MOUNTAIN ACCORD

Draft Existing Conditions & Future Trendlines of the Recreation System

System Group Recommendation

April 2014

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1. EXECUTIVE SUMMARY

This report presents the existing conditions and future trendlines for the Mountain Accord Recreation System Group. A bulleted summary of key points is provided below. This summary is followed by an introduction to the recreation system with a discussion on the regional context. The bulk of the report focuses on the existing conditions. Finally, future trendlines are presented in terms of baseline projections and effects on the recreation system.

SUMMARY OF RECREATION SYSTEM EXISTING CONDITIONS & FUTURE TRENDLINES

Natural Environment:

- *The Central Wasatch region boasts a unique environment in the Western U.S. that is prized by locals and visitors alike. With urban and suburban communities nestled adjacent to high-elevation mountains, opportunities to participate in countless recreation opportunities and escape from urban life abound. As the 8th most urban state in the country, with more than 90% of the population living on 1.1% of the land (U.S. Census Bureau 2010), Utah is in a unique position to preserve the natural environment that supports these opportunities.*
- *The mountains are also a place for the populous to escape summer heat and winter inversions. These environmental influences will become more intense through population growth and climate change, making the Central Wasatch even more important for its citizens to maintain their high quality of life.*

Recreation Users:

- *Utah residents participate in outdoor recreation at a higher rate than the national average, and projected population growth will only increase the number of the recreation users in the Central Wasatch. The Uinta-Wasatch-Cache National Forest already experiences higher visitor use than all five Utah National Parks combined (Utah Governor's Council on Balanced Resources 2013). Through expected increased use, recreation experiences will begin to decline due to crowding, conflicts between user groups, environmental impacts, traffic and parking congestion, and degrading infrastructure.*
- *The resorts are a vital element of the recreation system and, balanced with non-commercial winter recreation uses, make the Central Wasatch a unique, world-class skiing destination. Wintertime visitors to ski resorts are primarily out-of-state visitors, while the majority of general year-round recreational visits to other amenities are from Utah residents (RRC Associates 2013 and USFS 2008).*
- *Trends show that children are recreating less, leading to increased rates of childhood obesity and overall declining health. Childhood outdoor recreation creates a foundation for healthy lifestyles and establishes a lasting connection to the natural world. If these values are not fostered and passed through the generations, a trend toward diminished interest in outdoor recreation and the associated community health benefit may be lost.*

SUMMARY OF RECREATION SYSTEM EXISTING CONDITIONS & FUTURE TRENDLINES (CONTINUED)

Recreation Uses:

- *The Wasatch Mountains support a wide variety of recreation uses. Maintaining a balance of uses and activities is essential to ensure that all recreation users' needs are met. Anticipated future trends including climate change, land use development (e.g., residential and ski resort expansion), and population growth will concentrate more recreation users into smaller areas, increasing crowding and conflicts. This will be most evident during the winter season on high-elevation terrain, where the snow lingers the longest.*
- *Many of the high quality areas for different recreation activities overlap, which increases conflicts between different user groups during high use days. As the use of these areas increases, user conflicts will intensify, leading to diminishing future recreational experiences.*
- *Advancing technology has led to rapidly increasing participation in existing activities (e.g., mountain biking, backcountry skiing) as well as the emergence of new sports. Changing interests and further technological advances anticipated in the future will perpetuate these trends, underscoring the necessity of forward thinking recreation planning.*

Recreation Infrastructure and Setting:

- *Recreation infrastructure in the Central Wasatch consists of trails, resorts, campgrounds, picnic areas, and the natural features that draw recreation users to these areas. The resorts provide substantial economic benefit to the region, access to varied terrain for a range of skill levels, and are critical for the health of the ski industry. Resort summer uses will grow in importance as climate change shortens the winter season and more people seek access to recreation opportunities.*
- *The Wasatch trail system is a key infrastructure component, supporting a wide variety of recreation uses, including activities such as mountain biking, which have experienced an explosion in use. In some areas, overuse is leading to resource degradation, particularly on trails that were not originally designed for recreation uses. Future trends of increasing use will put further strain on the trail system.*
- *The setting in which recreation occurs plays a critical role in the enjoyment of a multitude of recreational activities. Each area within the Central Wasatch has a unique balance of different settings which support these activities. Future land use development and increasing use in these areas will modify the setting and character, upsetting the delicate balance of recreation uses.*

Access to Recreation:

- *Access to recreation opportunities affects an individual's complete, door-to-door recreation experience, which includes the opportunity for multiple types of recreation use in a single day. Currently, personal vehicles constitute the primary mode of access to recreation locations, severely stressing the transportation network on peak volume days and creating conflicts with other road users, such as road bikers. Continuing increases in use will make access more difficult, even on days that experience average traffic volumes, and will potentially limit recreation participation in the future.*

SUMMARY OF RECREATION SYSTEM EXISTING CONDITIONS & FUTURE TRENDLINES (CONTINUED)

Access to Recreation (continued):

- *Development, especially along the Wasatch Front, is physically blocking access to existing recreation areas, a trend which will become more prevalent with future development. On the Wasatch Back, planning regulations support the incorporation of recreation access into private land developments to maintain and increase recreation network connections.*

Recreational Funding:

- *Funding of recreation that promotes long-term maintenance and management is critical for the sustainability and flexibility of a high-quality recreation system. Many communities on the Wasatch Back have established tax bond measures to support the development, maintenance, and management of recreation facilities to meet changing demand. In contrast, level to decreasing U.S. Forest Service budgets and the necessity of balancing natural and developed recreation sites on the Wasatch Front have led to diminishing levels of trail maintenance. Trail conditions have degraded as maintenance has been unable to keep pace with increased recreation use in the Central Wasatch.*

2. INTRODUCTION

2.1 Report Introduction and Status

This is an interim version of the Recreation System Existing Conditions and Future Trendlines report for Mountain Accord. This report will be finalized after the Recreation System Group meeting on April 29, 2014, and following public and stakeholder input. The intended audience for this report is the general public and the four Mountain Accord system groups. Note that the key takeaway points are compiled in the executive summary for readers interested in a quick overview.

This report references detailed information and analyses, but is not meant to be a comprehensive description of all that is known about the recreation system. It is meant to concisely present available information that will help the Recreation System Group focus on key considerations for an idealized system. The intent is to help identify the key needs and opportunities for this system; inform the development of a vision, goals, and metrics; and establish a baseline against which to compare options for a future idealized system. If later steps in the process identify the need for additional information regarding existing conditions or future trendlines, that information can be added at that time.

A parallel report is being developed for each system group—environment, transportation, recreation, and economy. The purpose of these reports is to inform the Mountain Accord process and inform an agreement, by January 2015, on this region's direction for optimizing the future performance of the environment, recreation, transportation, and economic systems in the Central Wasatch. To reach that goal, Mountain Accord will be implementing a process to develop the following:

- Existing Conditions and Future Trends report
- Agreement on the Future Vision and Metrics for each system
- Agreement on Idealized Systems
- Agreement on a Preferred Scenario (that combines and optimizes the four idealized systems)

Each of these reports will be developed through the following actions:

- Develop draft information
- Solicit system group input
- Poll the system groups on their level of concurrence with the report
- Revise the information
- Invite public and stakeholder input
- Finalize the report for Executive Board review and adoption

Table 1, below, summarizes the key information regarding existing conditions and future trendlines that has been developed to date. If the need for additional information is identified during later steps in the process, that information can be added at that time. More information is included on the Mountain Accord website at www.mountainaccord.com.

Table 1. Status of Report Development

Milestone Development Steps	Incorporated in this Report?
Group Meeting #1 on Existing Conditions	X
Group Meeting #2 on Existing Conditions	X
Group Poll on Existing Conditions	X
Group Meeting #1 on Future Trendlines	X
Group Meeting #2 on Future Trendlines	
Group Poll on Future Trendlines	
Public Review of Interim Report	
Stakeholder Meeting Input	
Other	

2.2 Project Area

The project area (where proposed actions are anticipated) is bounded on the north by Parleys Canyon, on the south by Little Cottonwood Canyon, and on the west generally by I-15 in Salt Lake County. This project area extends north of I-80 in the Salt Lake Valley to include the University of Utah and the Salt Lake International Airport. The project area also extends into Summit County and Wasatch County, bounded on the east by U.S. Highway 40 (U.S. 40). It is recognized that the recreation system extends beyond the project area boundary; for instance, recreation uses within Emigration Canyon influence the overall recreation system within the Central Wasatch. Therefore, while the Mountain Accord analysis focuses on the project area, it is important to identify that the interconnected recreation system extends beyond the project area.

2.3 System Introduction

The recreation system in the Wasatch Mountains is composed of the natural environment, recreational infrastructure, and the people who build, maintain, and use these amenities to recreate. The natural, built, and human elements of the system are balanced such that they support a wide range of activities and provide an opportunity for high-quality recreation experiences in a small area. This balance

is unique in the Western United States and treasured by local residents who use the recreational amenities to support their healthy, active lifestyles and high-quality of life. This document describes the existing infrastructure and resources critical to the recreation system in the Wasatch Mountains, discusses the overall performance of the system, and describes its ability to meet the existing needs of recreational users. The report focuses on the experience of the recreational user of the Central Wasatch. This report also describes future trends, including population growth, expanding land use development, performance of the transportation system, climate change, and recreation-specific trends (e.g, emerging sports), in context with the current condition of the recreation system to describe the effect of these trends on the future performance of the system. Interrelated topics of recreation economics, environmental resources, and transportation to access recreation relevant to the Mountain Accord process are addressed in separate reports.

3. EXISTING CONDITIONS

3.1 Introduction

This report summarizes the best available information at this time on existing conditions for the Central Wasatch Recreation System, intended to succinctly inform the Mountain Accord process. This report references other detailed information and analyses, but is not meant to be a comprehensive description of all that is known about the Recreation System. It is meant to concisely present available information about the Recreation System that is most relevant to the intent of Mountain Accord. Together with the future trendline information, the existing conditions information will help identify the key needs and opportunities for this system; inform the development of a vision, goals, and metrics; and establish a baseline against which to compare options for a future idealized system. If during later steps in the process, the need for additional information on existing conditions is identified, that information can be added at that time.

SUMMARY OF RECREATION SYSTEM EXISTING CONDITIONS

Anyone who has lived in or visited northern Utah has been witness to the unique setting offered by the proximity of population centers to high-elevation mountains providing opportunities to recreate, exercise, experience solitude, recharge, and escape from urban life. The proximity of mountain and urban environments provides an increasingly urban population with an opportunity to access close-to-home open space and connect with the outdoors and the lands that sustain them. It also promotes health and fitness, and fosters community awareness of our environment, wealth of outdoor amenities, and heritage.

Within the mountains themselves the natural, built, and human elements of the recreation system are balanced such that they support a wide range of activities and provide high-quality recreation experiences in a small area. This balance is supported and maintained by existing land uses and regulations and allows opportunities for high-quality recreation pursuits, including hiking, skiing, mountain biking, road biking, rock climbing, and enjoying beautiful scenery, to coexist.

Easy access to a variety of quality outdoor recreation opportunities and the quality of these opportunities fuel residents' high-quality of life and makes the Central Wasatch a haven for local residents as well as an internationally recognizable destination for out-of-state visitors. The mountains attract new residents and businesses and receive high levels of use exceeding other popular recreational destinations including all of Utah's National Parks (U.S. Forest Service 2013 and Utah Governor's Council on Balanced Resources 2013). Where else can you ski in the backcountry or at one of our world class resorts in the morning and mountain bike on award winning trails in the afternoon? Wintertime visitors to ski resorts are primarily out-of-state visitors while the majority of general year-round recreational visits to other amenities are from Utah residents (RRC Associates 2013 and U.S. Forest Service 2008).

The most prominent issues associated with recreation in the Central Wasatch are related to high demand and use of existing facilities. Roadways, parking lots, trails, backcountry terrain, and trailheads become overcrowded during high demand days in both the summer and winter seasons, resulting in diminished opportunities for high quality recreational experiences. In some instances, due to overlapping high quality areas for multiple recreation activities, user conflicts occur which lead to dissatisfaction among recreational users. Examples of these user conflicts include: hikers and mountain bikers; cars and road bikers; and backcountry skiers, lift-served skiers, and helicopter skiers. High volume recreation use also results in degradation of trails, especially on those not originally designed for recreation use (i.e., mining roads). Lack of maintenance and degradation of the trails not only diminishes the user recreational experience but can also affect the environmental system supporting these recreational pursuits. The Wasatch Back has an ongoing trail construction and maintenance program that has minimized trail overcrowding and degradation supporting use during both the summer and winter seasons. Through increasing use and demand for popular recreational amenities, or changes in existing land uses and land use regulations, the delicate balance currently in place that supports each activity within the larger recreation system could be disrupted.

3.2 Regional Context

A fundamental component of the recreation system in the study area is the unique combination of natural environment provided by the Wasatch Mountains and human settlement pattern in adjacent valleys. Urban and suburban areas along the Wasatch Front and Back provide the population with access to amenities including jobs, education, cultural opportunities, and transportation infrastructure while the mountains provide the population with opportunities for recreation, exercise, solitude, to recharge, and escape from urban life (Figure 1). The proximity of urban and mountain environments and accessibility to a diversity of developed and dispersed recreation opportunities provided by this proximity are unmatched in the Western United States. This proximity provides a unique opportunity to connect the population with the outdoors and the lands that sustain them, promote health and fitness, and foster community awareness of our environment, wealth of outdoor amenities, and heritage.

Source: Mountain Accord Recreation System Group.

Figure 1. Regional Recreation Context

3.3 Natural Environment

The Wasatch Mountains and adjacent urban areas occur at the convergence of three major ecoregions. The climate, natural resources, and development pattern of each region facilitates the various opportunities for year-round recreation in the project area.

The climate in the Salt Lake Valley is characterized by long, hot summers and cold winters. The landscape has an urban character with outdoor recreation facilities generally limited to paved paths, city parks, and ball fields. In the mountain valleys along the Wasatch Back, the climate is characterized by warm to hot summers and cold winters. The landscape has a suburban to rural character and outdoor recreation facilities include mountain and paved trails, city parks, and ball fields. The climate of the Wasatch Mountains themselves is characterized by long, cold winters; short, cool summers; and a deep winter snowpack deposited by orographically enhanced precipitation. The mountain landscape maintains a natural character and provides a location for Wasatch Front and Back residents to escape the summer heat and winter inversions with consistent snowfall to support a variety of winter time recreational activities (Figure 2). Outdoor recreation facilities include ski resorts, mountain trails, campgrounds, picnic areas, and natural areas for dispersed recreation.

Source: Mountain Accord Recreation System Group.

Figure 2. Climate and Natural Environment

3.4 Recreational Infrastructure

Infrastructure used by people to access and participate in recreation activities plays a critical role in the function and structure of the recreation system. Private automobiles provide the primary mode of transportation for bringing people from population centers to mountain recreation destinations. Several main roadways traverse the Wasatch Front and Back and ascend the major canyon. In addition to serving automobiles these roads provide opportunities for road biking. Parking facilities at trailheads, on road shoulders, and at major resorts provide access to the network of recreational infrastructure and natural resources in the study area. On busy weekends and holidays, roadway congestion (both in the canyons as well as the areas at the canyon mouths) leads to delays and demand for parking exceeds the number of available spaces in popular areas. Transit opportunities are limited in the canyons along the Wasatch Front. A ski bus operates during the winter and provides access to the ski resorts and popular trailheads. Due to the travel time, stop locations, crowding, and frequency of ski bus service in addition to the level of congestion and high demand for parking, hitchhiking is common during the winter ski season. For additional detail about transportation in the Central Wasatch, please refer to the transportation system group report.

Other recreational infrastructure, including trails, resorts, campgrounds, picnic areas, and natural resources (e.g., cliffs for rock climbing, high elevations slopes suitable for backcountry skiing), are distributed throughout the study area. A database of these resources has been developed by the recreation system group and serves as the basis for observations about existing patterns of recreational uses

in the study area. The database of existing recreation infrastructure is available for review and depicted on an interactive map viewer located here.

Trails are some of the most important built components of the recreation system in the study area. Trails provide critical infrastructure for several of the most popular recreational activities in the study area, including activities that have experienced explosive growth in participation. Demand for different types of trail systems has evolved along with the activities that these trail systems support. Areas supporting active trail development have been able to adopt and keep pace with the evolving demand for different types of trail systems in comparison to areas with limited new development. Many of the trails on the National Forest were initially built as mining or logging roads which were later converted for use as multi-use or hiking trails. Several of these trails have design issues including steep grades and poorly planned alignments resulting in erosion, natural resource and watershed degradation, and reduced user experiences. Additionally, lack of directional and freeride/gravity biking trails has resulted in user conflicts and natural resource damage associated with user-created trails. In contrast, the trail network on the Wasatch Back has been able to adapt to evolving demand. Construction and designation of multi-use, hiking only, directional, and freeride/gravity mountain biking trails has resulted in a world-class trail system, has largely avoided natural resource damage associated with user-created trails, and requires less expensive maintenance.

One of the most influential components of recreation infrastructure, which occupies the central portion of the study area, are the seven ski resorts (Alta, Brighton, Canyons, Deer Valley, Park City, Snowbird, and Solitude). In addition to providing opportunities to lift-accessible skiable terrain for a variety of skill levels, these resorts also provide a range of summer amenities and have the most developed access including transit service and expansive parking areas.

3.5 Setting

The setting for a recreational activity and users' expectations about this setting play a key role in where users decide to recreate and the user's enjoyment of the experience. For example, a person accessing the mountains for a quick, after work mountain bike ride inherently has different expectations about the amenities, suitable levels of social interactions with other users, and acceptable modification of the landscape than someone looking for a quiet hike in nature to observe wildlife. Furthermore, the hiker may prefer to recreate in areas not used by downhill skiers or mountain bikers. Understanding the preferred setting for each use can help identify compatible and incompatible uses.

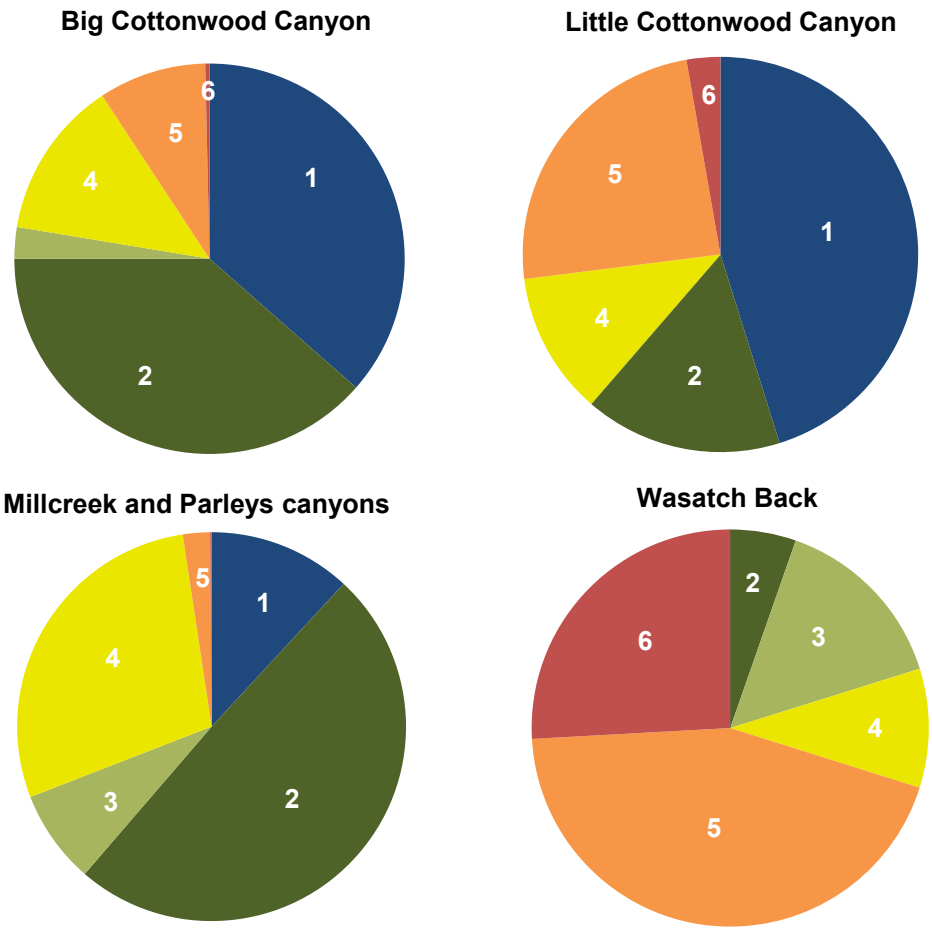
Primitive settings with low amounts of social interaction between users are relatively abundant in the study area, and members of the recreation system group have identified the variety of settings and the accessibility of primitive areas as unique

and critically important elements of the recreation system. Unfortunately, differences in recreational settings are inherently difficult to quantify. One tool for describing recreation settings is the U.S. Forest Service (USFS) Recreation Opportunity Spectrum (ROS). The ROS establishes descriptions for levels of acceptable accessibility, remoteness, naturalness, facilities and site management, social encounters, visitor impacts, and visitor management across a spectrum of recreational settings. More information about ROS is available here. The recreation system group has elected to inventory the existing recreational settings in the entire study area using the concepts developed by the USFS for ROS. For this inventory, a numerical scale ranging from 1 to 6, with 1 representing the most primitive and 6 representing the most developed settings was used to avoid confusion associated with the names of the USFS ROS categories (Figure 3). In the example above, the mountain biker may prefer to recreate at a ski resort with developed mountain bike trails (level 4 or 5 areas), whereas the hiker viewing wildlife would generally choose to hike in level 1 or 2 areas (i.e., a highly natural setting).

Sources: Mountain Accord Recreation System Group and U.S. Forest Service 1994.

Figure 3. Recreation Setting Spectrum

The recreation setting inventory for Mountain Accord was developed by the recreation system group based on members' knowledge and expertise during a workshop held on March 13, 2014. The information was provided for review using ArcGIS online as well. The resulting inventory of recreational settings is included in the database available for review using the interactive map viewer. The database includes all lands in the study area, does not imply management direction, and should not be used for parcel-specific interpretation. The quantity of each recreation setting level varies between the canyons and areas within the Central Wasatch and supports the unique balance of uses tied to these settings (Figure 4). Both Little and Big Cottonwood canyons have large areas of lands at the more primitive end of the spectrum (levels 1 and 2) which support a variety of recreation activities along the existing non-motorized trail network (e.g., hiking, backcountry skiing, and snowshoeing). By comparison, the Wasatch Back is largely comprised of more modified landscapes including ski resorts and rural housing developments (level 5). These more modified settings facilitate activities requiring more recreation infrastructure including resort skiing, Nordic skiing, and mountain biking.



Source: Mountain Accord Recreation System Group

Figure 4. Recreation Setting Breakdown by Area

The distribution and balance of recreational settings may be upset through additional development or the proliferation of recreation uses incompatible with the existing setting. Additionally, changes in setting can affect the quality of recreation experiences occurring in the area. Compatible uses and critical areas for long-term preservation of recreational experiences can be identified by understanding the recreation setting, how the setting supports existing activities, and how development and management changes can alter the setting.

3.6 Recreational Users

Studies that have been completed provide a wealth of information about the recreational users of the Wasatch Mountains, existing patterns of recreational use, and user preferences and perceptions. Unfortunately, detailed, site-specific studies of recreational use in the study area are not available at this time. Information that is

available, including trail counts and user surveys, show increasing use of trails over time. Concentrations of use occur around trailheads with high parking capacity and easy access, which are amplified on trails that receive local and national media attention. At least two efforts are currently underway led by participating organizations in the recreation system group to gather more detailed information about recreational users and relative levels of recreational use. The results of these efforts will provide important information for future recommendations to the Mountain Accord Executive Board.

Studies conducted at the national level have shown that the percentage of Americans participating in outdoor recreation has remained relatively stable over time and growth in outdoor recreation participation results directly from population growth. However, Utah residents participate in outdoor recreation at a much higher rate (82% participation) compared to nationwide averages (50% participation) (Outdoor Foundation 2013). Assuming that the rate of outdoor recreation participation in Utah has remained relatively steady over time, the number of users recreating in the study area has increased dramatically as the regional population has increased over the past decades (Table 2).

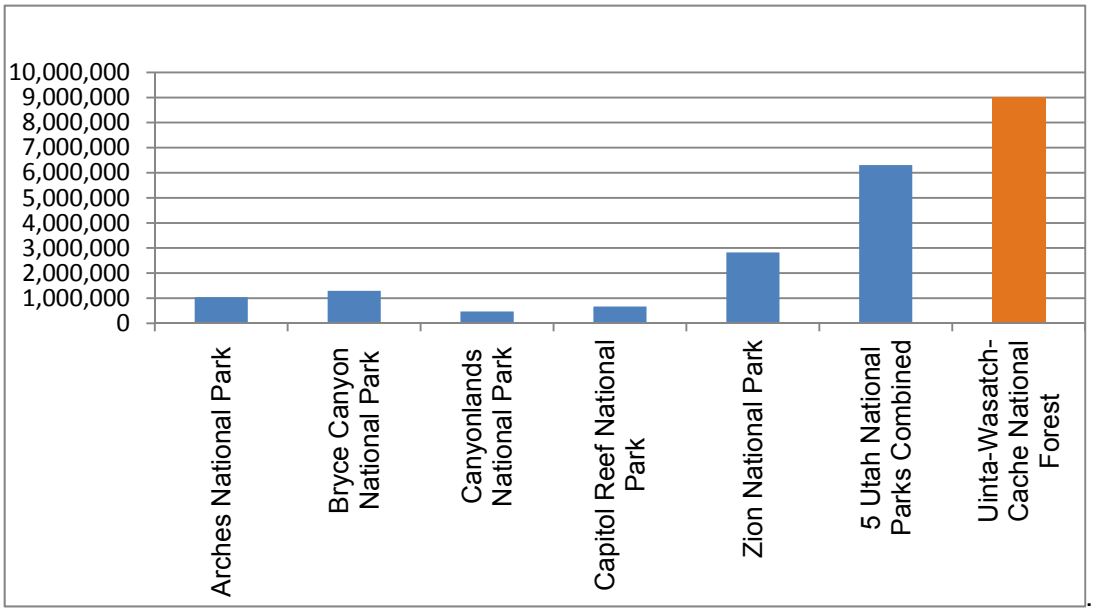
Table 2. Historic and Projected Population Growth

County	1950	1975	2000	2012	2020	2040
Salt Lake	279,000	521,200	902,843	1,059,112	1,180,859	1,507,997
(% of current)	(26%)	(49%)	(85%)		(111%)	(142%)
Summit	6,700	7,500	30,012	37,704	45,491	71,433
(% of current)	(18%)	(20%)	(80%)		(121%)	(189%)
Wasatch	5,500	7,000	15,427	25,354	32,741	59,159
(% of current)	(22%)	(28%)	(61%)		(129%)	(233%)

Source: Utah Governor's Office of Management and Budget 2012

The popularity of outdoor recreation in the Wasatch Mountains of northern Utah is confirmed by visitor use monitoring conducted by the Uinta-Wasatch-Cache National Forest (UWCNF). Lands administered by the UWCNF are located along the Wasatch Mountains from the Utah/Idaho border to U.S. Highway 6 south of Provo, Utah and extend into the Stansbury and Western Uinta Mountains. Resorts and popular recreation destinations on the Wasatch Back are not within the UWCNF and some visitor monitoring by UWCNF occurs outside the study area. Therefore, the National Forest's visitor use monitoring does not provide a comprehensive review of visitation in the study area but are the best available data to qualify relative levels of recreational use. The portions of the study area along the Wasatch Front administered by UWCNF are among the most heavily visited areas in the Wasatch Mountains. The UWCNF estimates that annual Forest-wide recreational visitation exceeds approximately 9 million visitor-days (U.S. Forest Service 2013). This level of recreational visitation does not include use occurring at popular destinations

along the Wasatch Back and exceeds the combined annual visitation at all five Utah national parks (approximately 6.2 million visitor-days) (Utah Governor's Council on Balanced Resources 2013) (Figure 5).

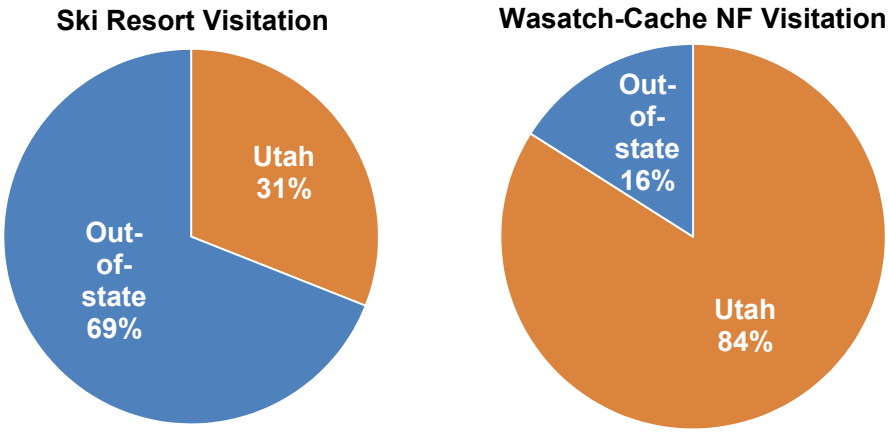


Source: U.S. Forest Service 2008 and Utah Governor's Council on Balanced Resources 2013

Figure 5. Annual Visitation at Utah Outdoor Recreation Areas

Wintertime visits to the ski resorts account for a significant proportion of the visitation to the area. The State of Utah currently receives approximately 4 million skier-days per year, including visits that occur at resorts outside of the study area (RRC Associates 2013). Other highly popular recreational uses of the study area include hiking, mountain biking, backcountry skiing and snowboarding, dog walking, picnicking, and escaping from the urban environment to relax.

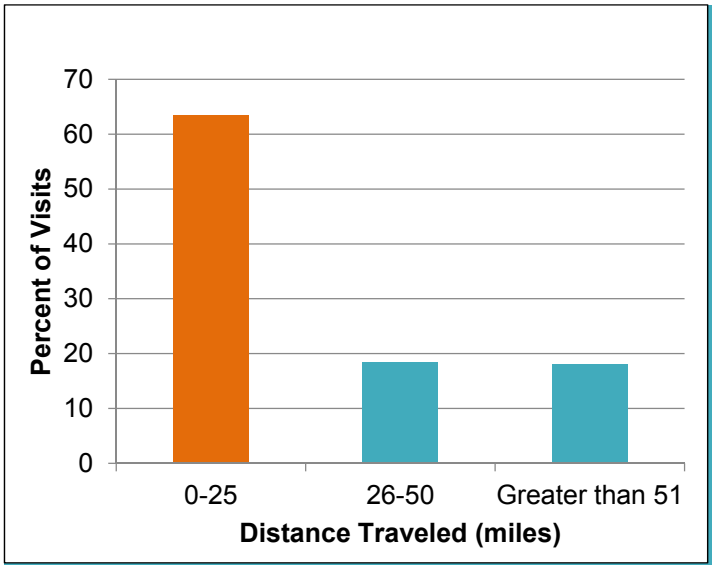
The variety of high-quality recreational activities occurring in the study area attracts a range of recreational users. A majority of the wintertime visitors to ski resorts are from out-of-state, while the majority of general recreational visits to the National Forest are from Utah residents (Figure 6).



Source: RRC Associates 2013 and U.S. Forest Service 2008

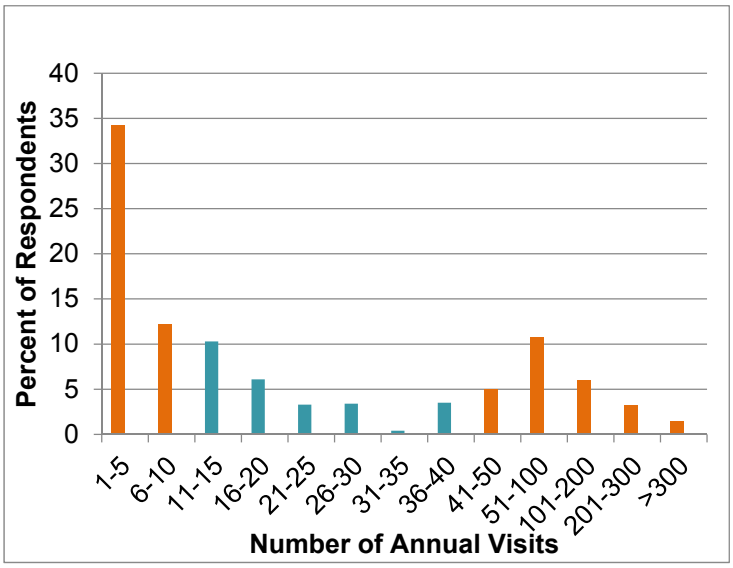
Figure 6. Comparison of visitation of Utah-residents and out-of-state visitors

Visitor use monitoring conducted specifically on the Wasatch-Cache National Forest (including areas outside of the study area) shows that an overwhelming majority of general Forest visits occur close to home (Figure 7). Most visitors are only occasional visitors to the Forest (45% visit 1-10 times/year). However, there is also a notable population of avid Forest visitors (26% of visitors visit more than 40 days/year) (Figure 8). As such, use within the study area includes both out-of-state visitors and two distinct groups of local residents, with each group holding different goals and expectations for their recreation experience.



Source: U.S. Forest Service 2008

Figure 7. Distance Traveled to Visit Wasatch-Cache NF



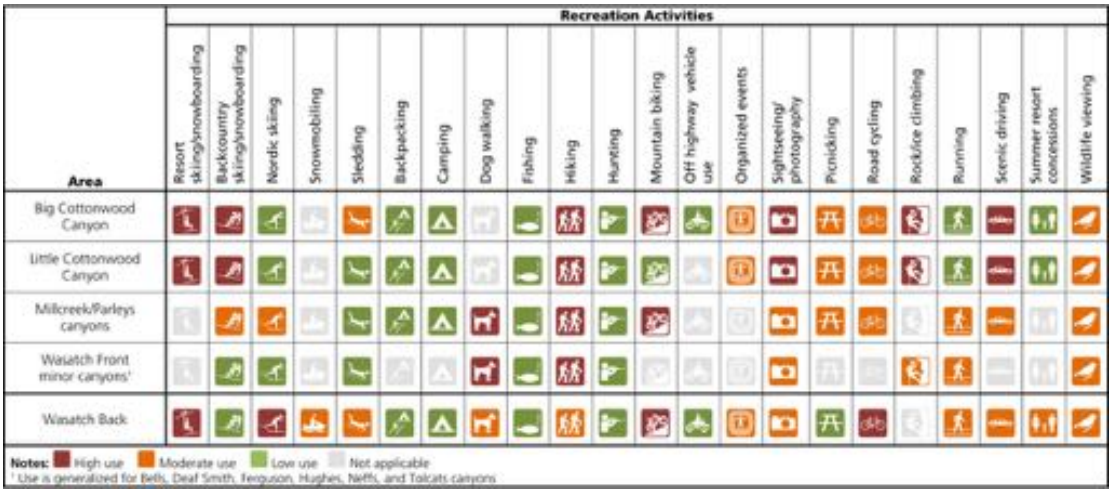
Source: U.S. Forest Service 2008

Figure 8. Number of Visits to Wasatch-Cache NF Annually

3.7 Patterns of Recreational Use

The distribution of natural resources, recreational infrastructure, and different recreational settings in the study area in combination with the preferences of users has resulted in predictable patterns of recreational use. These patterns can be used to describe the relative levels of use and geographic distribution of different activities (Figure 9). In addition to the major canyons (Little Cottonwood, Big Cottonwood, and Millcreek/Parleys canyons) and the Wasatch Back, there are several minor canyons on the Wasatch Front which are easily accessible from adjacent neighborhoods and frequently used by local hikers and dog walkers.

Historic changes in land use, increases in the number of recreational users, and a rise in the number of uses in the study area have resulted in increasing social interaction between users and competition for finite resources (e.g., trails, untracked snow, and areas offering opportunities for solitude), especially for the highest quality terrain and sites. Conflicts between and among user groups and between non-commercial users, commercial users, and private land owners are reoccurring, predictable, and becoming more frequent. Crowding has been identified as a major concern. However, different users perceive crowding differently. A study conducted in Albion Basin during the summertime found that visitors who visited more frequently (once per week) were much more likely to identify crowding as a concern compared to first time or occasional visitors (Friends of Alta 2010).

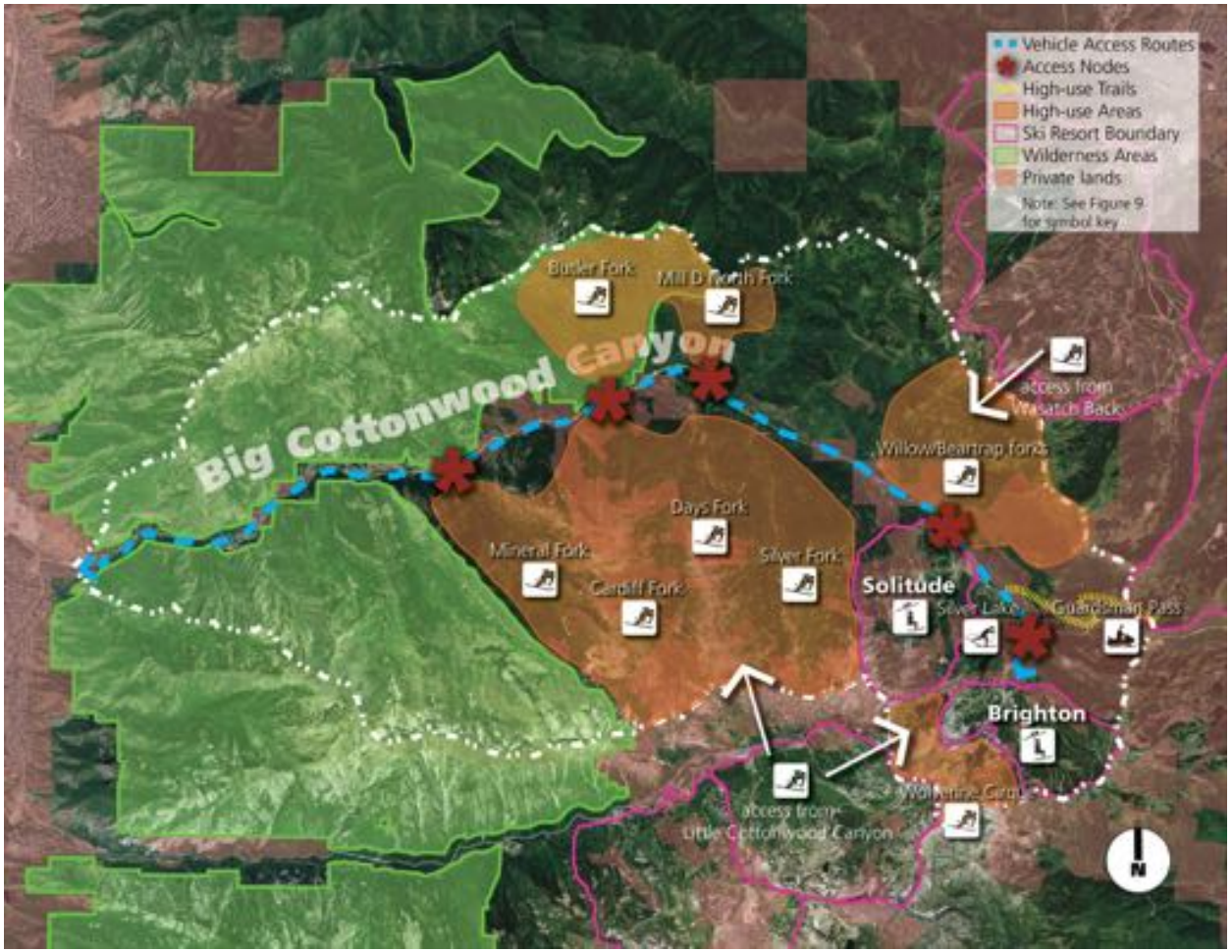


Source: Mountain Accord Recreation System Group

Figure 9. Patterns of Recreational Use

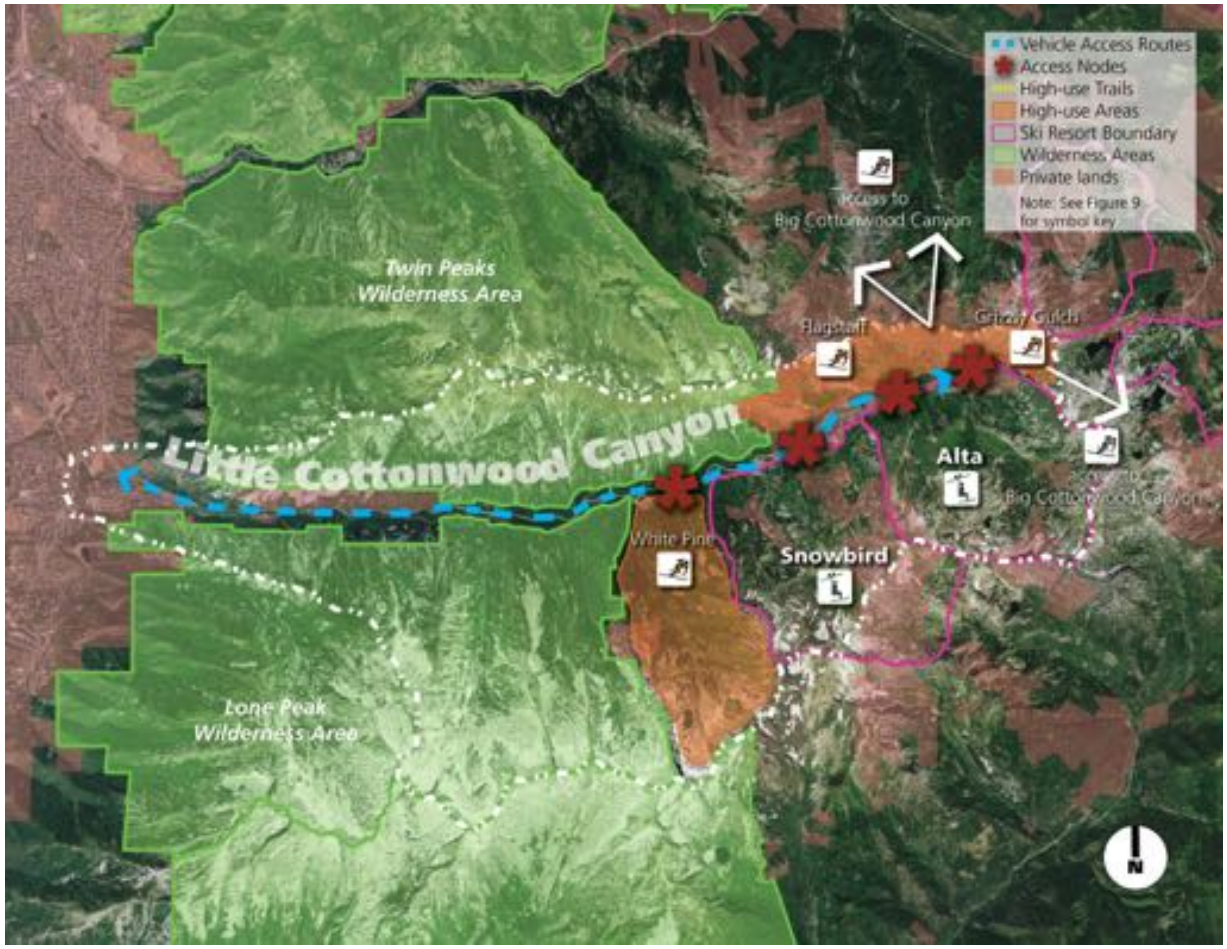
In some areas, lack of resources desired by recreation users has resulted in unmanaged and unplanned development (e.g., user-created mountain bike trails). The increasing frequency of these conflicts has diminished the quality of recreational experiences and heightened concern about the management objectives of landowners in the study area and preservation of recreational access on remaining undeveloped lands. Special events, which take place on both the Wasatch Front and Back, contribute to focused, intense crowding including traffic congestion, short-term overuse of resources, and can contribute to resource damage. These events also attract large numbers of people into the Central Wasatch to enjoy the natural beauty of the area that may not typically participate in outdoor recreation, and provide an opportunity for education of citizens to the importance of preserving these vital resources.

The locations and patterns of recreational conflicts, high-use areas, and areas critical for the most popular recreation pursuits in the Central Wasatch vary by season, and by area. A workshop was held with the Recreation System Group on April 10, 2014 to identify prime terrain for the most popular activities and most prominent conflict areas. In the winter, competition between multiple user groups (i.e., backcountry skiers, ski resorts, helicopter and cat skiing operations, and skiers exiting resorts) for limited skiing terrain and untracked powder snow occur. This conflict is most prevalent in areas with easy, quick access to high quality backcountry skiing terrain (upper Big and Little Cottonwood canyons) and adjacent to resort boundaries on high elevation terrain where the snowpack lingers the longest providing early and late season access to winter recreation. Other significant, reoccurring winter issues include traffic and congestion on roads used to access the mountains, lack of parking at ski resorts and popular trailheads, and competition for groomed winter trails for Nordic skiing, dog walking, biking, and other uses (Figures 10 to 13).



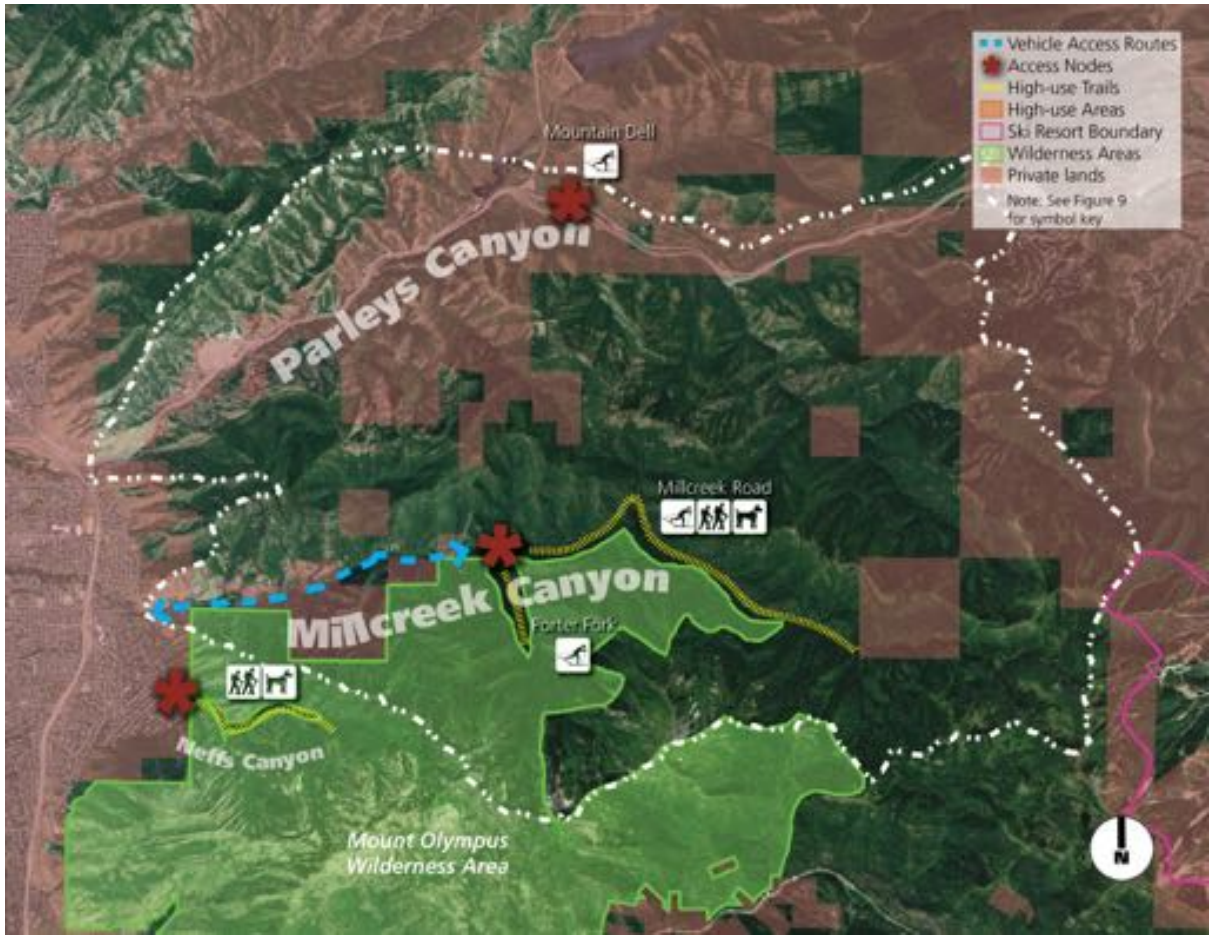
Source: Mountain Accord Recreation System Group

Figure 10. Big Cottonwood Canyon High Winter Use Areas



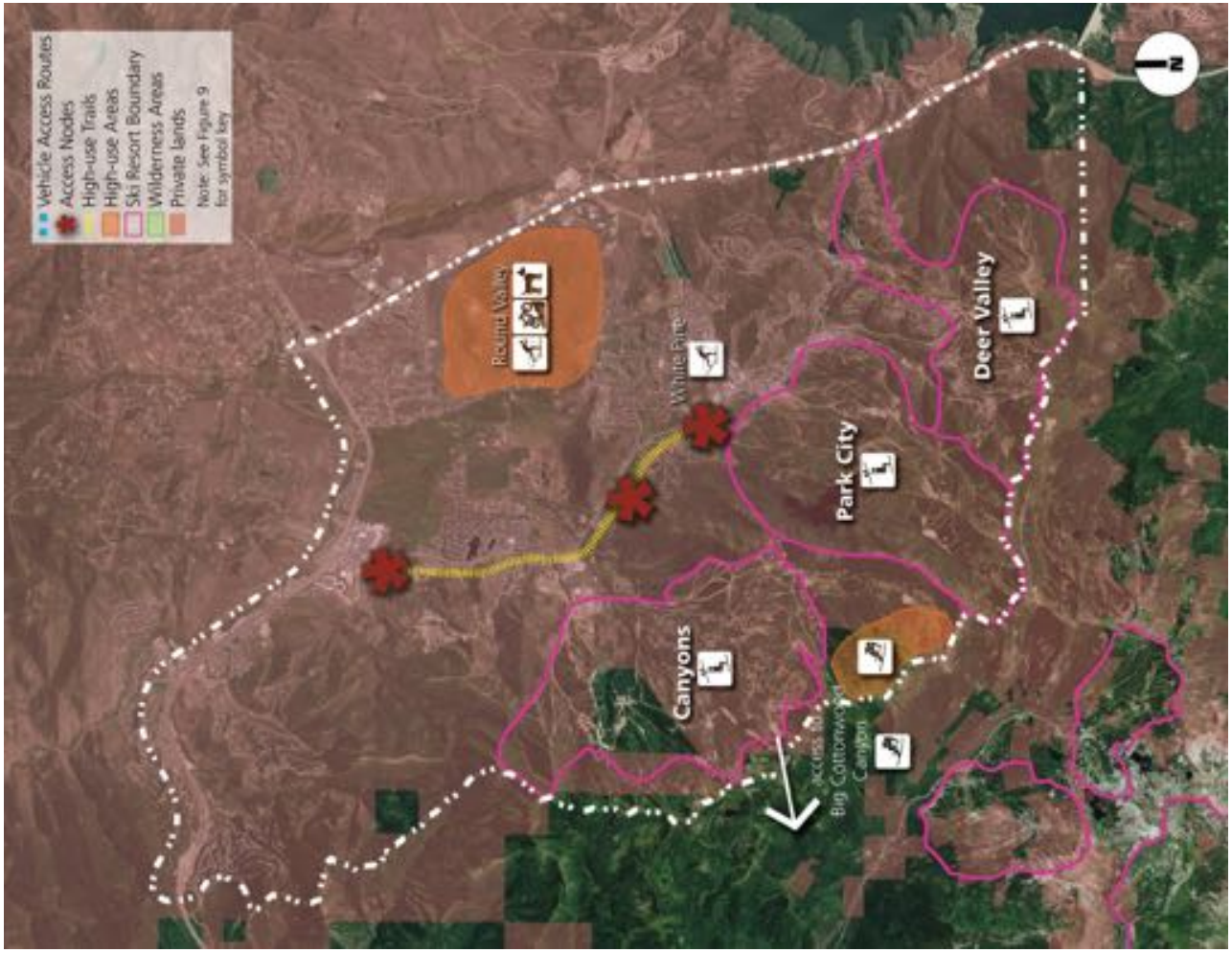
Source: Mountain Accord Recreation System Group

Figure 11. Little Cottonwood Canyon High Winter Use Areas



Source: Mountain Accord Recreation System Group

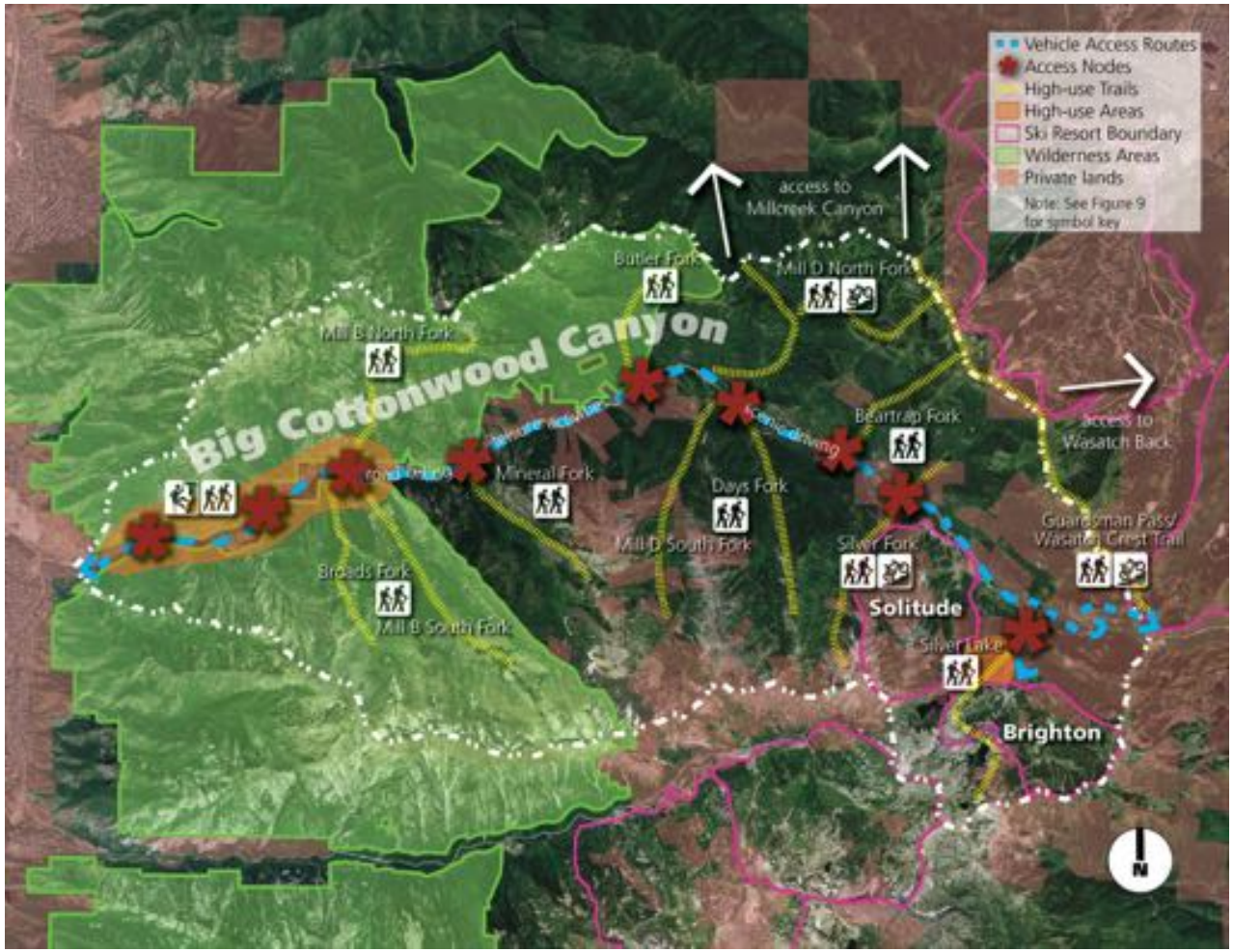
Figure 12. Millcreek and Parleys canyons High Winter Use Areas



Source: Mountain Accord Recreation System Group

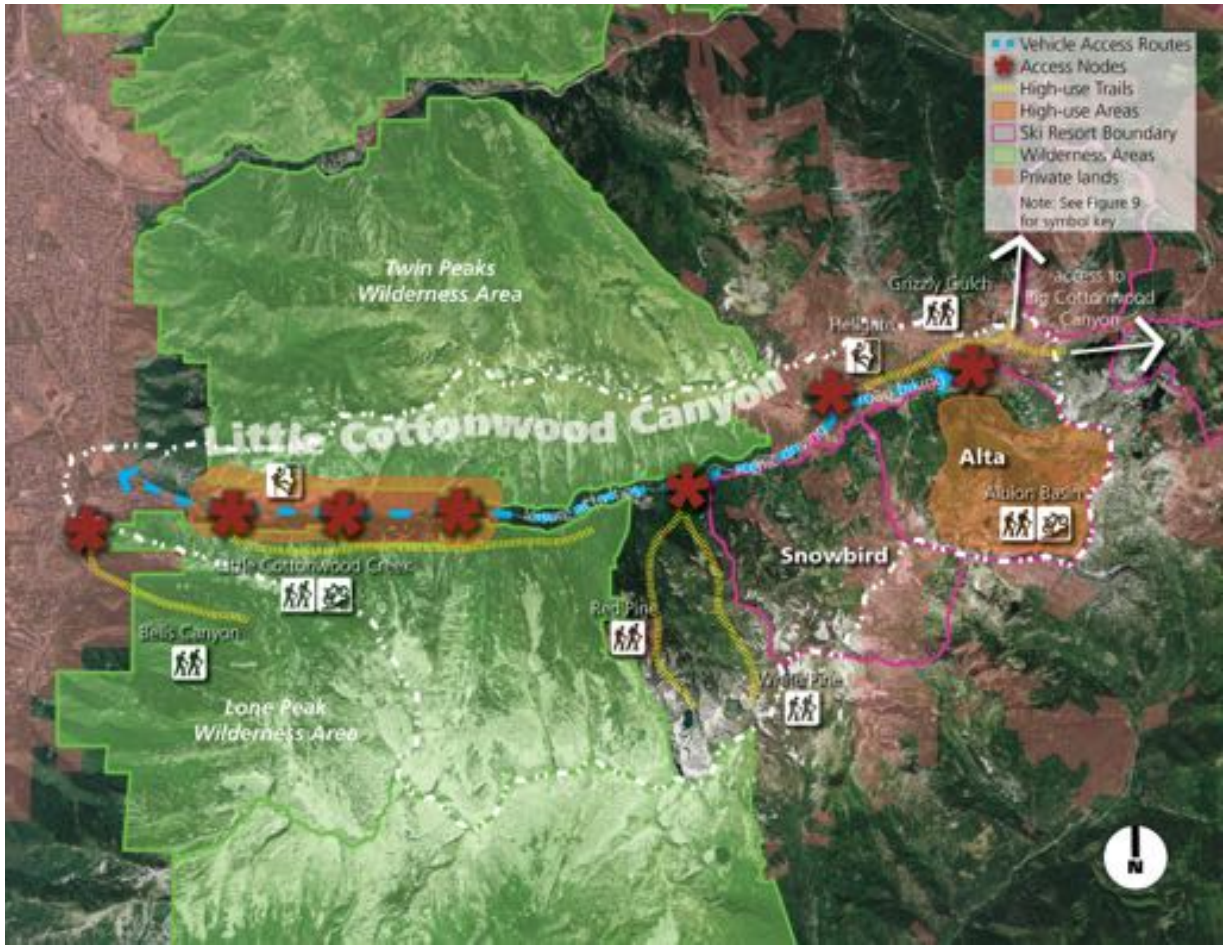
Figure 13. Wasatch Back High Winter Use Areas

In the summertime, the most substantial issues are related to crowding of trails and other sites popular with casual and leisure-focused visitors (e.g., picnic areas). In particular, access to special areas providing opportunities to view alpine lakes, waterfalls, stunning mountain scenery, and expansive views lead to the most intense crowding (Figures 14 to 17). Crowding is most likely to result in conflict between users when multiple user groups overlap (e.g., hiking, mountain biking, and dog walking) and in areas where systems are not in place to manage high levels of visitation (e.g., directional trail systems, designated use trails). Other significant, reoccurring summer issues include lack of maintenance on popular trails and facilities, overuse and unmanaged use resulting in natural resource damage, traffic and congestion on roads used by motorists and cyclists to access the mountains, lack of adequate shoulders to provide for cyclist safety, and lack of parking at popular trailheads.



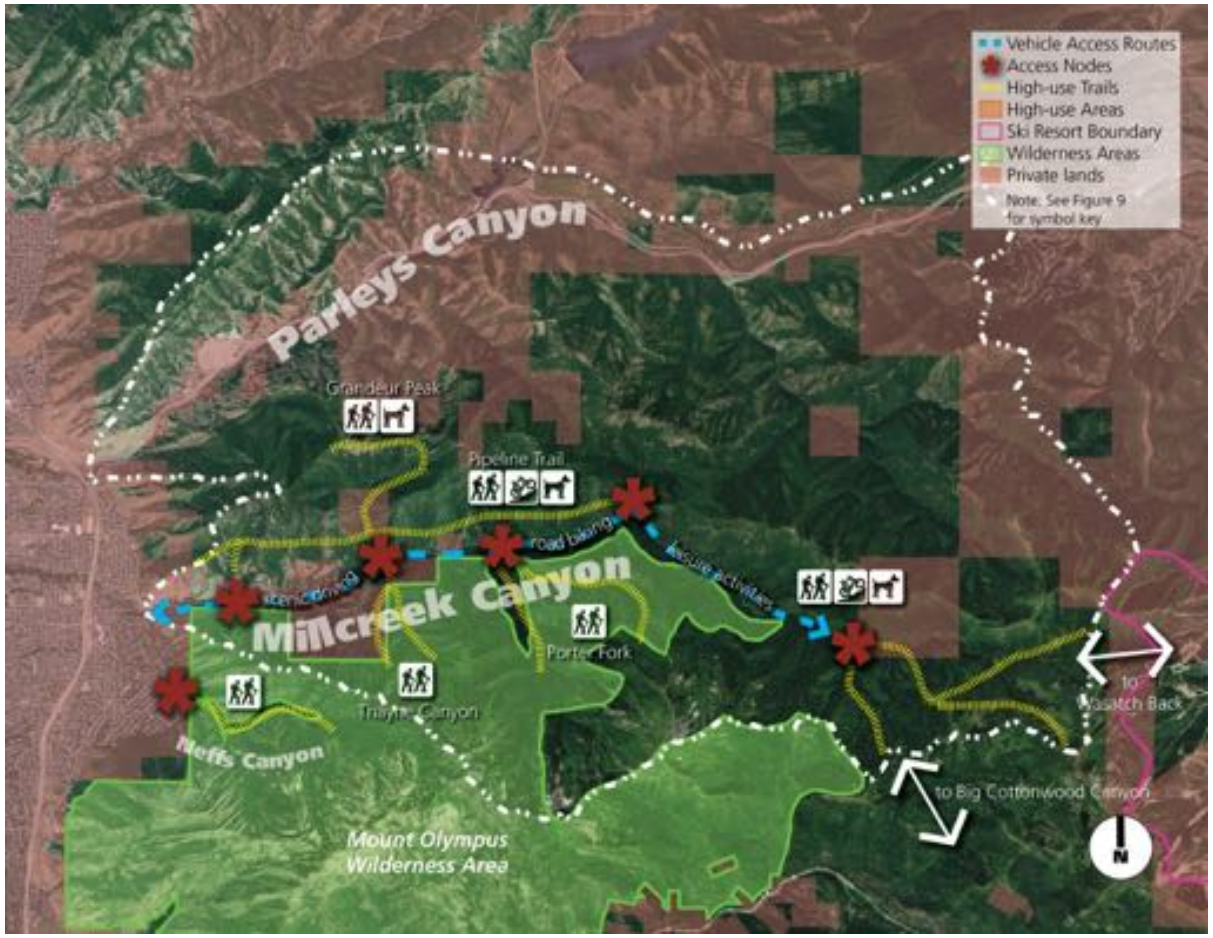
Source: Mountain Accord Recreation System Group

Figure 14. Big Cottonwood Canyon High Summer Use Areas



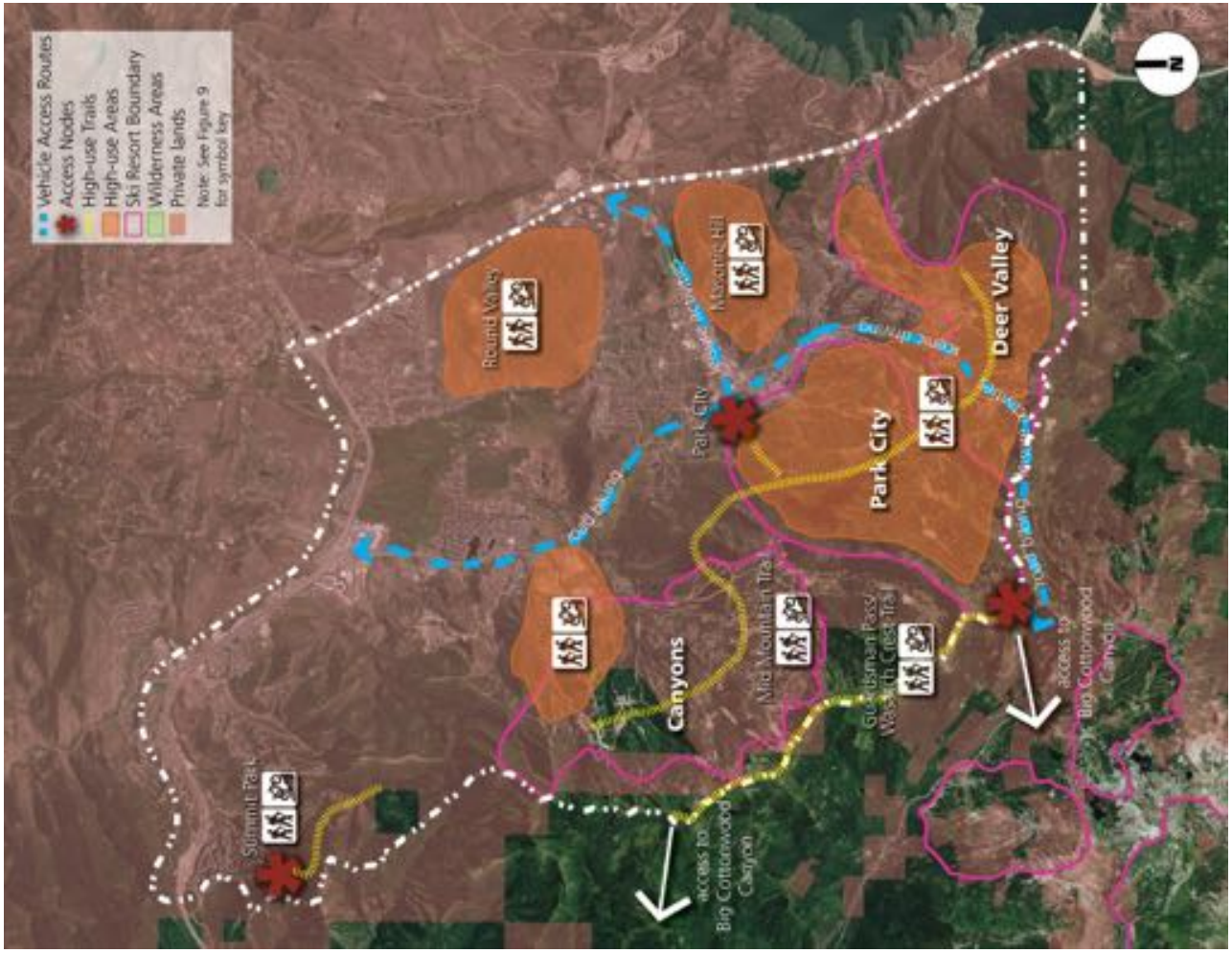
Source: Mountain Accord Recreation System Group

Figure 15. Little Cottonwood Canyon High Summer Use Areas



Source: Mountain Accord Recreation System Group

Figure 16. Millcreek and Parleys canyons High Summer Use Areas



Source: Mountain Accord Recreation System Group

Figure 17. Wasatch Back High Summer Use Areas

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3.8 Recreation Funding

Detailed information about existing funding for recreation facility development and maintenance and recreation management were not available to incorporation in this report. However, general observations about funding in the study area provide a good overview of issues and challenges. Multiple organizations are involved in funding recreation facility development, management, and maintenance in the study area. These organizations include federal agencies, city and county governments, special service districts, recreation advocacy groups, and private-public partnerships.

Partnerships between organizations are a large component of most major efforts and the number of partners involved can make comprehensive recreation planning and funding challenging. Funding from local government agencies is generally in the form of allocation of general funds and municipal bonding. Funding from federal government agencies (i.e., USFS) is allocated in national budgets and is constrained by national budget trends and varies based on regional and forest priorities. To help meet funding needs for recreation facility maintenance and management on federal lands, local governments and non-profit organizations provide some financial support to USFS. For example, Salt Lake County collects use fees and supplies some funding to USFS for facility maintenance in Millcreek Canyon, Salt Lake City provides funding for recreation and watershed management staff in municipal watersheds, and the Cottonwood Canyons Foundation partners with USFS for trail and education programs. Grant funding for new facilities also plays a large role but is variable and sometimes difficult to obtain for long-term management. Despite the many partnerships in place, funding for maintenance and management of recreation infrastructure, especially trails, along the Wasatch Front is not sufficient to address the level of use, degraded condition, or design flaws which occur as a result of the how the trails were developed. The lack of adequate funding to maintain existing facilities and complex jurisdictional environment also detracts from agencies' interest in developing new facilities that could help the trail system meet the evolving demands of the public. In general, communities along the Wasatch Back have higher levels of funding as a result of bonding and tax levies applied to recreation that allows for higher levels of development, maintenance and management of these resources. As a result, the trail system on the Wasatch Back provides opportunities for high quality recreation experiences for a variety of trail-based activities and has been recognized with several national awards.

3.9 Comments & Poll Results on Existing Conditions

Comments Received at First Group Meeting

When asked to describe the most important issue facing the Wasatch Mountains, the recreation group's responses included topics related to:

- Pressures related to population growth including increases in use and conflicts between users;
- Lack of multi-jurisdictional recreational planning;
- Effects of climate change on recreation opportunities;
- Maintaining the quality of current recreation experiences;
- Balancing use of the mountains and preservation of the natural environment;
- Funding and staffing limitations for recreation management;
- Provisions for/limitations on commercial use; and
- The need to preserve land for dispersed recreational use.

When asked about the types of information that would be needed to summarize the existing condition of the recreation system the recreation group's responses included topics related to:

- A method to evaluate the qualities of aesthetics, solitude, and other qualitative elements important to recreation;
- Address funding for recreation facility development and management;
- Understand the relative levels of use and locations of heaviest use;
- Understand where the most substantial recreational issues and user conflicts occur;
- Understand the influence of adjacent recreation destinations on the recreation system in the study area;
- Address commercial use in dispersed recreation areas; and
- Include elements of disperse recreation economics.

Since the first meeting, much of this information has been gathered with the assistance of the recreation system group. Additionally, workshops were held to identify the aesthetics, opportunities for solitude, and other qualities of recreational settings important to the recreation group as well as to identify key recreation, high use, and recreation conflict areas. This material was used in the development of this report. Information regarding the importance of dispersed recreation economics was gathered and provided to the Economic System Group including the statewide economic effect of outdoor recreation described in Outdoor Industry Association and International Mountain Bicycling Association reports.

Data Requests that could not be Filled

Members of the Recreation System Group requested information about existing funding for recreation facility development and maintenance and recreation management to be incorporated into the description of existing conditions. Detailed funding numbers for recreation development, management, and maintenance are not available for this existing condition report.

Summary of System Group Poll Results on Existing Conditions Information

Results of Poll Conducted on April 1, 2014

The members of the Recreation System Group were polled on their level of concurrence with the draft Existing Conditions report plus changes recommended by the Group. They were asked to indicate their level of concurrence with the following statement:

This Report (plus recommended changes) accurately represents currently available information on existing system conditions to inform my vote on a future Idealized System.

1. Concur
2. Concur with minor point of contention
3. Disagree with outcome but consent to move forward
4. Dissent
5. Waive or Abstain

Poll results were:

- Number of responses: 34
- 1 (concur with no contention): 15 %
- 2 (concur with minor or no contention): 59%
- 3 (consent to move forward): 15%
- 4 (dissent): 12 %
- 5 (waive or abstain): 0%

Members who dissented, or who disagreed with the outcome but consent to move forward, were asked to comment on their response. Comments are summarized below:

- Concerns with the vision projected - feel like the previous visions need to be part of the existing conditions.
- ONE Wasatch has a clear vision and proposal, what are the solutions proposed by this project? There is a need to identify where prime backcountry areas are located to balance this.
- Too much weight placed on U.S. Forest Service data. Understand there is option to supplement this data with qualitative information.
- More review opportunities and longer report review periods before polling.
- Need a better balance of resident and out-of-state guests in report.
- It is difficult to agree to a report without seeing the revised version. Minor point of contention. System group members will send any written comments technical leads.

4. DRAFT FUTURE TRENDLINES

4.1 Introduction

The following is a first draft summary of future trendlines information that could be relevant to Mountain Accord. The intent of this draft is to solicit input from the public and the Recreation System Group before the report is updated and finalized. The future trendlines discussion is organized in three sections. Section 4.2 includes baseline projections and forecasts that affect all four system groups (environment, transportation, recreation, and economy). All four groups are using the same projections and forecasts for population growth, land use, transportation, and climate change. Section 4.3 includes discussion on how population growth, land use, transportation and climate change projections affect the recreation system. Section 4.3 will include a summary of comments and poll results after review of this draft (it is currently just a placeholder).

4.2 Baseline Projections and Forecasts

Population Growth

Utah's population has experienced consistently high growth, which has outpaced national growth rates continuously for several decades. According to the U.S. Census and Utah Governor's Office of Management and Budget, between now and 2040, population is anticipated to grow about 58 percent statewide, from approximately 2.90 million to 4.57 million. In Salt Lake County, the anticipated growth will be slightly slower because developable land is scarcer. Summit and Wasatch counties, on the other hand, are anticipated to have steeper population growth rates than Utah as a whole:

- Salt Lake County: 1.08 million to 1.51 million (an increase of 42 percent)
- Summit County: 38,000 to 71,000 (an increase of 86 percent)
- Wasatch County 26,000 to 59,000 (an increase of 123 percent)

With so many new residents interacting project area, significant shifts in patterns of living, working, commuting, transacting business, and recreating will occur. These shifts will lead to increased challenges and opportunities, and will require thoughtful planning and investment in transportation and infrastructure projects, developed and undeveloped recreation accommodations, and environmental resource protection. Along with population growth, sustained growth in tax revenue will occur and will provide significant resources for the investments that are needed.

Land Use

The significant population bump in Salt Lake, Summit, and Wasatch counties between now and 2040 will increase the need for land development, driving construction of housing, retail, and commercial structures for nearly 500,000 new residents. This would result in an approximate 43 percent increase in the built environment in these three counties. Along with this population increase, important shifts in household size will occur. In each county, more units will be required per capita compared with current conditions:

- Salt Lake County: Average household size will **decrease** from 3.01 to 2.62. To accommodate the future population in the county, land development to support 231K new housing units, along with appropriate, retail, commercial, and office space is anticipated.
- Summit County: Average household size will **decrease slightly** from 2.80 to 2.74. Land development to support 13K new housing units, along with appropriate, retail, commercial, and office space is anticipated.
- Wasatch County: Average household size will **decrease** from 3.23 to 2.95. Land development to support 12.7K new housing units, along with appropriate, retail, commercial, and office space is anticipated.

Currently, the average residential acreage developed per person is: SLCO- 0.13; Summit-1.87; Wasatch-1.19 acres/person.

All three counties have undertaken planning in the most recent decade to shift land use and development patterns toward more dense, integrated, and sustainable patterns. Generally speaking, the average land consumed per capita in Salt Lake County would remain stable because it is already low. In Wasatch and Summit counties, significant reductions in land consumption per capita are likely, as more dense, clustered developments with preserved open spaces will be a common and standard development pattern.

Transportation Performance

Average daily traffic volumes have remained relatively constant on most corridors for the last decade, and generally the primary roadways accessing the Wasatch Front and the Wasatch Back function well under typical conditions. Unlike most urban-type roads that have the highest traffic loads during commute times, corridors in the study area frequently experience congestion during weekends and evenings from travel associated with recreation, tourism, and special events. Inclement weather, incidents, special events, and road closures also significantly impact mobility.

There is an extensive network of bus and rail throughout the Wasatch Front, and Park City Transit operates a free year-round bus service throughout Snyderville Basin and Park City with service to mountain resorts. Additionally, there is an

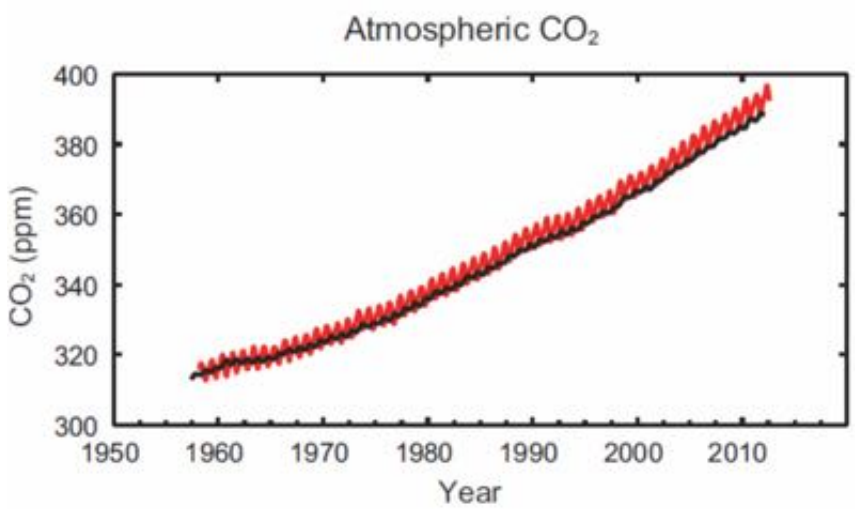
express bus service to Park City and seasonal (winter) bus routes serving the Cottonwood Canyons.

Although transit service is available, travel by private automobile is by far the dominant travel mode, as evidenced by parking congestion. In the Cottonwood Canyons, trailhead parking is at or near capacity on weekends, and ski areas struggle to accommodate visitor demand on holiday weekends. Transit park-and-ride lots are well utilized during the winter. Parking is frequently at capacity at recreation access points in the Wasatch Back during peak summer periods, and parking is usually scarce in Park City during the ski season.

Climate

Existing Conditions

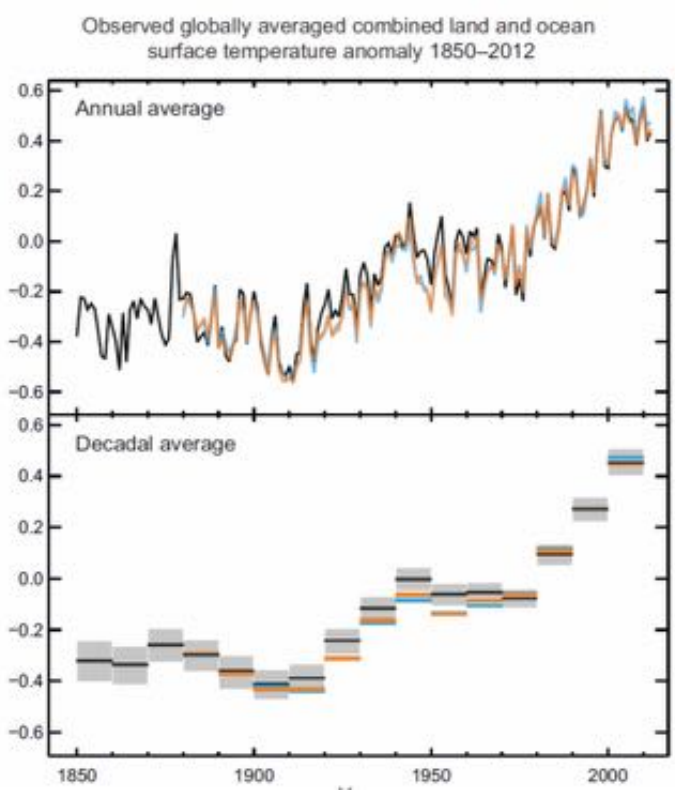
Atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years (IPCC 2013). In addition, the mean rates of increase in atmospheric concentration of greenhouse gases over the past century are unprecedented in the last 22,000 years (IPCC 2013). Carbon dioxide (CO_2) concentrations have increased by 40 percent since pre-industrial times, primarily from fossil fuel emissions, contributing to a global warming trend. Figure 18 shows the increase in atmospheric concentrations of carbon dioxide since 1958 from Mauna Loa, Hawaii (red) and the South Pole (black).



Source: IPCC, 2013 Summary for Policy Makers

Figure 18. Increase in Atmospheric CO_2 Levels

Warming of the climate system is unequivocal. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983 to 2012 was likely the warmest 30-year period of the last 1400 years (IPCC 2013). The globally averaged combined land and ocean surface temperature data as calculated by a linear trend, show a warming of 0.85°C (1.53°F) over the period 1880 to 2012, when multiple independently produced datasets exist (see Figure 19). The increase in temperature has reduced the frequency of low temperatures and frost while heat waves have become more common.



Source: IPCC, 2013 Summary for Policy Makers

Figure 19. Average Global Temperature, 1850 – 2012

Utah

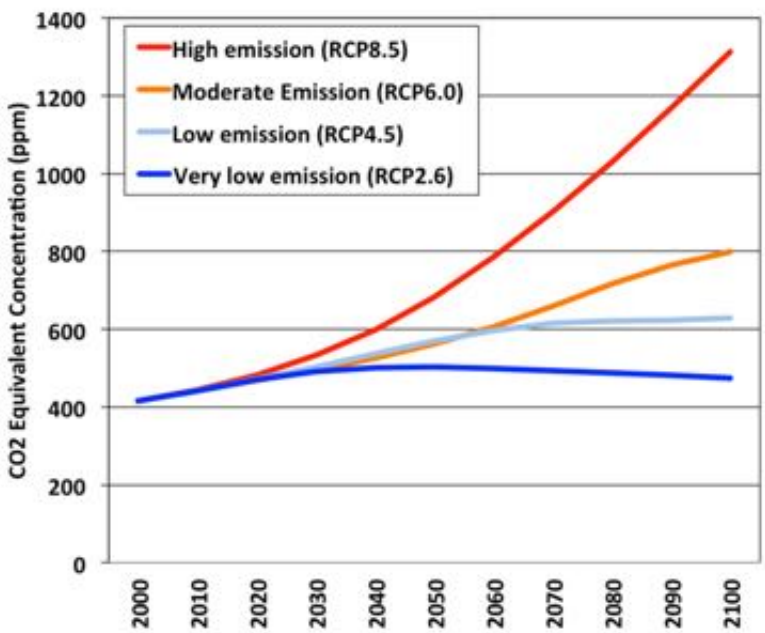
Historic long-term trends in stream flows and mountain snowpack remain uncertain. Annual precipitation amounts vary dramatically in Utah from year to year, making it difficult to identify precipitation trends. Geologic records and tree-ring data in the Colorado River Basin, reveal periods of very long droughts (Blue Ribbon Advisory Council on Climate Change 2007). Reconstructions in the Intermountain West suggest that droughts in previous centuries have often exceeded those of the past 100 years of observed record in both duration and magnitude (Bekker et al. 2014).

On a statewide basis during winter (January to March) the fraction of wintertime precipitation that falls as snow, snow depth, and snow cover have exhibited long-term declines during the past few decades (Gilles et al. 2012). These trends are likely dominated by declines at low elevations, with little or no trend at upper elevations.

Future Trendlines

Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gases (Intergovernmental Panel on Climate Change [IPCC] 2013). Figure 20 below shows a range of greenhouse gas concentration (mainly CO_2) trajectories adopted by the IPCC for its 2013 assessment report.

Representative Concentration Pathways or RCP is the current generation of climate change scenarios adopted by the IPCC. RCP emission scenarios allow for a range of modeling scenarios (very low, low, moderate and high emissions).



Source: RCP Database version 2.0.5, http://tntcat.iiasa.ac.at:8787/RcpDb/dsd?Action=htmlpage&page=compare.

Figure 20. Greenhouse Gas (Mainly CO_2) Concentration Trajectories

The global mean surface temperature increase for the period 2016 to 2035 relative to 1986 to 2005 will likely be in the range of 0.3°C to 0.7°C (0.5°F to 1.3°F). This assessment is based on multiple lines of evidence and assumes there will be no major volcanic eruptions or secular changes in total solar irradiance (IPCC 2013).

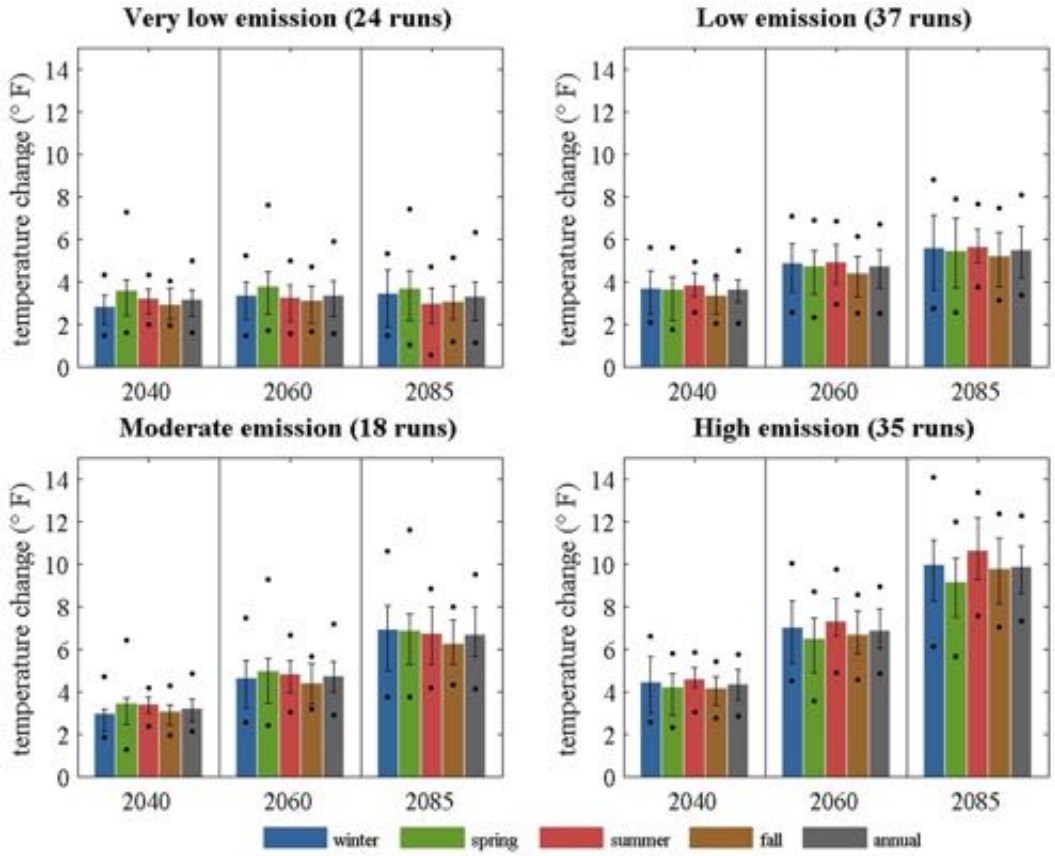
Increase of global mean surface temperatures for 2081 to 2100 relative to 1986 to 2005 is projected to likely be in the ranges of 0.3°C (0.5°F) to 1.7°C (3.1°F) based on RCP 2.6 simulations up to 2.6°C (4.7°F) to 4.8°C (8.6°F) based on RCP 8.5 simulations (IPCC 2013). There is a very high confidence that the Arctic region will warm more rapidly than the global mean, and mean warming over land will be larger than over the ocean (IPCC 2013).

It is virtually certain that there will be more frequent hot and fewer cold temperature extremes over most land areas on daily and seasonal timescales as global mean temperatures increase. It is very likely that heat waves will occur with a higher frequency and duration. Occasional cold winter extremes will continue to occur (IPCC 2013).

Looking forward, Utah is expected to warm more than the global average increasing the likelihood of the following trends continuing to emerge and strengthen in the 21st century:

- Increased temperatures, longer growing season, more heat waves
- Reduction in natural snowpack and snowfall in the early and late winter, particularly in lower-to-mid elevation mountain areas (trends in high elevation areas are unclear)
- Earlier and less intense snowmelt-driven spring runoff
- Increased demand for agricultural and residential irrigation due to more rapid drying of soils
- Warming of lakes and rivers with associated changes in aquatic life including increased algal abundance and upstream shifts of fish habitat

Utilizing the RCP scenarios, Figure 21 below shows projected seasonal and annual near-surface air temperature change over the central Wasatch and surrounding region for the 30-year periods centered on 2040 (2026 to 2055), 2060 (2046 to 2075), and 2085 (2070 to 2099) relative to 1976-2005. Winter is December through February, spring is March through May, summer is June through August, and fall is September through November. Bars show the average change across the model runs, whiskers show the range between the 25th and 75th percentile of the model runs, and filled circles show the range between the 10th and 90th percentile of the model runs. All scenarios show a 2.5°F to 4.5°F temperature increase by 2040 with considerable variability between climate models and emission scenarios.



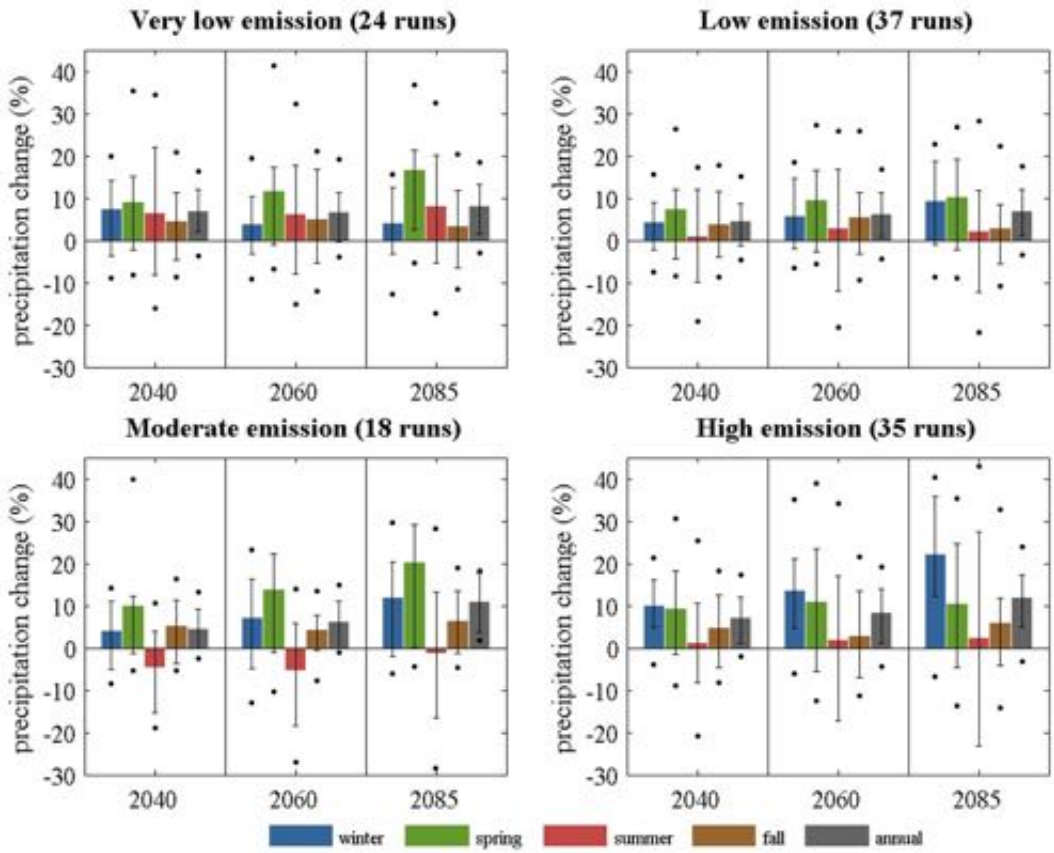
Source: http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/dcpInterface.html

Figure 21. Projected Seasonal and Annual Near-Surface Temperature Change

There is greater uncertainty in precipitation projections for northern Utah than temperature. While projections on average indicate wetter conditions on average, Utah is located in an uncertain transition zone. The models produce a broad range of overall precipitation trends (from as much as 30 percent drier to 40 percent wetter for the middle 80 percent of projections depending on season and the emission scenario).

Figure 22 below shows seasonal and annual precipitation change over the central Wasatch and surrounding region utilizing the RCP scenarios and the same 30 year periods highlighted in Figure 21 above. While bars show an average increase in precipitation across model runs, one should note the range of uncertainty represented in each scenario.

Climate model projections, combined with knowledge of past climate variations from tree-ring reconstructions, suggest the potential for larger year-to-year and decade-to-decade fluctuations in precipitation and stream flow during the 21st century than observed during the 20th century.

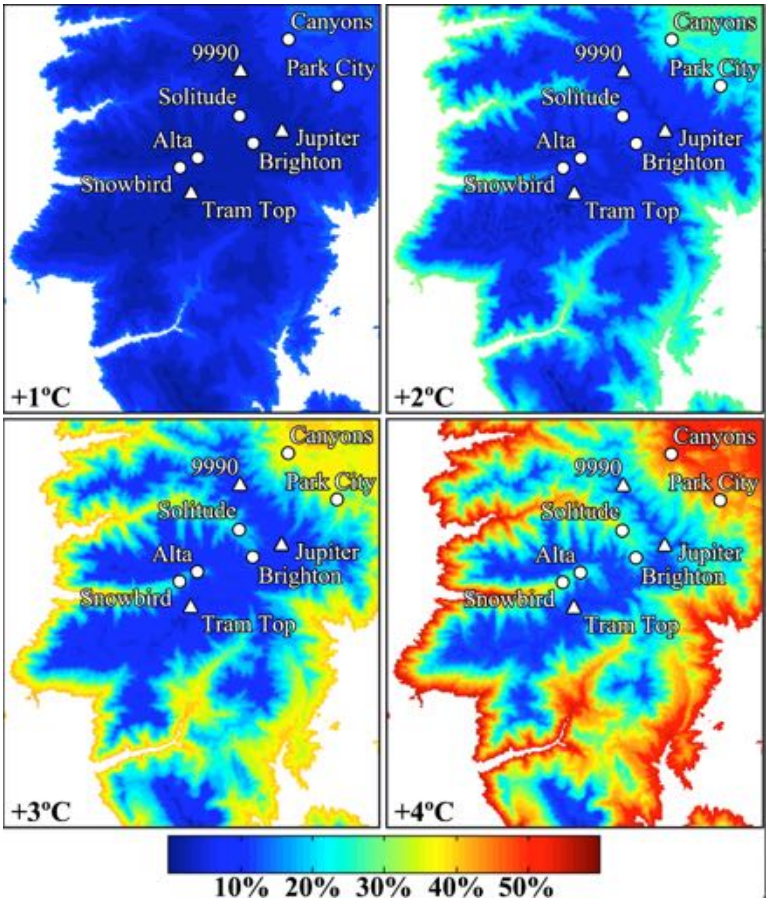


Source: http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/dcpInterface.html

Figure 22. Projected Annual and Seasonal Precipitation Change

Recent research shows that the influence of climate change on snow varies depending on the measure. Temperature and the fraction of winter precipitation that falls as snow exhibit measurable trends first, followed by the fraction of winter precipitation retained in the spring snowpack, and then the water content of the spring snowpack (Pierce and Cayan 2013).

While changes in total cool season snowfall are the hardest to detect, it is believed that year-to-year variations in snowfall will continue to dominate mountain snowpack during the next couple of decades. As temperature increases through the century, the fraction of precipitation that falls as snow will decrease it and the length of the snow accumulation season will decrease. Figure 23 below shows the percentage of precipitation (liquid equivalent) that currently falls as snow that would instead fall as rain per °C of warming.

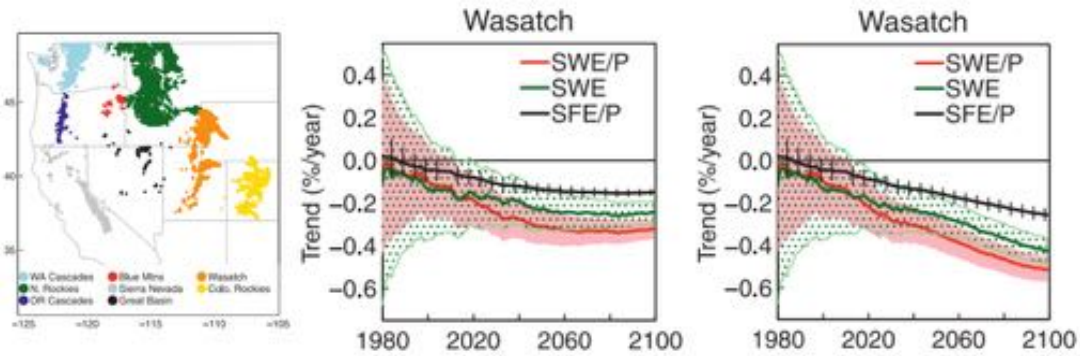


Source: Steenburgh, J., 2014: Secrets of the Greatest Snow on Earth. Utah State University Press. In press.

Figure 23. Percent Increase from Snow to Rain per °C Increase

Figure 24 below shows the mean trends (%/year) in snow-related variables in the "Wasatch Mountain Region" (orange in left figure) derived using downscaled climate models for the RCP4.5 (center) and the RCP8.5 (right) climate scenarios. Model results bulleted below indicate a downward trend in snow levels and increasingly earlier spring runoffs.

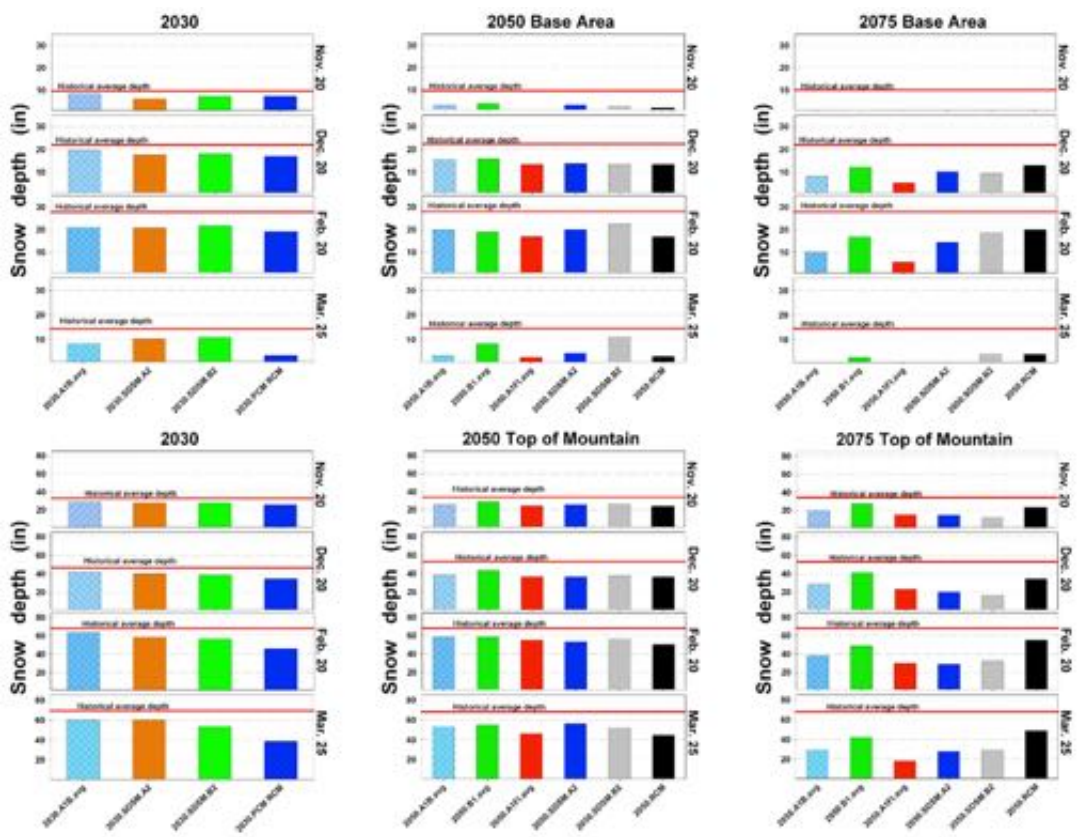
- SWE/P (snow water equivalent/fraction of precipitation) = Fraction of precipitation from October 1 through March 31 that remains in the snowpack on April 1 (orange curve with 95 percent confidence limits indicated by orange shading)
- SWE (snow water equivalent) = Amount of water contained in the snowpack on April 1 (green curve with 95 percent confidence limits indicated by green stippling)
- SFE/P (snow fall equivalent/fraction of precipitation) = Fraction of total water in the precipitation from October 1 through March 31 that has fallen as snow (black curve with 95 percent confidence limits indicated by vertical black bars)



Source: D. W., and D. R. Cayan, 2013: The Uneven response of different snow measures to human-induced climate warming.

Figure 24. Wasatch Mountain Snow-Related Variables

Figure 25 below shows projected snow depths at the base and top of Park City Mountain in 2030, 2050, and 2075 for several climate model scenarios generated in 2009. Note that the figure is based on previous-generation climate change models projections.



Source: Stratus Consulting, Inc., 2009: Climate change in Park City: An assessment of climate, snowpack, and economic impacts. Not peer reviewed.

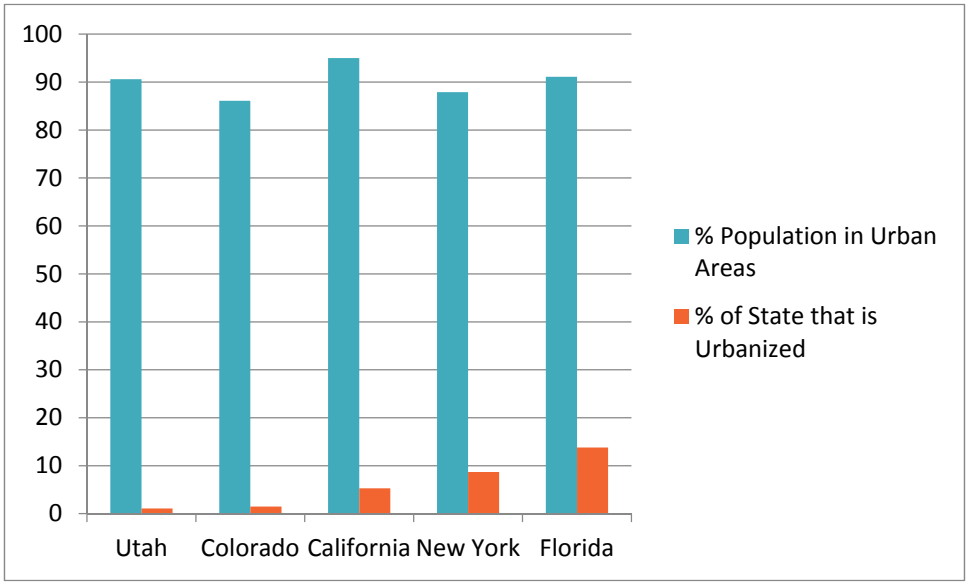
Figure 25. Projected Park City Snow Depths

4.3 Trendline Effects on the Recreation System

Population growth, changes in land use and development, climate change, and changes in transportation performance will affect the recreation system in the Central Wasatch and the ability of the system to respond to and provide recreational experiences desired by residents and visitors into the future. In addition to predicted trends related to these four areas, the future performance of the recreation system will be affected by many other factors. It is not possible to consider all potential influences on the future performance of the recreation system, and the precise relationship between many of the factors and the performance of the recreation system is not known in detail. However, there is broad consensus about the ways in which many of the most important trends will stress the system. Planning for the future of the recreation system should take into consideration both predictable and unpredictable trends, as the future performance and success of the system is dependent on both.

Population Growth and Demographic Changes

At the time of the 2010 census, Utah was the 8th most urban state in the country, with more than 90 percent of the state's population residing on 1.1 percent of the state's land mass (U.S. Census Bureau 2010). See Figure 26, below.



Source: U.S. Census Bureau 2010

Figure 26. Comparison by state – percentages of the population living in urban areas and percentages of urbanized land

This urban population is centered adjacent to the Central Wasatch and is projected to grow substantially by 2040. Utah's growth is facilitated by a uniquely large natural growth rate, but is also aided in part by people moving here for the high quality of life afforded by access to a multitude of recreation opportunities. Previous studies have shown that the percentage of the population that participates in outdoor recreation is relatively stable over short durations (7 years) and that growth in total recreational participation is largely a result of population growth (Outdoor Foundation 2013). If this assumption is true for the Central Wasatch, demand for outdoor recreation will grow substantially by 2040. If the existing recreation system is not upgraded to accommodate this increase in demand, users will have declining recreation experiences resulting from intense crowding, increased conflicts between user groups, decreased opportunities to experience solitude, escalated environmental impacts, heightened traffic and parking congestion, and increasingly degraded recreation infrastructure through overuse. According to the survey conducted for Wasatch Canyons Tomorrow, 62.5% of respondents believe the Wasatch Canyons are already overused (Envision Utah 2010), and use is expected to intensify as more people vie for valuable space in which to recreate.

It is important to note that participation in outdoor recreation is not entirely predictable and can be subject to changing societal values and norms. For instance, today's youth spend half as much time outdoors as their parents (America's Great Outdoors 2011) and seven hours each day using electronic devices (Kaiser Family Foundation 2010). The most common reason young people cite for not participating in outdoor recreation is lack of interest (Outdoor Foundation 2013). In the past thirty years, childhood obesity rates have tripled, and now one third of American children are overweight or obese (Daniels and others 2009). While Utah is known for its active, healthy population and high levels of participation in outdoor recreation, we are not immune to these trends. Currently, over half of Utah's population is overweight or obese, despite the fact that Utah residents participate in regular physical activity 17% more than the national average (Burbidge 2006). Studies show that access to the outdoors and participation in outdoor recreation provide significant physical and mental health benefits and can help turn the tide on the obesity health epidemic (Kuo 2010, America's Great Outdoors 2011).

Recreating in the outdoors as a child also helps create a foundation for healthy lifestyles, fosters environmental awareness and values in the community, and inspires a lasting connection to the outdoors (Vos 2007, Moore 1986). Given the decreasing amount of time young people spend outdoors, we must recognize that declining public health and changes in community values regarding the environment are trends that we will need to confront in the future. We should be taking steps now to alter these trends to prevent them from having far-reaching, long-term implications as today's children mature and choose which values to pass on to their own children. Shifting values associated with less frequent recreation may significantly affect community health, environmental awareness, and stewardship

activities in the future if steps are not taken to promote and facilitate residents' participation in active recreation.

Source: Eric Schramm – visitparkcity.com

Childhood recreation and contact with nature is essential to the establishment of an ecologically-conscious and proactive citizenry

Use Trends

Recreation interests have changed and will continue to evolve over time. Past changes in recreational interests and participation that have affected the Central Wasatch have been driven by the emergence of new sports or by advancing technologies that facilitate increased popularity and participation in existing activities. For example, mountain biking shifted from a little-known sport to a mainstream activity in the 1990s and 2000s. This increase in popularity was facilitated by national media attention and development of lightweight, full suspension mountain bikes and other equipment that became widely available during this period. While specific data regarding trends in participation in the Central Wasatch are not available, there is broad consensus that mountain biking has sharply risen in popularity in the area over this period.

Sources: Charlie Kelly's Mountain Bike Hubsite – http://sonic.net/~ckelly/Seekay/mtbwelcome.htm; Velospace – velospace.org

A 1970's mountain bike and a modern-day mountain bike

The increase in mountain biking popularity has also correlated with development of an extensive trail system, especially on the Wasatch Back. The area is now an internationally recognized mountain biking destination, and the popularity of this activity is expected to continue to rise as population and interest in developing aspects of the sport increase.

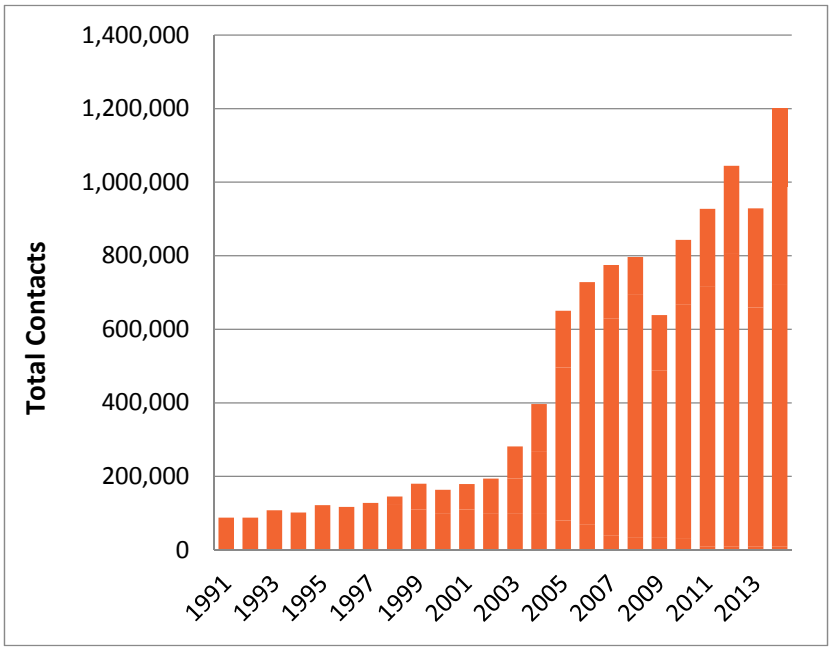
Source: Cardoso 2009

Other recreation use trends have been extensively observed by the Recreation System Group Stakeholders over the past several decades. One of the more significant trends is the continually growing popularity of trail-based sports. Trail use has anecdotally tripled in the last decade, and while hiking has persisted as the most common trail use, mountain biking use has risen to about half that of hiking (IMBA). Hikers and mountain bikers often use the same trails, leading to conflicts and serious safety issues associated with collisions, particularly on the portions of trails most regularly used for downhill mountain biking. Additionally, where demand for downhill and freeride mountain bike trails is not being met, particularly along the Wasatch Front, we have seen a rash of rogue trail-building that contributes to natural resource and watershed degradation. Construction of freeride trails on the Wasatch Back has been strongly correlated with a decrease in rogue trail-building in recent years. The continued popularity of hiking and growth of mountain biking are certain, and will only lead to increased conflicts, safety concerns, and degradation unless the management and design of the trail system is responsive to the demands of both user groups.

Similarly, backcountry skiing and snowboarding in the Wasatch Mountains has experienced a rapid increase in popularity and participation in recent years. This increase has been fueled by substantial improvements in alpine touring, split boarding, and avalanche safety equipment that has made these activities much more accessible to the general public. An increase in ski industry and national media attention on backcountry skiing and snowboarding has also fueled this trend. Sales of backcountry skiing and snowboarding equipment are among the fastest growing areas in the ski industry, and public outreach to the Utah Avalanche Center, which provides daily avalanche information accessed by backcountry users, has shown sharp increases in recent years (Figure 27). Backcountry skiing and snowboarding are expected to become more popular as trends progress and

equipment becomes more advanced, making the backcountry more accessible for more people.

New sports are expected to continue to emerge and grow in popularity. These sports could change the face of recreation within the Central Wasatch and introduce new forms of recreation into the already physically constrained Wasatch Mountains. It is impossible to know exactly what some of these changes will look like, since some of the sports that will define recreation over the coming decades may not have even been invented yet. This underscores the necessity of forward thinking recreation planning and incorporating flexibility into the construction and maintenance of recreation facilitates.



Source: Utah Avalanche Center

Figure 27. Total Contacts to the Utah Avalanche Center 1991-2014

Development and Land Use

A recent study on population growth and sprawl shows that Utah's urban areas grew by 17.6 percent between 2002 and 2010, giving Utah the second highest rate of urban sprawl in the country (Kolankiewicz and others 2014). Utah's sprawling development is attributed to its fast population growth, which will continue to drive private land development within the Central Wasatch in the coming decades. According to the Wasatch Canyons Tomorrow survey, development on private land constitutes the greatest concern among surveyed individuals about issues affecting

the canyons (Envision Utah 2010). The expansion of residential and commercial development along the Wasatch Front and Back, as well as within the canyons, will consume open space and land currently used for recreation. Recreation users will be concentrated into smaller areas, leading to increased crowding and density of recreation activities, potential conflicts with private landowners, and conflicts between recreation user types. Expanding development will limit opportunities to pursue some activities, especially those requiring large areas of land. Development could also significantly alter the recreational setting and views in the Central Wasatch, which are driving factors for where people recreate. As increased development is being proposed, planning ordinances defining the density, structure, and proper scale of development are critical for conserving open space, preserving the delicate balance of recreational settings, and maintaining the character of the Central Wasatch.

Source: Mark Maziarz – visitparkcity.com

In some instances, private land development, particularly along the Wasatch Front bench, has and will continue to physically constrain opportunities to develop future recreation facilities and the public's access to existing recreation opportunities. Development that deliberately incorporates recreation concerns into growth patterns has the capacity to increase connectivity and recreation opportunities. However, if not mandated by planning regulations, these actions are infrequently undertaken since these considerations require additional infrastructure and funding to develop. Many communities along the Wasatch Back have incorporated recreation considerations into planning regulations, promoting development that supports and even strengthens the interconnected network of trails and the health of the overall recreation system.

In addition to traditional development associated with residential and commercial interests, ski resorts have expressed interest in interconnecting their boundaries and some also have interest in expanding their boundaries to include adjacent terrain with additional access points. The goals of these expansion efforts are to increase national and international competitiveness of the Utah resorts, maintain long-term financial viability of the resorts, increase visitation, and support accessible ski opportunities for both locals and visitors. Attracting new skiers and snowboarders to the sport and providing easily accessible skiing opportunities are critical for the health of the ski industry. However, resort interconnections and expansions would

require government approvals that have not been granted and are discouraged in some existing regulation.

Any expansion or interconnection of the ski resorts would need to be considered in context with highly used backcountry recreation areas. The existing balance of commercial and non-commercial winter recreation use is delicate and the elements that make the Wasatch a unique, world-class backcountry skiing destination could easily be lost. Terrain that could be affected by resort expansion includes some of the most popular, easily accessible backcountry skiing areas where snow falls earliest and lingers the longest. Expansion of a ski resort into popular backcountry skiing terrain would channel and consolidate backcountry skiers into smaller areas, and skiers exiting expanded resort boundaries could diminish the quality of current backcountry skiing areas made more accessible by resort expansion.

Transportation Performance

Transportation plays a major role in the recreation system as it provides access to recreation sites and access points, facilitating a wide variety of recreation opportunities. Recreation experiences begin when the participant leaves their house or workplace to recreate. Stress associated with accessing recreation diminishes the quality of these experiences and curtails the positive benefits associated with outdoor recreation as the experience becomes dominated by traffic congestion and crowding. In some cases, anticipated traffic and congestion may deter recreation completely.

The use of personal vehicles to access recreation constitutes a significant portion of traffic along roadways, especially where use is consolidated into narrow canyons. These routes also have a high volume of road bikers, whose numbers are also growing, leading to increasing conflicts with vehicles as these two groups share narrow, steep roadways. The transportation network is most stressed during high volume days (e.g., holidays, powder days, etc.), which are generally unpredictable as recreation use volume is heavily dependent on weather conditions. During these high volume days, the existing network is already at capacity, with traffic congestion along

Traffic on Wasatch Boulevard during President's Day 2006

mountain roads and limited available parking at popular recreation areas. Access to the ski resorts within the Cottonwood Canyons is already curtailing participation during high volume days as a result of limited parking capacity, congestion along roadways, limited mass transit options to access these areas, and delays resulting from avalanche control. As a result of predicted increasing population along both the Wasatch Front and Back, traffic congestion on these routes is expected to worsen leading to diminishing recreation experiences and discouraging participation in outdoor recreation.

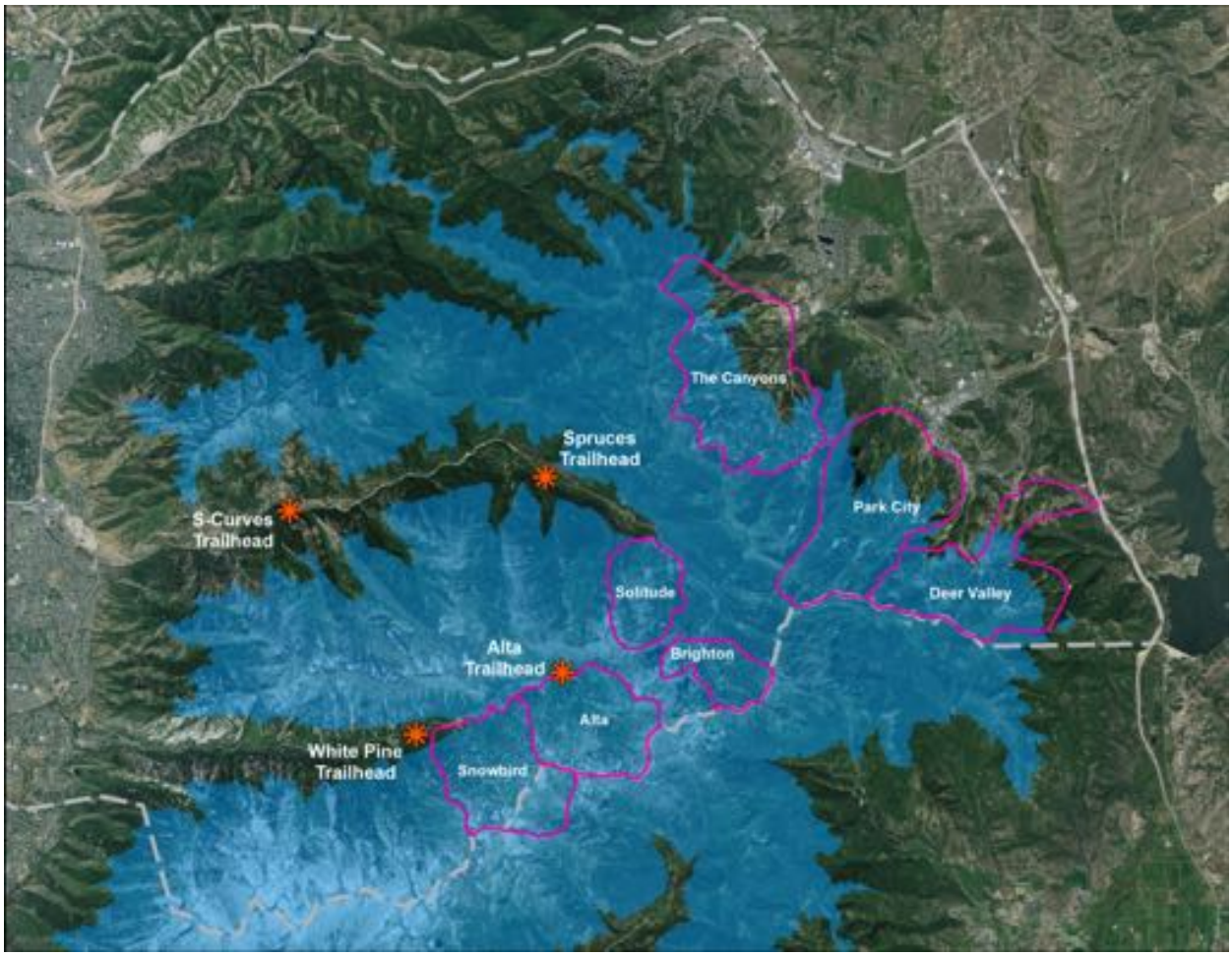
Current transportation policies attempt to manage volumes of use in the Wasatch Front Canyons by limiting the supply of available parking. This policy can have the unintended effect of reducing accessibility and participation in recreation opportunities in the Central Wasatch. As the population increases and more recreation users attempt to access mountain areas, this limit on recreation has the potential to extend beyond the high volume days and become a more common experience for all recreation users. As access becomes an increasingly limiting factor for recreation, participation could level off or decrease significantly. Universal access to outdoor recreational pursuits is a community value treasured by locals and makes Utah an international destination for visitors. These values, in context with increasing population, will stress the current transportation system and be a challenge for any proposed transportation improvements. Improvements must be carefully planned with regard to providing accessible mountain recreation while maintaining opportunities for solitude and preserving the environment.

Climate Change

The effects of climate change will alter current commercial and non-commercial recreation use patterns and the balance of uses within the Central Wasatch. Climate change is anticipated to have the greatest impact on winter recreation activities that depend on snow. Additional stress will be placed on this recreation system as more users seek access to a shrinking snowpack. Snow is expected to be increasingly unpredictable with the first snowfall shifting later into the winter and spring melting occurring earlier. These trends will be especially apparent at lower elevation areas where opportunities to pursue winter sports will be increasingly limited by lack of snow.

Base facilities at ski resorts on the Wasatch Back are located at lower elevations (base elevations under 7000 feet), when compared to resorts in the Cottonwood Canyons (base elevations over 8000 feet) (Figure 28). The length of the prime ski season at these resorts is anticipated to shorten in the future. Due to the expected shorter ski season, summer uses and concessions will become an increasingly important component of sustaining successful resorts. Resorts are expected to focus more attention on developing robust summer infrastructure to support the increasing population of recreation users.

Additionally, access to high elevation terrain with consistent and predictable snowfall will become increasingly limited for dispersed winter recreation users (e.g., backcountry skiing and snowshoeing) due to climate change. Many popular trailheads and access points for dispersed winter uses are at lower elevations. Lack of snow at these access points can block or limit access to higher elevation terrain suitable for winter recreation and concentrate users in terrain easily accessible from the highest elevation access points (Figure 28). These effects will be most dramatic during the early and late season and will lead to additional crowding where this access is intact. Furthermore, many of these high elevation areas are privately owned or located within the boundaries of the ski resorts. Changes in land use such as resort and residential development expansion could further exacerbate this crowding.



Source: Mountain Accord Recreation System Group

Figure 28. Resort boundaries and major backcountry access points in relation to elevations greater than 8,000 feet (areas with the most snow in early and late winter season)

The effects of climate change on the summer recreation system will not be as intense as those expected during the winter season, though there will be some noticeable changes. Increasing temperatures will add to the heat island effect of urban areas adjacent to the mountains. Residents use the cool, high elevation mountains as an escape from summer heat waves, and more people will seek this relief as summer heat intensifies. Additionally, the environmental attractiveness of many recreational destinations in the Central Wasatch may be affected by climate change. Earlier spring runoff and changing temperatures could affect important features like waterfalls, wildflower meadows, and fall colors that attract large volumes of users, leading recreation users to seek other destinations. Due to anticipated increasing temperatures and shrinking snowpack at low- and moderate-elevation areas, the season for summer uses will be longer. The predicted climate variability from year to year will increase the need for an evolving recreation system that can continue to support the activities that are important to Wasatch residents and visitors.

Sources: Utahwildflowers 2010; Wikimedia.com; Olsen 2008

Fall colors, wildflowers, and water features may be affected by climate change, which would impact where people recreate

Funding Trends

Recreation funding that promotes long-term maintenance and management is critical for the sustainability of high-quality recreation facilities. In addition, a robust funding mechanism allows for the recreation system to be responsive to changing use patterns, emerging sports, and to provide attractive opportunities for a range of users. Many communities along the Wasatch Back have established tax bond measures to support the development, maintenance, and management of recreation facilities. These measures are responsive to the growing population through the expanding tax base (Synderville Basin 2006 and Park City 2014). This allows communities to continue to supply the same level of service as well as respond to the changing demands on their recreation systems. Furthermore, these communities are focusing investment on trail-based recreation which facilitates both casual use and access for dispersed recreation users.

Communities along the Wasatch Front, due to the higher density and urbanization, strive to balance recreation funding between natural and developed recreation sites (i.e., community centers, city parks, golf courses). Focus on developed facilities has limited funding opportunities for trail-based recreation. Due to current federal funding limitations, the U.S. Forest Service is operating on level to decreasing budgets, which are not able to keep pace with increasing recreation use in the Central Wasatch. Trail conditions have been observed to be degraded in some areas and are potentially declining due to limited budgets for trail maintenance. In order for the Forest to maintain a threshold of quality of recreation infrastructure, some recreation sites are planned to be decommissioned and the levels of service at some sites will be diminished in order to alleviate costs (WCNF 2003 and WCNF 2006). This discrepancy between funding trends for the Wasatch Front and Back will be further stressed through increasing population growth, as recreation use grows and the system continues to deteriorate.

4.4 Comments & Poll Results on Future Trendlines

Comments from System Group on Draft Future Trendlines Information

During Recreation System Group Meeting #2, held on April 1, 2014, the stakeholders were asked the following questions in regard to future trendlines.

Which of these changes/trends would be the most critical for the future of this system? Why?

Are there other, more important TRENDS to understand? What existing data have we missed?

- Equipment (emerging sports) and increased accessibility to backcountry
- Usage trends—specifically in emerging sports
- Age-based participation
- What is our responsibility to transportation? How does it affect recreational use and users? Role of traffic congestion effects in, at mouth of, and just outside canyons.
- Road biking in direct conflict with transportation
- Trends of growth affected by transportation. If we are at capacity now, growth trends will limit availability to canyons and therefore availability of recreation opportunities
- Congestion--advocate for front mountain trails to limit driving time to recreation. Develop trail heads in conjunction with transportation planning.
- Are we dealing with 10% days of peak congestion (i.e., snow days or holidays) or are we looking at the entire picture (i.e., year-round)?

- Event congestion and the limitation of other recreation opportunities during these events
- Multiple uses within a day (i.e., ski in the morning and mountain bike in afternoon)

This section will expanded based upon input received during Recreation System Group Meeting #3, scheduled for April 29, 2014.

System Group Poll Results on Future Trendlines Information

To be completed after Recreation System Group Meeting #3, scheduled for April 29, 2014, once stakeholder input has been received.

5. CONCLUSION

5.1 Summary of Comments on Existing Conditions & Future Trendlines

Summary of Public Comments

Following the public review of this draft report, public comments will be summarized here in the final report.

Summary of Comments from Stakeholder Meeting

Following the Stakeholder meeting on this draft report, comments from Stakeholders will be summarized here in the final report.

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Note: This report reflects the input of the Recreation System Group, which is an advisory body to Mountain Accord. As such, this report may not necessarily reflect the opinions of the Mountain Accord Executive Board organizations. The intent of this report is to lead to the development of a recommendation from the Recreation System Group to the Executive Board for their consideration.