document, where a specific vehicle is referenced, its proper name is used, such as ATV or over-snow vehicle. The terms OHV and ORV are not to be confused as referring to cross-country travel off designated roads or trails. Cross-country or off-road or off-trail travel will be carefully specified whenever described in this report.

The information in this report is qualitative in nature and is based upon social patterns that are understood in the industry and science related to recreation and scenery management.

#### 3.2. Analysis Area

Recreation is a primary use of the lands within the Dixie National Forest; visitors come to the Forest for a wide variety of activities and experiences. These recreation opportunities range from primitive settings that include wilderness and backcountry areas to developed settings that include 26 campgrounds, five picnic sites, and several permitted resorts and a downhill ski area. Three historic Forest Service guard stations are offered to the public as rental cabins. There are 42 recreation residences on the Forest. Thirty-nine outfitter-guides are authorized to operate on the Forest, providing guided hunting, fishing, OHV and mountain bike touring, and horse riding trips. Five visitors centers distribute information about the area and activities. Dispersed camping, including dispersed use for large family reunions and hunting camps, is also a popular use of the Forest.

The Dixie National Forest provides habitat and non-motorized and motorized access for big and small game hunting, a highly valued activity in southern Utah. Several streams and lakes provide fishing opportunities; some lakes accommodate boats and others requiring hiking-in. Non-motorized and motorized trails are available for hiking, mountain biking, OHV use, and

horse riding. Although winter travel is not included in this decision, snowmobiling and cross-country skiing are also popular activities on the Forest.

The Dixie National Forest is home to several Scenic Byways and a National Scenic Byway and All-American Road (Highway 12). These highways are frequently chosen as scenic travel routes by visitors touring southern Utah and visiting other locations including Bryce Canyon, Zion, and Capitol Reef national parks, and Grand Staircase-Escalante and Cedar Breaks national monuments. The national parks and monuments attract national and international visitation to the Dixie National Forest. The spectacular scenery of the area is known around the world, with the Dixie National Forest contributing red rock cliffs, hoodoos and escarpments, and a mix of wildflowers, conifers, aspen, and a variety of shrub species that make spring and autumn viewing a major attraction. Year-round access and recreation enhance the desirability of the Dixie National Forest as a destination vacation area, as well as a neighbor to growing urban areas and mountain communities such as Pine Valley, Duck Creek Village, Brian Head Town, and a number of private subdivisions.

### **3.3. Existing Condition**

#### **3.3.1. Recreation Opportunity Spectrum and Forest Plan Direction**

The Forest Service uses the Recreation Opportunity Spectrum (ROS) to match visitor's desires, abilities, and expectations to a particular activity and setting (PLAE, Inc. 1993, pp. 25-27). ROS provides a framework for stratifying and defining classes of outdoor recreation environments. The continuum of this spectrum can be defined in terms of perceivable modifications to the natural environment, such as presence of roads and trails or the existence of buildings, facilities and conveniences. Also considered in the evaluation of a setting are social factors such as remoteness, size of the space, evidence of human activity, social encounters, and managerial presence. Philosophically, the ROS is based upon the following premises:

- People purposefully choose settings for their recreation activities,
- Choices are made with the expectation of achieving particular recreation experiences, and
- It is desirable, from a macro-planning perspective, to present a diverse spectrum of activity and recreation setting opportunities, ranging from highly developed to primitive, from which people may choose.

ROS is designed as a spectrum with five different classes: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Rural, and Urban. There are no Rural or Urban ROS classes on the Dixie National Forest. The continuum of the ROS spectrum can be defined in terms of perceivable modifications to the natural environment such as presence of roads and trails or the existence of buildings, facilities, and conveniences. Also considered in the evaluation of a setting are social factors such as remoteness, size of the space, evidence of human activity, social encounters, and managerial presence. Managers can use the ROS to assist in management decisions; however, areas may be reclassified depending on actual on-the-ground changes.

The experience opportunities for each ROS class on the Dixie National Forest are described below.

1. **Primitive.** “Opportunity for isolation (from the sights and sounds of people), to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills” (Manning 1999).
2. **Semi-Primitive Non-Motorized.** “Some opportunity for isolation from the sight and sound of people, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills” (Manning 1999).
3. **Semi-Primitive Motorized.** “Some opportunity for isolation from the sights and sounds of people, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area” (Manning 1999).
4. **Roaded Natural.** “Interaction between users may be low to moderate, but with evidence of other users prevalent. Conventional motorized use is provided for in construction standards and design of facilities” (Hammitt and Cole 1998).

According to the Forest Plan for the Dixie National Forest and the ROS framework, corridors along Highways 12, 14, 143 and 148, as well as numerous main forest roads, have historically been managed for roaded recreation opportunities (USDA 1986, pp. IV-26 through IV-118). Management activities conducted along these roads are directed to not be evident or must be visually subordinate to the natural character. Current direction for these corridors is to provide for high-quality scenery (an attractive setting for recreation), which is consistent with a Roaded Natural ROS classification. However, private residential developments, utilities related to those residential developments, and encounters with other recreationists are on the increase, and in some cases are shifting more developed and heavily used areas toward a Rural classification. Remote portions of the Forest are consistent with a Semi-Primitive recreation opportunity setting, with visitors usually experiencing fewer encounters with other users. Wilderness areas provide the most primitive settings with opportunities to experience solitude, risk, and challenge.

The Forest Plan describes a setting of highly diversified recreational opportunities (USDA 1986, pp. II-3). Among those activities described and predicted for substantial growth in demand are opportunities for driving for pleasure and dispersed recreation. Out of a total 1,881,000 acres on the Dixie National Forest, 103,959 are available as Primitive, 805,500 are available as Semi-Primitive Non-Motorized, 687,611 acres are available for Semi-Primitive Motorized, and 283,998 acres are available for Roaded Natural recreation. Information on the development of the ROS GIS layer can be located at Reading 2008.

The Forest Plan goes on to describe that although demand for dispersed recreation was not expected to exceed supply, competition for sites would create social conflict. Opportunities for improving the dispersed recreation experience and reducing conflicts include the development of a program for trailhead construction and encouraging use at more remote sites. Forest capacity for dispersed recreation is described in the Forest Plan as being directly related to ease of access and facilities. The easier the access and the more available the facilities, the greater the opportunity for dispersed recreation and reduction in user competition and conflict. The growing popularity of ATV use is also described as a growing concern and a plan to regulate use was recognized as a necessity to prevent damage to critical areas (USDA 1986, pp. II-8 through II-10).

The Forest Plan recognized that recreation occurs where there is an attraction. The location of facilities is based on the need to accommodate this use and preserve the physical environment. Developed facilities are generally located to take advantage of local attractions and to enhance

established dispersed recreation activities. The Forest Plan states that recreation facilities will be located to meet the needs of the public unless there is a conflict with other resources which cannot be resolved (USDA 1986, pp. III-2 through III-3). The Forest Plan provides separate and distinct areas of the Forest where the management direction will provide for recreation experiences ranging from Primitive to Roded Natural. Conflict between recreation user groups was planned to be minimized because there are sufficient areas of each experience type to accommodate the expected increase in user groups (USDA 1986, pp. III-2 through III-3).

The Forest Plan directs multiple use goals and objectives for recreation to include the following (pp. IV-1 through IV-3):

- Goal No. 1: Provide a broad range of outdoor recreation opportunities for all segments of the public.
  - Direction a: Where possible, provide group opportunities adjacent to communities. Maintain group recreation opportunities in proportion to demand.
- Goal No. 3: Provide a broad spectrum of low cost dispersed recreation opportunities.
  - Objective a: Providing ORV roads and trails, winter snow play areas, hunter camp areas, recreation stock trailheads, and others as needed.
- Goal No. 5: Provide a trail system adequate to disperse recreation users and prevent overuse in popular areas, and provide safety for the user and provide for more year around use of the Forest.
  - Objective a: Develop a summer and winter trail management plan. Provide a trail system consisting of 690 miles of summer trail.
  - Objective d: Program trail construction funds to reconstruct or construct 30 miles of trail each decade.
- Goal No. 7: Provide opportunities for the use of off-road motor vehicles where they will not unacceptably impact Forest resources or unnecessarily impact other Forest users.
  - Objective: Review the travel plan annually and revise as necessary. The most current revisions will become a part of the management direction for the Forest Plan.

### 3.3.2. Resource Review

**Table R3-1. Existing ROS Acres**

Area	Acres by ROS Class			
	Primitive	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roded Natural
Cedar City	7,266.64	96,981.90	153,349.26	97,110.02
Escalante	28,870.40	181,276.84	151,686.86	69,406.49
Pine Valley	67,292.07	225,222.07	115,513.04	54,848.56
Powell	530.57	193,171.99	140,377.68	45,245.86
Teasdale*	0	108,847.37	126,684.31	17,387.83
Forest-wide	103,959.68	805,500.17	687,611.15	283,998.76

\* In 2006 the Teasdale Ranger District on the Dixie National Forest and the Loa Ranger District on the Fishlake National Forest were consolidated into the Fremont River Ranger District. As this motorized travel plan project includes just the Teasdale portion of this new ranger district, the area is still referred to as Teasdale throughout this report.

### 3.3.3. Recreation Use and Demand

The six counties that contain the Dixie National Forest have a large proportion of land held in federal ownership and management. Compared to times past, less of the area's economic base is reliant on resource extraction and gathering of forest products, while recreation and tourism are becoming the major industry. Federal lands provide much of that opportunity.

Since the publication of the Forest Plan in 1986, recreation and tourism levels on the Forest have shown a dramatic increase, paralleling or exceeding statewide trends during this same period. According to the National Visitor Use Monitoring results for the Dixie National Forest, the Forest received 773,789 visits in 2003 (USDA 2004b, p. 6). Visits to the Dixie National Forest are often associated with visits to surrounding national and state parks and other recreation and travel opportunities. The Dixie National Forest's proximity to several parks, its location near Interstates 15 and 70 between major western population centers, and a growing resident and transient population are contributing to swelling trends in Forest visitation.

The increasing population of Clark County, Nevada, and Washington County, Utah, are major contributors to escalating visitation on the Forest. As a result of past contacts, and as illustrated in the following table, the growing temporary and permanent residential population living adjacent to or within the boundaries of the Dixie National Forest have in large part migrated from Clark County, Nevada. An indication of this influence comes from the results of a 1994 survey completed by A & A Research which indicated that 49 percent of the Las Vegas, Clark County, area residents surveyed had visited the Dixie National Forest at least once within the year prior to the survey (A & A Research 1994). In addition to the Las Vegas area, contacts made on the Forest indicate the increasing populations in the Phoenix, Arizona, and Los Angeles, California, areas are contributing to an increase in migration to southwestern Utah.

**Table R3-2. Most Common Zip Codes of Dixie National Forest Recreation Visitors**

Zip Code	City, State	County	Count	Percent
84770	St. George, UT	Washington	43	8.39844
84720	Cedar City, UT	Iron	33	6.44531
84790	St. George, UT	Washington	26	5.07813
84780	Washington, UT	Washington	14	2.73438
84737	Hurricane, UT	Washington	11	2.14844
89015	Calico Ridge, NV	Clark	9	1.75781
84738	Ivins, UT	Washington	8	1.56250
84741	Kanab, UT	Kane	7	1.36719
84765	Santa Clara, UT	Washington	7	1.36719
89123	Las Vegas, NV	Clark	6	1.17188
84726	Escalante, UT	Garfield	5	0.97656
84759	Panguitch, UT	Garfield	5	0.97656
84761	Parowan, UT	Iron	5	0.97656
89012	Henderson, NV	Clark	5	0.97656
89110	Las Vegas, NV	Clark	5	0.97656
89128	Las Vegas, NV	Clark	5	0.97656
89131	Las Vegas, NV	Clark	5	0.97656
84118	Salt Lake City, UT	Salt Lake	4	0.78125
84745	La Verkin, UT	Washington	4	0.78125
84781	Pine Valley, UT	Washington	4	0.78125
89027	Mesquite, NV	Clark	4	0.78125
89149	Las Vegas, NV	Clark	4	0.78125

Source: National Visitor Use Monitoring Results (USDA 2004b).

Note: According to these results, approximately 20.7 percent of visits to the Dixie National Forest in 2003 were by people from Washington County, Utah. Approximately 7.4 percent were from Iron County, Utah, and approximately 8.6 percent were by people from Clark County, Nevada. Two percent were from Garfield County and approximately 1.4 percent were from Kane County. Approximately 0.8 percent were from Salt Lake City.

Since 1986 there has also been a dramatic increase in summer and winter home building (for both seasonal and year-round residents) within the boundaries of the Dixie National Forest. These homeowners play a role in the economy through the purchase of goods and services from the immediate area and contributions to the local tax base. At the same time, they contribute to an increase in use on the Forest, particularly for the purpose of outdoor recreation.

### 3.3.3.1. Recreation Activities

#### Developed Camping

Camping is a popular recreation activity within the project area. There are 26 campgrounds and 5 picnic sites on the Forest. A number of these sites accommodate large groups. Several campgrounds are located near lakes and reservoirs and have boating and fishing opportunities. Activities such as hiking, mountain biking, OHV use, and horseback riding are oriented around these developed sites. Many campgrounds are located on or near designated scenic byways and backways, and are used by travelers visiting Zion, Bryce Canyon, and Capitol Reef national parks, and Cedar Breaks and Grand Staircase-Escalante national monuments.

## Dispersed Camping

Dispersed camping, or camping in non-developed areas, is a common recreation activity on the Dixie National Forest, occurring primarily during the summer and during the fall hunting season. Dispersed camping is allowed in most Forest areas except those within the vicinity of developed recreation sites such as trailheads, picnic areas, or campgrounds. An inventory of dispersed campsites found a total of 1,624 campsites across the Forest (USDA 2004a). Of those sites, 215 were located greater than 150' from a designated route (the distance allowed per Forest Closure Order #0407-04-03) in areas closed to cross-country travel.

To reduce resource damage while maintaining a primitive camping experience, the Dixie National Forest has designated dispersed campsites in three areas:

1. Along the East Fork of the Sevier River south of Tropic Reservoir,
2. Along Mammoth Creek near Mammoth Spring, and
3. In Yankee Meadows north of the campground.

The decision to designate sites in the East Fork area was made in a previous closure order, while the Mammoth and Yankee Meadows areas were designated in previous decisions. The designation of these areas will be carried forward in this travel plan as previous decisions.

## Trail Use

The Dixie National Forest has 266 designated trails that provide 1,499.5 miles of standard/terra trail related recreation opportunities. Recreation opportunities include hiking, biking, horseback riding, and OHV/ATV riding. In 2004 the National Visitor Use Monitoring Results indicated that Forest trails ranked fourth out of the 22 constructed facilities/designated area types most used by visitors on the Dixie National Forest (USDA 2004b, p. 14).

The Dixie National Forest has been monitoring trail and road use since 2003. There has been an increase in use numbers over the past four years. Although most of this increase is due to a true increase in use numbers, it should be noted that some of the increase may be from more accurate trail counter data collection methods. Table R3-3 below displays the average counts per day on the listed trails and roads.

**Table R3-3. Average Counts of Dixie National Forest Trail and Road Use\***

Monitoring Location	Average Counts/Day 2006	Average Counts/Day 2005	Average Counts/Day 2004	Average Counts/Day 2003
Pine Valley Ranger District				
Enterprise Reservoir Road	NA**	NA	29.92	NA
Equestrian Trail	10.97	6.92	7.84	7.3
Forsyth Trail	7.87	11.71	14.3	12.95
Mill Flat Trail	NA	8.33	11.47	7.62
New Harmony Trail	NA	NA	1.56	3.84
Whipple Trail	13.41	8.89	9.23	9.75
Upper Browse Road	8.5	NA	NA	NA
Lower Browse Road	21.1	NA	NA	NA
Oak Grove Trail	50.85	NA	NA	NA
Water Canyon Trail	NA	NA	NA	NA
Cedar City Ranger District				
Aspen Mirror ATV Trail	NA	NA	30.75	21.12

Monitoring Location	Average Counts/Day 2006	Average Counts/Day 2005	Average Counts/Day 2004	Average Counts/Day 2003
Blowhard Trail	7.8	8.5	9.63	NA
Bunker Creek	32.8	22	29.12	14.19
Cascade Falls	18	16.88	NA	NA
Cedar Breaks Road (winter)	27.65	28.15	NA	NA
Duck Creek East	101.05	65.26	NA	NA
Duck Creek Trail	15.7	17.63	13.76	13.46
Duck Creek (winter)	32.35	33.8	NA	NA
Crystal Springs Trail	NA	2.05	4.52	6.2
Dark Hollow Trail	NA	NA	14.23	NA
Longdeer/County Line (winter)	23.05	14.85	NA	NA
Markagunt Trail (Yankee)	22.9	14.99	5.89	NA
Potato Hollow Trail	NA	0.58	0.72	0.77
Rattle Snake Trail	5.86	3.64	4.31	7.3
Sidney Peak Trail	30.35	NA	31.13	NA
<b>Powell Ranger District</b>				
Casto Canyon Trail	51.2	45.36	52.95	NA
Freemont ATV Trail	3.6	10.66	5.28	8.55
Jones Corral Road	NA	NA	7.28	9.18
Red Canyon Trail	37.24	50.04	37.68	33.49
Thunder Mountain Trail	21.3	25.76	22.06	NA
<b>Escalante Ranger District</b>				
Upper Box Trail	NA	NA	1.36	1.96
Lower Box Trail	NA	2.09	3.88	1.9
Death Hollow Trail	0.81	0.82	0.66	0.55
Great Western ATV Trail	NA	NA	NA	NA
Pacer ATV Trail	4.25	1.35	2.94	NA
Poison Creek Trail	3.4	1.22	2.19	NA
Under The Point Trail	NA	NA	0.44	NA

Source: Dixie National Forest Recreation Monitoring Program.

\* No counts exist for the Teasdale portion of the Fremont River Ranger District as this area is administered by the Fishlake National Forest.

\*\*NA = Not Available. Counter either vandalized or stolen.

### *Great Western Trail*

The Great Western Trail (GWT) is a long distance trail that traverses approximately 4,455 miles across five states; 226 miles are on the Dixie National Forest. The GWT was designated a Utah Centennial Trail in 1996 and a National Millennium Trail in 2000. The GWT is somewhat unique in that it is a popular route for both motorized and non-motorized users, and for the fact that portions of it follow roads and other named trails. On the Dixie National Forest, the GWT travels through the Powell and Escalante Ranger Districts and the Teasdale portion of the Fremont River Ranger District. Across these three districts the GWT provides for approximately 139 miles of motorized opportunities and 87 miles of non-motorized opportunities. In some instances, use is separated by different routes, and in some cases, mixed use does occur. Past experience and research shows that mixing motorized and non-motorized use can create conflicts, and in general this conflict is greatest felt by non-motorized users (Ramthun 1995, Hendee and Dawson 2002, Hammitt and Cole 1998, Manning 1999, Gibbons and Ruddell 1995). In addition, the complications of properly managing a popular, long distance trail such as

the GWT are increased when accommodating both motorized and non-motorized use. This is especially true if enforcement is lacking, signing is poor or dated, and/or users do not follow regulations.

### **Non-motorized Trail Use**

There are 1,086.9 miles of designated non-motorized trails on the Forest. Of the 1,086.9 miles of trail, 154.8 miles are located in federally-designated wilderness areas. The Dixie National Forest also has two National Recreation Trails: Whipple (#31025) on the Pine Valley Ranger District, and Cascade Falls (#32055) on the Cedar City Ranger District. Some of the most common uses on non-motorized trails are hiking, horseback riding, and mountain biking.

- **Hiking.** Hiking is common on most all non-motorized trails. In particular, hiking is most common on trails that are too steep or narrow for equestrian and mountain bike use.
- **Horseback Riding.** Although horseback riding occurs on many trails across the Forest, it is most common on trails that access the Pine Valley Mountain Wilderness Area. Due to terrain constraints, equestrian use is limited on trails that access the Ashdown Gorge and Box-Death Hollow wilderness areas. Other trails that receive substantial equestrian use are the Losee Canyon Trail (#33090) and trails associated with the Great Western Trail (#34001). The Dixie National Forest also issues special use permits for equestrian endurance rides on the Powell Ranger District.
- **Mountain Biking.** Mountain biking is a common trail use on the Sidney Peaks Trail (#32010), Left Fork Bunker Creek (#32033), Right Fork Bunker Creek Trail (#32040), Dark Hollow Trail (#32032), Marathon Trail (#32024), Blowhard Trail (#32047), Navajo Lake Loop Trail (#32022), Virgin River Rim Trail (#32011), and the Thunder Mountain Trail (#33098). A new mountain biking trail is currently being constructed on the Pine Valley Ranger District. The Dixie National Forest issues special use permits for a number of bike races, including the National Off-Road Bicycling Association (NORBA) national series race.

### **Motorized Use**

Dispersed motorized recreation use has grown and developed considerably on the Dixie National Forest. Past and current field contacts have shown that this activity has become very popular with Forest users from Las Vegas, the Salt Lake area, and local communities. Adjacent private property has been purchased by people who value forest recreation experiences. A sizable number of those property owners place a high value on the nearby ATV access, as represented in recent public participation. As illustrated in Table R3-4, growth in demand for OHV use and other dispersed motorized recreation has increased, which is reflective of similar demand in other areas of the United States, particularly the west. Southern Utah is also recognized as a destination for OHV recreation activities, as well as non-motorized forms of recreation (USDA 2009).

**Table R3-4. OHV Registration for Select Utah Counties\***

County or Area	1998 Registrations	2005 Registrations	Percent Change
Salt Lake	15,747	39,593	151.43
Beaver	271	754	178.23
Sevier	1709	4,256	149.03
Wayne	124	455	266.94
Garfield	267	772	189.14
Kane	306	1,088	255.56
Washington	1,654	8,881	436.94
Iron	860	3,475	304.07
Piute	104	359	245.19
Sanpete	1,346	3,703	175.11
Millard	598	1,925	221.91
Emery	869	2,045	135.33
Grand	218	889	307.80
San Juan	295	948	221.36
Entire State of Utah	51,686	152,841	195.71

There are 412.8 miles of designated motorized trails on the Forest, as well as 2,580 miles of level 2 roads, and 481.6 miles of level 3 roads that are open to OHV/ATV travel, for a total of 3,474.4 miles of roads and trails open to OHV/ATV recreation.

The Dixie National Forest has several designated OHV/ATV trail systems. The Markagunt ATV/OHV trail system located on the Cedar City Ranger District is made up of 408 miles of well-marked OHV/ATV trail riding opportunities. The Fremont and Paunsaugunt ATV/OHV trail system located on the Powell Ranger District provides 147 miles of riding opportunities. In addition, the Great Western ATV/OHV trail system on the Powell and Escalante ranger districts provide around 65 miles of riding opportunities. Many of the miles of these ATV/OHV trail systems are located on level 2 and level 3 roads.

The Forest also has several OHV loading and unloading areas across the Forest:

- Pine Valley Ranger District
  - Upper Enterprise Reservoir
- Cedar City Ranger District
  - Duck Creek Campground Corral
  - Aspen Mirror Lake
  - Parking areas at Strawberry and Swains
  - Hwy 14/Mammoth Creek Road pull-out
  - Hwy 14/Stout Canyon Parking area
  - Red Creek Reservoir
  - Yankee Meadows Campground
  - North Red Creek Reservoir
  - Pole Hollow road pull-out just past private land on Markagunt trail system #25
  - Road # 30074 old gravel pit pull-out, provides access to Markagunt trail system #3
- Powell Ranger District
  - Great Western Trailhead
  - Casto Canyon Trailhead
- Escalante Ranger District

- Pine Lake
- Clayton Guard Station area
- Antimony area
- Teasdale portion of Fremont River Ranger District
  - Fish Creek Trailhead
  - Rosebud Trailhead

### **Wilderness Recreation Use**

The Dixie National Forest has three wilderness areas comprising 83,026 acres and containing 154.8 miles of trail. All three wilderness areas were designated in 1984 by the Utah Wilderness Act.

The Pine Valley Mountain Wilderness Area, at 50,232 acres, is the largest wilderness area on the Forest and the second largest wilderness area in Utah. The wilderness area, located on the Pine Valley Ranger District, is described as a mountain island surrounded by desert. The area is known for numerous meadows (up to 50 acres in size) and a beautiful forest of Engelmann spruce in the south, and spruce mixed with fir, pine, and large stands of aspen in the north. The Pine Valley Mountains rise through the entire center of the area and provide habitat for chipmunks, marmots, red squirrels, and a large herd of deer and elk in summer. Elevations rise to a high point at 10,365 feet on Signal Peak in the southern portion. On a clear day from this site, you can see Zion National Park across Interstate 15 to the west, and some of Arizona's highest mountains to the south.

Several springs fill numerous perennial creeks. Snow falls from October through March, followed by a relatively dry and pleasant period that ends with a season marked by typically violent storms from July through September.

The Summit Trail follows the crest of the Pine Valley Mountains in their north-south ramble for a distance of about 18 miles, and at least eight other trails climb the mountains to join the crest, including the Whipple National Recreation Trail (#31025).

The Box-Death Hollow Wilderness Area is the second largest wilderness area on the Dixie National Forest at 25,751 acres. The wilderness is characterized by vertical gray-orange walls of Navajo sandstone that stand above two canyon tributaries of the Escalante River. This is canyon country, home to numerous monoclines – places where fault lines have made layers of earth rise and fall sharply, exposing the colorful strata of sediment. The name Death Hollow gives reference to a number of livestock that plunged to their death trying to cross the steep canyon. Running north-south through a steeply dipping monocline, Pine Creek forms the area known as “The Box.”

Death Hollow Creek, east of The Box, has carved its way through a gently dipping monocline. Raging waters often flood these canyon narrows after a rain. Pinyon and juniper cover many of the plateaus above the canyons. Brown and rainbow trout are plentiful in Pine Creek and in portions of Sand Creek. Along the creek banks, you may see mule deer, an occasional cougar, black bear, or even elk in winter. The BLM's Phipps-Death Hollow Outstanding Natural Area lies south, adjacent to the wilderness. Nine miles of trail run the distance of “The Box.” Hiking in the remainder of this wilderness area requires following drainages or undesignated routes. Many of these routes require canyoneering and swimming skills and are subject to frequent flashfloods.

The Ashdown Gorge Wilderness Area is the smallest wilderness area on the Dixie National Forest at 7,043 acres. Sharing the western and northern borders of the desert-like Cedar Breaks National Monument, the wilderness area displays eroded, multicolored Wasatch limestone, meadows, and forestland including a significant stand of bristlecone pine known as the Twisted Forest in the northern corner. Bristlecone pines are among the oldest living life-forms. The area is home to a diversity of wildlife that includes mule deer, elk, black bear, cougar, yellow-bellied marmots, chipmunks, golden-mantled ground squirrels, voles, and mice. Creeks run year-round. Elevations range from 8,000 feet to 10,400 feet, and winter snows often add spectacular highlights to the colorful stone formations.

There are fewer than 10 miles of trail within the Ashdown Gorge Wilderness. The Rattlesnake Trail (#32051) traces the northern boundary of the national monument and follows Rattlesnake Creek on an east-to-west path across the wilderness to meet the Potato Hollow Trail. The latter trail continues south to a trailhead at Cedar Springs. The Potato Hollow Trail (#32050) forks before the trailhead to become the Blowhard Trail (#32047), which climbs Blowhard Mountain.

### **Hunting and Fishing**

There is extensive hunting use on the Dixie National Forest during the general season deer and elk hunts. Limited Entry elk hunts occur in the Panguitch Lake area north of Highway 14 on the Cedar City Ranger District, the Mount Dutton area north of Highway 12 on the Powell Ranger District, and the Thousand Lake area on the Teasdale portion of the Fremont River Ranger District. The Paunsaugunt Limited Entry Deer hunt occurs south of Highway 12 on the Powell Ranger District. A Limited Entry antelope hunt occurs in the Panguitch Lake, Paunsaugunt, Mount Dutton, and Pine Valley areas as well. Black bears, mountain lions, turkeys, waterfowl, and upland game birds are hunted across the Forest. Ruffed grouse are generally hunted along the rim areas.

Popular fishing sites are numerous and include opportunities for anglers to catch various trout and smallmouth bass. Popular lakes include Aspen-Mirror Lake, Barkers Reservoir, Blue Lake, Crescent Lake, Donkey Reservoir, Duck Lake, Enterprise Reservoir, Pine Valley Reservoir, Horseshoe Lake, Long & Round Willow Bottom Reservoirs, Lowder Creek Pond, McGath Reservoir, Navajo Lake, Pacer Lake, Panguitch Lake, Pine Lake, Posey Lake, Purple Lake, Red Creek Reservoir, Row Lake, Spectacle Reservoir, Tropic Reservoir, and Yankee Meadow Reservoir.

Popular streams include Antimony Creek, Blue Spring Creek, Bunker Creek, Butler Creek, Castle Creek, Center Creek, Deer Creek, Duck Creek, East Fork Boulder Creek, East Fork Sevier River, Fish Creek, Leeds Creek, Mammoth Creek, North Creek, Panguitch Creek, Pine Creek (Escalante), Pine Creek (Teasdale), Pleasant Creek, Podunk Creek, Santa Clara River, South Ash Creek, Threemile Creek, and the West Fork Boulder Creek.

### **Private Subdivisions/Vacation Home Sites**

There are 42 recreation residences under Forest Service permit on the Forest. Private residences, both primary and secondary homes, are located within the Forest in numerous subdivisions in and around the communities of Duck Creek Village, Strawberry Valley, Swains Creek, Mammoth Creek, and Zion View.

Duck Creek Village, within the boundaries of the Cedar City Ranger District, offers all amenities, including several retail stores, gasoline, lodging, restaurants, and ATV purchase and rentals.

## Chapter 4: Environmental Consequences

Environmental Consequences section written by:

- Kirk Flannigan, Recreation Staff, Pine Valley Ranger District

### 4.1. Introduction

This section discloses the environmental consequences of implementing the five alternatives considered in detail. Effects for recreation resources are discussed by tracking the following indicators by alternative:

- Miles of motorized routes decommissioned,<sup>1</sup>
- Miles of designated motorized routes open to OHVs,<sup>2</sup>
- Miles of designated motorized trails,
- Percentage of the Forest open to cross-country travel,
- Routes within all ROS classes,<sup>3</sup>
- Distance from motorized routes across the Forest,<sup>4</sup>
- Miles of non-motorized trails, and
- Number of dispersed campsites.

The effects of each alternative on other recreation concerns such as quality of experience and access for fuelwood retrieval are also discussed. Effects for scenery resources are discussed by tracking the following indicator by alternative: newly constructed routes. This indicator will then be examined through scenic integrity and visibility surrounding new construction.

### 4.2. Direct and Indirect Effects

#### 4.2.1. Features Common to All Alternatives

##### 4.2.1.1. Displacement

Implementation of any of the alternatives could result in the displacement of some Forest visitors. A travel plan that does not offer the desired setting or the desired mode of transportation on a preferred road, trail, or area could displace some people to other areas or they could choose to participate in other activities. In addition, adjacent areas may see an increase in impacts associated with increased use with the implementation of the Dixie National Forest Motorized Travel Plan. This could be especially true with Alternatives B, C, and D due to the fact that these alternatives reduce motorized route mileages as compared with Alternative A, the No Action alternative.

---

<sup>1</sup> Broken apart by system routes and unclassified routes.

<sup>2</sup> For the purpose of accurately displaying recreational opportunities, highway, administrative, permittee, and private property route mileage will not be displayed.

<sup>3</sup> Displays all motorized and non-motorized route mileage.

<sup>4</sup> Includes all motorized routes.

#### 4.2.1.2. Non-motorized Travel

Non-motorized travel is generally accepted across most of the Forest and on most travel routes. The opportunity to travel cross-country by non-motorized means in most Forest areas and on most travel routes is the same in all alternatives. Most Forest areas allow cross-country travel on foot, stock, snowshoe, skis, and bicycle. Non-mechanized trails, designated wilderness areas, and some Research Natural Areas are the exceptions.

#### 4.2.1.3. Dispersed Camping

Dispersed camping would be allowed within 150 feet along designated routes; however, three specific areas on the Forest have been restricted to designated campsites only (see page 9). More dispersed campsites and dispersed camping areas may be designated in the future if physical and social conditions reach a level where it is deemed necessary.

#### 4.2.1.4. Firewood Gathering

Off-road travel for the purpose of firewood gathering would be allowed only as specified under special use permit. Access to administrative routes (level 1 roads) will continue to be controlled as part of permit issuance.

#### 4.2.1.5. Winter or Over-snow Travel

Most areas of the Forest are open to cross-country over-snow vehicle use when adequate snow cover exists. The decision to restrict over-snow vehicles to designated routes may be made over time if necessary to address disturbance through big game winter range areas.

#### 4.2.1.6. Parking

Parking is allowed along the edges of designated routes. Parking should only occur where a vehicle can safely pull over and where meadows, stream, and riparian areas are avoided. Roads and closed gates are not to be blocked. These allowances provide the public reasonable access off designated routes to park their vehicle in order to fish, picnic, hike, retrieve game, etc., during the snow-free season. If parking is causing unacceptable resource damage, the Forest Service can close the area to parking off designated routes.

#### 4.2.1.7. Information, Education, Enforcement, and Partnerships

Over the years, the Dixie National Forest has become a popular place for motorized recreation. The Forest has been working since the mid-1990s to improve motorized travel management through smaller route designation projects and increased efforts toward visitor information and education.

Non-motorized areas can be affected by motorized travel planning; therefore, long-term impacts on non-motorized areas must be considered. Through increased coordination with the Utah

Division of Parks and Recreation, the Utah Division of Wildlife Resources, and local counties, the Dixie National Forest is working to publish maps of motorized and non-motorized recreation opportunities, install trailhead kiosks and trail signs, and provide outreach to visitors through the media. Substantial funding has been contributed by these partners to provide an enjoyable motorized recreation experience.

Partnership opportunities continue to emerge as state and local governments, organizations, and individuals offer volunteer labor, trail patrol, and grant funding. Coordination with other governments continues in the areas of law enforcement. OHV manufacturers and motorized interest groups are also partnering with the Forest Service to improve protection of natural resources, improve user etiquette, and protect the riding privilege.

#### 4.2.2. Alternative A

A no action alternative is required by NEPA regulations to provide a baseline to the action alternatives. This alternative would designate all National Forest System roads and motorized trails as open, but no non-system or unauthorized motorized routes would be added to the system. Current restrictions on cross-country travel (off-road or trail) would remain in place. Use of non-system or unauthorized motorized routes that are located in areas that allow cross-country travel would continue to be allowed.

Under this alternative, non-system routes identified as necessary for private property, permittee, or administrative access within areas prohibited to cross-country travel areas would not be open to motorized travel. Within those same areas closed to cross-country travel, non-system routes that have been identified as important for public access would also be closed. System routes that have been identified as unnecessary or undesirable that are situated in areas that allow for cross-country travel would remain open for use as cross-country travel.

**Table R4-1. Alternative A Issue Indicators**

Miles of motorized routes*	Miles of unclassified routes decommissioned/closed**	Miles of classified routes decommissioned/closed***	Area open to x-country travel	Miles of non-motorized trails	Miles of motorized trails****
4,275	354	203	1,150,113 (61%)	824	103

\* For the purpose of accurately displaying recreational opportunities, highway, administrative, permittee, and private property route mileage are not displayed.

\*\* Includes those unauthorized routes in the 39% of the Forest closed to cross-country travel.

\*\*\* From previous and pending decisions. Small percentage are converted to ATV trails, non-motorized trails, or non-mechanized trails.

\*\*\*\* Mileage is included in "Miles of motorized routes."

##### 4.2.2.1. Non-motorized Opportunities

Across the Forest as a whole, and as illustrated in Table R4-1, Alternative A offers 824 miles of non-motorized trails (the fewest outside of Alternative E), and provides more miles of motorized routes than Alternative B, C, or D.

In addition, and potentially more crucial, is the fact that this alternative allows for motorized cross-country travel on 61 percent of the Dixie National Forest. By allowing this use, this alternative is likely to match, if not increase, the current level of Forest user conflict between non-motorized and motorized users. Furthermore, with the total amount of motorized travel offered by this alternative combined with cross-country travel, the Dixie National Forest is likely to see similar or increased levels of resource impacts, including travel on and creation of illegal routes, thus potentially displacing a greater number of Forest user. Given these facts, Alternative A appears to be the least attractive to those seeking a non-motorized setting.

#### 4.2.2.2. Motorized Opportunities

This alternative offers 4,275 miles for motorized travel, second only to Alternative E, which offers 4,563 miles. In addition, this alternative decommissions fewer miles of motorized routes than Alternative B, C, or D, but 62 percent more than does Alternative E. Furthermore, this is the only alternative that allows for cross-country travel. In total, Alternative A allows for cross-country travel on 61 percent, or 1,150,113 acres, of the Dixie National Forest. However, as stated in Title 36 Code of Federal Regulations, Forest Service, Subpart A-General Prohibitions-Part 261.15 (h), use of vehicles off roads is prohibited if it is “. . . in a manner which damages or unreasonably disturbs the land, wildlife, or vegetative resources.” Thus, cross-country travel should not be regarded as an authorized means to develop new motorized routes.

As compared to the total mileage of motorized routes, this alternative offers the second least total mileage for motorized trail opportunities, just ahead of Alternative E by 2 miles, but below Alternatives B, C, and D. Motorized trails differ from other motorized routes due to the fact that they are potentially designed for a different experience and not just for travel to a certain destination. For example, in comparison to a road, a motorized trail may be more scenic, technically challenging, provide for loop opportunities, and may be designed for smaller vehicles, such as an ATV.

As compared with Alternatives B, C, and D, this alternative provides a greater variety of motorized route settings and opportunities. As compared with Alternative E, this alternative would most likely provide for less of a variety for motorized route settings, and, in the long run, fewer overall motorized opportunities. This is due to fewer total miles for motorized routes, amount of unclassified routes decommissioned, and the fact that cross-country travel would be limited if unreasonable resource damage is occurring.

#### 4.2.3. Alternative B

This alternative emphasizes the protection of natural and cultural resources and provides the most opportunity for non-motorized recreation experiences. Under this alternative, cross-country travel would be prohibited forest-wide and some unauthorized routes would be added to the system, including routes that must remain open for private property, permitted uses, or administrative access. Some system routes would also be closed. Alternative B retains the fewest miles of open motorized routes of all the action alternatives.

**Table R4-2. Alternative B Issue Indicators**

Miles of motorized routes*	Miles of unclassified routes decommissioned/closed**	Miles of classified routes decommissioned/closed**	Percentage open to x-country travel	Miles of non-motorized trails	Miles of motorized trails***
1,867	1,335	1,043	0%	956	193

- \* For the purpose of accurately displaying recreational opportunities, highway, administrative, permittee, and private property route mileages are not displayed.
- \*\* Small percentage are converted to ATV trails, non-motorized trails, or non-mechanized trails.
- \*\*\* Mileage is included in "Miles of motorized routes."

#### 4.2.3.1. Non-motorized Opportunities

Across the Forest as a whole, and as illustrated in Table R4-2, Alternative B offers 956 miles of non-motorized trails (the most outside of Alternative C), and provides the least amount of miles for motorized travel (214 fewer than Alternative C).

This alternative does not allow cross-country travel. Given these facts, it appears that Alternative B would provide the greatest amount of non-motorized opportunity. Furthermore, this alternative is likely to have the greatest effect on decreasing conflict, maintaining or increasing satisfaction levels, and mitigating displacement among non-motorized users. Impact reductions result from decreased goal-interference attributed to motorized users.

#### 4.2.3.2. Motorized Opportunities

This alternative offers 1,867 miles for motorized travel, the lowest of all the alternatives. In contrast, the most mileage offered for motorized travel is under Alternative E, at 4,563 miles, a difference of 2,696 miles. Alternative B does not allow for cross-country travel. Alternative B offers 193 miles of motorized trails, the third highest mileage by alternative, 92 miles more than Alternative E. In the other alternatives, the routes suggested for motorized trails for Alternative B are designated as open to all. Thus, Alternative B may provide motorized users who, for example, use ATV, side-by-sides, or motorcycles, a opportunity for more "trail" riding experiences, but overall, "open to all" motorized mileage is still below all other alternatives.

As compared to all other alternatives, Alternative B offers the least amount of motorized opportunities. However, the impact to motorized users is mitigated slightly by the fact that Alternative B offers 193 miles of motorized trails. Given these facts, this alternative is likely to displace a large amount of motorized users, thus making this alternative the least attractive to motorized users.

#### 4.2.4. Alternative C

This alternative allows for a higher level of motorized access than does Alternative B. Under this alternative, cross-country travel would be prohibited forest-wide and some unauthorized routes would be added to the system, including routes that must remain open for private property, permitted uses, or administrative access. Some system routes would also be closed.

Motorized access for recreation, administrative uses, and permitted uses would be allowed to a higher degree than under Alternative B.

**Table R4-3. Alternative C Issue Indicators**

Miles of motorized routes*	Miles of unclassified routes decommissioned/closed**	Miles of classified routes decommissioned/closed**	Percentage open to x-country travel	Miles of non-motorized trails	Miles of motorized trails***
2,173	1,244	756	0%	965	292

- \* For the purpose of accurately displaying recreational opportunities, highway, administrative, permittee, and private property route mileages are not displayed.
- \*\* Small percentage are converted to ATV trails, non-motorized trails, or non-mechanized trails.
- \*\*\* Mileage is included in "Miles of motorized routes."

#### 4.2.4.1. Non-motorized Opportunities

Across the Forest as a whole, and as illustrated in Table R4-3, Alternative C offers 965 miles of non-motorized trails (the highest among alternatives), and provides the second least amount of miles for motorized travel, 306 miles more than Alternative B. In addition, this alternative does not allow cross-country travel. Given these facts, Alternative C would provide a similar setting for non-motorized opportunities as would Alternative B. However, due to the fact that Alternative C has more motorized route mileage, non-motorized opportunities may be slightly less than those available in Alternative B.

#### 4.2.4.2. Motorized Opportunities

This alternative offers 2,173 miles for motorized travel, the second lowest by alternative. Motorized route mileage for Alternative C is 306 miles greater than Alternative B (the lowest among alternatives), and 2,390 miles fewer than Alternative E (the highest among alternatives). Balancing the impacts associated with lower miles for motorized travel is the fact that Alternative C allows for 292 miles of motorized trails, the highest among all alternatives.

As compared with the other alternatives, Alternative C may fall below Alternatives A, D, and E in providing for motorized opportunities. However, as stated earlier, this decrease in motorized opportunity may be balanced in some ways for Forest users due to the fact that motorized trail mileage would be increased.

#### 4.2.5. Alternative D

This alternative is a mid-range alternative that generally allows for a higher level of motorized access than does Alternative C. Under this alternative, cross-country travel would be prohibited forest-wide and some unauthorized routes would be added to the system, including routes that must remain open for private property, permitted uses, or administrative access. Some system routes would also be closed. Motorized access for recreation, administrative use, and permitted uses is allowed to a higher degree than under Alternative B or C.

**Table R4-4. Alternative D Issue Indicators**

Miles of motorized routes*	Miles of unclassified routes decommissioned/closed**	Miles of classified routes decommissioned/closed**	Percentage open to x-country travel	Miles of non-motorized trails	Miles of motorized trails***
2,742	1,072	462	0%	909	188

- \* For the purpose of accurately displaying recreational opportunities, highway, administrative, permittee, and private property route mileages are not displayed.
- \*\* Small percentage are converted to ATV trails, non-motorized trails, or non-mechanized trails.
- \*\*\* Mileage is included in "Miles of motorized routes."

#### 4.2.5.1. Non-motorized Opportunities

Across the Forest as a whole, and as illustrated in Table R4-4, Alternative D offers 909 miles of non-motorized trails, mid-range among alternatives for non-motorized opportunities. In addition, this alternative is mid-range among alternatives regarding motorized travel, allowing 875 more miles than does Alternative B, and 1,821 fewer miles than does Alternative E. This alternative does not allow cross-country travel. Given these facts, Alternative D would provide a similar setting for non-motorized opportunities as would Alternative C, but as a whole, may be the compromise alternative if associated with motorized use. Due to the fact that Alternative D has more motorized route mileage, non-motorized opportunities may be slightly less than those available in Alternative B or C.

Included in Alternative D is the construction of motorized routes T34070 and U24028A. These routes may impact non-motorized users due to the proposed trail locations. T34070 would at some points be adjacent to, and possibly cross, the non-motorized Marathon Trail (#32024). U24028A would be within view of the Marathon Trail and Sydney Peak Trail (#32010). Motorized use of both constructed routes would add to the noise pollution. Both routes would likely increase conflict levels between non-motorized and motorized users, thus potentially reducing user satisfaction and increasing displacement.

#### 4.2.5.2. Motorized Opportunities

This alternative offers 2,742 miles for motorized travel, mid-range among alternatives, allowing 875 more miles than Alternative B and 1,821 fewer miles than Alternative E. Additionally, Alternative D allows for 188 miles of motorized trails, the second highest among all alternatives.

In Alternative D, 1.26 miles of motorized trail would be constructed (see Table S4-1 on page 38).

Compared with the other alternatives, Alternative D may fall below Alternatives A and E in providing for motorized opportunities. However, the figures may be deceiving given the fact that unreasonable impacts to the resource may decrease opportunities within Alternative A, and that this alternative allows for 87 more miles of motorized trail than Alternative E. Alternative D is therefore the mid-range choice for motorized opportunities.

## 4.2.6. Alternative E

This alternative provides the most motorized access by designating all routes as open to public motorized travel with the exception of routes already designated through a specific previous decision (see Chapter 2 of the EIS for a list of these projects). All non-system or unauthorized routes would also be designated as open to public motorized travel and therefore added to the National Forest System of roads and trails. However, trails that are currently designated as non-motorized would not be designated for motorized travel.

Alternative E prohibits cross-country travel. It designates a system of routes for motorized travel and includes routes that must remain open for private property, permitted uses, or administrative access.

**Table R4-5. Alternative E Issue Indicators**

Miles of motorized routes*	Miles of unclassified routes decommissioned/closed**	Miles of classified routes decommissioned/closed**	Percentage open to x-country travel	Miles of non-motorized trails	Miles of motorized trails***
4,563	214	179	0%	806	101

\* For the purpose of accurately displaying recreational opportunities, highway, administrative, permittee, and private property route mileages are not displayed.

\*\* Small percentage are converted to ATV trails, non-motorized trails, or non-mechanized trails.

\*\*\* Mileage is included in "Miles of motorized routes."

### 4.2.6.1. Non-motorized Opportunities

Across the Forest as a whole, and as illustrated in Table R4-5, Alternative E offers 806 miles of non-motorized trails (the fewest among alternatives) and provides the greatest amount of miles for motorized travel, 2,696 more miles than Alternative B. In addition, this alternative would not allow cross-country travel. Due to these facts, this alternative is likely to have a positive effect on decreasing conflict between non-motorized and motorized Forest users when compared to Alternative A, but a potential negative impact when compared to Alternatives B, C, and D. Given this, Alternative E would provide the least amount of setting for non-motorized opportunities as related to all other alternatives, with the potential exception of Alternative A.

Included in Alternative D is the construction of motorized routes T34070 and U24028A. These routes may impact non-motorized users due to the proposed trail locations. T34070 would at some points be adjacent to, and possible cross, the non-motorized Marathon Trail (#32024). U24028A would be within view of the Marathon Trail and Sydney Peak Trail (#32010). Motorized use of both constructed routes would add to the noise pollution. Both routes would likely increase conflict levels between non-motorized and motorized users, thus potentially reducing user satisfaction and increasing displacement.

### 4.2.6.2. Motorized Opportunities

This alternative offers 4,563 miles for motorized travel, the greatest among alternatives, allowing 1,821 more miles than Alternative D, and 288 more miles than Alternative A, the two closest in

mileage. In addition, Alternative E allows for 101 miles of motorized trails, which is the lowest among all alternatives. As compared with the other alternatives, Alternative E may allow for the most in motorized opportunities on designated routes. However, Alternative A allows for cross-country travel (barring unreasonable resource damage) on 61 percent of the Forest. Alternative E also allows the fewest miles of motorized trail.

In Alternative E, 1.26 miles of motorized trail would be constructed (see Table S4-1 on page 38).

#### 4.2.7. Open Routes by ROS Class

As discussed earlier, ROS is designed as a spectrum with five different classes on the Forest: Primitive (P), Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM), and Roaded Natural (RN). The Affected Environment discussion beginning on page 4 details the current acres per ROS class on the Dixie National Forest.

The information in the table below portrays the miles of motorized routes and miles of non-motorized routes in each ROS class by alternative. Note that under Alternative A there are motorized routes in both Primitive and Semi-Primitive Non-Motorized ROS classes. The inclusion of motorized routes in non-motorized ROS classes is a reflection of an anomaly in the ROS mapping. When a final decision is made on this motorized travel plan for the Dixie National Forest, the ROS classes for the Forest will be updated to match the selected Forest Service system of routes. For purposes of this EIS, however, these mileages are presented to show the differences between alternatives to allow comparison.

**Table R4-6. Motorized and Non-motorized Routes by ROS Class**

ROS Class	Measure	Alternative				
		A	B	C	D	E
Primitive	Miles of motorized routes	5	0	0	4	5
	Miles of non-motorized routes	106	107	110	106	106
Semi-Primitive Non-Motorized	Miles of motorized routes	199	49	56	88	233
	Miles of non-motorized routes	464	479	484	478	462
Semi-Primitive Motorized	Miles of motorized routes	3,222	1,487	1,709	2,027	2,761
	Miles of non-motorized routes	179	275	275	235	172
Roaded Natural	Miles of motorized routes	1,966	1,280	1,406	1,564	1,936
	Miles of non-motorized routes	78	98	100	96	75

All mileages rounded to the nearest 1 mile. Motorized routes include all roads and motorized trails.

##### 4.2.7.1. Non-Motorized Opportunities

Existing route mileages within all ROS classes on the Dixie National Forest are shown in Table R4-1 on page 17. Alternative C offers the most non-motorized opportunities within Semi-Primitive Non-Motorized and Primitive ROS classes. Alternative C is followed closely in mileage by Alternatives B, D, A, and E, in that order. Within Semi-Primitive Motorized areas, Alternative B offers the most non-motorized route mileage, followed by Alternatives C, D, A, and E, in that order. Within Roaded Natural areas, Alternative C offers the most non-motorized route mileage, followed by Alternatives B, D, A, and E, in that order. Thus non-motorized users seeking a

Semi-Primitive Non-Motorized or Primitive experience may prefer Alternative C, followed closely by Alternatives B, D, then E and A.

Those seeking a Semi-Primitive Motorized experience may prefer Alternative B, followed by Alternatives C, D, A, and lastly E. Those seeking a Roaded Natural experience may prefer Alternative C, followed by Alternatives B, D, A, and lastly E. Lastly, non-motorized users purely seeking the maximum route mileage may prefer Alternative C, followed by B, D, A, and, lastly, E.

As noted in many textbooks, journals, and research papers, conflict is a key issue when dealing with motorized and non-motorized uses (Ramthun 1995, Hendee and Dawson 2002, Hammitt and Cole 1998, Manning 1999, Gibbons and Ruddell 1995). In addition, conflict among user groups is generally asymmetrical, or with one group perceiving a greater amount of conflict than the other (Ramthun 1995). In the field of outdoor recreation, non-mechanized users have generally perceived higher levels of conflict. This seems especially true when associated with mechanized users (Ramthun 1995; Adelman et al. 1982, Jackson and Wong 1982).

Furthermore, conflict frequently stems from goal interference (Gibbons and Ruddell 1995). For example, forest visitors expecting solitude in a certain location may experience conflict if this goal is interfered with by coming across other forest visitors in the same location. Or, if a hiker is expecting a non-motorized experience, conflict may be perceived if OHV users are encountered or heard. Lastly, conflict may simply stem from the evidence of past OHV use in a non-motorized area.

Keeping this information in mind, the following may assist in evaluating alternatives:

- For those seeking non-motorized opportunities, Alternative E allows for the most motorized use within Semi-Primitive Non-Motorized areas. This is followed by Alternatives A, D, C, and B, in that order.
- Within Primitive areas, Alternatives A and E each offer the same number of motorized route miles, followed by Alternative D with 4 miles, and then Alternatives B and C, both of which have 0.01 miles.

Thus, forest visitors seeking a non-motorized experience without the interference of motorized use may prefer Alternative B followed by Alternatives C, D, A, and lastly E.

#### 4.2.7.2. Motorized Opportunities

Existing route mileages within all ROS classes on the Dixie National Forest are illustrated under Alternative A in Table R4-6 on page 23. As for motorized opportunities, Alternative A allows for the most motorized opportunities within SPM and Roaded Natural ROS classes, followed by Alternatives E, D, C, and lastly B. Within SPNM areas, Alternative E offers the most motorized route mileage, followed by Alternatives A, D, C, and lastly B. Within Primitive areas, Alternatives A and E offer the most route mileage at 4.62 miles, followed by Alternative D at 4 miles, and lastly, Alternatives B and C at 0.01 miles.

Motorized users seeking a semi-primitive or roaded natural experience may prefer Alternative A, followed closely by Alternative E, then D, C, and lastly B. Those seeking a primitive experience may prefer Alternatives A and E, followed by Alternative D, and lastly Alternatives B and C. However, it needs to be noted that motorized routes within the Primitive ROS class are minimal,

and do not change much across alternatives. Lastly, motorized users purely seeking the maximum route mileage may prefer Alternative A, followed by Alternatives E, D, C, and B, in that order.

#### 4.2.8. Distance from Motorized Routes

**Table R4-7. Percent of Forest Lands Within One-Half Mile, 1 Mile, 2 Miles, and 3 Miles of Any Open Motorized Route, Administrative Route, or Motorized Trail**

Alternative	One-Half Mile Buffer		1 Mile Buffer		2 Mile Buffer		3 Mile Buffer	
	Acres	% Within Buffer	Acres	% Within Buffer	Acres	% Within Buffer	Acres	% Within Buffer
A	1,383,352.696	70.20%	1,739,001.01	88.25%	1,922,881.11	97.58%	1,965,590.91	99.75%
B	1,155,563.153	58.64%	1,601,203.26	81.26%	1,881,721.37	95.50%	1,949,750.78	98.95%
C	1,216,473.612	61.73%	1,642,418.98	83.35%	1,898,914.45	96.37%	1,953,861.12	99.16%
D	1,300,305.166	65.99%	1,691,334.93	85.83%	1,914,645.26	97.17%	1,961,975.63	99.57%
E	1,403,409.133	71.22%	1,752,593.49	88.94%	1,928,324.78	97.86%	1,966,239.42	99.78%

Includes highways and roads on private land within the Forest boundary. Total Forest acres for calculation are 1,970,486.8, and includes all private land inholdings and Cedar Breaks National Monument. The acres of each buffer also include Cedar Breaks National Monument and private land inholdings.

Table R4-7 illustrates the percent of the Forest within varying distances from motorized routes. Paralleling previous analysis, Alternative B generally offers the greatest percentage of acres away from motorized routes. After Alternative B, Alternatives C, D, A, and E, in that order, prevent decreasing acres away from motorized routes. Thus, Alternative E would be the alternative allowing the least amount of buffer area, or acres, away from motorized routes.

Given these figures, it appears that non-motorized users may prefer Alternative B, followed by Alternatives C, D, A, and E, in that order. Motorized users may prefer Alternative E, followed by Alternatives A, D, C, and B, in that order. However, Forest users are very diverse, and attributes required for goal attainment may in fact contradict common theory. This can be highlighted with the fact that motorized users may seek large tracks of undeveloped land, or non-motorized user may seek large amount of motorized access to certain locations.

In addition to illustrating the proportion of the Forest within varying distances from motorized routes, this table also illustrates the percentage of motorized access provided across the Forest by alternative. As calculated from Table R4-7, the average percentage of the Forest that is within one-half mile from a motorized route is 65.56 percent; within 1 mile is 85.53 percent; within 2 miles is 96.89 percent; and within a 3 mile buffer is 99.94 percent. Thus, on average, only 0.6 percent of the Forest is further than 3 miles from a motorized route, while 34.44 percent is further than one-half mile. Given these figures, it appears that a majority of the Forest is available for motorized access.

## 4.2.9. Dispersed Camping and Effects Across All Alternatives

**Table R4-8. Number of Legally Accessible Inventoried Dispersed Campsites**

Measure	Alternative				
	A	B	C	D	E
Number of dispersed campsites accessible by motorized vehicle	1,409	725	817	1,052	1,315
Percent change from Alternative A	N/A	51%	58%	75%	93%

Note: There are a total of 1,624 inventoried dispersed campsites across the Forest, 215 of which are in areas closed to cross-country travel and not legally accessible via motorized vehicles.

Alternative A: 1,227 campsites are within 150' of a designated route. There are an additional 182 campsites further than 150' from a designated route but within the 61 percent of the Forest open to cross-country travel; these sites are therefore legally accessible by motorized vehicles.

Alternatives B, C, D, and E: These are the number of campsites within 150' of a designated route.

Dispersed campsites vary greatly in regards to development level. Some sites show signs of heavy use, with indicators such as exposed mineral soil, developed ingress/egress routes, tree root exposure, damaged trees, and well-used rock fire rings. Other sites may be barely noticeable, with little evidence of overnight camping. These sites may have little exposed soil, simple rock fire rings covered in vegetation, and little or no evidence of routes leading in or out.

The Dixie National Forest's 2002 and 2003 inventory defined a dispersed campsite as "an area with obvious human-caused impact. This includes vegetation or soil disturbance, fire scarred rocks, or 'improvements' such as stock ties, log benches, tree damage, etc." Further clarification states, "Be sure to distinguish natural conditions from those that are human-caused. For example, when looking at understory vegetation loss on sites, it is important to examine the surrounding area; does there appear to be actual differences between on-site vegetation and adjacent, unused areas? Lightning or wildlife damage to trees should not be mistaken as human or stock damage. Sometimes mineral soil is naturally occurring such as on floodplains, or areas where soil development is slow. Include only human-related impacts in the monitoring process" (USDA 2004a).

As stated in section 4.2, "Dispersed camping would be allowed within 150 feet along designated routes." This motorized travel plan will directly affect dispersed camping accessed by motorized means across the Forest. In addition, these changes will impact both non-motorized and motorized Forest users alike. Impacts to dispersed camping by alternative parallel those discussed above with motorized and non-motorized users: the greater the number of miles of motorized routes, the greater the number of available dispersed sites.

As illustrated in the previous table, Alternative A provides motorized access to the greatest number of dispersed campsites across alternatives, with 1,409 legally accessible inventoried sites. This figure decreases by 94 sites when compared to the next highest amount in Alternative E. Compared to Alternative A, the numbers decline further with a decrease of 357 sites accessible in Alternative D, by 592 sites accessible in Alternative C, and by 684 sites accessible in Alternative B. Given these figures, impacts to use associated with dispersed camping are greatest with Alternative B, and least with Alternative A. Paralleling this is the fact that displacement associated with dispersed camping would be greatest with Alternative B, and

the least with Alternative A. However, a decrease in dispersed campsites may actually increase user's experiences if solitude is a main objective.

#### **4.2.10. Conclusions: Motorized and Non-motorized Opportunity**

All alternatives provide a variety of recreation opportunities, motorized and non-motorized alike. In the long run, all the action alternatives would improve upon the existing condition and have a positive effect on decreasing conflict between non-motorized and motorized forest users. Short-term impacts associated with all alternatives may include displacement and decreased levels of user satisfaction. This is due to the fact that all the alternatives decommission a varying degree of motorized routes, dispersed campsites, and potentially decrease access for all users.<sup>5</sup> Impacts may be greatest among motorized users, specifically when dealing with the action alternatives.

Alternative B would provide the most non-motorized opportunities, followed by Alternatives C and D. Alternative E provides the most motorized opportunities, followed by Alternatives A and D. Alternative D is a mid-range alternative. A feature unique among alternatives is the inclusion of cross-country travel in Alternative A. This allowance may create a greater occurrence of user conflict, displacement, and resource damage when compared to the action alternatives.

### **4.3. Cumulative Effects**

The biggest increment for potential cumulative impacts to motorized and non-motorized recreation uses comes directly from the Dixie National Forest's Motorized Travel Plan rather than from past or foreseeable actions (as detailed in USDA 2008). Most ongoing and future Forest Service actions have little long-term or cumulative effect on outdoor recreation opportunities.

#### **4.3.1. Cumulative Effects Area**

The cumulative effects area for recreation is the southern section of Utah, portions of eastern Nevada, and the northern section of Arizona. This area is comprised of the following Utah, Nevada, and Arizona counties:

- Utah: Millard, Sevier, Wayne, Garfield, Kane, Washington, Iron, Beaver, and Piute,
- Nevada: Clark and Lincoln, and
- Arizona: Coconino and Mohave.

Generally, these areas have similar climates, vegetation types, landscape character, and basin and range topography.

---

<sup>5</sup> For Alternative A, this refers to the unauthorized routes within the 39 percent of the Forest closed to cross-country travel that would be decommissioned and those routes carried forward from previous decisions.

## 4.3.2. Recreation

All alternatives would cause some displacement of both non-motorized and motorized users. This includes, but is not limited to, the following activities: hiking, ATV use, scenic driving, backpacking, picnicking, dispersed camping, fuelwood gathering, driving of full-sized, high-clearance 4x4s, and hunting. Congestion on roads in the cumulative effects area may increase due to user displacement; if so, this would likely increase the potential for user conflict on these roads. Lastly, adjacent areas may see an increase in impacts associated with increased use with the implementation of the Dixie National Forest Motorized Travel Plan. This could be especially true with Alternatives B, C, and D due to the fact that these alternatives reduce motorized route mileages as compared to Alternative A, the No Action alternative.

### 4.3.2.1. Decisions on BLM and other Forest Service Lands

Displacement of forest users could be further impacted if locations adjacent to the project area implement land management actions that severely reduce motorized route mileage. Adjacent areas would generally fall under authorization of the Fillmore, Richfield, Kanab, St. George, Arizona Strip, Ely, Las Vegas, and Cedar City Bureau of Land Management (BLM) field offices, and the Fishlake National Forest.

The Fishlake National Forest completed its Motorized Travel Plan in late 2006. The Arizona Strip, Richfield, Ely and Kanab BLM field offices completed their respective Resource Management Plan (RMP) in 2008. The Fillmore RMP is about 20 years old, the Las Vegas RMP is about 9 years old, and the St. George RMP is about 10 years old; no revisions are currently scheduled. Lastly, the Cedar City BLM field office is slated to begin their RMP update within the next several years. These processes will establish motorized route guidelines for the foreseeable future

The Richfield BLM field office RMP designated 1,908,210 acres as limited (OHV travel on designated routes), 9,890 acres as open (allowing OHV cross-country travel), and 209,000 acres as closed to OHV use. When associated with their No Action Alternative or pre-2008 management practices, the Richfield preferred alternative essentially eliminated cross-country travel. Prior to the 2008 RMP, 1,636,400 acres of this area was designated as open. The Kanab BLM field office RMP designated 528,000 acres as limited, 1,000 acres as open, and 25,000 acres as closed to OHV use. When associated with their No Action Alternative or pre-2008 management practices, the Kanab preferred alternative essentially eliminated cross-country travel. Prior to the 2008 RMP, 466,600 acres within the Kanab field office was designated as open.

The Fishlake National Forest designated 2,742 miles of motorized routes open to the public, a reduction from their existing condition of approximately 16 percent. The Fishlake decision closed the Forest to cross-country travel, with the exception of two play areas comprising 879 acres.

The Arizona Strip BLM field office RMP designated 1,899,260 acres as limited, 80,829 acres as closed, and 976 acres as open to OHV use. When compared with their 1992 RMP, the Arizona Strip 2008 RMP essentially changed directions from "limited to existing roads and trails" to "limited to designated roads." Prior to the 2008 RMP, 1,764,000 acres within the Arizona Strip

field office was limited to existing roads and trails, 690,400 acres was limited to designated roads and trails, 358,600 acres was closed, and 1,400 acres was designated open.

The Ely BLM field office 2008 RMP designated 10,306,500 acres as limited to designated roads and trails, and closed (through designated wilderness and wilderness study areas) 1,153,500 acres to OHV traffic. The Ely BLM Field Office may review specific route designations further in the future. Prior to the 2008 RMP, a large percentage of the Ely Field Office was essentially open (allowing cross-country travel) to OHV travel.

The Las Vegas BLM Field Office RMP essentially eliminated cross-country travel by decreasing "open" areas by over 2.8 million acres. As with other RMPs, the Las Vegas RMP dramatically increased OHV travel regulations to "Limited to existing roads trails and washes" and "Limited to designated roads, trails, and washes." Areas completely closed to OHV use essentially did not change.

The St. George BLM Field Office 1999 RMP allows for 89,235 acres as open, 335,780 acres as "Open for use on existing roads and trails," 112,286 acres as "Open for use on designated roads and trails," and 91,704 acres as "Closed."

In regards to Forest users seeking motorized use on travel routes, the above figures suggest that management actions within the cumulative effects area should not significantly add to the impact of displacement associated with the Dixie National Forest Motorized Travel Plan. However, Forest users seeking motorized cross-country travel may see a significant impact associated with displacement when combined with other management actions within the cumulative effects area and the Dixie National Forest Motorized Travel Plan. Lastly, and as previously stated, adjacent areas may see an increase in impacts associated with increased use with the implementation of the Dixie National Forest Motorized Travel Plan. This could be especially true with Alternatives B, C, and D due to the fact that these alternatives reduce motorized route mileages as compared with Alternative A, the No Action alternative.

#### 4.3.2.2. Dispersed Recreational Driving

Opportunities for dispersed recreational driving would be reduced. Traffic on open routes may increase, causing more congestion and use on these routes. Due to higher use in the area and the amount of closures, opportunities to get away from other people for a peaceful driving experience would be reduced. Many recreational drivers that would typically use specific areas may be displaced to other similar or nearby locations.

#### 4.3.2.3. High Clearance Vehicles, Firewood and Christmas Tree Collection

Opportunity for recreational driving of full sized, high-clearance 4x4s would decrease in the project area due to route closures. This recreation activity would be affected in the project area and would likely increase traffic on similar roads in the cumulative effects area.

Most people need to drive to the point where firewood gathering would occur for loading purposes. Miles of route closed would directly affect this activity. Firewood gatherers would likely be displaced to other locations, causing an increase in traffic in the cumulative effects

area. Although a difference exists in the method of retrieval, Christmas tree cutting would be affected in much the same way as firewood gathering.

#### 4.3.2.4. Hunting, Game Retrieval, and Wildlife Viewing

Road hunting and driving to view wildlife may increase in the cumulative effects area because of the reduction in these opportunities available in the project area. Road hunting and driving to view wildlife would be reduced directly by the number of miles of road closed. The opportunity to hunt and view wildlife away from roads would increase directly in relation to the amount of area created by road closures between roads remaining open.

Average distances of a downed animal from a road for game retrieval would likely increase. It is difficult to predict an increase or decrease in hunting activities in the project area due to the proposed action and preference of hunting methods; however, road hunting and driving to view wildlife would cease to exist on roads to be closed and foot/horseback hunting would likely increase. Crowding may occur on legally open roads within the project area, but because crowding is not conducive to road hunting or wildlife viewing, those users would likely be displaced.

#### 4.3.2.5. Public Awareness

In the short-term, the administrative and physical changes on the ground may be confusing to users who are unfamiliar with this project. Routes within the cumulative effects area may have a variety of signing protocols. Thus the “closed unless designated open” management strategy may add to the confusion of users going to and coming from the project area. Proper signing and public information would help reduce or eliminate this confusion.

#### 4.3.2.6. Dispersed Camping and Picnicking

Dispersed camping and picnicking opportunities would be reduced by proposed route closures. Dispersed camping opportunities were reviewed during the route evaluation process. An attempt was made by the Interdisciplinary Team to keep roads open that accessed most of the frequently-used dispersed camping areas. However, some people would likely be displaced from their favorite camping spot. Road closures in the project area would likely increase dispersed camping and picnicking in the cumulative effects area.

#### 4.3.2.7. Non-Motorized Recreation

Road closures in the project area would also have direct effects on non-motorized recreation activities such as horseback riding, hiking, backpacking, and mountain biking. Roads closed to motorized use would still be available for non-motorized uses, and many more miles of road would be available for those activities free of potential conflicts with motorized vehicles. The closed roads would provide additional areas for non-motorized users to recreate and get away from vehicles. Non-motorized use in the project area may increase due to additional opportunities, but it is not known what the effects would be for non-motorized activities in the cumulative effects area.

#### 4.3.2.8. Vandalism

Vandalism and other illegal activities may increase within the project area. Vandalism to government property, especially in the form of destroying or removing restrictive signage, is often linked to the desire to deliver a defiant message by defacing a symbol of the perceived oppressor (Magill 1976). In addition, increased vandalism may stem from releaser-cue (i.e., vandalism begets vandalism), responsibility denial (i.e., users understand rule, but don't comply because it interferes with their pre-set goals), or willful violator (i.e., fully aware of wrong doing, yet persist because their goals are more important than resource protection) (Gramann and Vander Stoep 1987). Whatever the reason, vandalism may increase throughout the cumulative effects area. Mitigation to vandalism is community partnership, strong volunteer efforts, and Forest Service presence.

#### 4.3.2.9. Population Growth

Western states are among the fastest growing states in terms of population in the country. A past, present, and future trend that would have long-term cumulative effects on recreation travel within the cumulative effects area is the loss of open space for animals and people through rural subdivision and development. Often, the relationship between population growth and land development is disproportionate. A 1 percent growth in population can mean a 5 percent growth in developed land. The loss of private land as open space can also mean loss of wildlife habitat, which could diminish the opportunities to view, photograph, or hunt wildlife. This cumulative impact to recreation experiences would be the same under all alternatives.

Combining the effects of the increase in forest visitors and the loss of private land as open space, which in turn could decrease access to public lands, may create a general decrease in the outdoor recreation experiences throughout the cumulative effects area. This cumulative effect would be the same for all alternatives.

#### 4.3.2.10. New Recreation Technologies

The technologies that made mountain bikes and ATVs popular changed the recreation experiences available on public lands. The advent of new uses changed the relationships between recreational pursuits. New recreation technologies have the potential to affect outdoor recreation on a regional and national scale. New equipment, vehicles, and/or technologies will offer new modes of transportation and new ways of doing traditional sports.

Light-weight camp equipment is allowing backpackers to expand their range. This could increase the number of people participating in extended backpacking trips. GPS and cellular phones encourage more people to venture further into the backcountry without the risk of being lost or injured without rescue. This has increased the number of people using remote areas. The potential for new technologies to change outdoor recreation is very high; however, the nature of the changes cannot be predicted. Not all new outdoor recreation pursuits will be considered appropriate for public lands or National Forests. The effects of new technologies on outdoor recreation and public lands for the cumulative effects area cannot be predicted. It is likely that the Dixie National Forest Motorized Travel Plan alternatives would not have a cumulative effect on future recreation pursuits.

### **4.3.3. Fire and Fuels**

The cumulative effects of past, present, and proposed vegetation and fuel reduction treatments could be temporary displacement of Forest users and a change in the visual quality of the area. Results would be similar with wildfire. However, displacement and change in visual qualities may be prolonged when associated with wildfire. These effects would be the same under all alternatives.

### **4.3.4. Vegetation Treatments**

Vegetation treatments on the Dixie National Forest can affect recreation use patterns. The cumulative effects of past, present, and proposed vegetation treatments could be temporary displacement of Forest users from areas directly adjacent to or part of the treatment activities, and a change in the visual quality of the area. Associated with vegetation treatments may be the construction and reconstruction of roads. This could assist in mitigating impacts to motorized users and/or increase displacement of non-motorized users, or those seeking a primitive experience. Due to the scale of acres affected, the displacement is not significant for the cumulative effects area; effects would be the same for all alternatives.

### **4.3.5. Wildlife and Fisheries**

The cumulative effects of past, present, and future wildlife and fisheries management and watershed restoration would have a positive long-term effect on forest travelers who view wildlife, hunt, or fish in the area. However, past restoration projects have displaced dispersed users from streamside camp sites. This displacement could occur with future projects. Restoration projects generally improve the visual quality of riparian areas within three to five years. These effects would be the same with all alternatives.

### **4.3.6. Noxious Weeds**

Noxious weed control could have a minor but cumulative effect on forest road and trail use. Noxious weed control activities include spraying from ATVs. These activities leave a noticeable track in some areas, which could encourage illegal off-route travel by members of the public. On-site signing could mitigate the situation. It is likely that these treatments would continue throughout the cumulative effects area. In the long-term, successful weed control would improve landscape conditions for all forest visitors.

Motorized travel is known to encourage the spread of noxious weeds. Thus, a reduction in route mileage may assist in mitigating the spread of noxious weeds. When compared to the other alternatives, Alternatives B and C would do the most in mitigating off-route travel associated with weed control and the spread of noxious weeds associated with travel routes.

### **4.3.7. Oil and Gas**

The cumulative effect of past, present, and future oil and gas exploration and development activities is displacement of forest visitors from areas directly adjacent to or part of the activities. Scenic integrity is also affected by oil and gas development. Some oil and gas impacts are

long-term, so localized displacement and scenic integrity impacts can also be long-term depending on reclamation practices and resource resiliency. Oil and gas leasing on the Forest can affect recreation use patterns. Associated with oil and gas leasing is construction and reconstruction of roads. This could assist in mitigating impacts to motorized users and/or increase displacement of non-motorized users, or those seeking a primitive experience.

In some cases, oil and gas activities are short-term and cause very little ground disturbance. In cases such as this, impacts associated to recreation and scenic integrity would be minimal and generally brief in nature. Impacts associated to recreation may be short-term displacement of non-motorized users or those seeking a primitive experience. Due to the scale of acres affected, the displacement is not significant for the cumulative effects area. Effects would be the same for all alternatives.

#### **4.3.8. Livestock Grazing**

Livestock grazing in some areas has caused conflicts with recreation use. If livestock is allowed to congregate in developed sites, at trailheads, or along popular travel routes, resulting conditions can reduce the recreation experience for forest visitors. Recent and future grazing management changes would reduce this conflict through improved riparian protection measures and adjusting the timing and duration of grazing in high-use recreation areas. Due to the scale of acres affected, the displacement is not significant for the cumulative effects area. The effect may be greatest among alternatives that offer the most designated route mileage (Alternatives A and E).

### **4.4. Project Design Features**

A public education program should be implemented along with the travel plan. An Implementation Plan should also be developed, to include a schedule of closures to assist in public education. To accomplish the project objectives, a signing plan should be developed. Due to the cost and extent of needed signing, cost of road closures, cost of public education, and cost of law enforcement, a Project Financial Work Plan should also be developed.

### **4.5. Consideration of Available Science**

The techniques and methodologies used in this analysis are considered the best available science. The analysis refers to credible literature and professional practice related to recreation management which is relevant to evaluating reasonably foreseeable adverse impacts. Analysis and conclusions are based on a thorough review of relevant information, a consideration of responsible opposing views, and the acknowledgment of incomplete or unavailable information, scientific uncertainty, and risk.

The relevant science considered for this analysis consists of several key elements:

- On-site data and history. The project area was included in a forest-wide survey and the following data was collected: mileage of motorized routes decommissioned by alternative; mileage of motorized routes by alternative; mileage of non-motorized routes by alternative; affects to routes within SPNM areas by alternative; distances from

motorized routes by alternatives; dispersed camping sites by alternative; mileage of new routes constructed by alternative; and average counts of road and trail use. Other data that was gathered for this project includes current and past Utah OHV registrations, and home locations of recreation visitors to the Dixie National Forest.

- Relevant literature. Literature reviewed and cited is listed in the Literature Citation sections of chapter 3 and 4.
- Professional knowledge, judgment, and experience. The primary specialists who conducted the recreation resource analysis were Kirk Flannigan, Natural Resource Specialist (Recreation), and Noelle Meier, former Forest Landscape Architect. Nick Glidden, Wilderness, Trails, and Dispersed Recreation Program Manager, assisted with the affected environment. The analysis was reviewed by resource peers.
- The collective knowledge of the project area by Interdisciplinary Team members, integrated with recreation management objectives, applications, and local conditions.
- Comparative analysis considering other local projects. The effects to the recreation resource in other projects in the local area and across the Forest have been considered in the analysis.

## Scenery

### Chapter 3: Affected Environment

#### 3.1. Introduction

The National Forest Scenery Management System is the process used for planning and design of the visual elements of multiple use land management. Scenery management is based on the criteria and guidelines in the Landscape Aesthetics Handbook for Scenery Management, USDA Handbook Number 701. This system was implemented in 1996, superceding the Visual Management System and replacing National Forest Landscape Management, Vol. 2, USDA Handbook Number 462.

There are 11 fundamental principles to the Scenery Management System.

1. Biological, physical and social factors create and influence scenery and interact to determine landscape character.
2. Landscape character varies greatly with the interaction of environmental factors.
3. People have the ability to perceive landscape character and develop expected images.
4. Through various activities, people have the ability to modify landscape character and scenic conditions and have often done so.
5. Such changes in landscape character and scenic condition often modify, suppress, or replace the original landscape character.
6. People value most highly the more scenic landscapes.
7. Generally, natural-appearing landscapes are the most valued.
8. Resource managers can design their activities to reduce adverse impacts on landscape character and scenic integrity.
9. People have the ability to establish goals to maintain or create desired landscape character.
10. People have the ability to apply ecological, technical, and design knowledge to meet scenery management goals and objectives.
11. In some situations, resource managers perpetuate or create desired scenic environments to provide an improved quality of life (USDA 1995).

The Scenery Management System (SMS) began with the basic premises established in the Visual Management System, but has been expanded to better accommodate ecosystem management and the time frames of natural systems. This system also places greater importance on establishing which scenic elements Forest constituency most value, and identifying ways to maintain or improve on those qualities.

The terminology introduced in the SMS will be used in this analysis. The Forest Plan specified the use of Visual Quality Objectives (VQOs) from the Visual Management System associated with the Management Areas. SMS uses Scenic Integrity Objectives (SIOs) to establish the desired condition for management of an area instead of VQOs. A crosswalk between these two systems is described in "Landscape Aesthetics: A Handbook for Scenery Management" (USDA 1995). An inventory has been completed, and an amendment to Forest Plan using the SMS was approved in 2000 (USDA 2000).

## 3.2. Concern Levels

Concern Levels represent a method of categorizing the importance of scenic resources to Forest visitors.<sup>6</sup> As defined in “Landscape Aesthetics: A Handbook for Scenery Management,” Concern Level 1 travel routes and use areas are those that are nationally or regionally important locations associated with recreation and tourism use, where there is a high interest in scenic resources (USDA 1995). Examples of travel routes that would fall into this rating would include designated scenic byways, national parks, and areas such as Red Canyon, Panguitch Lake, and Navajo Lake. An example of a trail that would fall into this rating is the Virgin River Rim Trail and areas seen from it as it would be of high scenic concern because of its popularity for mountain biking and other uses. Concern Level 2 routes would be those that are locally important and are associated with recreation, and where there is a high to moderate interest in scenic resources. All remaining roads and unnamed trails would be Concern Level 3 travel routes, which are routes that receive low use and where users have a moderate to low interest in scenic resources. Scenic Integrity Objectives provide a standard for management or a desired future condition, where Concern Levels examine the significance of scenic quality and aesthetic experience to people.

## 3.3. SMS Forest Plan Amendment (2000)

Former Forest Service Chief Jack Ward Thomas directed the Forest Service to use the Scenery Management System (SMS) as the analysis and management process for scenic resources, replacing the Visual Management System. In response, the 2000 SMS amendment specified Scenic Integrity Objectives for Management Areas, which replaced the VQOs specified in the 1986 Forest Plan. In 2000, a Forest Plan amendment was approved to adjust the management area boundaries to reflect the changes to the landscape, primarily as a result of the spruce mortality in forested areas, and to adopt scenic integrity objectives using the updated SMS inventories to define the boundaries. The amendment was necessary to implement the Scenery Management System (SMS) on the Dixie National Forest.

Scenic Integrity is defined as “a measure of the degree to which a landscape is visually perceived to be ‘complete.’ The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the character valued by constituents for its aesthetic appeal” (USDA 1995). Scenic Integrity Levels describe the current condition of the scenic resource. Scenic Integrity Objectives describe the objectives for management, or the desired future conditions.

---

<sup>6</sup> Concern Levels will be used to analyze the visual effects of the new motorized trail construction proposed in Alternatives D and E.

**Table S3-1. The Visual Quality (Visual Management System) and Scenic Integrity Objective (Scenery Management System) Transition.**

Visual Quality Objective	Scenic Integrity Objective	Definition
Preservation	Very High	<i>Unaltered</i> - Valued landscape character "is" intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.
Retention	High	<i>Appears unaltered</i> - Landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
Partial Retention	Moderate	<i>Appears Slightly Altered</i> - Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Modification	Low	<i>Appears Moderately Altered</i> - Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside of the landscape being viewed.
Maximum Modification	Very Low	<i>Appears Heavily Altered</i> - Deviations may strongly dominate the valued landscape character.

### 3.4. Resource Review

The Scenic Integrity Objectives and percentages for the Dixie National Forest are displayed in Table S3-1 above. Management Areas (MA) are defined in the Amendment to the Dixie National Forest Land and Resource Management Plan (USDA 2000).

**Table S3-2. Scenic Integrity Objectives for the Dixie National Forest**

Scenic Integrity Objectives	Notes
Very High (5%)	Wilderness Areas (8A), Research Natural Areas (10A), and Antone Bench and Box Death Hollow (8A1/8A2 adjacent to designated wilderness)
High (27%)	Management Areas 1A, 1B, 2A, 4A, 4A*, 9B and the foreground of Concern Level 1 travelways and use areas in other management areas.
Moderate (30%)	Management Areas 2B, 5A, 5B, 6A, 9A and foreground of Concern Level 2 travelways and use areas in other management areas.
Low (18%)	Management Areas 4B, 4C, 4D, 7A, and 10B.
Unclassified (16%)	Management Area 1, except within the foreground of Concern Level 1 and 2 travelways and use areas. These areas can range from low to high scenic integrity objectives.

\* Private land makes up the remaining 4%.

## Chapter 4: Effects Analysis

### 4.1. Introduction

When associated with a high scenic integrity area, recreation and visitor services are designed to reflect the valued landscape character. Trails are designed to “lay lightly” on the land. When possible, road cuts are planted with species found in the greater landscape. Materials and designs for signs and recreation facilities are chosen that reflect the natural character (USDA 1995). In general, long-term alterations to the scenic character of the Dixie National Forest would be positive in nature. However, in a few occurrences, some impacts may occur. Areas that may see a negative impact to scenic character are those where route construction takes place. Given that, this section will analyze the new motorized trail construction proposed in Alternatives D and E. This indicator will be examined by reviewing scenic integrity and visibility surrounding new construction.

### 4.2. Direct and Indirect Effects

**Table S4-1. Trail Construction by Alternative**

Alternative				
A	B	C	D	E
No new trail construction proposed	No new trail construction proposed	No new trail construction proposed	2 new routes proposed for construction  1.26 total miles  Routes T34070 – 0.65 miles U24028A – 0.61 miles	2 new routes proposed for construction  1.26 total miles  Routes T34070 – 0.65 miles U24028A – 0.61 miles

**Table S4-2. SIO Class**

Route #	Length in Miles	Applicable Alternative	District	SIO Class
T34070	0.65	D, E	Cedar City	High
U24028A	0.61	D, E	Cedar City	High

Insert map: Alternatives D and E: Proposed Motorized Trail Construction  
mtp\_proposed\_moto\_trail\_construction.pdf  
426 KB

## 4.2.1. Route T34070

### 4.2.1.1. Description

Proposed for construction under Alternatives D and E. The legal location of this proposed trail is Township 36S. Range 9W. Sections 11 and 14. This location is approximately 1.5 miles southwest of Brian Head Peak in Iron County. This 0.65 mile route, in conjunction with U24028A, would assist in the connection of Brian Head to the Markagunt OHV trail system. Specifically, this route would allow legal access from Brian Head resort to Forest Service Road 30047.

OHVs are currently accessing 30047 by traveling cross-country. This route would eliminate the need for cross-country travel through the constructing of a sustainable trail. Construction of this route would meet Forest Service ATV standards of “more difficult,” and construction operations would be accomplished with a trail dozer. BMPs would be used during construction. Signing, enforcement, sustainable trail building techniques, and volunteers would be used to reduce user conflicts and resource damage.

Development of this route would assist in reducing cross-country travel and the proliferation of user-created routes, thus helping to reduce further resource damage. However, due to the fact that T34070 would directly cross the non-motorized Marathon Trail (#32024), this route would likely increase conflict levels between non-motorized and motorized users, thus potentially reducing user satisfaction and increasing displacement.

### 4.2.1.2. Variety

In general, the terrain is flat to rolling, with a mix of grass, sub-alpine fir, aspen, and spruce. In this location, a large amount of the spruce is dead standing due to bug kill. As seen from the actual route, open fields of grass provide an experience of vastness and great visual variety. The forest offers a variety of colors, shapes, and textures in all season. While some views from this route may be limited to foreground because of the screening effect of adjacent forest cover or topography, most of this route allows views into Cedar Break National Monument, Ashdown Gorge Wilderness Area, and other areas of scenic interest.

### 4.2.1.3. Visibility

Large portions of this route could be seen as immediate foreground (from zero feet to 300 feet) and foreground views (from 300 feet to one-half mile) from Highway 14 and Forest Service Road 30047, both Concern Level 1 routes. In addition, this route would directly cross over the non-motorized Marathon Trail (#32024), a Concern Level 2 trail. Furthermore, this route, and associated users, may be visible from Cedar Breaks National Monument overlooks and Ashdown George Wilderness trailheads.

T34070 may increase use of this specific area, thus increasing the chance that OHV and associated impacts, such as dust plumes, would be within the immediate foreground and

foreground views more consistently. Other impacts to visibility may include scarring as a result of trail construction and OHV use. Scarring impacts should decrease within a 5-year period. In order to mitigate impacts, BMPs would be implemented. Currently, this area is used during the winter season by snowmobiles, thus impacts to immediate foreground and foreground views do currently exist, although temporarily.

#### 4.2.1.4. Scenic Integrity and Scenic Integrity Objectives

Portions of this route would be constructed in an area classified as having a high scenic integrity objective. As described in the transition table on page 37, high SIO, "Appears unaltered. Landscapes where the valued landscape character 'appears' intact. Deviations may be present but must repeat the form, line color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident" (USDA 1995).

Construction of this route may alter intact landscapes. This is due to a combination of potential construction results, such as the unearthing of a large quantity of soils that may not blend with the surrounding landscape, and newly constructed routes that run perpendicular to Concern Level 1 roads. Project design techniques, such as seeding and the use of unobtrusive gravel and trail design, may decrease the level of visual impacts. However, implementation of this route could reduce scenic integrity objectives from high to moderate.

### 4.2.2. Route U24028A

#### 4.2.2.1. Description

Proposed for construction under Alternatives D and E. The legal location of this proposed trail is Township 36S. Range 9W. Sections 18 and 19. This location is approximately 1 mile southeast of Brian Head peak in Iron County. This 0.61 mile route would assist in the connection of existing routes U24028 and Forest Service Road 32310. In addition, this route, in conjunction with T34070, would allow legal access from Brian Head resort to the Markagunt OHV trail system.

Construction of this route would meet Forest Service ATV standards of "more difficult," and construction operations would be accomplished with a trail dozer. The trail would be located in a sustainable location and BMPs would be used during construction. Signing, enforcement, sustainable trail building techniques, and volunteers would be used to reduce user conflicts and resource damage.

Development of this route would assist in reducing cross-country travel and the proliferation of user-created routes, thus helping to reduce further resource damage. However, due to the fact that U24028A would be within view and within the soundscape of the non-motorized Marathon Trail (#32024) and Sydney Peak Trail (#32010), it is likely that conflict levels between non-motorized and motorized users would increase, thus potentially reducing user satisfaction and increasing displacement.

#### 4.2.2.2. Variety

In general, the terrain is flat to rolling, with a mix of grass, sub-alpine fir, aspen, and spruce. In this location, a large amount of the spruce is dead standing due to bug kill. As seen from the actual route location, open fields of grass provide an experience of vastness and great visual variety. The forest offers a variety of colors, shapes, and textures in all season. While views from this route may be limited to foreground (from 300 feet to one-half mile) because of the screening effect of adjacent forest cover or topography, some of this route would allow middleground (from one-half mile to four miles) views into Cedar Break National Monument, Brian Head peak, and other areas of scenic interest.

#### 4.2.2.3. Visibility

Some portions of this route may be seen as foreground views (from 300 feet to one-half mile) from Forest Service Road 30047, a Concern Level 1 road. In addition, this route would be seen as immediate foreground (from zero feet to 300 feet) and foreground views (from 300 feet to one-half mile) from the non-motorized Marathon Trail (#32024) and Sydney Peak Trail (#32010), both Concern Level 2 trails. Further, this route, and associated users, may be visible from Cedar Breaks National Monument and Brian Head Peak.

U24028A may increase use of this specific area, thus increasing the chance that OHV and associated impacts, such as dust plumes, would be within the immediate foreground and foreground views more consistently. Impacts to visibility may also include scarring resulting from trail construction. Scarring impacts should decrease within a 5-year period. In order to mitigate impacts, BMPs would be used during construction.

#### 4.2.2.4. Scenic Integrity and Scenic Integrity Objectives

Portions of this route would be constructed in an area classified as having a high scenic integrity objective. As described in the transition table on page 37, high SIO, "Appears unaltered. Landscapes where the valued landscape character 'appears' intact. Deviations may be present but must repeat the form, line color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident" (USDA 1995).

Construction of this route may alter intact landscape. This is due to a combination of potential construction results, such as the unearthing of a large quantity of soils that may not blend with the surrounding landscape, and newly constructed routes that run perpendicular to Concern Level 1 roads. Project design techniques, such as seeding, the use of unobtrusive gravel, and trail design, may decrease the level of visual impacts. However, implementation of this route could reduce scenic integrity objectives from high to moderate.

### 4.2.3. Conclusions

In general, a vast majority of the Forest would meet or exceed Scenic Integrity Objectives across all alternatives. However, within Alternatives D and E, construction of routes T34070 and U24028A may result in impacts that reduce scenic integrity from high to moderate. Project design techniques, such as sustainable trail design and seeding, could limit the reduction in scenic integrity to less than 5 years.

## 4.3. Cumulative Effects

Cumulative effects for scenic resources are also discussed in the recreation cumulative effects section beginning on page 27.

### 4.3.1. Cumulative Effects Area

The cumulative effects area for scenery management is the viewsheds surrounding the area of the proposed trail construction. Areas immediately adjacent to the constructed routes are likely to experience the most direct impacts.

### 4.3.2. Cumulative Effects

The major influences on scenery within and adjacent to the project area have been timber harvest, insect infestations, fuel treatment, fire, roads, trails, and recreation development, all of which have the potential to change the vegetative cover and landform being viewed on the Forest. Effects on scenery are managed according to the guidelines provided in the amendment to the Dixie National Forest Land and Resource Management Plan (USDA 2000).

None of the actions under any alternative would result in a change in scenery integrity guidelines as described in the 2000 amendment. Cumulative effects on scenery are predictable within the provisions of the guidelines in the amendment. This is also the case with all routes proposed for construction. However, routes U24028A and T34070 may provide two circumstances where scenic integrity objectives would be modified from high to moderate, although those modifications would still be within the parameters of the guidelines.

Both of the routes proposed for construction in Alternatives D and E may diminish the views that Forest users' would experience. This may be particularly true for those seeking a more primitive experience or those whose expectations are altered or are not met due to the presence of motorized routes and associated impacts. Additionally, the effects of proposed routes U24028A and T34070 may have some cumulative effect with the visual effects of the dead and dying spruce component of the adjacent Forest and project area, which would remain after route implementation. However, due to the scale of acres affected, impacts are not significant for the cumulative effects area.

Further impacts associated with route construction may be displacement of other forest users in conflict with motorized use or those seeking higher levels of solitude. This action has the potential to increase use and conflict levels in other nearby areas or areas with similar settings. Also, route construction would add to soil compaction, thus potentially creating instances of soil erosion. Further, route construction may increase cross-country travel due to the fact that some route placement occurs in areas with no formidable obstacles to mitigate off-road travel. Combined, these items may lead to further impacts to the scenic resource. However, due to the scale of acres affected, impacts are not significant for the cumulative effects area.

Past, present, and future environmental conditions within the cumulative effects area include drought cycles, accumulation of forest fuels, and the increasing threat of invasive species. These conditions, alone or in combination with one another, have the potential to change the scenery and settings of the Forest. However, national responses have been put in place to

mitigate impacts. The alternatives considered would have no impact associated with drought, though Alternatives D and E, which include motorized route construction, may slightly increase the spread of invasive species and increase human-caused fires within the cumulative effects area (see the *Vegetation and Fire and Fuels Specialist Report*, the *Noxious Weeds Specialist Report*, and the *Rare Plants Specialist Report*).

Past and foreseeable future actions within the cumulative effects area include vegetative treatments, oil and gas activities, utilities, and grazing. These conditions, alone or in combination, have the potential to change the scenery and settings of the Forest. However, due to the scale of acres affected, they would not create a cumulative effect when considered together with any of the proposed trail construction.

Effects associated with route construction would be with the same for Alternatives D and E. Alternatives A, B, and C would have no effects associated with trail construction.

## 4.4. Project Design Features

Project design features include professional trail design, construction in sustainable locations, and proper signage and enforcement.

**Table S4-3. Project Design Features for Motorized Trail Construction**

	Easiest	More Difficult	Most Difficult
<b>Grade</b>			
Max. sustained	15%	25%	35%
Length	200'	300'	500'
Max. pitch	20%	30%	50%
<b>Clearing (wooded)</b>			
Downhill side	2'	1.5'	1'
Uphill side	3'	3'	3'
Level	3.1' each side	2.6' each side	2.5' each side
<b>Clearing (open)</b>			
Downhill side	2'	1.5'	1'
Uphill side	3'	3'	3'
Level	3.1' each side	2.6' each side	2.4' each side
<b>Height</b>			
	6'	6'	5'
<b>Tread (width)</b>			
Minimum	6.2'	5.2'	4.8'
Maximum	7.2'	6.2'	5.8'
<b>Surface</b>			
	Relatively smooth	Sections of relatively rough	Relatively rough with very rough sections

Source: Forest Service Handbook, Section 2309.18-Trails Management Handbook: ATV Trail (three-wheel/four-wheel vehicle) Guide (USDA 1991).

## 4.5. Consideration of Best Available Science

The techniques and methodologies used in this analysis are considered the best available science. The analysis refers to credible literature and professional practice related to scenery management which is relevant to evaluating reasonably foreseeable adverse impacts. Analysis and conclusions are based on a thorough review of relevant information, a consideration of responsible opposing views, and the acknowledgment of incomplete or unavailable information, scientific uncertainty, and risk.

The relevant science considered for this analysis consists of several key elements:

- On-site data and history. The project area was included in a forest-wide scenery management survey conducted in 1997 by Nancy Brunswick, Forest Landscape Architect. A landscape description was written as part of the survey and ratings for scenic attractiveness, existing integrity, viewing distances, biophysical/ecological and cultural features, and concern level were assigned. This information served as the basis for completing the Scenery Management System Amendment to the Dixie National Forest Land and Resource Management Plan (USDA 2000) and the scenic integrity objectives referenced in this report.
- Relevant literature. Relevant literature includes the Scenery Management System Amendment to the Dixie National Forest Land and Resource Management Plan (2000) and the Agriculture Handbook 701 (1995), "Landscape Aesthetics: A Handbook for Scenery Management," which supersedes Agriculture Handbook 462 National Forest Landscape Management Volume 2, Chapter 1, and The Visual Resource Management System, April 1974.
- Professional knowledge, judgment and experience. The primary specialists who conducted the scenery resource analysis were Noelle Meier, Landscape Architect, and Kirk Flannigan, Natural Resource Specialist (Recreation). Professional knowledge and experience in scenery management applications, including the practices recommended in the design criteria, have been incorporated into the analysis to best meet scenic integrity objectives set forth by the Scenery Management System Amendment to the Dixie National Forest Land and Resource Management Plan (2000).
- The collective knowledge of the project area by Interdisciplinary Team members, integrated with scenic integrity objectives, applications, and local conditions.
- Comparative analysis considering other local similar projects. The effects to the scenery resource in other similar projects in the local area and across the forest have been considered in the analysis and design criteria.

## Literature Cited

- A & A Research. 1994. Dixie National Forest customer satisfaction and communication workbook: summary of findings by Dr. E. B. Eiselein. A & A Research, Kalispell, MT.
- Adelman, B. J. E., T. A. Heberlein, and T. M. Bonnicksen. 1982. Social psychological explanations for the persistence of a conflict between paddling canoeists and motorcraft users in the Boundary Waters Canoe Area. *Leisure Sciences* 5(1): 45-61.
- Gibbons, S. and E. J. Ruddell. 1995. The effect of goal orientation and place dependence on select goal interference among winter backcountry users. *Leisure Sciences*, 17, 171-183.
- Gramann, J. H. and G. A. Vander Stoep. 1987. Prosocial behavior theory and natural resource protection: a conceptual synthesis. *Journal of Environmental Management*, 24, 247-257.
- Hammit, W. E. and D. N. Cole. 1998. *Wildland recreation: ecology and management* (2nd ed.). New York: John Wiley & Sons, Inc.
- Hendee, J. C. and C. P. Dawson. 2002. *Wilderness management: stewardship and protection of resources and values* (3rd ed.). Colorado: Fulcrum.
- Jackson, E. L. and R. A. G. Wong. 1982. Perceived conflict between urban cross-country skiers and snowmobilers in Alberta. *Journal of Leisure Research* 14(1): 47-62.
- Magill, A. W. 1976. The message of vandalism. In *Vandalism and outdoor recreation: symposium proceedings*. USDA Forest Service. General Technical Report PSW-17, 50-54.
- Manning, R. E. 1999. *Studies in outdoor recreation: search and research for satisfaction* (2nd ed.). Corvallis: Oregon State University Press.
- PLAE, Inc. 1993. *Universal access to outdoor recreation: a design guide*. PLAE, Inc. Berkeley, CA.
- Ramthun, R. 1995. Factors in user group conflict between hikers and mountain bikers. *Leisure Sciences* 17(3): 159-169.
- Reading, Russell. 2008. Development of the Dixie and Fishlake national forests recreation opportunity spectrum GIS layer. July 7.
- USDA. See U.S. Department of Agriculture. Forest Service.
- U.S. Department of Agriculture. Forest Service. 1986. *Land and resource management plan for the Dixie National Forest*. Cedar City, UT.

U.S. Department of Agriculture. Forest Service. 1991. Forest Service handbook, section 2309.18 – trails management handbook: ATV trail (three-wheel/four-wheel vehicle) guide. Washington D.C.

———. 1995. Landscape aesthetics: a handbook for scenery management. Agriculture Handbook No. 701. Washington DC.

———. 2000. Scenery management system amendment to the Dixie National Forest land and resource management Plan. Cedar City, UT. April.

———. 2004a. Dispersed campsite inventory, Dixie National Forest.

———. 2004b. National visitor use monitoring results: June 2004. Dixie National Forest.

———. 2008. Cumulative effects summary for the motorized travel plan. December.

———. 2009. Social and economic specialist report: motorized travel plan. Dixie National Forest.