

Outdoor Recreation Study in Mount Shasta, CA: Public Input to Improve Recreation Experiences along the Everitt Memorial Highway

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ABSTRACT

The purpose of this study is to determine what recreational activities are pursued at different locations along the Everitt Memorial Highway at Mt. Shasta (Shasta-Trinity National Forest, CA), how visitors evaluate the quality of their trips, and recreationists' opinions about management policies and facilities. A brief on-site survey (N=805) was conducted on randomly selected days over a period of one year (from March, 2017, through February, 2018) by stopping vehicles along the Everitt Memorial Highway. The self-administered questionnaire was conducted as recreationists were leaving and took about 10-15 minutes to complete. The survey results describe the current recreation activities and locations where people recreate on Mt. Shasta, users' motivation for recreating on Mt. Shasta, users' satisfaction with their experience in the area, and users' opinions on different management actions, as well as recommendations for improving their experience in this area. Forty-two percent of the survey respondents were local residents, which was defined as having a 96xxx zip code. Bunny Flat was the

most visited recreation location (57% of the survey respondents visited this location) followed by Old Ski Bowl (17%) and Panther Meadows (16%). The top primary activities that occur on Mount Shasta were hiking (28%), sightseeing (14%), metaphysical/spiritual/meditation activities (9%), driving (6%), backcountry skiing (5%), mountaineering (4%), camping (4%) and mountain biking (3%). Overall, the majority of the survey respondents did not have many concerns or problems with their trip. Approximately half of the respondents provided comments regarding improvements that they would like to occur, which included improvements in signage (17% of comments), new or improved facilities (14% of comments), more restrooms/improvements of restrooms (10% of comments) and parking (10% of comments). The information gained from the survey will be used along with other information to guide recreation planning on the Shasta-Trinity National Forest in order to achieve a sustainable level of recreation on Mount Shasta.

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INTRODUCTION

Outdoor recreation plays a huge role in the lives of many Americans (Manning & Anderson, 2012; USDA Forest Service, 2016). It provides many people with mental, physical and spiritual health, offers an opportunity to bond with family and friends, and presents many different physical challenges. It can provoke inquiry and interest, generate feelings of wonder and awe of the outside natural world, and provide a sense of well-being, among other benefits (Parry et al., 2014; USDA Forest Service, 2016). Outdoor recreation can even be defined as an ecosystem service, as it benefits society and natural resource management “as a form of resilience-based ecosystem stewardship” (Lehew et al., 2015, p. 58).

Outdoor Recreation Activities and Trends

The type of recreation activities Americans undertake has changed over time and has evolved rapidly over the last several decades (Cordell, 2012). Research from Cordell (2012) and White et al. (2016) showed the activities projected to increase in the future include motorized water activities, challenge activities, developed skiing, undeveloped skiing, and equestrian activities. Cordell (2012) also found the activities with the lowest expected rate of growth were hunting, fishing, motorized off-road activities, visiting primitive areas, motorized snow activities, and floating activities. Between 1999 and 2009 nature-based outdoor recreation activities increased in terms of participation rates, and activities based on viewing and photographing nature were some of the fastest growing activities (White et al., 2016). Off-highway vehicle travel, kayaking, snowboarding and surfing all increased in participation rates during this timeframe, although all winter recreation activities except snowboarding had decreased (White et al., 2016). The number of participants in outdoor recreation is projected to increase by 2060 as the US population grows (Cordell, 2012). Table 1 (from White et al., 2016) shows the percent change between 1999-2001 and 2005-2009 in the total number of days and total participants in a variety of outdoor recreation activities across all ownerships of land and water in the United States. Understanding these trends can help recreation managers prepare for the future in regards to how to manage the recreation facilities.

The outdoor recreation activities people choose to do today have shifted from what people chose to do in past decades. For example, new activities like snowboarding and mountain biking were unknown to

past generations, and new activities will no doubt emerge as the 21st century unfolds (Cordell et al., 2012). Several factors have contributed to these changes in recreation activities. Cordell (2012, p. 4) explained that our country’s “changing demographics, lifestyles, reliance on digital technologies, economic fluctuations (e.g., from rapid growth in the 1990s to recession in the last half of the 2000s), changing landscape and natural land base, globalization, and many other changes will continue to drive changes in outdoor recreation.”

Table 1: Historical (1999-2009) and projected (2008-2030) change in outdoor recreation activity participation among US adults.

Activity Type	% Change in Total Participants between 1999-2009	% Change in Total Days between 1999-2009	Projected % Change in Per Capita Participation 2008-2030	Projected % Change Total Days/ Participant 2008-2030
<i>Visiting Developed Sites</i>				
Developed Site Use:			0.7	-0.8
Family gathering	10.5	21.5		
Picnicking	2.8	-5.8		
Developed camping	1.1	0.5		
Visiting interpretive sites:			3.2	2.6
Visit outdoor nature center/zoo	10.2	18.6		
Visit historical sites	8.1	7.0		
Visit prehistoric sites	11.1	9.4		
<i>Viewing/Photographing Nature</i>				
Birding:			4.4	0.2
Viewing/photographing birds	22.8	36.7		
Viewing:			1.2	-3.3
Viewing/photographing natural scenery	17.9	62.6		
Viewing/photographing flowers etc.	29.4	83.5		
Viewing/photographing other wildlife	25.4	51.8		
Viewing/photographing birds	22.8	36.7		
Gathering mushrooms, berries, etc.	28.6	30.1		
<i>Backcountry Activities</i>				
Challenge:			3.6	-0.6
Mountain climbing	-5.9	-4.3		
Caving	18.4	14.0		

Rock Climbing	9.5	12.3		
Equestrian:			2.7	1.2
Horseback riding on trails	1.6	-9.7		
Hiking:			3.1	2.3
Day hiking	15.4	-4.9		
Visiting primitive areas:			-2.1	-1.1
Backpacking	7.9	26.6		
Primitive camping	3.2	6.6		
Visit a wilderness	17.7	31.8		
<i>Motorized Activities</i>				
Motorized off-road use:			-4.7	-2.8
OHV driving	34.5	47.6		
Motorized water			2.5	0.5
Motorboating	8.6	12.3		
Waterskiing	33.1	20.0		
Use personal watercraft	10.9	12.7		
Motorized snow:			-10.4	-1.3
Snowmobiling	-5.5	-23.7		
<i>Hunting and Fishing</i>				
Hunting:			-11.6	-5.0
Small game hunting	11.4	-0.7		
Big game hunting	17.1	22.2		
Migratory bird hunting	-1.1	0.4		
Fishing:			-2.6	-1.8
Anadromous fishing	24.1	9.7		
Coldwater fishing	8.7	1.4		
Saltwater fishing	17.2	-0.7		
Warm water fishing	17.1	13.1		
<i>Non-Motorized Winter Activities</i>				
Developed skiing:			6.7	3.2
Downhill skiing	-8.5	-19.4		
Snowboarding	33.7	32.6		
Undeveloped skiing:			-0.6	2.1
Cross-country skiing	-21.7	-32.9		
Snowshoeing	-9.4	-25.1		
<i>Non-Motorized Water Activities</i>				
Swimming:			3.4	0.6
Swimming in lakes, streams, etc.	14.0	16.0		
Snorkeling	11.8	-0.6		
Surfing	46.3	18.6		

Scuba diving	-5.6	-15.6		
Visit a beach	20.7	28.2		
Visit waterside besides beach	6.3	28.1		
Windsurfing	-10.1	-24.7		
Floating:			-3.9	0.5
Canoeing	18.2	8.0		
Kayaking	103.8	86.3		
Rafting	-2.8	7.9		

Note: Data are taken from White et al. (2016).

Not only is the changing activity and participation rates going to be a moving recreation management target, but advancements in technology and changes in generational lifestyles will be others. A prominent factor Cordell et al. (2012) discussed in their technical report involves the changing relationship between young people and the outdoors, where young people are spending quite a bit of time outdoors and many of them are using electronic devices when doing so (Cordell et al., 2012). One type of outdoor recreation that involves electronic devices is geocaching. Cordell (2012) stated that approximately 100,000 people were members of a geocaching organization (geocaching.com) in 2010 and there were approximately 1,000,000 caches around the world. He estimated that 8 million participants aged 16 years or older participate in this recreation type. As another example, a popular smart phone game that became popular in 2016 was “pokemon go” which -- according to wikipedia -- logged around 500 million downloads. This game got many people outside recreating and was fully dependent on electronics to participate.

As technology continues to evolve it can be assumed that this will mean changes in outdoor recreation which will mean land managers will have to update/modify facilities and/or permit processes to accommodate these new trends and demands. Some current demands that the Forest Service is facing are providing online permitting systems, reservation opportunities for camping, information and maps being available online as well as downloadable maps for people’s smart phone devices. The Shasta-Trinity National Forest also piloted a digital touring app for smart phones called ‘OnCell Systems’ that allowed people to take a digital tour of certain locations on the Forest. This type of technology offers a new avenue to provide educational, interpretive and information to visitors on smart devices in addition to or instead of using traditional sign boards and kiosks.

The Growing Outdoor Recreation Industry and Visitor Use Management

Over the past few decades outdoor recreation has become a key economic contributor in the United States, and it continues to grow every year. In 2017, the Outdoor Industry Association issued a report stating that \$887 billion is spent annually by consumers on outdoor recreation products and associated trip/travel expenses in the United States. In California alone it is estimated that approximately \$20 billion is spent annually in direct expenditures for outdoor recreation (BBC Research and Consulting, 2011). Outdoor recreation provides many different economic benefits for local communities and cities that surround the National Forests and National or State Parks. These include business activity created by visitor spending, increased property values, attraction of businesses due to the proximity of the natural amenities, and health benefits from stress reduction and physical activity of being outdoors (White et al., 2016).

With this growing and changing industry and demand for outdoor recreation areas, the environment that these activities depend on can experience stresses from increased recreational use and people recreating in different fashions. Some ecological impacts that can occur with increases in use and unmanaged outdoor recreation include water quality alterations, soil erosion, wildlife disturbances and vegetation trampling (Manning & Anderson, 2012; Marion et al., 2016). Social impacts that can reduce visitor satisfaction or degrade the quality of their experience include crowding (Luque-Gil, et al., 2018; Manning, 2011; Roemer & Vaske, 2014; Usher & Gomez, 2017; Vaske & Shelby, 2008) and user conflicts (Jackson et al., 2003; Vitterso et al., 2004). Both ecological and social impacts can be managed through a variety of techniques which are designed to modify the type of use, visitor behavior, visitor attitudes and expectations, timing of use, location or spatial distribution of use. Other management alternatives are to increase the facility capacity, increase the overall supply of opportunities, or reduce the levels of use (Interagency Visitor Use Management Council, 2016; Manning & Anderson, 2012). Some examples of these include site/facility engineering (Interagency Visitor Use Management Council, 2016), education programs to reduce ecological and social problems (Interagency Visitor use Management Council , 2016; Manning, 2011; Marion et al., 2016), visitor use management such as use allocation practices (Manning, 2011; Manning & Anderson, 2012; Marion, 2016) and zoning or separation of conflict (Jackson et al., 2003; Manning, 2011). The management strategies selected to reduce or eliminate the ecological or social problem will be dependent on the desired outcome of the land management agency (Interagency

Visitor Use Management Council, 2016) and should include objective information on preferences, perceptions and attitudes of the visitors as a prerequisite (Manning, 2011).

The Forest Service needs to anticipate growth in order to move to a proactive versus reactive management approach. The Forest Service manages 193 million acres of land in the United States, which makes up 30 percent of all federal land (USDA Forest Service, 2015). These lands receive more than 160 million outdoor recreation visits annually, and most of the acreage is in the western US (USDA Forest Service, 2015). California alone is estimated to receive about 90 million recreation visits per year on federally managed land, which includes US Forest Service lands, National Parks, BLM lands, National Wildlife Refuges, and Army Corps of Engineers properties (BBC Research and Consulting, 2011).

Mount Shasta, CA, has been somewhat of a hidden gem, but is slowly starting to see the impacts of growth in recreation demand. As a result, the Forest Service is seeking to prepare in advance for the anticipated crowds, rather than react to further ecological and social impacts that will occur after use increases. Some known ecological and social issues that recreation managers are currently facing on Mount Shasta that will need to be addressed in creating a sustainable recreation management plan include the following:

- crowding at parking lots which is creating user conflicts and safety concerns
- user conflicts between motorized and non-motorized winter recreationists
- visitation regularly reaching facility capacity at the two campgrounds on Mount Shasta (McBride Springs Campground and Panther Meadows Campground) which has led to further dispersed camping some in sensitive locations or no camping areas
- the large number of visitors during climbing season -- all climbing the Avalanche Gulch route on Mount Shasta -- which has created a crowding issue for camping and trekking to the summit as well as lowering the solitude criteria for this designated wilderness
- user-created downhill mountain bike trails which are non-sustainable, and creating erosion concerns
- high levels of spiritual use of the recreation sites on Mount Shasta which has created crowding and some resource damage in sensitive areas.

Sustainable Recreation Management and Challenges

Sustainable outdoor recreation management as a professional and institutional goal has become a popular topic in land and park management over the past three decades (Selin, 2017). Lehw et al. (2015) describe sustainable recreation as a system that includes natural resources, social capital and supporting infrastructure and facilities that need to be maintained or increased over time to support the system. Social capital refers to “organizations that facilitate collective actions to produce mutual benefits,” in other words, utilizing the recreating public, local communities, clubs and organizations to apply their passion for the area to work together to assist in problem solving or accomplish goals and initiatives that will sustain and support outdoor recreation programs (Lehw et al., 2015, p. 57). The USDA Forest Service (2010) defines sustainable recreation as maintaining the benefits of outdoor recreation for the present and future generations by balancing the three spheres of economic, social and environmental conditions. Many different factors are and will continue to become a challenge for sustainable recreation management, such as drought, climate change, political conflict, and the scarcity of public resources (Selin, 2017).

Goal of this Capstone Project

The USDA Forest Service has a goal of “providing sustainable recreation opportunities and high quality recreation experiences while minimizing the impacts of visitor use on the landscape” as part of “Strategic Objective F – Connect people to the outdoors” (USDA Forest Service, 2015). The sustainability issue surrounds the problem of how to manage recreation so resources are not being jeopardized while still providing ample opportunities that the public wants in order to enjoy this area. To achieve this goal at Mount Shasta, the agency needs to know what the public’s expectations are for improving their recreation experience; a visitor survey is the first step for understanding what those expectations are. Therefore the purpose of this study is to obtain information to assist in developing a sustainable recreation program for the Everitt Memorial Highway corridor on Mount Shasta. As will be explained later, the Everitt Memorial Highway is the primary focus of recreation in the Mount Shasta portion of the Shasta-Trinity National Forest, which makes it appropriate for a visitor survey. Needed data were gathered by asking visitors about the types of recreational use on Mt. Shasta, where those uses are occurring, what recreationists want as their preferred experience, and how visitors feel about different facilities, policies, and actions. The survey addressed several topics that have been identified in research

as impacting visitor experiences or that are important for planning and management. For example, it asked about the following topics:

- Public perception of crowding on Mt. Shasta (Luque-Gil, et al., 2018; Manning, 2011; Roemer & Vaske, 2014; Usher & Gomez, 2017; Vaske & Shelby, 2008)
- Visitors' reasons for recreating on Mt. Shasta (Anderson et al., 2000)
- Visitors' evaluations of the quality of facilities and services
- The impact of encountering other visitors on the quality of the experience or creation of conflict (Jackson et al., 2003; Vitterso et al., 2004)
- What the Forest Service can do to improve visitors' experience

As explained in detail later, the survey was completed over a period of one year (from March, 2017, to February, 2018) along the Everitt Memorial Highway. The survey respondents were adults traveling down the Everitt Memorial Highway, including visitors to Mount Shasta, locals, and tourists on guided tours. The information gained from the survey will be used to guide planning to better manage recreation in a sustainable fashion based on public input.

In the following section, I review the relevant social, ethical, natural and political considerations surrounding recreation on Mount Shasta to build a framework to understand the complexity of sustainably managing recreation in the area. Then I explain the methods of the year-long public survey, followed by the results from the survey. I conclude with proposed management recommendations from this study.

STUDY AREA

Mount Shasta, California, is located in Northern California (Figure 1), about one hour by car south of the Oregon border, and can be easily accessed from a major interstate highway (I-5). Mount Shasta is the largest stratovolcano in the Cascade Range, at 14,179 ft (USDA Forest Service, 2012). This geological feature has long attracted people to the area. Being prominently visible, it has cultural importance amongst the local Native American Tribes. More recently, it draws visitors for a wide range of recreation purposes from downhill sports activities to sightseeing, spiritual quests and other activities that are dependent on the peak. There are seven glaciers located on Mount Shasta which bring visitors to the

area who have interest in glacier travel or the more technical mountaineering experience. Managing for these many different uses can present challenges.

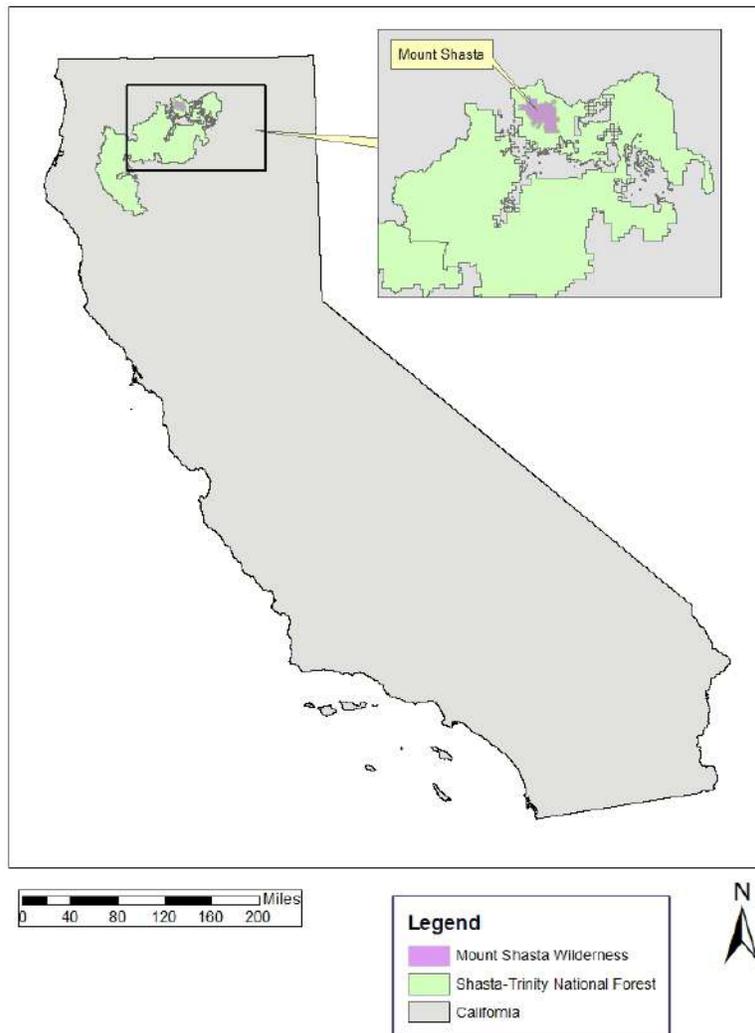


Figure 1: Location of Mount Shasta in Northern California (created from USFS GIS data)

Mount Shasta is located in the Shasta-Trinity National Forest and is managed by the US Forest Service. Throughout this study Mount Shasta is often referred to as the ‘mountain’ so as not to be confused with the City of Mount Shasta, which is a town located at the foothills of the mountain. The mountain encompasses many different land allocations, including private non-timber land, private timber land, designated wilderness, and federal timber plantations, which will be discussed in further detail later in this report. The Everitt Memorial Highway is a paved county road (A10) that starts in the City of Mount

Shasta and travels up the mountains to its terminus at the Old Ski Bowl, which is 7,850 ft in elevation. This is the highest point to which vehicles can drive on Mount Shasta. The Everitt Memorial Highway accesses 12 developed recreation sites that the Forest Service manages and one developed site located on the Sierra Foundation Property (Horse Camp), as well as numerous non-developed recreation destinations (Table 2). Figure 3 shows the locations of the developed sites as well as the survey site, which was located across from the Gateway Trails Trailhead.

Table 2: Recreation destinations along the Everitt Memorial Highway and the facilities and activities present at each location

Location	Facilities	Description	Activities Pursued
Gateway Trails	Parking, trail sign with map of trails	Trail outside wilderness 11.4 miles	Hiking, mountain biking, trail running, dog walking
Black Butte Trail	Parking	Trail outside wilderness 5.2 miles round-trip	Hiking
McBride Springs Campground	Developed campground (fee), campfire rings, picnic tables, camp host, paved pads, vault toilet, spring water	12 campsites; \$10/night	Camping, metaphysical day use
John Everitt Vista Point	Parking, vault toilet, vista overlook, interpretive trail	Day use only	Sightseeing, hiking
Red Fir Flat Group Camp and Day Use Area	Vault restroom, parking, trash cans, reservable group camp site (fee & up to 35 people) with picnic tables and fire ring	1 group campsite; \$12/night	Metaphysical day use, camping
Sand Flat Trailhead	Trail sign and kiosk	Trail inside and outside of wilderness	Metaphysical day use, hiking, dispersed camping, snowshoeing, cross-country skiing
Bunny Flat Trailhead	Parking, interpretive sign, trash cans, vault toilets, trail sign and kiosk	Trail inside and outside of wilderness. Trails lead to Horse Camp, Sand Flat, and around the area	Metaphysical day use, sightseeing, hiking, mountaineering, backcountry skiing/split boarding, cross-country skiing, snowshoeing, sledding, snowmobiling, dispersed camping

Location	Facilities	Description	Activities Pursued
Horse Camp (Sierra Club Foundation-private inholding)	Composting toilet, spring water, low-impact campsites, cabin	\$5 per camp, \$3 per bivy and \$1 per visitor; trail inside wilderness 3.4 miles round-trip	Sightseeing, hiking, mountaineering, backcountry skiing/split boarding, snowshoeing, backpacking
Panther Meadows Campground	Parking, walk-in developed campsites, trash cans, vault toilets, campfire rings, picnic tables, camp host, trail sign	12 sites; no fee; inside Traditional Cultural Property	Camping, metaphysical day use, hiking
Gray Butte Trail	Parking at Panther Meadows CG, trail sign	Trail outside wilderness 4 miles round-trip	Hiking
Panther Meadows Trail	Parking, trail sign, interpretive sign	Trail outside wilderness, inside Traditional Cultural Property. 1 mile round trip to the Upper Meadow. 1.5 miles round trip to Upper and Lower Panther Meadows	Hiking, metaphysical day use
South Gate Meadows Trailhead	Parking, trail sign	Trail outside and inside wilderness and inside Cosmologic District. 4 miles round-trip	Hiking, metaphysical day use
Old Ski Bowl	Parking, trail sign and kiosk, picnic tables	Trail outside wilderness and inside Cosmologic District 4 miles round-trip	Hiking, metaphysical day use, sightseeing, mountaineering, backcountry skiing/split boarding, snowshoeing, snowmobiling
Helen Lake	Inside wilderness no facilities	Dispersed camping (no developed campsites) 7 miles round-trip	mountaineering, backcountry skiing/split boarding, dispersed camping
Mount Shasta Summit	Inside wilderness (no facilities), registration canister	N/A No NFS designated trail to summit (climber route only)	mountaineering

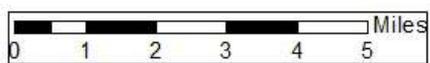
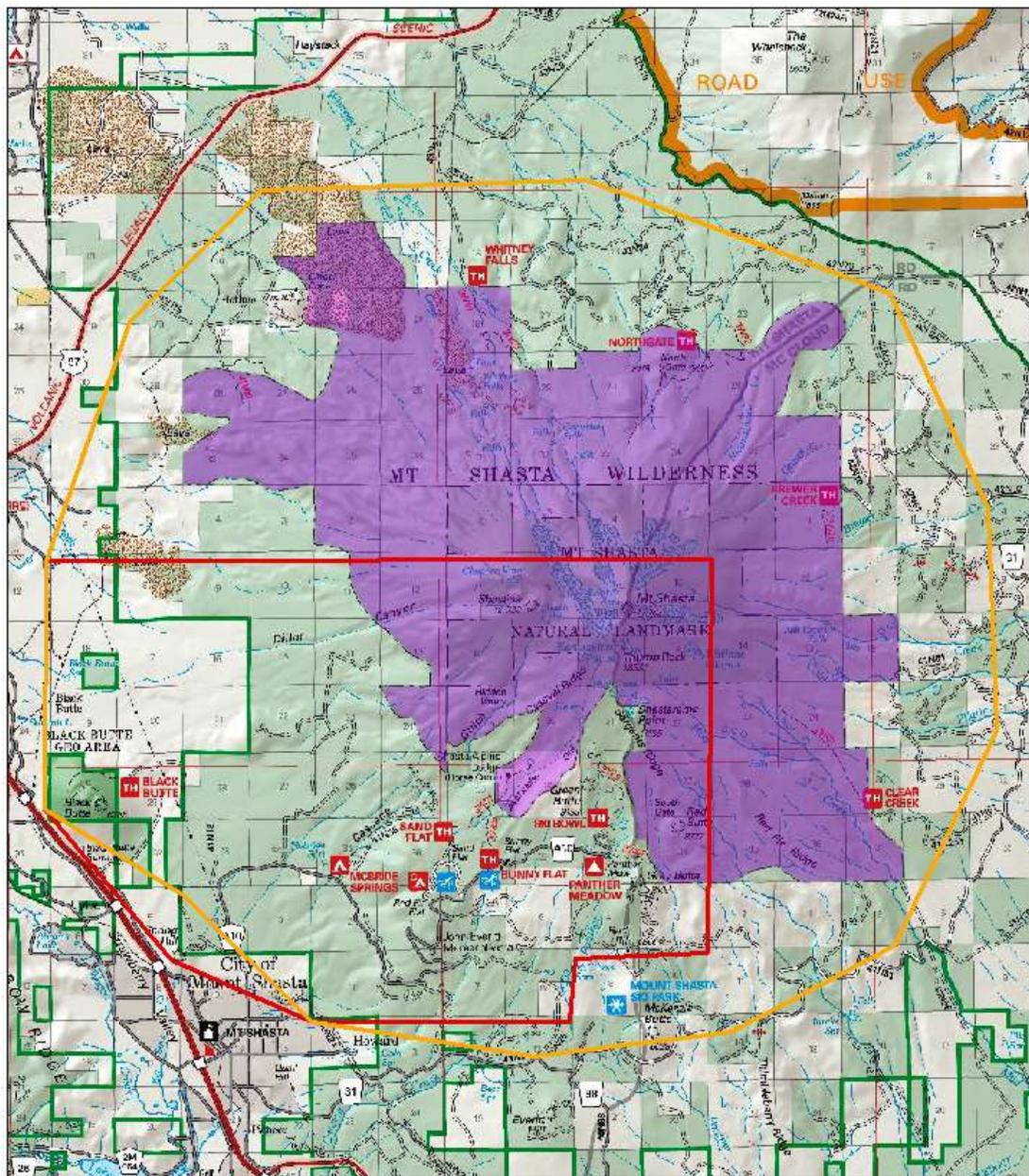


Figure 2: Map of the study area (Shasta-Trinity Forest Map)

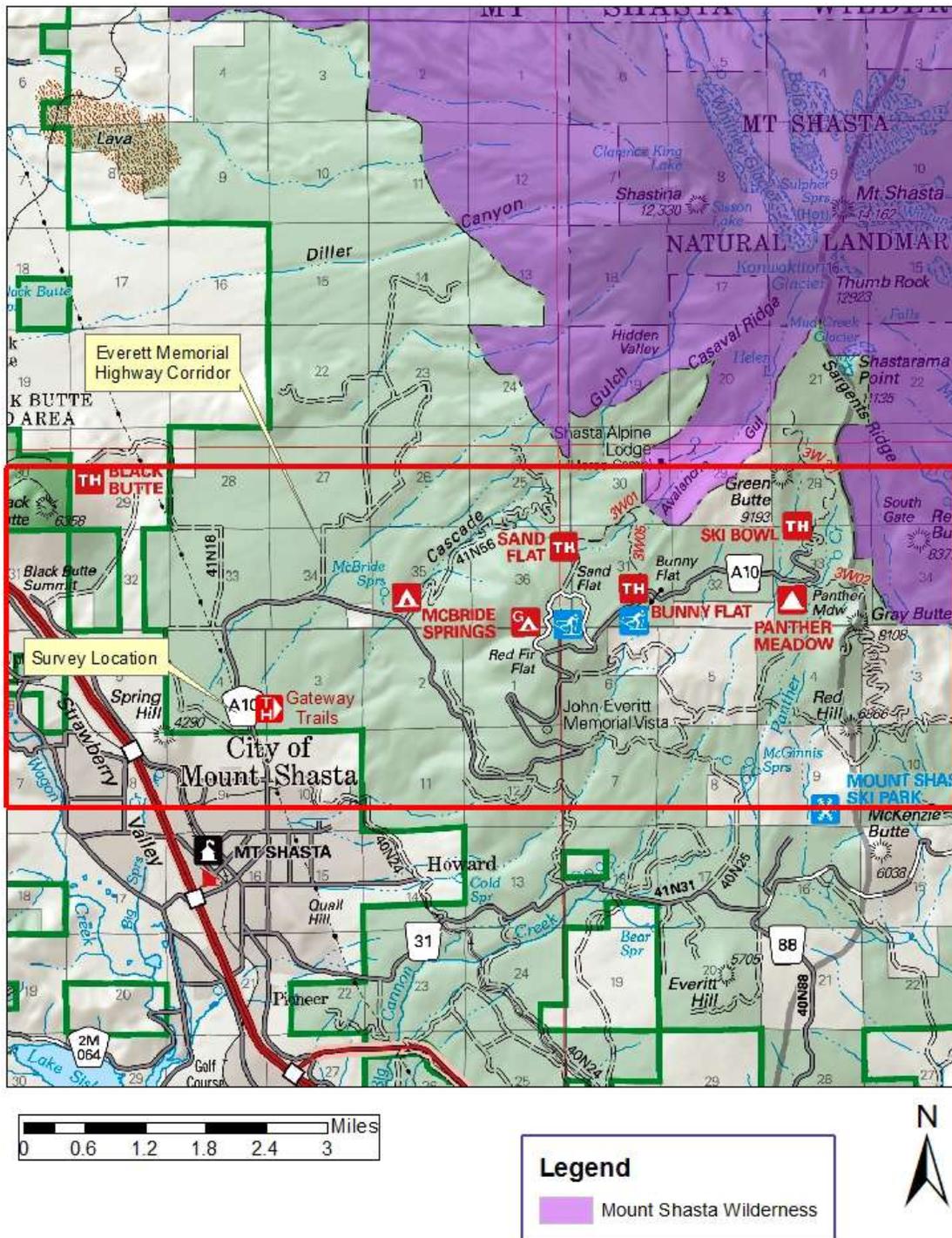


Figure 3: Map of the Everett Memorial Highway corridor, which is the main travel route to get to Mount Shasta and other recreation areas near Mount Shasta (Shasta-Trinity Forest Map)

Land Use Description and Designations:

Mount Shasta is about 97,842 acres and 78% (77,116 acres) of this area is National Forest System lands that is managed by the Forest Service (Shasta-Trinity National Forest, 2018-c). The remaining 22% is private timber land or other private land (Shasta-Trinity National Forest, 2018-c). The study area (Figure 2) makes up about 40% of this area (39,888 acres), with 74% (29,822 acres) being National Forest System lands (Shasta-Trinity National Forest, 2018-c). Mount Shasta was designated in 1926 as the Mount Shasta Recreation Area by the Secretary of Agriculture (USDA Forest Service, 2012). At that time, it was approximately 29,620 acres and was designated for “the enjoyment of the general public for recreation purposes, coordinately with the purposes for which the Shasta National Forest was established” (USDA Forest Service, 2012). This area has not been expanded or changed since its designation, nor has a management plan been created for the areas specifically designated as the Mount Shasta Recreation Area.

The land surrounding the mountain is subject to many uses, which can make managing recreation more of a challenge. The western and southern slopes of Mount Shasta have shrublands that were converted to ponderosa pine plantations. These areas provide recreation opportunities for people who participate in dispersed non-developed recreation activities, such as camping, walking and dog walking/running. These locations are typically less popular, so people can recreate without much chance of running into other people. User-created and National Forest System trails for hiking and mountain biking are found in these areas as well. The forest plantations are actively managed by the Forest Service to reduce fuel loading and maintain forest health, which creates minor interruptions to recreation in these areas periodically every few years. Given the low use of these areas, they were not included in the survey and are not further considered in this document.

Surrounding the mountain, and especially on the southern and eastern portions of the mountain, there is checkerboard ownership of private timberlands intermixed with National Forest System lands (Figure 2 – white layers represent private land and green layers represent National Forest System lands). The checkerboard ownership makes managing recreation sometimes a challenge, especially for road and trail maintenance. Coordination with multiple different landowners is necessary to maintain public easements on the roads that cross private lands and access National Forest System lands. This

coordination occurs to ensure access to the trailheads that surround the mountain for hiking, backcountry skiing/snowboarding and mountaineering.

The top of Mount Shasta is a National Registered Natural Landmark, which was designated in 1976 (USDA Forest Service, 1992). There are no unique land management policies for this designated area, though this entire area falls within the Mount Shasta Wilderness boundary and is managed as such.

The Mount Shasta Wilderness was designated in 1984 and is comprised of approximately 38,000 acres (USDA Forest Service, 1992). Twenty-six percent of the Mount Shasta Wilderness (9,947 acres) falls within the study area boundary. Under the Wilderness Act of 1964, “A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” Annually approximately 15,000 visitors (day and overnight trip visits) enter the Mount Shasta Wilderness, many of whom are there for backcountry skiing/snowboarding, mountaineering, hiking, or spiritual purposes (Shasta-Trinity National Forest, 2013). Not everyone fills out a wilderness pass, so these visitor numbers are probably lower than the actual visitation amount. This area is managed to maintain wilderness values, which means having a group size limitation, pack-out bag system so people pack out their human waste, and a prohibition on dogs. Even with these management techniques, maintaining opportunities for solitude as required by the Wilderness Act is a challenge in certain areas of Mount Shasta, such as Avalanche Gulch, the most heavily utilized area for mountain climbing and backcountry skiing/snowboarding, especially during holidays and weekends in the months of May through July.

There is about a small (720-acre) parcel of Sierra Club Foundation land on Mount Shasta, which falls mostly within the designated Wilderness boundary (Sierra Club Foundation, 2018). This property can be accessed by two of the National Forest Service trailheads, Bunny Flat and Sand Flat, with the Bunny Flat Trailhead being the most popular access point. The Sierra Club Foundation property lies within the most popular climbing route on Mount Shasta and receives thousands of visitors every year, many of whom come to climb, while others visit to day hike in summer or snowshoe, ski, or snowboard in winter. The Sierra Club Foundation provides a toilet and water source for visitors, as well as a camping area with a minimal fee of \$5 per camp, \$3 per bivy and \$1 per visitor. The Forest Service coordinates with the Sierra Club Foundation on management decisions of the area to work towards common regulations so

as to limit confusion amongst visitors. A good example of this is the no dog policy: no dogs are allowed in the wilderness and the same policy applies on the Sierra Club Foundation property.

Climate:

Mount Shasta has as a Mediterranean climate, characterized by warm dry summers and cool wet winters (USDA Forest Service, 2012). This climate provides for year-round recreation activities, and the season of most recreation activities is dependent on the annual snowfall. During winters and springs of heavy snowfall the winter sports activities such as backcountry skiing, snowboarding, cross-country skiing, and snowmobiling continue later in the season, and the hiking, mountain biking and mountaineering seasons are delayed. The amount of snowfall is also a factor in how long climbing season will last for people attempting to summit Mount Shasta.

Vegetation/Hydrology/Fish and Wildlife:

The dominant tree species on Mount Shasta change with elevation. At lower elevations, forests contain a mix of conifers (e.g., incense cedar, ponderosa pine, Douglas-fir), while slopes higher up are dominated first by white fir, followed by red fir, then finally at the highest elevations by whitebark pine (USDA Forest Service 2012). For the most part, recreation activities are not related to forest composition except for the small subset of individuals who come to Mount Shasta to see trees, especially the red fir and the whitebark pine. (Whitebark pine has some spiritual significance to some of the new age visitors who come to the area.)

Due to volcanic activity during the past 10,000 years (USDA Forest Service, 2012), there is very little surface water on Mount Shasta, and consequently little aquatic or riparian habitat. Water is mainly found subsurface, appearing on the surface as springs around the mountain. The springs tend to be sacred locations to both Native Americans local to the area and new age people who come to Mount Shasta in the summer and fall to visit them. The popularity of these mountain springs has brought issues such as user-created trails through the meadow, which has led to resource concerns such as soil compaction, vegetation change and changes in the water relationship with the meadow. Some work has been done to Panther Meadows to create a better trail system through the meadow and remove some of the trails, but work needs to be done to the other alpine meadows like Hummingbird and Southgate Meadows, where user created trails braid through meadow vegetation.

Fish and wildlife species are not major concerns for the recreation program. Habitat is not suitable for many wildlife species. However, pika are present in alpine areas and there are some northern spotted owl activity centers on the eastern side of Mount Shasta (USDA Forest Service, 2012). There currently are no issues from recreation sites or recreation activities to these wildlife species, as most of the recreation in their habitat is occurring in winter months over snow. There are no fish on Mount Shasta, as the volcanic soils and geology limit the amount of surface water. Wildlife viewing and fishing are therefore minimal at Mount Shasta.

Social:

Mount Shasta holds value to many different user groups and for many different reasons. The many user groups include local residents in the towns surrounding Mount Shasta; visitors who travel from around the state, country and world to visit Mount Shasta; and tribal people who revere the mountain as a sacred place and come annually to hold a ceremony on Mount Shasta. These different user groups have varied economic resources and sociodemographic characteristics, as well as different recreation expectations. This makes management decisions challenging, as no single solution or policy is likely to make everyone happy.

The recreation opportunities present on Mount Shasta include mountaineering, rock climbing, equestrian use, mountain biking, hiking, snowmobiling, backcountry skiing/snowboarding, cross-country skiing, snowshoeing, sightseeing, driving for pleasure, camping, star gazing, photography, meditation and spiritual/metaphysical practices, among others. Some of these recreation activities are being managed (e.g., human waste on Mount Shasta from mountaineering activities by utilizing a pack-out bag system, ongoing developed campground and trail use through routine upkeep and maintenance, and relocation of trails that run through sensitive alpine meadows) and some are not being managed (e.g., mountain biking and hiking that occurs on user-created trails, meditation and spiritual/metaphysical practices that occur in sensitive areas, and high use areas such as Bunny Flat parking lot, Avalanche Gulch climbing route and dispersed wilderness camping at Helen Lake). Creating a sustainable recreation management plan is essential so ecological and social impacts are reduced/limited while still providing the opportunities that local residents and visitors want in order to enjoy this area. This study was conducted in order to find out what the people recreating on Mount Shasta think of the current management of the area and what areas need better management in order to improve their overall experience. When there is a demand for an activity and it is not being provided, the public has at times

taken matters into their own hands to create the opportunities. Some examples on Mount Shasta include user-created downhill mountain biking trails, unauthorized dispersed camping, off-road driving, and disc golf.

A few sources of data provide estimates of the amount of use Mount Shasta receives. The Forest Service has had a road counter on the Everitt Memorial Highway for several years, which has logged approximately 63,000 cars annually since 2007 traveling up the road (Shasta-Trinity National Forest, 2018). The number of cars that travel up the Everitt Memorial Highway has been increasing annually (Figure 4).

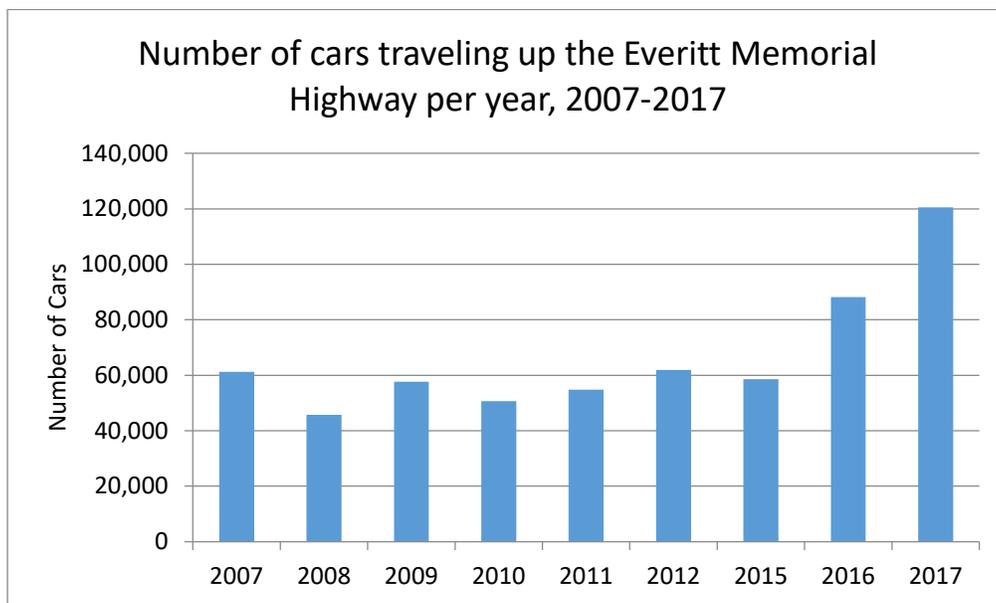


Figure 4: Road counter data from 2007-2017 on the Everitt Memorial Highway (Note: From 2007-2016, the counter was located just beyond McBride Springs Campground, but in 2017 it was moved to a location below Gateway Trailhead (see Figure 3 for recreation site locations), which accounts for some of the gain in 2017.)

The City of Mount Shasta’s visitor center has logged the number of visitors who enter the building annually. Since 2013 this has averaged approximately 18,201 visitors, with the number of visitors increasing each year (Mount Shasta Visitors Center, 2018). The Sierra Club Foundation has a door counter on the restroom on its property, and the counter has logged an average of 7,243 visits annually over the past 12 years (personal communication, Rick Chitwood, 2018).

Finally, the Mount Shasta Wilderness received an average of about 15,000 visitors each year according to the wilderness passes from 2005-2012 (Figure 5), and approximately 6,586 people attempt to summit Mount Shasta each year based on the summit passes sold annually (Figure 6) (Shasta-Trinity National Forest, 2013; Shasta-Trinity National Forest, 2017). The summit passes are required for anyone planning on going above 10,000 feet on Mount Shasta and there is a fee associated with this pass of \$25 for a 3-day pass or \$30 for an annual pass. About 95% of the money from these passes stays locally to manage the Mount Shasta Wilderness program. The number of people who attempt to summit Mount Shasta and enter the wilderness each year varies based on snowpack, however, overall there has been a noticeable increase in people climbing Mount Shasta; this has been attributed to the release of Jon Krakauer’s book “Into Thin Air” which was published in 1997 and was an account of the Mount Everest disaster of 1996. The wilderness passes are utilized to inform Mount Shasta Wilderness visitors about the Leave No Trace and pack-out bag program as well as the regulations that pertain to this wilderness. These passes are free and help the Forest Service track how many people enter this wilderness, though not everyone fills them out. The wilderness passes since 2012 have not been catalogued yet, so no data are available for these years.

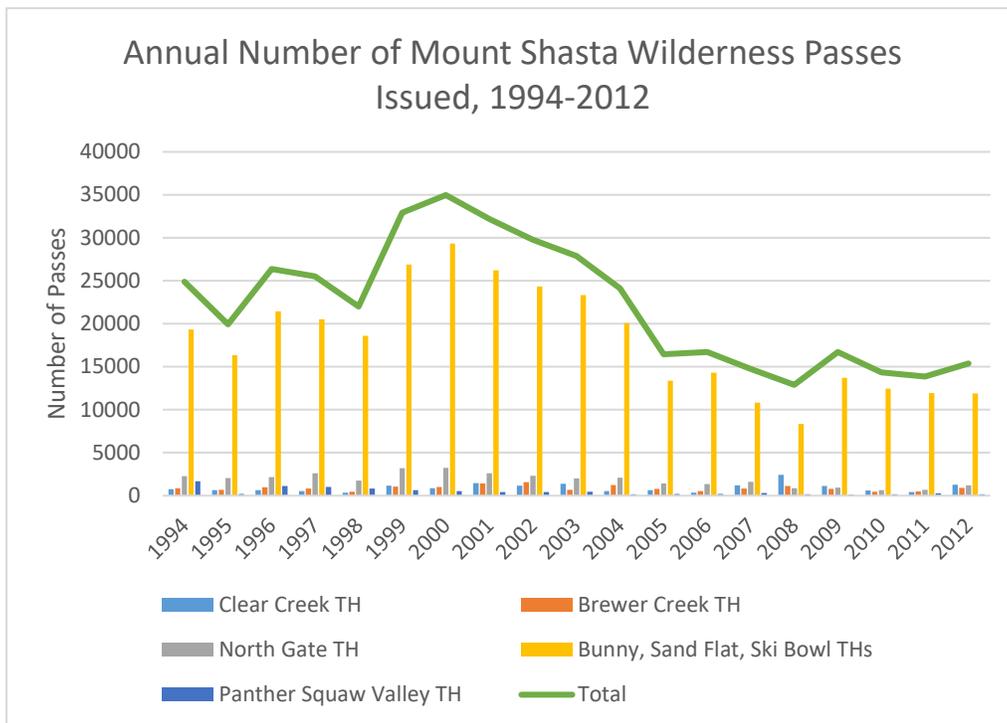


Figure 5: Mount Shasta Wilderness pass data from 1994-2012 from the seven trailheads that enter the wilderness

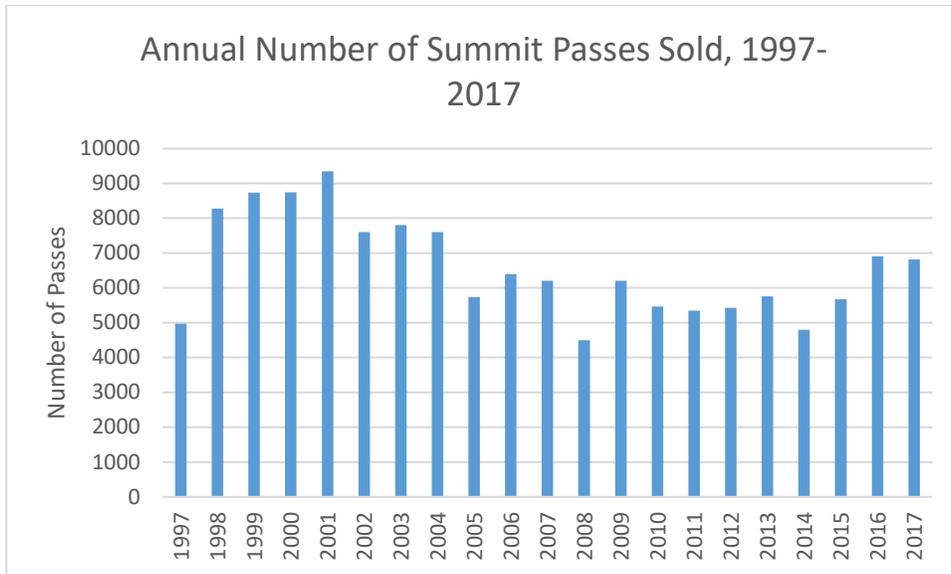


Figure 6: Number of Mount Shasta summit passes sold annually from 1997-2017

Cultural:

Mount Shasta is the center for many of the local tribes’ creation story. There are two designated state historic traditional cultural properties located on Mount Shasta, and all proposed actions inside those boundaries must undergo consultation with the local tribes and gain concurrence from the State Historic Preservation Office that the proposed action will not negatively impact those traditional cultural property resources. There are currently no unique management plans or policies for these properties that affect recreational use.

The Native American Cosmologic District on Mount Shasta is an historic district eligible for the National Register of Historic Places under criteria A and C (SHPO reference #USFS880811A, September 4, 1992). It encompasses everything above about 8,000 ft in elevation. The National Register of Historic Places has the following information about this Cosmologic District:

“The significance of the upper slopes of Mount Shasta for Native American history and culture is that it is the scene of cosmological and mythological events that were crucial to the world view of several tribes in north central California. This historically significant landscape continues to have import to Native Americans, including as it does symbolic features that express Native American values and origins.”

There is a need for a historical properties management plan, though there is no anticipated timeframe for drafting this plan. Currently the only commercial activities that are authorized inside this boundary are the mountaineering and backcountry skiing companies, spiritual companies that wish to go to Old Ski Bowl, bus tour companies that wish to go to Old Ski Bowl, and other incidental hiking and spiritual groups that want to go to the areas outside of Panther Meadows or the Mount Shasta Wilderness.

Panther Meadows Traditional Cultural Property is eligible for the National Register of Historic Places under criterion A (SHPO reference #USFS880811A, September 4, 1992). The National Register of Historic Places has the following information about this Traditional Cultural Property:

“Panther Meadow's primary significance or value is that sometime during the historic period, the property became a place where several tribes came for spiritual renewal, healing, prayer, etc. The intertribal use of a single location is unusual and historically very noteworthy.”

There is a need for a historical properties management plan for Panther Meadows, though there is no anticipated timeframe for developing this plan. Currently the only commercial activity permitted inside this boundary is a local spiritual guide company that is authorized to take clients to Grey Butte. The guide company is only authorized to traverse Panther Meadows on the trail to Grey Butte.

In addition to Mount Shasta having cultural significance to the Native American's local to the area, it has spiritual significance to various new age metaphysical groups. Archival record can be found dating back 150 years of pilgrim (journey to a sacred place) accounts of Mount Shasta and spiritual ascension and encounters with the mountain (Duntley, 2014). These accounts vary from mountaineers' experiences on the mountain to metaphysical experiences which may include accounts of ascension, esoteric discovery or encounter with the mountain (Duntley, 2014). A substantial sector of the City of Mount Shasta's business community is comprised of spiritual channelers, mystics and healers, which make up about one-third of the Chamber of Commerce membership as of 2013 (Duntley, 2014).

Political (Current Management Direction):

A variety of laws and policies govern what and how the Forest Service provides recreational opportunities across the lands it manages. The Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan) has very limited and generalized management direction and standards and guidelines for recreation. The following are relevant excerpts taken from the Management Direction section on recreation (USDA Forest Service, 1995):

- “Manage the Shasta-Trinity National Forests land base and resources to provide a variety of high quality outdoor recreation experiences.
- Increase emphasis on areas of national significance such as Mt. Shasta, the Whiskeytown Shasta-Trinity National Recreation Area (NRA), and the Wild and Scenic Rivers System.
- Encourage use of the Forests by the disadvantaged, physically challenged, and minorities.”

The following excerpts are the most recent Standards and Guidelines taken from the Forest Plan on outdoor recreation (USDA Forest Service, 1995):

- “Create additional opportunities for winter recreation, including alpine skiing, cross-country ski areas, snowmobile areas, and snow play areas.
- Continue to improve access to rivers, streams, and lakes for water-oriented recreation activities consistent with the Aquatic Conservation Strategy. Continue to provide access to hunting, fishing, and wildlife viewing areas.
- Mitigate the physical impacts of increased, dispersed recreation use. Rehabilitation efforts should respond to resource damage to soils, water, and vegetation.
- Evaluate public demand for outfitter/guide services. Encourage commercial outfitting and guide permits where there is a demonstrated need that is compatible with general public use and resource conditions.
- Develop and administer an operating plan consistent with Management Area direction for each outfitter/guide and, when appropriate, for other recreation special use permittees.”

The Recreation Opportunity Spectrum (ROS) is a typology that defines the different types of settings managers provide, based on their physical, natural, managerial, and social characteristics. Recreationists choose the types of settings where they expect to have a satisfying experience (USDA Forest Service, n.d.). Applying the ROS across the landscape helps land managers intentionally maintain opportunities for diverse experiences. The opportunity classes are arrayed along a spectrum from less developed and used to most developed and heavily used: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban (USDA Forest Service, n.d.). The ROS class that is assigned to the Mount Shasta Wilderness is primitive, and the areas surrounding Mount Shasta Wilderness are characterized as roaded natural, semi-primitive motorized, and semi-primitive non-motorized (Figure 7). Almost half of the study area (49%; 16,014 acres) falls within the roaded natural class, followed by 30% being in primitive (9,948 acres), 14% being in semi-primitive motorized (4,593 acres) and finally 6%

being in semi-primitive non-motorized (4,593 acres). Most of the Everitt Memorial Highway corridor falls within the roaded natural and semi-primitive motorized classes, which is appropriate as these areas have the developed sites listed in Table 2. Any management decisions that involve re-engineering or expanding developed use will occur in these areas, and management decisions affecting the primitive and semi-primitive non-motorized areas will need to be cognizant of not having much if any further developed infrastructure.

The Mount Shasta Wilderness was designated 1984 (Public Law 98-425, 1984). The Wilderness Act (1964) generally prohibits the following activities inside a designated wilderness area: commercial enterprises, permanent or temporary roads, use of motor vehicles, motor boats, motorized equipment, mechanical transport, landing of aircraft, and permanent structures. However, there are special provisions listed in the Wilderness Act for authorizing the prohibited activities. Currently commercial activities for mountain climbing and backcountry skiing are authorized in the Mount Shasta Wilderness, as they fall into a special provision under Section 4(d)(5) of the Wilderness Act (1964) “for activities which are proper for realizing the recreational or other wilderness purposes of the area.” These guided activities are authorized due to the safety concern for people attempting to summit Mount Shasta as well as the technical expertise required to do so. There is currently a limit of three mountaineering companies permitted for the Mount Shasta Wilderness. The three mountaineering companies collectively utilize about 2,400-3,500 service days (calculated as the total number of clients on a trip multiplied by the number of days of each trip) (Shasta-Trinity National Forest, 2018 - b).

In 1992, the Shasta McCloud Management Unit of the Shasta-Trinity National Forest completed the Final Environmental Impact Statement (FEIS) for the Mount Shasta Wilderness Plan, but the plan went unsigned. It is unclear why this document was never signed and incorporated into the management of Mount Shasta. Nevertheless, the issues identified and analyzed in the FEIS were wilderness carrying capacity, the permit system, water and sanitation, domestic pets, wood fires, use of meadows, outfitters/guides, riding and pack stock, and trail development and maintenance. The preferred alternative proposed the following changes:

- The predetermined management zones would be divided into primitive, semi-primitive and transition opportunity classes (see Figure 6)
- The maximum party size would be 10 people
- The length of stay would be limited to seven days
- A permit system would be in place for wilderness trips during the months of May to October where day use would not be limited but camping permits would be limited based on the zone requested for camping. The permits would be issued on a first come first served basis and would be split where 75% would be for long-range advance planned camping requests and 25% would be for spontaneous trips.
- Initiation of a pack-out system for human waste

- Dogs would be prohibited
- Campfires would be prohibited
- Camping in and adjacent to meadow areas would be prohibited
- The number of permitted outfitters would be restricted to six companies, each with a maximum of 700 service days.
- Use of stock would be permitted for day use only but limited to 10 head per party. Stock would not be permitted to graze or run loose in the meadows.
- New trails would be developed: Ski Bowl to Diller Canyon, Ski Bowl to Mud Creek Overlook, Whitney Falls to Ash Creek Overlook, Olberman's Causeway to Lake Helen, Green Butte to Lake Helen.
- Bolam Creek trailhead and Sand Flat trailhead would be moved.
- Sand Flat, Bolam Creek, North Gate, Brewer Creek and Clear Creek trailheads would be developed with designated campsites, potable water, sanitation facilities, stock facilities, interpretive and directional signage and adequate parking.
- Where feasible, potable water and designated campsites would be added to Bunny Flat trailhead.
- Roads giving access to semi-primitive zones, except for the Cascade Gulch zone, would be improved for better access of different types of vehicles.

The preferred alternative in the FEIS for the Mount Shasta Wilderness Plan had suggested breaking down the current 'primitive' ROS class for the wilderness to Wilderness Recreation Opportunity Spectrum WROS class assignments based on the different management zones that the plan identified. Those assignments were 'primitive zone' for the northern and northwest portion of the wilderness, as well as a portion on the east side of the wilderness (Figure 8). The 'semi-primitive zone' would make up the most of the wilderness and be found on the northern and eastern portions of the wilderness, as well as a sliver section on the southwestern side where Cascade Gulch is found. Finally, the transition zone would be located on the southern portion of the wilderness where Avalanche Gulch and South Gate Meadows are found. The transition class is used by the Forest Service for especially high use areas that "transition" between non-wilderness lands and the ROS classifications of primitive and semi-primitive non-motorized, which are the only two ROS classifications appropriate for wilderness areas (USDA Forest Service, 1985).

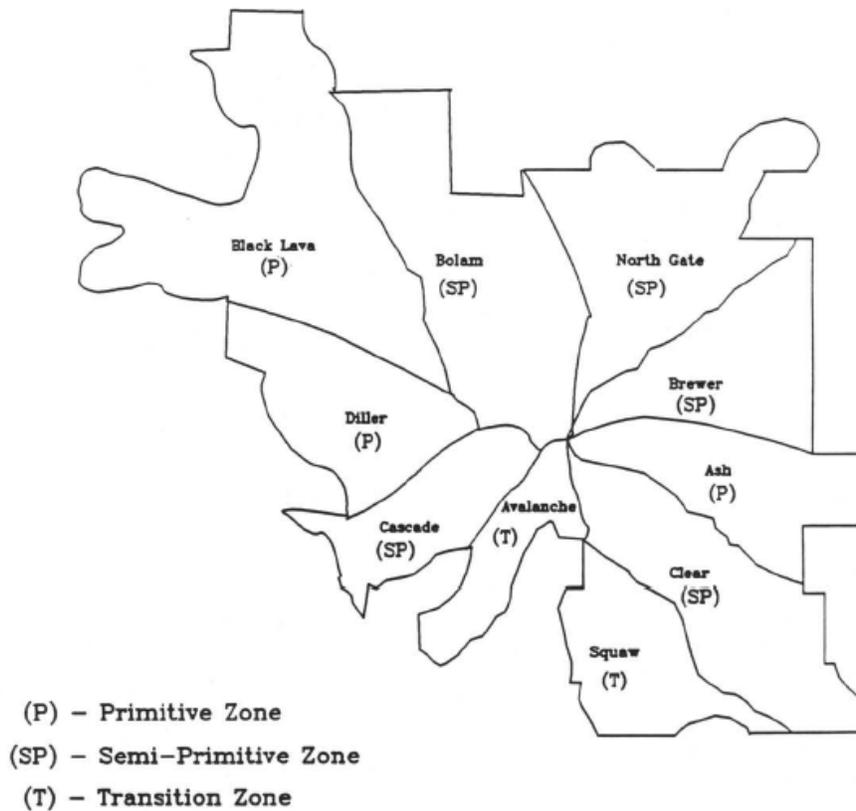


Figure 8: Wilderness Recreation Opportunity Spectrum categories under the preferred alternative of the Wilderness Plan FEIS for Mount Shasta

Even though the Mount Shasta Wilderness Plan never came to be the managing document for the Mount Shasta Wilderness, a Forest Order (1994) -- Number 14-59/61-31 -- was issued that took into consideration some of the provisions from the preferred alternative. Below are the relevant prohibitions in the Mount Shasta Forest Order that have been in force since 1994:

- Building, maintaining, attending or using a fire, campfire or stove fire, except portable stoves using gas, jellied petroleum or pressurized liquid fuel. 36 CFR 261.52(a)
- Entering or being in spring-fed meadows, except on designated trails. 36 CFR 261.53 (b)
- Entering or using a trail, campsite or other area by a group larger than 10 persons. 36 CFR 261.58 (f)
- Camping for more than 7 nights within a 30 day period, starting with the first night of occupancy. 36 CFR 261.58 (a)
- Hitching, tethering, or hobbling a horse or other saddle or pack animal for more than 2 hours in any one place. 36 CFR 261.58(aa)

- Entering or being in the area with more than 10 head of pack or saddle animals. 36 CFR 261.57 (a)
- Entering or being in the area with pack or saddle animals overnight. 36 CFR 261.57 (a)
- Grazing stock in spring-fed meadows. 36 CFR 261.57 (e)
- Camping within 100 feet of lakes, streams, springs, and trails, or where posted. 36 CFR 261.11 (c)
- Entering or being in the area with a dog(s). 36 CFR 261.53(e)

Some other requirements that the Shasta-Trinity National Forest has implemented for the Mount Shasta Wilderness are a pack-out waste system in wilderness, a wilderness pass required for visitors entering wilderness (which is free of charge), and a summit pass requirement for visitors planning on hiking above 10,000 feet (\$20 for 3-day pass, \$30 for annual pass).

A 1999 Forest Order for Panther Meadows and the surrounding parking lots of Upper and Lower Old Ski Bowl (Order Number 14-59-39) prohibited groups of more than 10 people; being in a body of water; camping in Panther Meadows or within 300 feet of the Meadows; camping in the Lower Ski Bowl Parking Lot for more than three consecutive days; having a campfire or stove in Panther Meadows, the Upper Ski Bowl Parking Lot and the Lower Ski Bowl Parking Lot; parking in the Upper Ski Bowl Parking Lot between 12:00 a.m. and 6:00 a.m.; parking in the Lower Ski Bowl Parking Lot for more than seven consecutive days; and being publicly nude in Panther Meadows.

A 2017 camping and campfire Forest Order (Order Number 14-17-02) prohibited camping and having a campfire or fire stove within the plantations that surround Mount Shasta. These plantations are located on either side of the Everitt Memorial Highway from Gateway Trailhead to about 1.5 miles south of Red Fir Flat. These restrictions were put in place due to the disruptive and irresponsible dispersed camping that had been occurring in these locations, as well as the threat of human caused wildlife to the local communities.

An Over-the-Snow Vehicle (OSV) Travel Restriction Forest Order (Order Number 14-59-36) issued in 1996 prohibits operating a motorized over-the-snow vehicle within designated closure areas. These are north of the Everitt Memorial Highway from the Cascade Gulch Road to about 1.5 miles past Bunny Flat and the Mount Shasta Wilderness.

Summary

To recap, with the growing and changing industry and demand for outdoor recreation -- especially with the projected increases in use of developed and interpretive sites, sightseeing/viewing nature, challenge activities, hiking and developed skiing/snowboarding -- modifications will need to occur at the recreation sites along the Everitt Memorial Highway corridor in order to accommodate the expanding usage. There are currently ecological and social stresses visible on Mount Shasta which include crowding at parking lots, user conflicts between motorized and non-motorized winter recreationists, visitation regularly reaching facility capacity at the two campgrounds on Mount Shasta (McBride Springs Campground and Panther Meadows Campground), the large number of visitors during climbing season - all climbing the Avalanche Gulch route on Mount Shasta, user-created downhill mountain bike trails, and high levels of spiritual use of the recreation sites on Mount Shasta. There are several strategies/techniques that can be utilized to manage and repair the ecological and social impacts visible on Mount Shasta which involve modifying the use and spatial distribution or timing characteristics of that use, facility design changes or expansions, new facility development, visitor use management (capacity), and education. The ultimate selection of management strategies will be dependent on the desired outcome of the land management agency (Interagency Visitor Use Management Council, 2016), as well as objective information on preferences, perceptions and attitudes of visitors (Manning, 2011). Once management strategies are decided upon, a 'proposed action' to complete the changes/improvements will be developed and subjected to the National Environmental Policy Act process. This process does include public involvement through scoping and public meetings to comment on the 'proposed action' before any changes can occur.

METHODS

An on-site vehicle intercept survey was conducted to understand visitors' views on management of recreation in the Mount Shasta recreation area. We conducted a random sample survey along the Everitt Memorial Highway (Siskiyou County Road A10) over a year-long period starting in March, 2017, and ending in February, 2018. The goal was to achieve at least 600 completed surveys, which was large enough to be able to compare important subgroups. Consulting historic data from the Everitt Memorial Highway road counter suggested that having six days (four weekdays, two weekend days) per month would generate the target sample size. Random selection of dates, using an on-line random number generator, ensured that the sample would not be biased. Six make-up days were also randomly generated each month in case it was not possible to survey on any of the original dates (e.g., due to weather or illness). However, only one make-up date was used, due to heavy snowfall which made stopping vehicles a safety hazard. Ultimately, the target was met with 805 completed surveys.

A single survey location was selected that permitted contacting people leaving from all the recreation areas/trails along the Everitt Memorial Highway corridor (Figure 3). On each survey day, the surveys started at 10:00 a.m. and ended at either 4:00 p.m. or 6:00 p.m., depending on the number of daylight hours. (Surveying from December through March ended at 4:00 p.m., and surveying from April through November ended at 6:00 p.m.)

A variety of Forest Service employees and volunteers implemented the surveys. Each person was trained on how to implement the survey and they were monitored to ensure the data were collected appropriately and accurately. During the survey period, every vehicle, pedestrian and bike that exited past the survey site was counted using hand tally counters by the surveying crew. Every 10th vehicle, pedestrian or bike was stopped and the visitors were asked if they wanted to participate in the voluntary survey. If they were willing they were asked to pull off the road to the pullout to receive the survey for completion. If the vehicle had more than one person inside, the person who had the next birthday (from the survey date) and was over 18 years of age was asked to complete the survey. If they were unwilling they were asked to answer three questions from the survey so that we could compare their responses with those of people who agreed to complete the full survey. This would reveal whether there was any systematic bias in the sample. (The three questions asked were: where did they recreate, what was their primary recreation activity and what was their zip code/country of origin.)

If a bus or large RV was the 10th vehicle, it was stopped and one occupant (closest to the door and could speak English) was asked the three questions. They were not asked to participate in the full survey because the pull-out was not large enough for these vehicles to pull off the road completely. All buses and RVs were tallied for the survey duration. No Forest Service, law enforcement, or emergency vehicles were stopped to participate in the survey. If these vehicles happened to be the 10th vehicle the survey crew stopped the next vehicle.

A TRAFx Generation 4 vehicle counter was used for the duration of the study and was located below the lowest trailhead along the Everitt Memorial Highway. It was used to count all the vehicles in 24-hour periods beginning at 1200 a.m. (midnight) the day of the survey and concluding at 11:59 p.m. after the survey. This information was collected to determine the total number of vehicles that drove up the Everitt Memorial Highway during the 24-period of the survey day and will be helpful to see how representative our random sample days are.

The survey instrument (see Appendix A) was a written questionnaire with 31 multiple-choice and open-ended questions. Most of the questions were selected from the “pool of known questions” that have been approved by the Office of Management and Budget (OMB), with two new questions developed for this study. The survey questions included trip characteristics, crowding perception, opinions about management and facilities, visitor satisfaction and demographic questions. The survey was approved by the OMB prior to initiating the study (OMB No. 0596-0236). The survey took from 5 to 15 minutes to complete.

All the survey data were entered into an Excel spreadsheet and then imported for analysis into IBM SPSS Version 21. SPSS was used to generate frequencies for responses to each of the survey questions. Cross-tabulation analyses (chi-square tests) were used to compare subgroups of visitors on some of the questions, as well as to compare respondents to non-respondents (non-response bias tests). Microsoft Excel was used to create tables and graphs of each analysis.

RESULTS

Use Levels during the Survey Year and during Survey Periods

The traffic counter registered nearly 130,000 vehicles for the entire year, and approximately 26,000 vehicles on the days when surveys were administered (Table 3). On the study days, 1,422 total contacts were made, which makes up about 1% of the total vehicles that traveled down the Everitt Memorial Highway during the entire year. A total of 83 RVs/trailers were tallied, only 3.6% of which were not surveyed due to lack of space at the pullout (Table 4). Eighty of the people contacted had previously completed the survey and declined to take the survey again. After removing these 80 contacts, the valid total was 1,342 contacts. Of these, 805 completed the survey and 537 refused, which was a response rate of 60%. Table 5 shows the primary reasons given for refusing to take the survey.

Table 3: Summaries of traffic counts and surveys collected

Season/Day	Total Vehicle Count from Year Survey Period	Total 24 Hour Road Count on Survey Days	Total Hand Tally Count During Survey Period	Total Cars Stopped During Survey Period	Surveys Completed	Surveys Completed/ Cars Stopped - Response Rate
Spring (Mar-May)	27,675	5,664	3,197	308	180	58.4%
Summer (Jun-Aug)	54,516	10,481	5,493	540	309	57.2%
Fall (Sep-Nov)	30,660	6,818	3,459	338	195	57.7%
Winter (Dec-Feb)	17,016	3,217	2,469	237	121	51.1%
weekday	-	14533	7556	730	411	56.3%
weekend	-	11647	7062	693	395	57.0%
Total	129,867	26,180	14,618	1,422	805	56.6%

Note: Data are number of vehicles that traveled on the Everitt Memorial Highway during the survey period, 24-hour period of the survey day and during the year the survey was conducted. (Response rates include vehicles that were stopped but whose occupants had already completed the survey (n=80)).

Table 4: Total number of large vehicles tallied during the survey period and percent excluded from survey due to size

Vehicle Type	Count	Percent Stopped but Excluded from Survey
Total RV/Trailers	83	3.6
Total Buses	4	50.0

Table 5: Reasons given for refusal to complete the survey (N=537)

Reason	Percent
No reason given	45.0
In a hurry	44.0
Caravanning with other cars	3.7
Had restless kids/dogs in the car	3.7
Could not speak English well	3.5
Unwilling to answer questions	3.2
Did not recreate	2.8
Too tired	1.5
Part of a commercial or educational trip	1.3
Too large to pull into survey site	0.9
Was having car issues	0.7
Showing a friend around	0.2
Shuttling someone	0.2

Non-response Bias Checks

To evaluate the representativeness of survey respondents, I examined how they differed from those who refused to complete the survey in the locations they visited (Table 6), their primary activities (these activities were asked in an open ended question form, so activities will differ from the pre-determined set of 25 activities reported later in Table 24) (Table 7), and their region of residence (Table 8). Overall, the frequency of visitation to the different sites was similar for the two groups, with the primary difference being that survey respondents were slightly more likely to have visited Gateway, Sand Flat, Bunny Flat, Panther Meadows and Campground, and Old Ski Bowl. (Several of the other differences were statistically significant, due to large sample sizes, but quite small.)

Table 6: Locations visited by survey respondents (N=800) and non-respondents (N=495) on their trip to Mount Shasta

Locations	Respondents	Non-Respondents	Chi-square	<i>p</i>
	% who visited each site			
Gateway	9.8	2.6	23.75	<.0005
Black Butte	6.5	4.2	2.93	0.09
McBride Springs Campground	6.9	4.4	3.23	0.07
John Everitt Vista	6.1	2.4	9.33	0.002
Red Fir Flat	5.8	3.0	5.04	0.03
Sand Flat	10.8	5.1	12.68	<.0005
Bunny Flat	57.0	43.0	23.90	<.0005
Panther Meadows	16.0	7.7	18.96	<.0005
Panther Meadows Campground	8.1	3.0	13.69	<.0005
South Gate Meadows	3.5	1.2	6.26	0.01
Old Ski Bowl	17.1	7.9	22.26	<.0005
Grey Butte	3.0	0.6	8.58	0.003
Horse Camp	6.5	3.8	4.18	0.041
Helen Lake	5.6	2.2	8.56	0.003
Mount Shasta Summit	4.4	4.0	0.08	0.77

Among both respondents and non-respondents, hiking was the primary activity for just over one-quarter of visitors (Table 7). Sightseeing and metaphysical/spiritual activities were next for both groups. Overall, then, the distribution of activities among respondents and non-respondents was quite similar.

Table 7: Primary activity survey respondents participated in while on their visit to Mount Shasta (N=489)

Primary Activity	Respondents	Non-Respondents	Chi-square	<i>p</i>
	% who visited each site			
Hiking	27.6	28.4		
Sightseeing	14.2	17.6		
Meditation/Spiritual/Metaphysical	8.9	7.8		
Driving For Pleasure	5.8	5.7		
Backcountry Skiing	4.6	2.5		
Mountaineering	3.9	4.3		
Camping	3.5	4.9		
Sledding	1.6	2.5		
Playing In The Snow	1.1	3.9		

Photography	1.1	3.1		
Walking Dogs	1.1	2.7		

After deleting people who had already done the survey (most of whom were local residents), survey respondents and non-respondents were equally likely to be from the different region of the country (Table 8). The local area was defined as having a 96xxx zip code, while “regional” visitors were from central California, northern California and southern Oregon. “Distant” was considered all other parts of the US.

Table 8. Region of residence of survey respondents and non-respondents (US residents only)

	Respondents (n=644)	Non-Respondents (n=456)
	-----Percent-----	
Local	42.1	42.3
Regional	38.2	34.9
Distant	19.7	22.8

Chi-square = 2.02, *p* value = .36

Demographics of Survey Sample

Seven of the survey questions were about socio-demographic characteristics. I chose to ask these questions to provide background information about the respondents as well as to enable a comparison with the general population (from Census data) and other similar research that has been completed. In my sample, 54.8% of the respondents were male, 43.9% were female and 1.3% marked “other.” Nearly all respondents (93.5%) indicated that their primary language was English, and 6.5% responded that they primarily spoke another language (Table 9).

Table 9: Primary languages spoken by the 6.5% of respondents (n=52) who responded that their primary language was not English

Language	Percent
Spanish	21.2
French	11.5
Dutch	5.8
Hebrew	5.8
Japanese	5.8
Portuguese	5.8
Chinese	3.8
Czech	3.8

German	3.8
Hungarian	3.8
Russian	3.8
Swedish	3.8
Armenian	1.9
Bulgarian	1.9
Cantonese	1.9
Danish	1.9
Finnish	1.9
Gujarati	1.9
Hindi, Urdu	1.9
Mandarin	1.9
Marathi (Indian)	1.9
Mongolian	1.9
Sanskrit	1.9

Nearly 18% of respondents (n=138) chose not to answer the question about their ethnicity, and 17% of respondents (n=130) chose not to answer the question about the racial group with which they self-identified. Excluding the visitors who chose not to answer, Tables 10 and 11 show the breakdown of the ethnic and racial groups with which respondents self-identified. The majority identified as white and non-Hispanic or Latina/o.

Table 10: Ethnicity breakdown of survey respondents (N=614)

Ethnic Group	Frequency	Percent
Not Hispanic or Latina/o	569	92.7
Hispanic or Latina/o	45	7.3

Table 11: Racial group breakdown of survey respondents (N=674)

Racial Group	Frequency	Percent
White	559	82.9
Asian	57	8.5
American Indian/Alaska Native	32	4.7
Black/African American	14	2.1
Native Hawaiian or other Pacific Islander	12	1.8

Respondents tended to be well educated (Figure 9). Approximately one-third had earned a graduate degree or professional degree, and nearly as many had stopped their education with a Bachelor's

degree. According to the US Census Bureau website (2012-2016), 32% of California residents and 31% of Oregon residents who are 25 years old of age or older have at least a Bachelor’s degree. Thus, the survey respondents are more highly educated than the public at large.

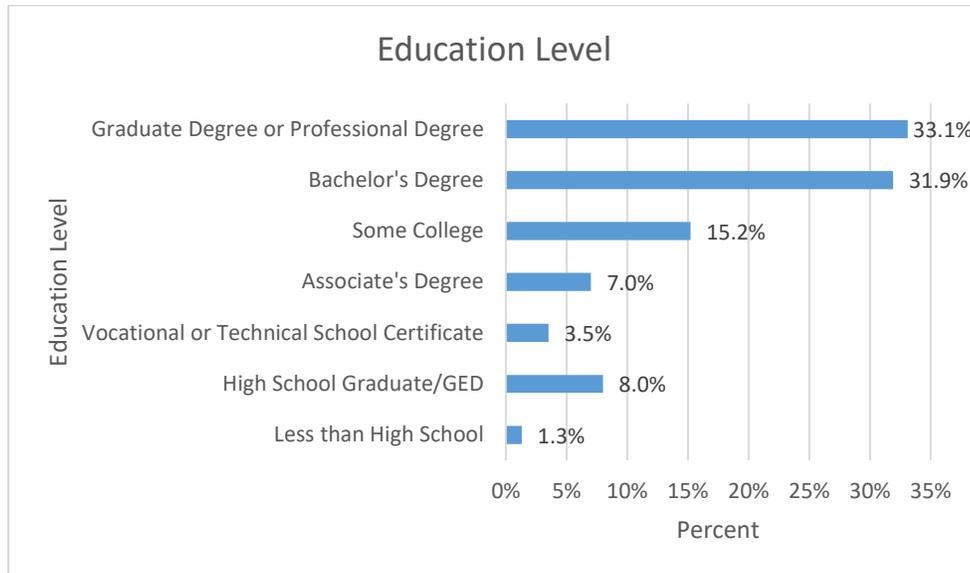


Figure 9: Highest education level attained by respondents (N=752)

Nearly 20% of respondents (n= 147) chose not to answer a question about their household income. Excluding these individuals, the median income was \$24,999, and 50% had incomes between \$50,000 and \$150,000 (Figure 10). According to the US Census Bureau website (2012-2016) the median household income for California residents was \$67,169 and \$56,119 for Oregon residents. Thus, about half of the survey respondents make more than the public at large, and the remaining 32% of the survey respondents make less than the public at large.

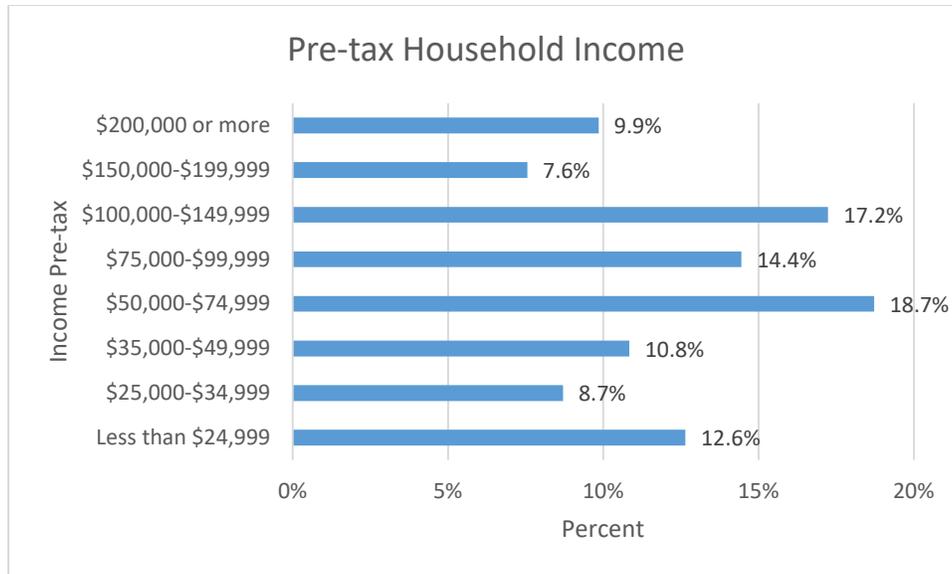


Figure 10: Household income of survey sample respondents who answered the question (N=609)

Table 12 shows the top 10 zip codes of the survey respondents from the US; the largest single group of respondents were from the City of Mount Shasta (n=157). Approximately 5% of respondents were from other countries (Table 13).

Table 12: Top 10 zip codes of survey respondents

Zip Code	Frequency	City
96067	157	Mount Shasta, CA
96094	26	Weed, CA
96003	15	Redding, CA
97520	15	Ashland, OR
96025	14	Dunsmuir, CA
96097	10	Yreka, CA
96001	7	Redding, CA
96057	7	McCloud, CA
95134	6	San Jose, CA
96002	6	Redding, CA

Table 13: Country of origin for non-U.S. residents (n=33)

Country	Frequency
Canada	6
Australia	3
England	3

Israel	3
UK	2
Spain	1
Belgium	1
Colombia	1
Czech Republic	1
Denmark	1
Finland	1
First Nations Canadian	1
France	1
Hong Kong	1
Mexico	1
Netherlands	1
New Zealand	1
Sweden	1
Switzerland	1
The Netherlands	1
Vanuatu	1

Most respondents were traveling in private parties, with only 7.0% being part of an organized group. School groups were less common than commercially guided or other organized groups (Figure 11). Large/organized groups had the potential to be underrepresented in the sample because large vehicles such as school/charter buses could not pull into the survey site safely and groups that were caravanning might be unwilling to stop for long enough to take the survey. However, there were few such instances (Tables 4 and 5). The majority (58.3%) of respondents had 2-3 people in their group; a surprisingly large number (27%) of respondents were on a solo trip (Figure 12). Most respondents (83.5%) did not have any children in their group; visitors with children typically had one or two children in their group (Figure 13).

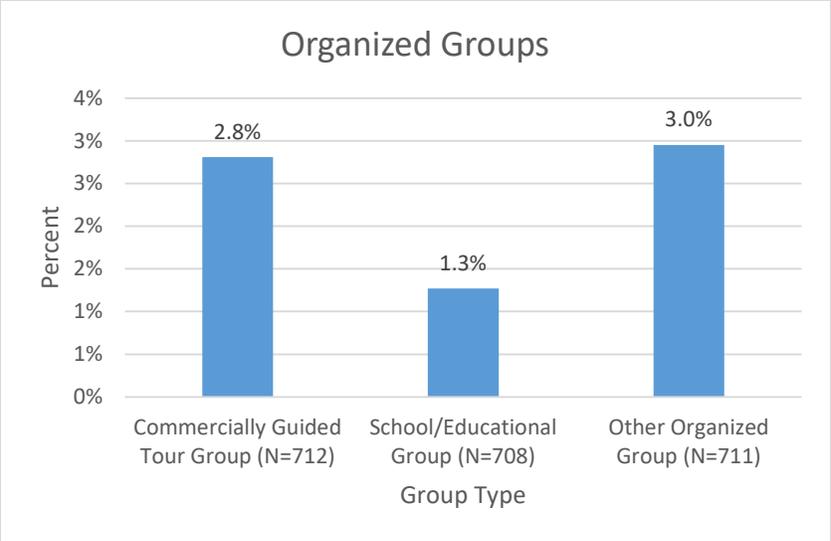


Figure 11: Percent of survey respondents who traveled with an organized group

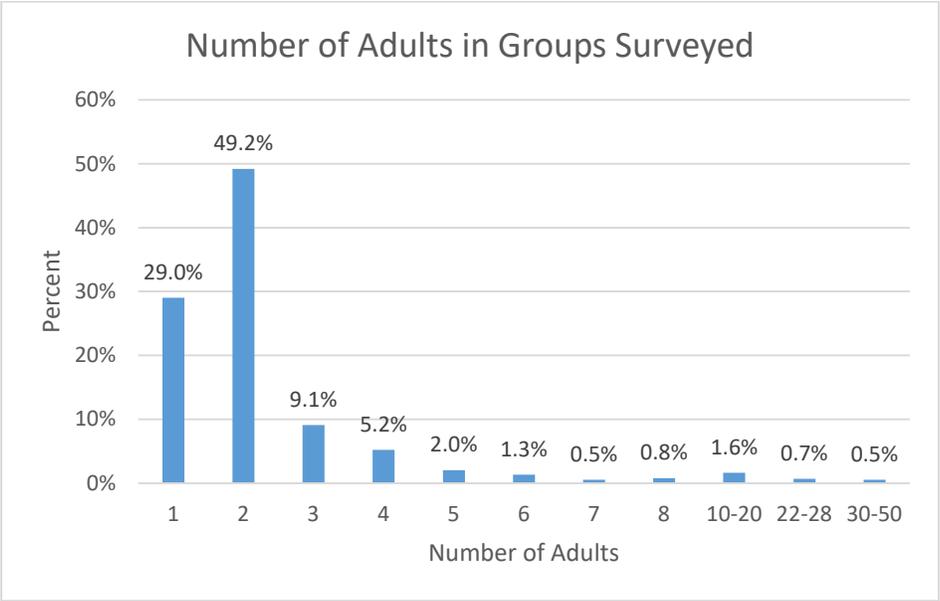


Figure 12: Number of adults in each group surveyed (N=748)

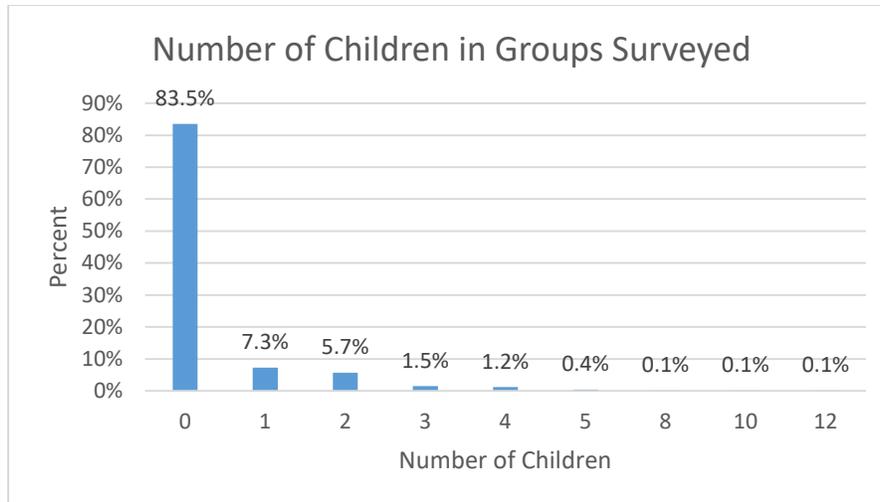


Figure 13: Number of children in each group surveyed (N=740)

Two questions were asked about trip planning – one about how far in advance visitors planned their trip (Tables 14 and 15) and one about whether Mount Shasta was a primary or secondary destination (Table 16). More than half of respondents (61.3%) planned their trip on relatively short notice (from hours up to 7 days in advance), while one-quarter (24.8%) planned their trip more than a month in advance (Table 14). People visiting from distant areas were much more likely to plan ahead than local residents (Table 15); nearly three-quarters of local visitors made the decision to visit within just hours of their trip.

Table 14: How far in advance survey participants planned their visit to Mount Shasta (N=738)

Length of Time	Percent
<24 hours ago	38.1
1-7 days ago	23.2
1-4 weeks ago	14.0
>1 month ago	24.8

Table 15: Trip planning by location of residence

Length of Time	Distant (Southern CA and Rest of USA)	Regional (Central/Northern CA and Southern OR)	Local (96000 zip codes)
	-----Percent-----		
Months	41.3	51.0	7.7
Weeks	21.5	65.8	12.7
Days	16.9	50.0	33.1
Hours	10.7	16.9	72.3

Pearson Chi-Square Value: 212.609 and p -value < 0.0005 (N=606)

Just over half of the survey respondents visited Mount Shasta as their sole purpose (Table 16). Most of them had visited Mount Shasta before (Table 17), with many having visited more than 51 times (Table 18). More than half of the local survey respondents (64.8%) had made more than 50 visits to Mount Shasta, compared to only 10-15% of visitors residing farther away (Table 19).

Table 16: Survey respondents' purpose of visit to Mount Shasta (N=740)

Purpose of Visit	Percent
Primary/Sole Destination of Trip	52.3
One of Multiple Planned Destinations	28.1
Incidental/Spur of the Moment Stop on a Trip Taken for Other Purposes	19.6

Figure 17: Percent of visitors who had and had not previously visited Mount Shasta (N=768)

Description	Percent
Had Visited Mount Shasta Before	72.3
First Visit to Mount Shasta	27.7

Table 18: Number of times repeat visitors had previously visited Mount Shasta (N=518)

Number of Visits	Percent
1-5	32.6
6-20	18.0
21-50	10.8
51+	38.6

Table 19: Past visits to Mount Shasta, by region of residence (N=433)

Number of Times Visited Mount Shasta	Distant (Southern CA and Rest of USA)	Regional (Central/Northern CA and Southern OR)	Local (96000 zip codes)
-----Percent within Residence-----			
1-5	63.5	48.0	12.4
6-20	23.1	25.7	11.2
21-50	3.8	10.8	11.8
51+	9.6	15.5	64.8

Pearson Chi-Square Value= 139.73 and p -value < 0.0005

Repeat visitors were asked during which seasons they had previously visited Mount Shasta; the responses for winter, spring and fall were similar (Figure 14). However, more people had visited Mount Shasta before in the summer.

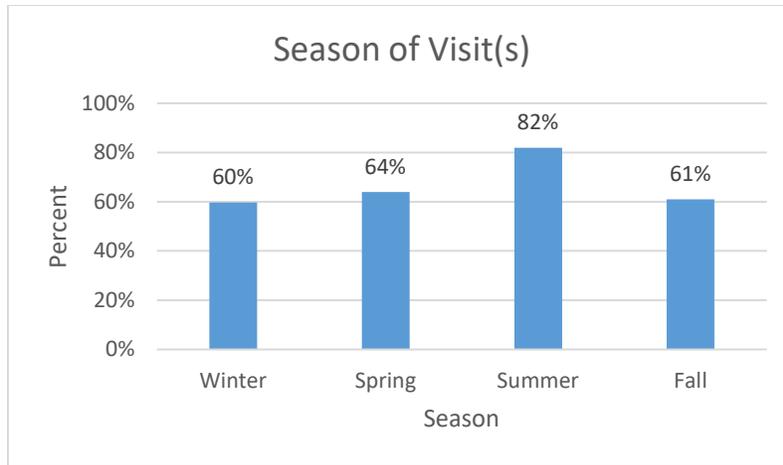


Figure 14: Seasons during which repeat visitors had previously visited Mount Shasta (N=519)

Figure 15 shows the year that repeat visitors had first visited Mount Shasta. The earliest year any respondent had visited was 1946. Approximately 15% of respondents first visited in 2015 or 2016.

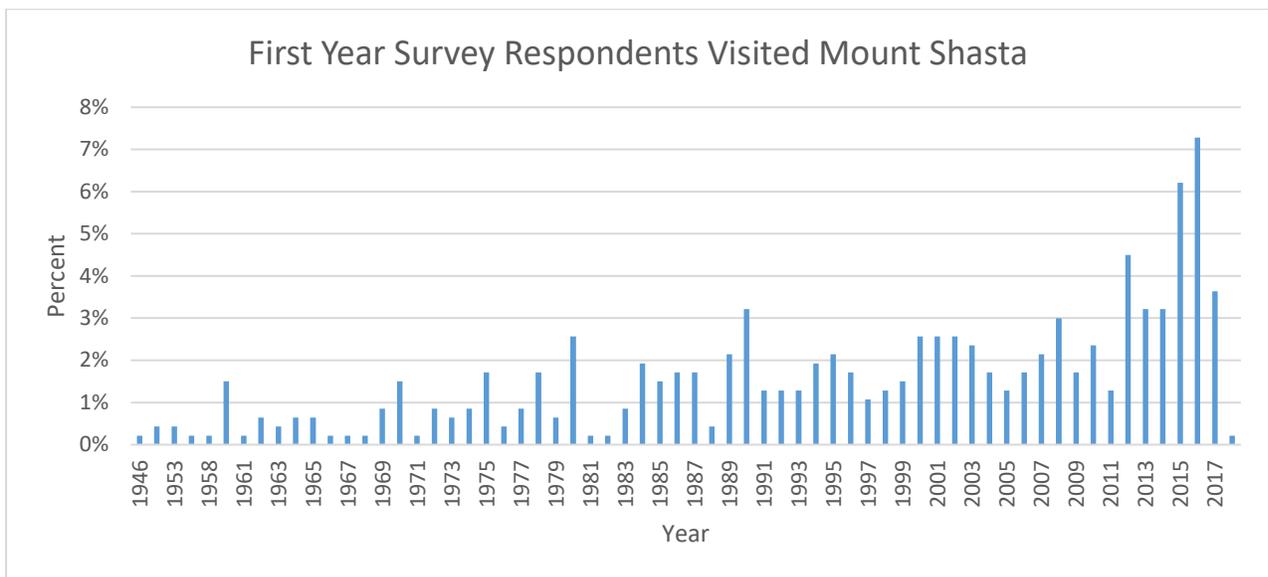


Figure 15: Year of first visit to Mount Shasta among repeat visitors (N=467)

Trip Characteristics

The most highly visited location along the Everitt Memorial Highway was Bunny Flat, followed by Old Ski Bowl and Panther Meadows (Table 20). Bunny Flat is accessible all year by vehicle and is the end of the road during the snow season. A gate beyond Bunny Flat is seasonally locked, making Old Ski Bowl and Panther Meadows only accessible by vehicle from about July to November, depending on snowfall.

During the survey period, Old Ski Bowl and Panther Meadows were accessible from August 7 to October 31. This was a month shorter than usual because of the large snowfall received that year. Eighty-two respondents indicated visiting a site other than those listed in the questionnaire (Table 21). Of these, 21 visited plantations and 22 wrote in a specific route/location on Mount Shasta (such as west of Casaval Ridge, Avalanche Gulch, or east of Green Butte Ridge).

Table 20: Locations survey respondents visited on their trip to Mount Shasta (N=800)

Location	Percent
Bunny Flat	57.0
Old Ski Bowl	17.1
Panther Meadows	16.0
Sand Flat	10.8
Other	10.6
Gateway	9.8
Panther Meadows Campground	8.1
McBride Springs Campground	6.9
Black Butte	6.5
Horse Camp	6.5
John Everitt Vista	6.1
Red Fir Flat	5.8
Helen Lake	5.6
Mount Shasta Summit	4.4
South Gate Meadows	3.5
Gray Butte	3.0

Table 21: Locations listed under the 'other' category of sites visited (n=82)

Location	Percent
Plantations	2.6
Outside Study Area	1.9
East of Green Butte Ridge	1.3
Avalanche Gulch	1.0
56 Road/Cascade Gulch	0.5
West of Casaval Ridge	0.5
Spiritual Destination	0.4
4 Mile Mountain Bike Trail	0.3
5 Mile Mountain Bike Trail	0.3
Wagon Camp Road	0.3

User Trail by McBride Campground	0.1
----------------------------------	-----

Visitation to the different locations varied by season (Table 22), and most of these differences were statistically significant, except for Black Butte, McBride Springs Campground, John Everitt Vista and Sand Flat. The visits to McBride Springs Campground and John Everitt Vista in the winter months is surprising, as the campground is closed to camping during that time and both sites had snow coverage during the survey period. Black Butte and Sand Flat are accessed year round, though the summit of Black Butte is not while there is snow. The rest of the locations had slight variability in visits across the seasons. Gateway Trails is visited more in the winter and spring months because the trails are wet, packed and not as dusty as they are in the summer and fall. The gate at Bunny Flat was only open from August through November 1st during the survey period, which explains why most of the visits occurring at Panther Meadows, Panther Meadows Campground, South Gate Meadows, Old Ski Bowl, and Grey Butte were in the summer and fall seasons when there was driving access to those locations. The trailhead to Horse Camp is at Bunny Flat and the most visits to this location were in the summer months, which could also be attributed to the gate at Bunny Flat being closed, making Horse Camp one of the only high elevation trails accessible along the Everitt Memorial Highway during these months. Red Fir Flat had more visits in the summer and fall, which is when this location is free of snow and open to camping.

Table 22: Locations visited across each season (N=800)

Location	Winter (Dec-Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Chi-Square Value	p value
	-----Percent within Season-----					
Bunny Flat	52.5	64.1	63.3	43.3	24.47	<0.0005
Other	24.2	12.4	4.6	10.4	35.29	<0.0005
Gateway	15.8	13.8	6.6	7.2	13.39	0.004
Sand Flat	8.3	8.8	13.4	9.8	3.91	0.272
Black Butte	5.0	8.3	6.9	5.2	2.05	0.563
McBride Springs Campground	4.2	5.0	9.5	6.2	5.85	0.119
Old Ski Bowl	4.2	5.0	18.4	34.5	74.80	<0.0005
Horse Camp	3.3	5.5	10.8	2.6	16.54	0.001
John Everitt Vista	2.5	7.7	7.5	4.6	5.37	0.147
Helen Lake	2.5	11.0	6.6	1.0	20.45	<0.0005
Red Fir Flat	1.7	2.8	8.9	6.2	12.16	0.007
Panther Meadows	1.7	1.7	21.0	30.4	81.67	<0.0005
Panther Meadows Campground	1.7	1.1	9.8	16.0	35.88	<0.0005
Gray Butte	0.8	1.1	2.3	7.2	16.54	0.001

South Gate Meadows	0.0	1.1	4.3	6.7	13.84	0.003
Mount Shasta Summit	0.0	7.7	6.9	0.0	23.84	<0.0005

The local survey respondents visited Gateway, Black Butte, and 'other' sites (Table 23) more than the distant and regional respondents. These locations are close to town, which could explain the higher visits from locals. Horse Camp, Helen Lake, and the Summit of Mount Shasta had more visits from the distant and regional visitors than the local visitors. These locations are along the climbing route of Mount Shasta and the data show that visitors from farther away are summiting Mount Shasta more than local residents. Bunny Flat -- which is the most popular recreation location along the Everitt Memorial Highway -- had about the same level of visitation by distant and regional visitors, but about 20% less from locals. Old Ski Bowl and Panther Meadows -- which are the second and third most popular recreation sites -- are also visited more by distant and regional visitors than locals.

Table 23: Locations visited based on resident location (N=639)

Location	Distant	Regional	Local	Chi-Square Value	p value
	-----Percent within Region-----				
Bunny Flat	61.6	67.5	45.4	26.89	<0.0005
Old Ski Bowl	24.0	17.7	12.5	8.30	0.016
Panther Meadows	23.2	16.5	8.1	17.51	<0.0005
Sand Flat	15.2	7.4	10.3	5.50	0.064
Panther Meadows Campground	11.2	8.2	4.4	6.50	0.039
John Everitt Vista	9.6	7.0	4.8	3.33	0.189
Mount Shasta Summit	9.6	7.0	0.7	18.46	<0.0005
Red Fir Flat	8.8	5.3	3.0	6.25	0.044
Gateway	8.0	4.5	18.1	25.52	<0.0005
Helen Lake	8.0	9.1	2.6	10.34	0.006
South Gate Meadows	5.6	3.7	2.2	3.03	0.220
McBride Springs Campground	4.8	7.4	3.0	5.36	0.069
Horse Camp	4.8	9.5	3.3	9.01	0.011
Other	4.8	9.1	17.4	15.65	<0.0005
Gray Butte	3.2	3.7	1.1	3.85	0.146
Black Butte	2.4	3.3	10.3	14.80	0.001

Distant = Southern CA and Rest of USA; Regional = central/northern CA and southern OR; Local = 96xxx zip codes

Visitors were asked to mark which activities they pursued during their visit from a table of options listed in the survey (Table 24). The four most popular were hiking, viewing natural features, driving for

pleasure and metaphysical/spiritual activity. Respondents were then asked to identify one primary activity (Table 25). Because this was an open-ended question, respondents wrote in more activities than just the 25 listed in the previous question.

Table 24: Recreation activities in which survey respondents participated during their current trip
(N=804)

Activity	Percent
Viewing Natural Features	55.0
Hiking	55.0
Driving for Pleasure	37.2
Metaphysical/Spiritual Activity	25.6
Star Gazing	14.7
Picnicking	13.4
Backpacking	10.6
Family Gathering	10.2
Other	10.0
Dispersed Camping	8.0
Developed Camping	7.6
Mountaineering	7.6
Backcountry Skiing/Split Boarding	7.1
Visiting Historic/Prehistoric Sites	5.2
Mountain Biking on Trails	4.2
Off-Highway Vehicle Travel	3.7
Gathering Natural Products	3.2
Snowshoeing	3.2
Sledding	3.1
Rock Climbing	2.9
Cross-Country Skiing	2.4
Bicycling on Roads	2.2
Snowmobiling	1.0
Hunting	0.2
Horseback Riding	0.1

Table 25: Primary activity survey respondents participated in while on their visit to Mount Shasta
(N=805)

Activity	Percent
Hiking	27.6
Sightseeing	14.2

Metaphysical/Spiritual/Meditation	8.9
Drive	5.8
Backcountry Skiing	4.6
Mountaineering	3.9
Camping	3.5
Mountain Biking	2.9
Sledding	1.6
Snow Shoeing	1.6
Family Gathering	1.5
Backpacking	1.1
Dog Walking	1.1
Playing In The Snow	1.1
Taking Pictures	1.1
Picnicking	1.0
Cross Country Skiing	0.9
Relaxation	0.9
Road Biking	0.9
Backcountry Split Boarding	0.7
Hiking/Spiritual	0.7
Skiing And Mountaineering	0.7
Christmas Tree Cutting	0.6
Running	0.6
Being In/Appreciating Nature	0.5
Snowmobiling	0.5
Being On The Mountain	0.4
Dispersed Camping	0.4
Mushroom Hunting	0.4
Star Gazing	0.4
Wood Cutting	0.4
Dirt Bike Riding	0.2
Shuttling Mountain Bikers	0.2
Vacation	0.2
Gathering Water	0.1
Geocaching	0.1
Geological Expedition Of Knowledge And Research	0.1
Guide Training Skills/Skiing	0.1
Hiking/Road Biking	0.1
Killing The Day	0.1
Looking For Deer	0.1
Metal Detecting	0.1

Off Road Driving	0.1
Rock Climbing	0.1
Shuttling Hikers	0.1
Skiing/Sledding	0.1
Snow Biking	0.1
Split Boarding And Mountaineering	0.1
Survey for Future Climb to the Summit	0.1
Wildflowers	0.1

The percentage of respondents whose primary activity was hiking did not differ notable between survey respondents who were local or visiting from out of the area (Table 26). However, distant and regional visitors participated more in sightseeing, metaphysical/spiritual/meditation activities, mountaineering and camping than local respondents. Conversely, local respondents participated more in backcountry skiing, driving and mountain biking than the distant and regional visitors.

Table 26: Top primary activities by region of residence

Activity	Distant (Southern CA and Rest of USA)	Regional (Central/Northern CA and Southern OR)	Local (96000 zip codes)
	-----Percent within Region-----		
Hiking	26.0	28.0	29.9
Sightseeing	20.5	17.5	7.4
Metaphysical/Spiritual/Meditation	10.2	8.9	4.4
Mountaineering	7.9	6.1	0.4
Backcountry Skiing	3.9	3.7	7.7
Camping	3.9	4.9	0.4
Driving	3.1	4.9	9.2
Mountain Biking	1.6	0.8	6.6

Pearson Chi-Square Value= 180.10 and p -value < 0.0005 (N=644)

Respondents were asked to rate from not at all important (1) to extremely important (5) how much various possible reasons to recreate at Mount Shasta applied to them. More than half of all respondents indicated that the following reasons were extremely important (Table 27): “to experience natural surroundings,” “to get away from the regular routine,” “for relaxation,” and “to be outdoors.”

Table 27: Importance of various reasons for recreating on Mount Shasta

Description	Not at all	Somewhat Important	Moderately Important	Very Important	Extremely	N=
	-----Percent-----					
To Be Outdoors	0.4	0.4	2.3	17.6	79.3	772
To Experience Natural Surroundings	0.7	0.7	2.8	20.6	75.4	759
For Relaxation	1.0	2.4	8.1	24.6	63.9	765
To Get Away From The Regular Routine	2.3	2.8	11.4	22.8	60.7	740
For Spending Time With Family Or Friends	12.3	6.4	12.2	22.3	46.8	705
For Physical Exercise	6.5	7.5	21.7	24.7	39.7	738
To Meditate	26.0	12.9	14.6	12.9	33.6	712
For The Challenge Or Sport	20.9	14.0	21.8	15.4	27.8	693
Summitting Mount Shasta	53.3	12.1	12.9	7.4	14.4	653
Other	0.0	0.0	2.9	15.7	81.4	70

To determine how many respondents were on day versus overnight visits, they were asked whether or not they stayed overnight at their homes during their trip. Respondents were almost split equally among people who stayed away from their permanent residence (i.e., overnight trips) and people who stayed at home (Figure 16). Among those on overnight trips, approximately half stayed in a hotel, cabin or B&B, and approximately one-quarter were tent camping (Table 28). Respondents had an option to mark if the location they were staying at was along the Everitt Memorial Highway or within a 45-minute drive from the Everitt Memorial Highway. This would help recreation managers know how much camping and what type of camping (i.e., car, tent, RV, or backpacking) occurred in the Everitt Memorial Highway corridor. The largest group of respondents who stayed overnight along the Everitt Memorial Highway were tent camping (17.9%).

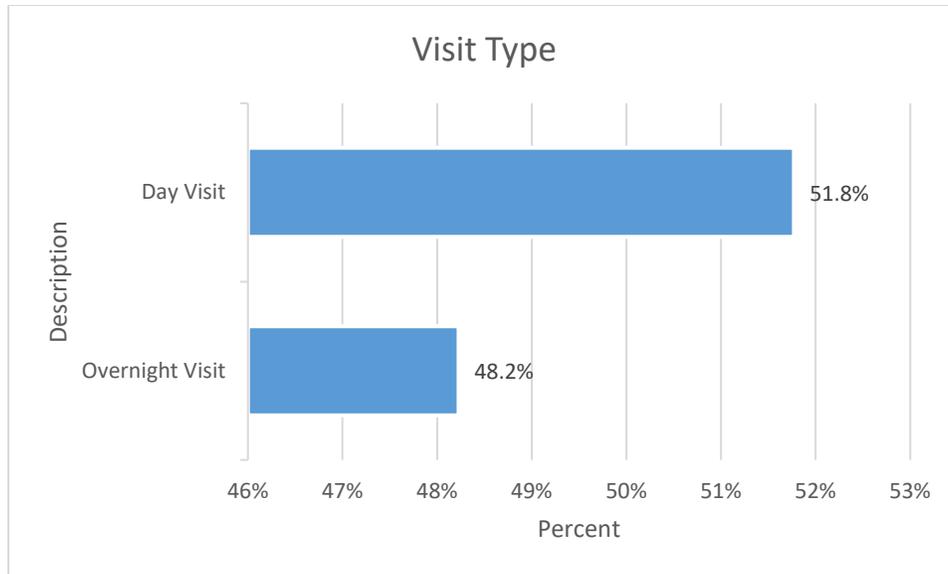


Figure 16: Percentage of survey respondents who made a day visit (did not stay away from their permanent residence overnight) or overnight visit (stayed away from their permanent residence overnight) to Mount Shasta

Table 28: Accommodations used by respondents who stayed overnight away from their permanent residence (n=381)

Location	Along Everitt Memorial Highway	Within 45 Minutes	Total
	-----Percent-----		
Developed Accommodation (hotel, cabin, B&B, etc)	0.0	50.1	50.1
RV/trailer Camping	7.1	2.6	9.7
Tent Camping	17.9	5.5	23.4
Backcountry Camping (Backpacking)	6.0	1.1	7.1
Residence of a Friend/Relative	0.3	5.0	5.3
Other Accommodations	3.7	4.2	7.9

Perceptions of Issues

More than half of the respondents stated that they did not feel crowded at all during their trip to Mount Shasta (Figure 17). Less than 7% felt “very” or “extremely” crowded. The locations where survey respondents did find crowding issues were at the parking lots, especially Bunny Flat parking lot (Table 29). The majority of respondents felt that the roads, trails, Panther Meadows and the Mount Shasta Wilderness were not at all to slightly crowded, and 3.3% found the roads very or extremely crowded,

6.9% felt the trails were very or extremely crowded, 6.6% felt the Mount Shasta Wilderness was very or extremely crowded and 13.1% felt Panther Meadows was very or extremely crowded. Survey respondents had higher perceptions of crowding on weekends and holidays than on weekdays (Table 30) and higher perceptions of crowding during the spring and summer months (Table 31). Survey respondents who participated in mountaineering (25.8% very or extremely crowded) and family gathering (25.0% very or extremely crowded) as their primary recreation activity had felt more crowded than the respondents with other primary recreation activities (Table 32). Regional visitors were slightly more likely to feel very or extremely crowded (8.0%) than the local respondents (4.4%) and distant visitors (4.0%) (Table 33).

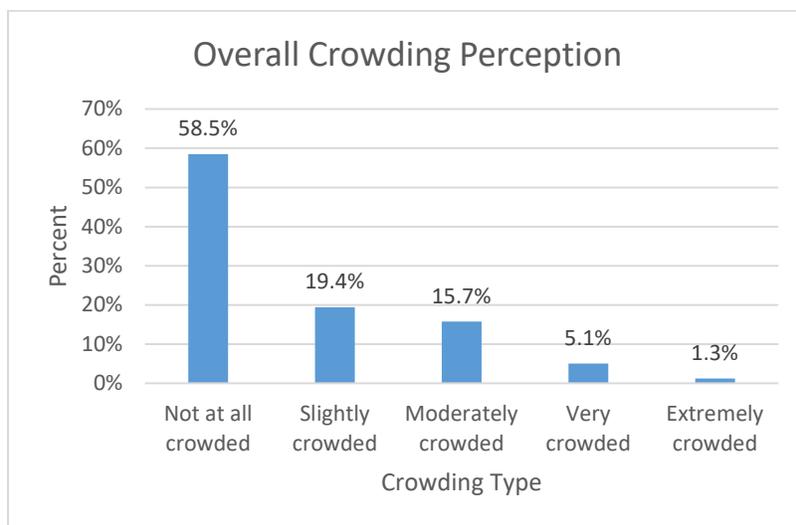


Figure 17: Overall crowding perception of survey respondents for their visit to Mount Shasta (N=788)

Table 29: Perception of crowding at different sites

Location	Not at All	A Little	Very	Extremely	N=
	-----Percent-----				
Roads Leading to Recreation Destination	73.5	23.2	2.6	0.7	762
Parking Lots at National Forest Trailheads/Sites	41.9	36.2	15.3	6.5	718
Trails	65.7	27.4	4.9	2.0	639
Panther Meadows	64.6	22.3	10.5	2.6	305
Mount Shasta Wilderness	71.9	21.5	5.2	1.4	367
Bunny Flat	40.3	31.1	17.9	10.6	546

Table 30: Weekday vs. weekend crowding perceptions

Day	Not at All Crowded	Slightly Crowded	Moderately Crowded	Very Crowded	Extremely Crowded
	-----Percent-----				
Weekend/Holiday	45.5	21.3	22.4	8.2	2.6
Weekday	71.2	17.5	9.3	2.0	0.0

Pearson Chi-Square Value: 70.385 and p -value < 0.0005 (N=788)

Table 31: Crowding perception across seasons

Season	Not at All Crowded	Slightly Crowded	Moderately Crowded	Very Crowded	Extremely Crowded
	-----Percent-----				
Winter (Dec-Feb)	69.7	10.1	15.1	4.2	0.8
Spring (Mar-May)	59.3	11.9	17.5	7.9	3.4
Summer (Jun-Aug)	45.2	27.7	20.1	5.9	1.0
Fall (Sep-Nov)	72.0	19.0	7.4	1.6	0.0

Pearson Chi-Square Value: 68.33 and p -value < 0.0005 (N=788)

Table 32: Crowding perceptions by primary activity

Primary Activity	Not at All Crowded	Slightly Crowded	Moderately Crowded	Very Crowded	Extremely Crowded
	-----Percent-----				
Family Gathering	58.3	8.3	8.3	16.7	8.3
Backcountry Skiing	67.6	10.8	13.5	2.7	5.4
Camping	39.3	17.9	32.1	7.1	3.6
Mountaineering	22.6	19.4	32.3	22.6	3.2
Drive	71.7	6.5	17.4	2.2	2.2
Hiking	63.8	21.3	11.3	2.7	0.9
Metaphysical/Spiritual/Meditation	51.4	22.9	18.6	7.1	0.0
Mountain Biking	77.3	13.6	9.1	0.0	0.0
Sightseeing	54.5	25.9	15.2	4.5	0.0
Sledding	61.5	15.4	23.1	0.0	0.0
Snow Shoeing	41.7	16.7	33.3	8.3	0.0

Pearson Chi-Square Value: 368.07 and p -value < 0.0005 (N=788)

Table 33: Crowding perception based on primary residence location

Primary Residence Location	Not at All Crowded	Slightly Crowded	Moderately Crowded	Very Crowded	Extremely Crowded
	-----Percent-----				
Distant (Southern CA and Rest of USA)	55.6	28.2	12.1	3.2	0.8
Regional (Central/Northern CA and Southern OR)	51.7	19.7	20.6	6.3	1.7
Local (96000)	65.2	15.0	15.4	3.7	0.7

Person Chi-Square Value: 19.345 and *p*-value: 0.013 (N=629)

Respondents were asked whether or not the presence of other people made them feel rushed or slowed them down at any point during their trip. Only 75 respondents (9.5%) answered affirmatively (Figure 18). Among this group, the primary locations listed were Bunny Flat (27 respondents), Panther Meadows (11 respondents), Old Ski Bowl (4 respondents), McBride (3 respondents), and on roads (3 respondents); 27 people listed other locations.

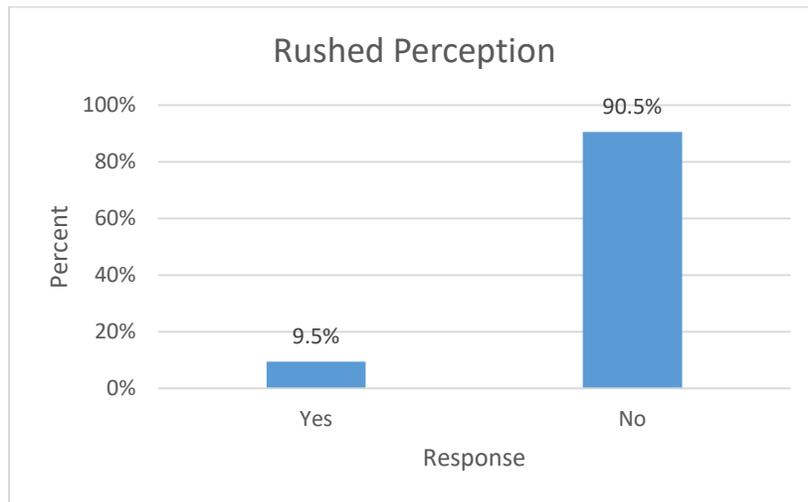


Figure 18: Percentage of survey respondents who did or did not feel rushed or slowed down at any point during their trip due to the presence of other visitors (N=793)

The majority of respondents (81.6%) felt that the number of people currently recreating along the Everitt Memorial Highway is acceptable (Figure 19). Among the 3.5% of respondents who felt the level of use was not acceptable, most of the concerns were around parking and crowding at Bunny Flat and

crowding. Table 34 lists the other recommendations respondents had in order to create an acceptable level of recreation along the Everitt Memorial Highway.

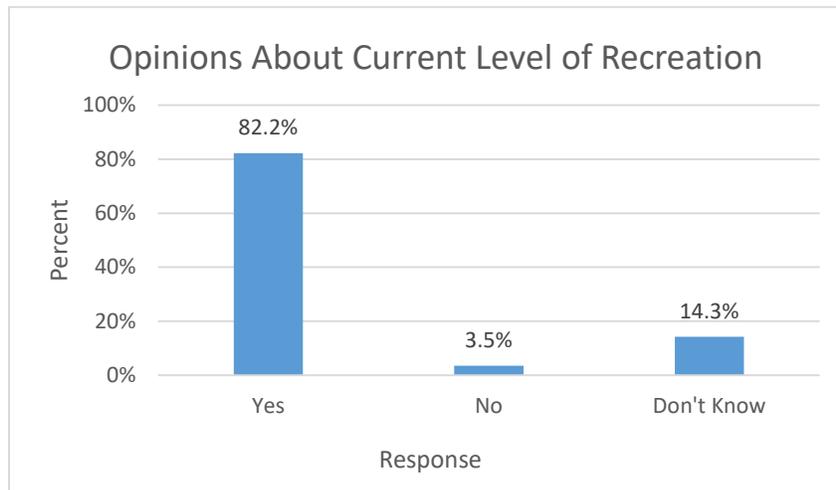


Figure 19: Acceptability of the number of people recreating along the EMH corridor (N=799)

Table 34: Suggestions survey respondents provided to create acceptable level of recreation along the Everitt Memorial Highway (N=40)

Recommendation	Frequency
More Multi-use (Motorized/Non-Motorized) Parking Needed at Bunny Flat (two respondents suggested separate parking for snowmobilers; one respondent suggested using parking attendants)	8
Would Like to See an Increase in Use of the Area	2
Would Like to See Less People (one respondent had specifically at Bunny Flat)	2
Provide More Campgrounds Besides McBride	1
Eliminate Camping at Vista Point and Along Roadway, Many Campers Spend Days at Them	1
Eliminate Long Term Campers	1
Provide Accessibility to Campers	1
Build More Mountain Bike Trails to Accommodate More People	1
Eliminate Vehicles from Dirt Roads	1
Initiate Use Restrictions	1
Initiate Permit System for Climbing Especially Over Holiday Weekends	1
Initiate Lottery/Limit at Bunny Flat	1
Initiate Camping Permits	1
General Comments	
Getting Crowded on Holiday Weekends/Weekends	6

Is it Sustainable for the Wilderness?	1
Don't Care for the Noise and Exhaust Pollution of Snowmobiles at Bunny Flat	1

In a direct question asking whether participants had experienced “any conflicts with other parties,” only 18 respondents answered affirmatively (Figure 20). Those conflicts consisted of encounters with people who had dogs off leash, people being loud or playing music, people driving fast, a car idling in the campground, and having a campsite taken by someone who pulled the camp tag off of a campsite.

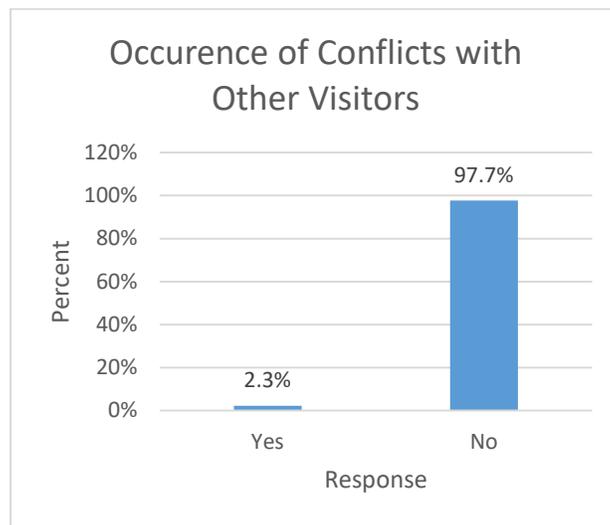


Figure 20: Survey respondents’ responses about whether or not they had conflicts with other people (N=799)

Visitors who had made prior trips were asked whether or not they “had noticed any changes related to recreation” at Mount Shasta in the last five years. Within this group, 51% of people had not noticed any changes related to recreation, while 49% of the survey respondents had noticed changes (Table 35). Some of the changes survey respondents mentioned are listed in Table 36. The change that most people reported noticing was more people.

Table 35: Perception of changes related to recreation in the past five years among long-time visitors (N=356)

Response	Percent
Yes	49.0
No	51.0

Table 36: Changes in recreation conditions reported by long-time visitors over the past five years

(N=157)

Comment	Percent
More People/Climbers/Skiers/Snowmobiles/Spiritual Tourists	50.0
New Trails/Improved/Better Maintained	8.5
More Transients, Homeless Camping/Living In The Woods/Drug Use	6.0
Sign Improvement	4.0
More Trash	3.5
Better Roads/Road Maintenance	2.5
More Restrictions/Rules	2.0
The Prohibiting Of Camping At Mcbride Plantation	2.0
User Created Mountain Bike Trails	1.5
Nice Changes In Meadow Restoration	1.5
Improved Facilities	1.5
More Forest Thinning	1.0
More Recreation Sites/Areas To Recreate	1.0
More Facilities	1.0
More Monument Construction/Graffiti	1.0
Panther Meadows Vandalized/Not Flourishing As Much	1.0
More Patrols From Law Enforcement/FS	1.0
Change Of Campgrounds	0.5
Nicer Area At Top	0.5
Less Signs (Trails And Info)	0.5
Improvements At Spring In John Muir	0.5
People Packing Out Human Waste Is Better. Shastaavalanch.Org Is Great!	0.5
It Has Become More High Desert, Less Alpine	0.5
Warmer Winters	0.5
Less Skiers	0.5
Less Transient Traffic Lately	0.5
Illegal Dumping	0.5
Mean Dogs	0.5
More Human Waste	0.5
Increased Intrusion By Snowmobiles Into Wilderness With Improved Performance Of Machines	0.5
More Impact	0.5
Not Enough Campsites	0.5
No Snow	0.5
Too Much FS LEO Harassment	0.5

More Limitation On Freedom By Forestry	0.5
Too Many Politics Running Our Forest	0.5
Too Much Private Timber Company Land	0.5
Have To Pay Fees	0.5
Jeep Roads Blocked For Mountain Bikes, Fascist Treatment Of Impoverished	0.5

Opinions about Recreation Opportunities on Mount Shasta

The survey asked for an overall rating of the survey respondent’s trip and provided six possible responses, from perfect to poor (Figure 21). No survey respondents reported that their trip was poor, while 60% felt their trip was perfect. A follow-up question asked for written comments regarding the trip rating. The same types of problems were identified by all respondents, regardless of whether they evaluated the trip as fair, good, or perfect. Several comments related to lacking information, such as the absence of a host, lack of posted information, or hours of the information center. Other visitors commented on facilities, including problematic road conditions, condition of restrooms, road closures, the lack of available camping, and crowding in parking lots. The weather was responsible for other problems, such as smoky conditions or problematic snow or ice. Finally, a few people mentioned situations within their own groups, such as car trouble or being locked out of their vehicle.

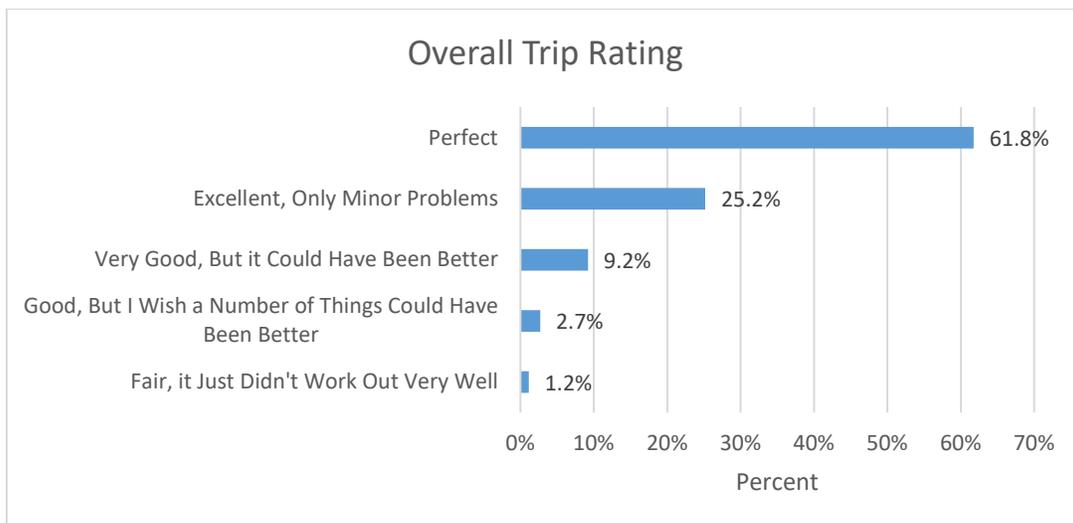


Figure 21: Respondents’ evaluations of their trips (N=782)

The survey included several items probing aspects of satisfaction with trips. These had 5-point (strongly disagree to strongly agree) response options. (There was a “no opinion” option, and therefore those responses are excluded from the analyses reported here.) Overall, the majority of the survey respondents did not have many concerns/issues with their trip (Table 37). Most (94.4%) people felt their trip was well worth the money they spent. About 20% of the respondents did state there were places they avoided due to the amount of people, and 10% felt the restrooms could have been cleaner. Between 6 and 8% of respondents felt that parking, directional and interpretive signage could have been better.

A follow-up question asked respondents to describe the locations and nature of any problems they had encountered (Table 38). Most of the comments were related to signage (34.5%). Restrooms (20.7%) and parking (18.6%) also received several comments.

Table 37: Survey respondents’ opinions about listed statements

Description	Strongly Disagree and Disagree	Neutral	Strongly Agree and Agree	N=
	-----Percent-----			
Trip to Mount Shasta Was Money Well Spent	1.8	3.8	94.4	711
Avoided Places Because Too Many People	62.3	16.9	20.8	673
The Number of People Reduced Enjoyment	72.5	20.1	7.4	705
Recreation Areas on Mount Shasta in Good Condition	2.6	7.3	90.0	723
Restroom Cleanliness Met Group’s Needs	10.3	21.5	68.2	494
Safety/Security at Recreation Sites Met Group’s Needs	1.7	12.5	85.8	592
Current Parking Met Group’s Needs	7.7	11.5	80.8	697
Current Facilities Met Group’s Needs	5.5	16.0	78.4	580
Current Directional Signage Met Group’s Needs	7.8	12.7	79.5	694
Current Interpretive Signage Met Group’s Needs	6.3	18.4	75.2	602

Table 38: Open-ended responses about problematic conditions listed in Table 37 (N=123 respondents and N=145 comments)

Comment	Frequency	Percent of Comments
More Trail Signage (i.e. to Horse Camp, to Black Butte Summit, Panther Meadows to Southgate Meadows, Panther Meadows signs visible in snow)	14	-
More Directional Signage (i.e. to Black Butte Trail, to Bunny Flat, Sand Flat Trail, to Campgrounds)	8	-
More Interpretive/Educational Signs (i.e. Red Fir Flat, Sensitive Alpine Vegetation, What Can Be Seen Along Trails, Hydrology, Geology, Silence/Respect to Others)	7	-
Need Mileage Signs for Trails (i.e. Southgate Meadows (need to be more accurate), to summit, to Panther Meadows from Bunny (on road))	3	-
Need Trailhead Sign (i.e Black Butte, Bunny Flat)	3	-
Update Maps and Signage	2	-
Need More Signage (General Comment)	2	-
Signs Need Repairing (i.e. weathered signs, Gateway trail signs)	2	-
Closed Road Posting Needs to be Closer to Town	2	-
Provide Trail Maps at Trailheads	2	-
Need FS Signs in Direction of Traffic Descending on the Everitt Memorial Highway	1	-
More Informational Signs in Campgrounds (i.e. safety with campfires)	1	-
Move Educational Sign for Upper Panther Meadows Closer to Parking Lot	1	-
Google Maps Wrong for Directions to Bunny Flat from McCloud	1	-
Need Information Signs (i.e. snowmobile signs need to be year round; "don't snowshoe in the skin track")	1	-
Total Comments for Signage		34.5
Restrooms Dirty	14	-
Need More Restrooms (i.e. Upper Parking Lot, Gateway)	13	-
Restrooms Could Be Better (i.e. Red Fir Toilet Needs Repair, TP Nearly Gone at Red Fir)	2	-
Restrooms Not Woman Friendly	1	-
Total Comments for Restrooms		20.7
Parking at Bunny Flat Crowded	16	-
Bunny Flat Parking Needs to be Changed (i.e. Snowmobiles Should Have Their Own Parking Area, More Defined/Plowed Out)	5	-
Road Repairs Needed (i.e. Sand Flat Road, Black Butte Road)	2	-
Parking at Red Fir Limited	1	-
Parking at Some Trailheads Scarce	1	-
Need Parking at Gateway	1	-

County Needs to Rotary Plow Parking Lot	1	-
Total Comments on Parking		18.6
Bunny Flat Crowded	4	-
Snowmobiles, Motorized Snow Bikes and ATVs are Noisy, Inconsiderate, Intimidating and Not Welcome	3	-
Helen Lake Crowded	2	-
Number of People In South Gate Meadows and Heather Trampling Reduced Our Enjoyment	2	-
Large Dispersed Camps and Garbage Being Left is a Problem	1	-
Anticipated Panther Meadows to be Crowded	1	-
People Were Loud and Wanted to Disturb Their Neighbors	1	-
People Lying in Hammock and Laying on Blanket in Lower Panther Meadows	1	-
Displaced Because of People Living in Gateway Trails Parking Lot	1	-
Disrupted in Red Fir Flat By People Talking	1	-
Don't Always Feel Secure In Sand Flat in Summer Months	1	-
Structure Created in Old Ski Bowl is Questionable	1	-
We Picked Private Campsites	1	-
Do Not Permit This Mountain	1	-
Snowmobiles Need to Stay in Their Area	1	-
People Dispersed Camping Sometimes Diminishes Enjoyment of Nature/Wilderness.	1	-
Total Comments on People/Crowding		15.9
Need More Showers	3	-
Need More Potable Water Faucets/Fountains	2	-
Need More Benches (i.e. Along the Everitt Memorial Highway, at Bunny Flat)	2	-
Need More Picnic Tables	1	-
Need More Campgrounds	1	-
Need More Dog Friendly Trails	1	-
Need Garbage Cans at Gateway Trails	1	-
Garbage Was Full	1	-
McBride Needs Camp Host	1	-
Total Comments on Infrastructure		9.0
Questioning Legality of Camping Ban in Plantations	1	-
Need More Rangers Patrolling Especially on Fire Roads	1	-
Total Comments on FS Policy/Procedure		1.4

Another question asked if visitors were “able to easily access the various recreation activities” they sought to do at Mount Shasta (Figure 22). Most (94%) responded affirmatively. The remaining 6% who

were not easily able to access their recreation destination had issues with the road being icy or snow covered, closed, or too rough to drive.

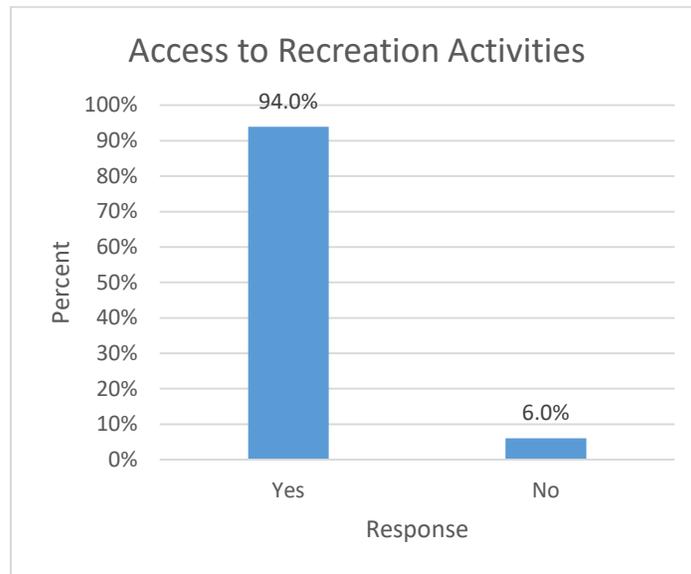


Figure 22: Survey respondents' self-reported ability to easily access various recreation activities (N=780)

Table 39 shows nine different recreation facility categories; survey respondents were asked whether would like to see 'more', 'the same', or 'less' of each category. The majority of the survey respondents marked 'the same' for most items. As a whole, substantial segments of the sample would like to see more trails for hiking and biking, but less for snow machines; many would also like to see more overall facilities and signage, but the responses were about split for roads suitable for passenger vehicles. Cross-tabulation tests were performed to compare survey respondents who engaged in each of the most popular primary recreation activities (Tables 40-48). More than half of the respondents from the most popular primary recreating activities would like to see the same amount of hiking and mountain biking trails, roads suitable for passenger vehicles, parking at trailheads (with the exception that backcountry skiers and snowshoers were almost split between those wanting no change and wanting more parking), developed campgrounds, wayfinding/directional and information/interpretive signage, and accessible friendly sites and facilities. The survey respondents in most of the activity groups reported the 'same' for all the facilities. There are a few noteworthy exceptions:

- More than half of the mountain biking respondents would like to see more hiking trails.

- Respondents who engaged in meditation/spiritual/metaphysical activities want to see fewer mountain bike trails. It should be noted that some user-created mountain biking trails travel right through popular new age/spiritual sites (i.e., Red Fir Flat, Sand Flat).
- More than half of the backcountry skiers would like to see more mountain bike trails.
- Nearly 70% of backcountry skiers would like to see fewer trails for snowmobiling; mountaineers and metaphysical/spiritual/meditational would also like to see fewer trails for snowmobiling. These three activities compete for parking spaces at Bunny Flat and do have some overlapping recreating areas especially in late spring/early summer when there is still enough snow for snowmobiles to be launching at Bunny Flat.
- Mountain bikers were about split for wanting more or less trails for snowmobiling.
- People doing winter sports activities (i.e., backcountry skiing, mountaineering, sledding, snowshoeing) would like to see more parking. This can be assumed to be at Bunny Flat.
- Almost a third of the respondents who were driving for pleasure would like to see more roads suitable for passenger vehicles.
- There is moderate interest in more directional and wayfinding signs across all activity groups.
- There is moderate interest in more informational and interpretive signs across all activity groups except the mountaineers. The people who are climbing Mount Shasta are primarily starting their trek from Bunny Flat, which does have quite a bit of informational signage related to summiting Mount Shasta.

Table 39: Survey respondents’ opinion if they would like to see ‘less’, ‘the same’ or ‘more’ of the following facilities

Facility	More	Less	Same	N=
	-----Percent-----			
Trails for Hiking	34.4	1.2	64.4	721
Informational and Interpretation Signs	29.2	2.8	68.0	685
Parking at Trailheads	27.8	3.1	69.2	684
Directional and Wayfinding Signs	26.9	3.7	69.4	677
Trails for Mountain Biking	22.8	10.6	66.6	632
Developed Campgrounds	21.0	7.7	71.3	663
Accessible-Friendly Sites and Facilities	17.4	3.3	79.3	638
Roads Suitable for Passenger Vehicles	16.4	11.5	72.1	677
Trails for Snow Machines	8.9	29.8	61.4	621

Table 40: Survey respondents' opinions about the number of trails for **hiking** based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	24.2	0.0	75.8	33
Camping	32.0	0.0	68.0	25
Driving	27.5	0.0	72.5	40
Hiking	40.7	0.5	58.9	214
Metaphysical/Spiritual/Meditation	34.8	0.0	65.2	66
Mountain Biking	61.9	0.0	38.1	21
Mountaineering	24.1	3.4	72.4	29
Sightseeing	26.0	0.0	74.0	96
Sledding	36.4	0.0	63.6	11
Snowshoeing	41.7	0.0	58.3	12

Table 41: Survey respondents' opinions about the number of trails for **mountain biking** based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	56.3	0.0	43.8	32
Camping	10.0	0.0	90.0	20
Driving	17.9	7.7	74.4	39
Hiking	18.9	12.2	68.9	180
Metaphysical/Spiritual/Meditation	11.3	18.9	69.8	53
Mountain Biking	82.6	0.0	17.4	23
Mountaineering	16.7	12.5	70.8	24
Sightseeing	15.9	9.8	74.4	82
Sledding	20.0	0.0	80.0	10
Snowshoeing	8.3	8.3	83.3	12

Table 42: Survey respondents' opinions about the number of trails for **snow machines** based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	2.9	68.6	28.6	35
Camping	5.3	26.3	68.4	19
Driving	12.8	10.3	76.9	39

Hiking	5.1	28.6	66.3	175
Metaphysical/Spiritual/Meditation	5.6	33.3	61.1	54
Mountain Biking	25.0	20.0	55.0	20
Mountaineering	4.3	39.1	56.5	23
Sightseeing	13.8	22.5	63.8	80
Sledding	30.0	10.0	60.0	10
Snowshoeing	0.0	33.3	66.7	12

Table 43: Survey respondents' opinion about the number of *roads suitable for passenger vehicles* based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	13.9	16.7	69.4	36
Camping	20.8	4.2	75.0	24
Driving	32.5	2.5	65.0	40
Hiking	16.0	12.4	71.6	194
Metaphysical/Spiritual/Meditation	12.3	9.2	78.5	65
Mountain Biking	10.0	15.0	75.0	20
Mountaineering	8.0	24.0	68.0	25
Sightseeing	19.6	7.6	72.8	92
Sledding	22.2	0.0	77.8	9
Snowshoeing	0.0	9.1	90.9	11

Table 44: Survey respondents' opinion about the amount of *parking available at trailheads* based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	47.1	2.9	50.0	34
Camping	22.7	0.0	77.3	22
Driving	22.5	2.5	75.0	40
Hiking	26.7	2.0	71.3	202
Metaphysical/Spiritual/Meditation	27.4	0.0	72.6	62
Mountain Biking	30.0	5.0	65.0	20
Mountaineering	40.7	7.4	51.9	27
Sightseeing	25.3	3.3	71.4	91
Sledding	36.4	0.0	63.6	11
Snowshoeing	50.0	0.0	50.0	12

Table 45: Survey respondents' opinion about the number of *developed campgrounds* based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	24.2	12.1	63.6	33
Camping	41.7	8.3	50.0	24
Driving	18.4	5.3	76.3	38
Hiking	20.4	5.8	73.8	191
Metaphysical/Spiritual/Meditation	24.6	9.2	66.2	65
Mountain Biking	30.0	5.0	65.0	20
Mountaineering	19.2	3.8	76.9	26
Sightseeing	26.1	3.4	70.5	88
Sledding	9.1	0.0	90.9	11
Snowshoeing	8.3	0.0	91.7	12

Table 46: Survey respondents' opinion about the number of *directional and wayfinding signs* based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	21.9	9.4	68.8	32
Camping	25.0	4.2	70.8	24
Driving	31.7	4.9	63.4	41
Hiking	30.5	2.0	67.5	203
Metaphysical/Spiritual/Meditation	27.0	3.2	69.8	63
Mountain Biking	21.1	0.0	78.9	19
Mountaineering	24.0	4.0	72.0	25
Sightseeing	23.9	0.0	76.1	88
Sledding	18.2	0.0	81.8	11
Snowshoeing	25.0	0.0	75.0	12

Table 47: Survey respondents' opinion about the number of *information and interpretation signs* based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	29.4	5.9	64.7	34
Camping	33.3	4.2	62.5	24
Driving	33.3	2.4	64.3	42

Hiking	29.5	2.0	68.5	200
Metaphysical/Spiritual/Meditation	29.7	3.1	67.2	64
Mountain Biking	30.0	0.0	70.0	20
Mountaineering	12.0	4.0	84.0	25
Sightseeing	28.6	0.0	71.4	91
Sledding	33.3	0.0	66.7	12
Snowshoeing	33.3	0.0	66.7	12

Table 48: Survey respondents’ opinion about the number of **accessible friendly sites and facilities** based on top primary activities they pursued

Primary Activity	More	Less	Same	N=
	-----Percent-----			
Backcountry Skiing	23.5	5.9	70.6	34
Camping	18.2	4.5	77.3	22
Driving	20.5	2.6	76.9	39
Hiking	13.8	2.8	83.4	181
Metaphysical/Spiritual/Meditation	22.6	1.6	75.8	62
Mountain Biking	15.8	0.0	84.2	19
Mountaineering	9.1	9.1	81.8	22
Sightseeing	19.0	0.0	81.0	84
Sledding	18.2	0.0	81.8	11
Snowshoeing	16.7	0.0	83.3	12

A follow-up question asked respondents what they would ask managers to change related to any recreation opportunities or facilities at Mount Shasta. Written responses were provided by 377 people (Table 49 provides a summary; the full list of comments can be found in Appendix B). The majority (16.5%) of the recommendations received were about signage, followed closely by recommendations for adding facilities/improvements to facilities (14.3%) and restrooms (10.0%). Some of the most frequently suggested changes were the following in order of largest to smallest: more trails, no improvements needed, ‘other’, more restrooms, improved restrooms, more parking, more directional signs, limit/ban snowmobiling, more interpretive signs, deal with parking issues at Bunny Flat, and more campgrounds. About half of the comments came from local residents (Table 50), followed by regional survey respondents (34.3%), and about 42.9% of the respondents who provided recommendations had visited Mount Shasta more than 51 times (Table 51). There were some differences visible in the type of comments received from the locals, regional and distant visitors. Some examples include: mountain bike and hiking trails, wanted parking issues to be addressed; locals and regional visitors wanted more

opportunities where they could have their dogs, snowmobile complaints and wanting potable water available at trailheads. There were very little differences amongst the three groups for comments on wanting more campgrounds, no change, more restrooms, and better signage. There were not many visible differences in the types of comments received from new visitors compared to those that have visited many times. The only comment that provided some variability were those relating to mountain bike and hiking trails, parking, signage, and snowmobile complaints. Visitors that have frequented Mount Shasta more provided more comments related to wanting mountain bike and hiking trails, more parking and had more snowmobile complaints where visitors that have been to Mount Shasta less than 20 times wanted more signage.

Table 49: Survey respondents' recommended changes to improve their experience (N=370 comments and N=377 respondents)

Recommendation	Frequency	Percent of Comments
More Directional Signage	16	-
More Interpretive Signage	14	-
General Signage	9	-
More Trailhead Maps/Trail Maps At Trailheads	8	-
More Informational Signage At Trailheads	7	-
More Road Signs	2	-
More Road Closure Signs	2	-
More Speed Limit Signs	2	-
More Snowmobiling Signs	1	-
Total Signage Comments		16.5
No Improvements Needed	21	-
Want Drinking Water Source	11	-
Other Development	8	-
More Garbage Receptacles	4	-
Vendor	4	-
Add Additional Amenities At Campgrounds	3	-
More Benches At Bunny Flat	1	-
More Wheel Chair Options	1	-
Total New Facility/Improvements to Facilities Comments		14.3
More Restrooms	20	-
Improve Restrooms	17	-
Total Restroom Comments		10.0
More Parking	17	-

Parking Issue At Bunny Flat	13	-
Improve Snowmobile Parking Area	4	-
Limit Cars Or Provide Shuttle Service	1	-
Plow Parking Spots On Side Of Road	1	-
Total Parking Comments		9.7
More Trails	23	-
General Trail	4	-
Trail Improvement	3	-
Approve Mountain Bike User Created Trails	2	-
Total Trail Comments		8.6
More Campgrounds	13	-
More Dispersed Camping Options	3	-
Upset About Camping Prohibition In Plantations	3	-
Move Red Fir Group Camp And Open To Dispersed Camping	1	-
Continue Camping Prohibition In Plantations	1	-
Reservable Campsites	1	-
Dislike Of Campgrounds On Mount Shasta	1	-
Dispersed Camping Concern	1	-
No Camping/Pets At Bunny Flat	1	-
Limit For Campgrounds	1	-
Total Camping/Campground Comments		7.0
Continue/Improve Winter Plowing	8	-
Improve Roads	7	-
Open Gate At Bunny	6	-
Re-Open FS Roads	1	-
Add Bike Lane On EMH	1	-
Total Road/Access Comments		6.2
More Education Outreach	11	-
More FS Presence To Monitor Human Use	6	-
Website Improvements	6	-
Total Education/FS Presence Improvement Comments		6.2
Other	21	-
Total Other Comments		5.7
Limit/No Snowmobiling	15	-
More Snowmobile Areas	2	-
Move Snowmobiling Boundary (For More Snowmobile Access)	1	-
Snowmobile Safety (Motorized Vs Non-Motorized Use On Road)	1	-
Total Snowmobiling Comments		5.1
Restrictions For People	8	-

Limit In Wilderness	5	-
Concern With Crowding	3	-
Total People/Crowding Comments		4.3
More Dog Access	7	-
No Dogs	4	-
Total Dog Comments		3.0
No Fee	6	-
Initiate Fee	1	-
Total Fee Comments		1.9
More Vista Points	3	-
Restore Vista Point	1	-
Add View Finders At Everitt Vista	1	-
Total Vista Point Comments		1.4

Table 50: Percentage of survey respondents who provided recommendations by primary residence location (n=274)

Primary Residence Location	Distant (Southern CA and Rest of USA)	Regional (Central/Northern CA and Southern OR)	Local (96000 zip codes)
Percent of Respondents	16.4	34.3	49.3

Table 51: Percentage of recommendations received based on number of times respondent had visited Mount Shasta (n=233)

Number of Times Visited Mount Shasta	1-5	6-20	21-50	51+
Percent of Comments Provided	27.0	17.2	12.9	42.9

One of the questions in the survey was intended to explore visitors' opinions about a potential new standard amenity fee for some of the recreation sites along the Everitt Memorial Highway. The question stated that the fee would be \$5 per vehicle (daily) or \$25-30 per vehicle (annually), with 95% of funds remaining with the local land managers for maintenance. The majority of respondents (approximately two-thirds) stated that they would support such a fee, 20.9% stated that they would not support it and 14.4% said they were not sure (Table 52). The majority of the support for the standard amenity fee came from distant and regional respondents (about 70% support from both) with the bulk of the opposition to a standard amenity fee being from local residents (Table 53). However, even among local

residents, a slight majority would support a fee. Most (80-88%) of the respondents who were in support of the fee have household incomes above \$100,000 annually. The income group that had the most reservation about a standard amenity fee were the respondents who make less than \$25,000 annually (37.7%) (Table 54).

Table 52: Respondents' support for a standard amenity fee of \$5 daily pass/vehicle or \$25-30 annual pass/vehicle along the Everitt Memorial Highway (N=777)

Support a fee	Percent
Yes	64.6
No	20.9
Not Sure	14.4

Table 53: Support for standard amenity fee by residence

Support for fee	Distant (Southern CA and Rest of USA)	Regional (Central/Northern CA and Southern OR)	Local (96000 zip codes)
	-----Percent-----		
Yes	71.4	74.6	55.8
No	15.9	12.5	27.2
Not Sure	12.7	12.9	17.0

Pearson Chi-Square Value: 24.17 and p -value < 0.0005 (N=631)

Table 54: Percentage of support for standard amenity fee by income

	Support for fee		
	Yes	No	Not Sure
Income	Percent within Income		
Less than \$24,999	44.2	37.7	18.2
\$25,000-\$34,999	67.3	26.9	5.8
\$35,000-\$49,999	64.1	23.4	12.5
\$50,000-\$74,999	64.0	15.3	20.7
\$75,000-\$99,999	65.9	19.3	14.8
\$100,000-\$149,000	80.8	9.6	9.6
\$150,000-\$199,999	82.2	8.9	8.9
\$200,000 or more	88.3	3.3	8.3
Do Not Wish to Answer	50.0	29.9	20.1

Pearson Chi-Square Value: 73.17 and p -value < 0.0005 (N=745)

RECOMMENDATIONS

The survey had a final open-ended question asking the respondents to provide any recommendations that they had to change/modify any recreation opportunity or facilities on Mount Shasta that would improve their experience. Just over one-third of respondents (37%) responded to this question. Of this group, 49.3% were local (96000 area codes), 34.3% were regional (central/northern CA and southern OR) and 16.4% were from distant areas (southern CA and rest of USA).

A full list of the recommendations received from all the survey respondents can be found in Appendix B of this document. Some of these recommendations are outside management control or ability to implement; the bullets below describe recommendations that are proposed for consideration based on the input from survey respondents.

Information, Education, Signage

Maps/Brochures

- Create an interpretive plan for popular 'vortex' locations, which may include collaborating with local new age groups to create a brochure with information about sites.
- Develop a map with locations where dispersed camping can occur along the Everitt Memorial Highway and coordinate signage on the ground to assist with where camping is allowed vs. not allowed.
- Create trail maps of the trails along the Everitt Memorial Highway and provide them at trailheads. These trail maps should have information about which trails allow pets, as well as trail mileage.
- Create a map for winter recreation opportunities along the Everitt Memorial Highway so people understand which areas that allow motorized versus non-motorized use.

Education

- Develop an outdoor education program for certain days throughout the summer months and at different locations for the public to attend (i.e., Panther Meadows, Old Ski Bowl, Grey Butte, Horse Camp). This can include ranger led hikes, continued staffing of the visitor information trailer at Bunny Flat, etc.

- Continue FS patrolling and conduct more patrols with seasonal staff, which includes monitoring use areas along the Everitt Memorial Highway for inappropriate activities.
- Continue to update the Shasta-McCloud Management Unit information on the Shasta-Trinity National Forest webpage.

Interpretive/Directional Signage

- Contact Google Maps to remove the route option to Bunny Flat that takes people up the 31 Road and up to Bunny Flat on the dirt roads.
- Add interpretive signage information and trail mileage information at Black Butte, Upper Panther Meadows, South Gate Meadows, Old Ski Bowl, and Sand Flat trailheads and add interpretive signage at Red Fir Flat day use area.
- Improve trail location signage where appropriate.
- Provide better directional signage to the Black Butte Trailhead.
- Clear out vegetation that blocks signs along the Everitt Memorial Highway.
- Address the signage issue at Gateway Trail, as many people pass the trailhead and have to turn around (this recommendation was purely based on observations during the survey period, where almost every survey day there were cars that passed the Gateway Trails turn off and had to turn around).
- Work with Siskiyou County about the speed limit and getting more speed limit signs on the Everitt Memorial Highway.
- Provide information at Bunny Flat about the reasoning for the gate being closed during the periods that it is closed and post a sign when Bunny Flat gate is closed along the Everitt Memorial Highway near Gateway Trailhead.

Trail and Trailhead Improvements

Parking

- Address the parking lot situation at Bunny Flat. This could involve expanding the parking lot, creating a separate snowmobile parking lot, looking at an alternative snowmobile parking and launching location such as at Wagon Camp Road during big snow seasons (this won't work when the snow is not deep or when the snow starts to melt).
- Address the parking situation at Black Butte Trailhead to create more parking.

- Create a better parking and trailhead kiosk location at the Upper Panther Meadows trailhead.

Restrooms

- Add restrooms at Old Ski Bowl, Sand Flat Trailhead and Gateway Trailhead.
- Add hand sanitizers to restroom facilities.

Trails

- Evaluate areas for trails that can accommodate wheel chair opportunities. Some options include Everitt Vista, Old Ski Bowl, and the overlook into Panther Meadows.
- Improve the short interpretive trails along the Everitt Memorial Highway and evaluate locations for additional accessible trails.
- Restore the Whitney Creek Trail.
- Re-route and improve the trail in South Gate Meadows and Hummingbird Meadows and restore the meadows from the trail braiding that is currently occurring in the meadows.

Installations

- Install a couple more benches at Bunny Flat that face the mountain.
- Look into usage of a gate at Sand Flat for the non-motorized snow trails.
- Evaluate and provide potable water at Bunny Flat and potentially Sand Flat if use numbers at these locations show a need.
- Provide garbage cans at all trailheads along the Everitt Memorial Highway.

Vista Points

- Install view finders at Bunny Flat trailhead
- Improve the view at Everitt Vista as trees have grown in which block the view from the vista point
- Assess the potential for new vista point locations

Roads and Plowing

- If a fee is established for the Everitt Memorial Highway corridor, look at opportunities to provide money to Siskiyou County for plowing parking lots at the recreation locations along the Everitt Memorial Highway.
- Get potholes fixed on the road between Upper Panther Meadows trailhead and Old Ski Bowl.
- Improve road condition to North Gate, Brewer Creek, Whitney and Bolum Trailheads.
- Improve road condition on loop road to Sand Flat.

Other

- Evaluate and design campground options at locations such as Bunny Flat, Sand Flat, Red Fir Flat.
- Develop an allocation system (i.e. reservation system, lottery, first-come first-serve) for climbing Mount Shasta during peak climbing season.
- Continue to evaluate a fee structure based on the outcome of voluntary donation tubes that are installed in 2018-2019.
- Ensure any upgrades maintain the natural feel to not take away from the surrounding natural beauty.
- Look into opportunities to have summit passes issued online. This should be part of the “Modernization of Recreation Special Uses” in regards to getting certain permits online.

DISCUSSION

The Shasta-Trinity National Forest’s Forest Plan is quite dated and has very limited management direction for outdoor recreation, which leaves many options on the table for making improvements. The plan stipulates that the agency will provide a variety of high quality outdoor recreation experiences; increase emphasis on areas of national significance (which includes Mount Shasta itself); encourage use of the Forest by the disadvantaged, physically challenged and minorities; create additional opportunities for winter recreation; and mitigate and rehabilitate areas that have resource damage from increasing dispersed recreation use (USDA Forest Service, 1995). The ROS categories that are assigned to the study area (Figure 7) -- almost half of which (49%; 16,014 acres) are in the roaded natural class and 14% of which are in the semi-primitive motorized class (4,593 acres) -- provide flexibility with management decisions that involve re-engineering. Any new development or expansion to current developed areas

will occur in these locations. The only recommendations for actions in the primitive zone, which takes up 30% of the study area (9,948 acres), would be use allocation and rehabilitation of trails in wet meadows systems, which would be compatible with those areas. There are no current recommendations to change anything in the semi-primitive non-motorized zones which are slivers of land adjacent to the wilderness primitive areas.

The Forest completed a watershed analysis for Mount Shasta in 2012 which resulted in the development of several potential opportunities to address issues that arose related to recreation. Many of these potential opportunities are similar to recommendations the public provided during this study. The full list of recommendations from the Mount Shasta Watershed Analysis can be viewed in Appendix C. Some highlights to note from these recommendations that mirror the survey respondent recommendations include the following:

- trail re-design and creation of new trails (i.e., re-design trails at Panther Meadows, South Gate Meadows, and Hummingbird Meadows; create new trails at Old Ski Bowl; re-develop John Muir Trail
- manage and expand current single track mountain bike trails and consider circumnavigation trail around Mount Shasta)
- expansion and creation of developed campgrounds along the Everitt Memorial Highway (i.e., Bunny Flat, Red Fir Flat, Sand Flat)
- development of water sources at developed sites
- development of a comprehensive sign plan that includes directional, informational, regulatory and interpretive information for all recreation sites and update current signs
- redesign and develop Old Ski Bowl parking lots with educational/interpretive information
- conduct pilot studies with use allocation processes for high concentration use areas in order to manage crowds and provide limits.

Recreation at Mount Shasta generates economic revenue for the cities of Mount Shasta, Weed and McCloud. Historically, logging was a primary economic engine in these cities, but as logging slowed and the mills in the area closed, other revenue sources were becoming necessary for these towns to survive. Recreation has subsequently become a major focus for these communities. Tourists spend money in local restaurants, hotels, and gift shops, which provides income for the community, as well as jobs. The spring season brings many mountain climbers, while during the summer months spiritual tourism and

family vacations bring in tourism dollars. In the winter months, the local Mount Shasta Board and Ski Park, which is located on private property on Mount Shasta and outside the study area, also helps support the local economy. This economic value becomes very apparent in years of drought when winter recreation is not sustained and local businesses have to limit their hours of service. My survey found that 48% of the survey respondents spent at least one night away from their home, and half of these visitors did so in a hotel, bed and breakfast or vacation rental in the area of Mount Shasta. The Forest Service has a desire and commitment to support the local community's economy and wellbeing as its management "is based on strong relationships between our local offices and the communities we live in—the neighbors who live next door" (USDA Forest Service, 2015, p. 20). The economic activity that the Forest Service supports can be attributed in part to natural resource investments such as outdoor recreation (which is the largest contributor); in FY 2011, outdoor recreation on National Forest System lands contributed about \$13.6 billion to the Nation's gross domestic product and supported more than 205,000 jobs (USDA Forest Service, 2015).

A few new economic pursuits are currently under way in the City of Mount Shasta in partnership with the Forest Service. For example, the Mount Shasta Trail Association -- together with its partner the Mount Shasta Mountain Bike Association -- has brought in significant amounts of money (through fund raisers and grant dollars) and support to expand the proposed trail system to add approximately 100 miles of multi-user trails over the next 10 years. The majority of these trails are located on the National Forest and will attract more recreation users to the area, which is expected to bring more economic opportunities to the surrounding communities (Mount Shasta Trail Association, 2018; Mount Shasta Mountain Bike Association, 2018). In 2018, the City of Mount Shasta is becoming a "PCT Trail Town," the first of its kind along this National Scenic Trail (Wilkinson, 2018). Both the additional trail miles around the City of Mount Shasta and the city becoming a Trail Town will bring more people to the area for outdoor recreation. The added trail miles will create a need for more trailheads, signs and parking, as well as demand for more camping. Right now there are areas close to town where dispersed (non-developed) camping is not allowed, so more developed camping and clearly authorized dispersed camping areas will be necessary.

Continuing to manage and potentially expand some of the facilities inside the Everitt Memorial Highway corridor could help support economic growth in the local communities; however, the decisions the Forest Service makes to manage recreation along the Everitt Memorial Highway and the rest of Mount Shasta will invariably benefit some user groups and have negative impacts for other user groups. For

example, respondents' views on the desirability of more motorize recreation opportunities varied depending on people's primary activity, as has been found in other studies. There are few situations that would result in a win-win situation for all user groups involved, but it would be desirable to minimize the potential negative impacts of a decision to the majority involved. Finding a balance between the differing desired outcomes is key, as the demographics of people and their opinions do vary.

Some of the survey results varied between local residents and visitors from out of town. For example, some of the local survey respondents suggested that we implement a fee for usage of the Everitt Memorial Highway area, but that the fee only be for non-residents. While exempting locals from a fee is likely not feasible, the concern could in part be addressed by having an annual pass available for purchase and a different daily fee rate. The survey results show that use of the study area is almost equally split between local residents (people with a 96xxx area code) (42%) and people from out of the immediate area (58%), so this option might be attractive to people who frequent the area.

Another consideration is variation among respondents in the desire for change versus the status quo. Twenty-one survey respondents (6% of overall comments received) commented that they did not want to see any changes/improvements made on Mount Shasta and that it needed to be left as is, while the remaining 349 respondents would support some form of change/modification. Six percent may seem like a small number, but this may still be a noteworthy segment of the visiting public.

The local tribes may or may not support some of the possible recreation management decisions, and their input must be considered alongside views of the visiting public. For example, what is best for the sustainable recreation purposes might not be the best decision in eyes of the local tribes for protecting their traditional cultural property resources. All of the decisions the agency makes will be weighed based on potential negative impacts to different constituents and will be available to the public and local tribes for review and comment, as well as participate in these decisions.

Key Findings from the Visitor Survey

Keeping the above considerations in mind, it is useful to review key findings from the survey that may impact decisions about recreation management. Summarizing the characteristics of the sample, I found that:

- Survey respondents were split almost evenly between men and women.
- The large majority of respondents speak English as their primary language.

- Most identified as white and not Hispanic or Latino.
- 70% of the respondent had an Associate's degree or higher (i.e., were more highly educated than the population of the region).
- Most lived locally (40%), with 157 of the respondents living in the City of Mount Shasta (23%), or in the region of central/northern California or southern Oregon (36%). Nearly three-quarters of the survey respondents had visited Mount Shasta before and, of those respondents, 39% had visited Mount Shasta more than 51 times. Not surprisingly, local residents were more likely to be repeat visitors.
- Very few respondents were part of an organized group such as a commercial tour or educational group, and most were in small groups without children.
- About half of the visitors went to Mount Shasta as their primary destination, and approximately one-third planned their visit to Mount Shasta with less than 24 hours of advanced planning. Approximately one-quarter of visitors planned their visit more than a month ahead.
- Among people who had been visiting the area for at least five years, 60% said that they had not noticed any changes related to recreation, while the 40% who had noticed changes mostly noticed an increase in people to the area.

Bunny Flat was the most visited site during the year the survey was conducted, which makes sense because it is the terminus of the Everitt Memorial Highway during most of the year, has a great view of Mount Shasta and is the main trailhead for people climbing Mount Shasta. Old Ski Bowl and Panther Meadows were the next most visited locations; both of these locations are beyond the gate at Bunny Flat, which is typically closed starting in November through early July. (During the study year, the gate remained closed until August because it was such a heavy snow year.) Old Ski Bowl is the highest location accessible by vehicle on Mount Shasta and has become a popular location for people sightseeing as well as the new age/spiritual visitors who come to meditate, have ceremonies or walk the user created labyrinth made from rocks that persists year after year. These locations will remain important areas where the agency should maintain and improve parking, as well as interpretation and trail signage.

Hiking was the most common activity reported as the "primary" activity, although it was selected by only 28% of the survey respondents. This was followed by sightseeing (14%), metaphysical/spiritual activity (9%), driving for pleasure (6%), backcountry skiing (5%), mountaineering (4%), camping (3.5%)

and mountain biking (3%). The national trend data and future projections back up the popularity of the activities documented in this survey. For example, hiking was identified as the most popular backcountry activity in 2008 and has been projected to continue to increase in participation through 2030 (White et al., 2016). Viewing and photographing nature is projected to increase by 2030 in participation rate and typically is found to occur close to home, while participating in other activities, or while traveling to participate in other recreation activities (White et al., 2016). The trailheads where hiking and nature viewing are most popular may need to be improved to accommodate this current and growing use. These trailheads include Gateway Trail, Black Butte Trail, Bunny Flat, Sand Flat, Upper Panther Meadows, Old Ski Bowl and South Gate Meadows.

Downhill skiing and snowboarding are projected to increase by 2030 in both the number of participants and the per capita participation rate – these increases are probably linked to projected income growth (White et al., 2016). Challenge activities -- which include rock climbing, mountaineering and caving – are expected to increase in the number of participants, most likely due to projected increases in income. However, the number of days participants do these activities annually is projected to decrease by 2030 (White et al., 2016). Bunny Flat trailhead is the most popular access point for people mountaineering and backcountry skiing or snowboarding on Mount Shasta. If demand increases, capacity and maintenance may need to be addressed. The parking lot already reaches capacity regularly during holidays and weekends in the snow season.

The national user trend data show that snowmobiling participation rates are projected to decrease by 2030 because this activity is geographically limited to areas with snow and only about 4% of the population participates in this activity (White et al., 2016). However, with projected climate change I do not foresee decreases occurring on Mount Shasta. Bunny Flat is one of the highest areas in Northern California that has predictable snow year-to-year, which means people will be coming to this location for snowmobiling as lower elevation areas become unsuitable. Again, it will be very important to address the parking situation at Bunny Flat and potential conflicts between the winter motorized and non-motorized uses in order to prepare for the continued use and conflict that will occur at this trailhead.

Climate change will also have impacts to winter recreation on Mount Shasta that are dependent on snow. Snow-based recreation activity will have to occur high on the slopes of Mount Shasta as the snow on the lower slopes may turn to rain. Mount Shasta is currently one of the only areas in Northern California with elevations high enough to receive some dependable snow every year. This location will

continue to become crowded with different snow user groups coming to the area to access the snow when it is not available elsewhere. This will create more crowding issues as well as increase the potential for user conflicts.

Most of the survey respondents agreed that the top reasons that they recreate on Mount Shasta were to be outdoors, to experience natural surroundings, for relaxation, and to get away from the regular routine; many also felt that spending time with family and friends, physical exercise and meditation were very or extremely important. About 22% of the survey respondents felt that summiting Mount Shasta was very or extremely important, and there were mixed feelings amongst the survey respondents in regards to a reason to recreate on Mount Shasta being for a challenge or sport. Mountaineering was the 6th most popular outdoor recreation activities that occurred on Mount Shasta with 3.9% of the survey respondents partaking in it as their primary activity, which makes it interesting that almost half of the survey respondents reported that summiting Mount Shasta was at least somewhat to extremely important to them. Respondents might not have fully understood what summiting Mount Shasta meant and there could be recreationists who were not mountaineering at the time of the survey who do feel summiting Mount Shasta is at least somewhat important to them.

Understanding what drives people to recreate will be important in making certain management decisions; for instance, people who choose areas for meditation, experiencing natural surroundings and relaxation might not want their chosen recreation location to become more developed or want developments (even signs) taking away from the natural beauty of the area. Evidence of this has been observed between some people who go to Panther Meadows for meditation, for example, and do not like seeing restrictive signs (e.g., “no water collection”, “stay on trail”, “no commercial operations”, “no depositing of cremains”), or any signs at all, and other visitors who would like to see more interpretive and informational signage.

The perception of crowding differs from person to person and can be influenced by many things including the expected number of people one might encounter, the type of recreation activity being pursued, the level of infrastructure and development, and the location of encounters (Usher & Gomez, 2017; Vaske & Shelby 2018). Survey respondents whose primary recreation activity was mountaineering (25.8% very or extremely crowded) and family gathering (25.0% very or extremely crowded) had a higher perception of crowding than the respondents who had other primary recreation activities (Table 32). The higher sensitivity to crowding from mountaineers makes sense, as this user group is recreating

in the Mount Shasta Wilderness area, which could create an expectation for solitude (even though opportunities for solitude may be compromised during the months of March-July when climbing season is at its peak). Crowding has been shown to be more related to the number of people a person expects to encounter rather than the actual level of density of people - encountering more people than anticipated while recreating has a tendency of making the individual feel more crowded, and encountering fewer or the same number of people than expected will significantly lower their perception of crowding (Luque-gil et al., 2018). The survey question that was used to quantify people's perception of crowding was a 5-point scale (i.e., not at all crowded, slightly crowded, moderately crowded, very crowded and extremely crowded); the survey did not include questions that would measure specific variables such as how many people were encountered or how expectations were met (or not). Nevertheless, more than half (59%) of the survey respondents did not experience any crowding issues while recreating on Mount Shasta. The remaining (41%) survey respondents experienced at least slight crowding to extreme crowding; the areas with the most crowding were parking lots (55% of respondents), specifically Bunny Flat (49% of respondents). Some also experienced crowding on trails (31% of respondents), the wilderness (17% of respondents) and Panther Meadows (19% of respondents). Vaske and Shelby (2008) and Manning (2011) have a table showing capacity judgement categories based on visitors' crowding perceptions; according to this table my study results would put some areas in the category of 'low normal' (36-50% feeling crowded) and some in the category of 'high normal' (51-65% feeling crowded). The overall crowding perception result (41%) and the crowding perception at Bunny Flat, trails, wilderness and Panther Meadows fell within the 'low normal' range which meant "access, displacement, or crowding problems are not likely to exist at this time and may offer unique low-density experiences"; and one area (parking lots) of this study fell within the 'high normal' range which means "these locations or activities probably have not exceeded carrying capacity but may be tending in that direction. Should be studied if increased use is expected, allowing management to anticipate problems" (Vaske & Shelby, 2008, p.120; Manning, 2011, p.100). I am assuming that the parking lot crowding perception is likely referring mostly to Bunny Flat, Black Butte and Panther Meadow trailhead parking lots, as these areas were described as crowded in the written comments. I would still recommend moving forward on a fix to the congestion problem at Bunny Flat based on the number of reoccurring comments received (Tables 34, 36, 38 and 49). Many of the crowding concerns at Bunny Flat revolved around parking congestion especially on weekends and holidays and added congestion caused by snowmobile trailers.

In spite of some degree of crowding, the majority of survey respondents (81.6%) felt that the level of recreational use along the Everitt Memorial Highway is acceptable. The few concerns expressed were around parking at Bunny Flat. Only 2% of the survey respondents reported having conflicts with other users. Crowding has been shown to be an important concept in visitors' overall satisfaction (Usher & Gomez, 2017). Most people who visited Mount Shasta enjoyed their experience and felt that their money was well spent on their trip, which does positively coincide with the lower overall crowding perception.

Overall, the general consensus about facilities was that they met visitors' present needs, being in good condition, clean, and safe. Most visitors felt that their needs were met for parking, facilities, directional signage, and interpretive signage. Not surprisingly, then, most people did not have strong opinions that there should be more or less of each facility. People who were critical of facilities or services cited parking at Bunny Flat, issues with restrooms, issues with signage, and conflict with snowmobiles. The large majority of people reported not having any problems accessing their recreation destination, and the few problems listed were largely outside managerial control, such as weather or Google Maps.

Across all respondents, more people supported than opposed the development of trails for hiking and biking, more parking at trailheads, more developed campgrounds, more signage and more accessible sites and facilities. Respondents were split about the desirability of developing more mountain biking trails and roads suitable for passenger vehicles. In an open-ended question asking about needed facility changes, signage, restrooms, trails, parking, snowmobiles, and campgrounds had the most comments.

Priority Issues and Recommendations

Signage was the number one recommendation that survey respondents provided (16% of comments were about signage). With the number of people visiting recreation areas along the Everitt Memorial Highway corridor, it will be important to improve the directional and interpretive signs that are currently present at the recreation sites and along the roadways. Also, as the number of visitors continues to increase, the current restroom infrastructure will need to be expanded or additional restrooms added at more of the trailheads. Some minor improvements (as recommended by some survey respondents), such as adding hand sanitizer and trash receptacles, should also be considered.

Several survey respondents commented on wanting more bike trails or wanting user-created trails to become legal Forest Service System trails. Gateway Phase II is currently under way; this is a NEPA

(National Environmental Policy Act) project to add an additional 45 miles of non-motorized multi-use trail with a little over nine of those miles being specifically for downhill mountain biking. The user-created mountain biking trails are being reviewed to see which are sustainable and can be added to this trail system, and the other non-sustainable erosion-creating trails will be decommissioned.

Based on professional evaluation and the survey responses, three recreation areas have parking issues that need to be addressed: Bunny Flat Trailhead, Black Butte Trailhead, and Upper Panther Meadows Trailhead. Bunny Flat parking lot is most problematic in the winter months when the gate is closed, as this area becomes the final destination accessible to recreators. This area becomes congested with regular vehicle traffic from sightseers as well as snowmobilers with trailers and people coming to backcountry ski, snowshoe or sled. As there were several complaints received about the snowmobiles, developing some separation between the snowmobile parking area and the non-motorized recreation parking area will be key to avoiding user conflicts. Black Butte Trailhead needs more parking capacity, especially in the summer months and at times when there is no snow. The Upper Panther Meadows Trailhead parking lot could use a complete facelift with improved parking and interpretative signs at the trailhead.

There are currently only two campground facilities along the Everitt Memorial Highway, McBride Springs Campground and Panther Meadows Campground, both of which have a small capacity and get booked up quickly. Several survey respondents (21%) would like to see more developed campground facilities. This is an appropriate recommendation especially with the slight projected increase in developed recreation per capita participation and days spent camping into the future (White et al., 2016), as well as the proposed 100 mile trail expansion in Mount Shasta which may mean more people wanting the opportunity to camp. A few locations could be evaluated to build a new campground, namely Sand Flat, Red Fir Flat and Bunny Flat. Adding potable water and restrooms to these locations should also be evaluated. However, finding the right balance of improvements is a challenge because not all visitors want the same things, and the locations suitable for a potential developed campground currently are used for dispersed camping. The agency needs to find the right balance between the two types of camping opportunities, as dispersed and developed campers often seek different camping experiences. The ROS class that is assigned to the areas that could be evaluated for a developed campground (Sand Flat, Red Fir Flat, Bunny Flat) all reside inside the semi-primitive motorized class. Developed and dispersed camping activities are both deemed appropriate in this zone and therefore will not be a restricting factor in determining the appropriateness of the location (USDA Forest Service, n.d). It will be

important to make sure that there will still be dispersed (free) camping locations available, especially since camping has been eliminated from the plantation zones with the Forest Order Closure 14-17-02 that occurred in 2017 near town.

Many people commented that they did not want anything to change to the current facilities along the Everitt Memorial Highway or they wanted any actions to maintain the natural aesthetic feel of the area. However, it may not be possible to accommodate these desires for the status quo. The current facilities and opportunities along the Everitt Memorial Highway cannot support the growing recreation demand and have begun to create unsustainable problems such as crowding, user conflict due to limited parking and camping areas, irresponsible dispersed camping and garbage, degradation of resources due to increases in user-created trail systems, and the depletion of wilderness values such as solitude. To do nothing will continue these unsustainable problems, so it is likely that the agency will have to take some steps to improve infrastructure. However, any upgrades or new development will be naturalized to the extent possible so as to not take away from the natural aesthetic and beauty of the area.

Whether or not to implement a standard amenity fee is a challenging question. Two-thirds of the survey respondents said they would support such a fee, though 21% said they would not. Many people who opposed the initiation of a fee felt that their tax dollars should be spent for managing recreation sites and improvements instead of having visitors pay an additional fee. There are also social justice implications of charging fees. More and Stevens (2000) conducted research in New Hampshire and Vermont and found that about 49% of low-income people would be significantly impacted by having a daily fee of \$5 which would be excluding about half of that recreating public. In my study, 26% of the survey respondents reported household incomes below \$50,000, so the cost of a standard amenity fee could create a barrier for a sizable segment of the public who want to visit the area. Five dollars for a daily pass or \$25 for an annual pass might not seem like much money, but some people in the lowest income group might choose to recreate elsewhere where there are no fees associated with their activity. Manning and Anderson (2012) reviewed several studies on user fees and found that in some cases people modified their visitation patterns and went to areas that did not charge fees; for example in one study, 40% of respondents reported that they would not use Army Corps of Engineers areas if a fee was instituted. In another study, a parking fee was initiated in Scotland and use declined by 31%. Likewise, a survey in a National Forest in the southwestern United States discovered that visitation patterns changed among one-third of the people recreating because a fee was implemented on the Forest. The demand to visit Mount Shasta may be high enough -- because of the uniqueness of the area

-- to maintain high levels of visitation even if a fee is implemented. This has been documented for some locations, such as National Parks that did not see changes in visitation due to new fees, as long as the fee level range was reasonable and not a dramatic increase (Manning & Anderson, 2012).

Fees are currently collected from people climbing Mount Shasta or going above 10,000 feet. No studies have been conducted to see if these fees are displacing any users from planning to summit Mount Shasta. Nearly all (95%) of these fees are used locally to support the climbing ranger program (which provides climbing rangers who do patrols, provide education and assist in rescues avenues), support the avalanche forecasting program, maintain Bunny Flat and provide the pack-out bag program which has reduced the human waste inside the wilderness (which used to be a huge problem).

Challenges

Land management agencies are faced with developing new management models that will expand their capacity to provide high quality recreation opportunities as well as build resiliency and sustainability in these public recreation areas (Lehew et al., 2015). In 2010, the Forest Service outlined its strategy to move forward with attaining sustainable recreation on National Forest System lands. Elements of the strategy include engaging the community to help create a sustainable recreation program; resolving unmanaged recreation issues by planning and properly designing the network of trails, roads and facilities; utilizing educated citizen stewards and partnerships to help reduce the impacts of visitor use on the landscape; providing a field presence that will help reduce the impacts of visitor use on the landscape; and restoring the function and condition of current recreation facilities and settings, as well as expanding and adapting them to reflect the needs of our ever-changing society. Some of the institutional challenges of creating a sustainable recreation program for Mount Shasta include appropriated funding constraints, multiple agency targets, and limited personnel. Funding a sustainable recreation program is the number one challenge facing outdoor recreation in this area today. As stated in the USDA Forest Service Framework for Sustainable Recreation (2010, p. 3 and 7):

“We can no longer manage (outdoor recreation) as we have in the past. Any course we choose cannot depend solely on appropriated funding to meet our constituents’ needs... It is unlikely that appropriated funds will ever meet the total program need for providing excellent recreation opportunities while protecting the land.”

Implementation of a standard amenity fee is one solution that could help create a sustainable recreation program. It has been successful and the backbone of the climbing ranger program on Mount Shasta. There have been some other funding tactics taken to support the recreation services currently being provided on Mount Shasta. For example, in August of 2018 the Forest Service initiated donation tubes at recreation sites along the Everitt Memorial Highway to try and obtain some funds to help maintain the sites. There are currently donation tubes located at Gateway Trail, Bunny Flat and Old Ski Bowl and there are plans to install a donation tube at Everitt Vista in the next three years (pending Gateway Phase II expansion plans). Unfortunately, not much donation money has been received at this point (Gateway fee tube collected \$17 and the Bunny Flat/Old Ski Bowl tubes collected \$150), though advertising efforts regarding this new opportunity were not made. Advertisement of the available donation tubes for the area will commence in 2019.

The Forest Service has received grant funding from OSV (Over Snow Vehicle) sources to help provide funding for maintaining Bunny Flat, as well as assist in the avalanche forecasting program and snowmobile education program. The Forest Service will continue to pursue grant funding when opportunities arise to support the ongoing programs. However, many grant funding entities are hesitant to provide money for new facilities without there being a plan in place for maintaining these facilities. With the current allocated funding and staffing, maintaining new facilities will not be likely.

In addition to the funding problem, the Forest Service's 2010 strategy is an ambitious one made more difficult due to challenges associated with meeting other targets and priorities assigned by the agency. These other initiatives compete for resources and personnel who work on each Forest. For example, making improvements and developing new recreation facilities involves staff to plan and create the mandatory NEPA (National Environmental Policy Act) documentation; with the many other ongoing projects that currently occur on the Shasta-Trinity National Forest, adding projects to create new recreation facilities is a challenge for current personnel. Thus, fulfilling the spirit of the 2010 strategy would involve substantial resources and expertise that is currently being pulled in many different directions. With personnel being a limiting factor to work on recreation based projects, engaging others for help is a primary way of overcoming this challenge. One of the Forest Service's current roles in regards to advancing a sustainable recreation program is to engage local communities and organizations to assist in the creation and management of new and current recreation facilities by serving as "planners, facilitators, conveners, [and] collaborators, tapping the enormous energy and creativity of

people in communities that care for and benefit from public lands, including both the private and public sectors” (USDA Forest Service, 2010, p. 4). This has currently been a successful venture with numerous local partnerships (e.g., Mount Shasta Trail Association, Bike Shasta, Friends of the Mount Shasta Avalanche Center, Bioregional Ecology Center, and Youth Conservation Corps) and will hopefully continue to be productive.

There are more recommendations than what can be attained at one time, and most of them involve money for implementation and maintenance. Priorities will need to be set to decide which recommendations are feasible as well as the order in which they will occur. With the current funding situation, projects proposals for improvements or new construction that come with money already earmarked for them will have greater success at becoming a reality than those that will need to wait for funding to appear. These recommendations will also need to work through the NEPA process as mentioned above, so there is no guarantee as to what the final outcome will be after they have been put out to the public for scoping and review.

Conclusions

The Shasta-Trinity National Forest Land Management Plan highlights proposed to expand outdoor recreation opportunities on Mount Shasta and improve winter recreation opportunities. A substantial amount of work has been accomplished to analyze opportunities for improvements, for instance in the Wilderness Plan FEIS in 1992 and the Mount Shasta Watershed Analysis in 2012. My recent year-long recreation survey identified concerns and recommendations from the public that recreates along the Everitt Memorial Highway, many of which are similar to the opportunities described in the existing agency analyses and planning documents. It is evident that the demand for recreation has increased in the 25 years since the Forest Plan was written. My survey showed that overall visitors were largely satisfied with their experiences on Mount Shasta and crowding perception was low to moderate with the parking lots, with the exception of higher levels of crowding at Bunny Flat parking lot. There were very few user conflicts encountered by survey respondents. Low levels of crowding and conflict, along with high levels of satisfaction, are commonly reported in recreation research (Manning, 2011; Roemer & Vaske, 2014; Vaske & Shelby, 2008). The majority (between 61% and 79%) of the respondents in my study feel that the current amount of facilities is acceptable, though most of the remaining respondents would like to see more trails for hiking and biking but less for snow machines; visitors would also like to see more overall facilities and signage.

The facilities along the Everitt Memorial Highway do not accommodate the current peak use, and capacity is reached at the campgrounds and parking lots regularly, especially on weekends and holidays during spring and summer months. With projected increases in use of developed and interpretive sites, sightseeing/viewing nature, challenge activities, hiking and developed skiing/snowboarding, it will be important to expand some of the current facilities to meet the needs of the growing recreating public. Therefore the following bullets capture key priorities for the agency to address:

- Improve information and interpretive signage at trailheads and include trail maps at these locations; improve signage to trailheads (e.g., Black Butte Trailhead) and on trails; create a map that has information about where dispersed (non-developed) camping can occur, trail mileage, where dogs are not allowed, and where people can expect to encounter snowmobiles.
- Address the congestion at Bunny Flat parking lot either by expanding the parking lot, creating a separate snowmobile parking lot, or looking at an alternative snowmobile parking and launching location; improve/increase parking at Black Butte Trailhead and Upper Panther Meadows Trailhead.
- Add a restroom at Old Ski Bowl, Sand Flat Trailhead and Gateway Trailhead.
- Evaluate and design campground options at locations such as Bunny Flat, Sand Flat, or Red Fir Flat.
- Develop a permit system for climbing Mount Shasta during peak climbing season.
- Continue to evaluate a fee structure based on outcome of voluntary donation tubes that are installed in 2018-2019.
- Ensure any upgrades maintain the natural feel to not take away from the surrounding natural beauty.

With the help of partners, work is currently underway to make improvements to the facilities along the Everitt Memorial Highway (i.e., new Bunny Flat interpretive signs, new accessibility trail at Gateway) and expand recreation opportunities along this highway (i.e., Gateway Phase II trail expansion and McBride Campground expansion). With the agency being financially constrained, new revenue sources must be pursued which could include implementing a standard amenity fee, continuing to apply for grant money and continuing to work with partners and volunteers for facility development/improvement and maintenance. This work will hopefully continue in order to bring about a sustainable recreation program

to provide for current and future generations of the outdoor recreating public along the Everitt Memorial Highway.

My survey resulted in a huge amount of data that has never been collected in this area before. It will be used to inform recreation managers about current use and will hopefully be useful in making final management decisions. Knowing the distribution of recreation activities that are pursued along the Everitt Memorial Highway, as well as the popular locations where people are recreating, is also very useful information, not only to the Forest Service but also the local community, businesses and governments for planning purposes. Future research that would be beneficial in this area would include crowding studies targeting just the Mount Shasta Wilderness to help guide land managers about the overall perceptions from mountaineers. This survey only captured the input from 31 individuals that were mountaineering and a handful of others that were hiking or backcountry skiing/splitboarding in the wilderness.

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APPENDIX A: MOUNT SHASTA SURVEY

To be completed by Forest Service						
Date	Time	Weather Condition (circle one)		Completed Survey?	Vehicle Tally Count	
		Sunny	Overcast	Raining	Snowing	Yes No

OMB No. 0596-0236
Expiration Date: 11/30/2017

Mount Shasta Recreation Survey

Trip Characteristics

- On this visit** to Mount Shasta, which of the following sites did you and your personal group visit? (Please circle all that apply.) Use the map provided to help you locate the sites you visited.

a. Gateway Trails	i. Panther Meadows Campground
b. Black Butte	j. South Gate Meadows
c. McBride Springs Campground	k. Old Ski Bowl
d. John Everitt Vista	l. Gray Butte
e. Red Fir Flat	m. Horse Camp (Sierra Club Foundation)
f. Sand Flat	n. Helen Lake
g. Bunny Flat	o. Mount Shasta Summit
h. Panther Meadows	p. Other: _____
- In what activities on this list did you participate **during this recreation visit** to Mount Shasta? (please mark an (x) next to all that apply)

<input type="checkbox"/>	Camping in developed sites (McBride Springs CG, Red Fir Flat GC, or Panther Meadows CG)
<input type="checkbox"/>	Dispersed car camping (not in a developed campground)
<input type="checkbox"/>	Backpacking
<input type="checkbox"/>	Picnicking
<input type="checkbox"/>	Family gathering
<input type="checkbox"/>	Viewing natural features (such as scenery, wildlife, birds, flowers, fish, etc.)
<input type="checkbox"/>	Star gazing
<input type="checkbox"/>	Visiting historic or prehistoric sites/areas
<input type="checkbox"/>	Off-highway vehicle travel (4-wheelers, dirt bikes, etc.)
<input type="checkbox"/>	Driving for pleasure on roads
<input type="checkbox"/>	Hunting—all types
<input type="checkbox"/>	Hiking/walking on trails
<input type="checkbox"/>	Horseback riding
<input type="checkbox"/>	Bicycling on roads
<input type="checkbox"/>	Mountain biking on trails
<input type="checkbox"/>	Gathering mushrooms, Christmas trees, firewood, or other natural products
<input type="checkbox"/>	Rock climbing
<input type="checkbox"/>	Snowmobiling
<input type="checkbox"/>	Backcountry skiing/split boarding

	Cross-country skiing
	Snowshoeing
	Sledding
	Metaphysical, meditation, or spiritual activity
	Mountaineering
	Other (Please specify): _____

3. From the list in Question 2, which **one** of those activities was your primary activity during this recreation visit to Mount Shasta? _____

4. Below is a list of possible reasons why people recreate on Mount Shasta. Please indicate how important each item was to you as a reason for recreating on Mount Shasta during this trip.

REASON	Not at all Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
To be outdoors	1	2	3	4	5
For relaxation	1	2	3	4	5
To get away from the regular routine	1	2	3	4	5
For the challenge or sport	1	2	3	4	5
Summitting Mount Shasta	1	2	3	4	5
For spending time with family or friends	1	2	3	4	5
For physical exercise	1	2	3	4	5
To experience natural surroundings	1	2	3	4	5
To meditate	1	2	3	4	5
Other (please specify): _____	1	2	3	4	5

5. **On this trip**, did you stay overnight away from your permanent residence?

- a. No (Go to question 6)
- b. Yes

If yes, how many nights did you spend in the following types of accommodations, along Everitt Memorial Highway and/or in the nearby vicinity? Please write the number of nights stayed (write in number of nights in boxes beneath the two arrows).

Number of nights spent along Everitt Memorial Highway corridor, including on Mount Shasta (the mountain)		Number of nights spent within a 45 minute drive of Everitt Memorial Highway corridor
←	lodge, hotel, motel, cabin, rented condo/home, or bed & breakfast	→
	RV/trailer camping	
	Tent camping	
	Backcountry camping (backpacking)	
	Residence of friends or relatives	
	Other accommodations - please specify:	

Crowding and User Conflict

6. Overall, how crowded did you feel **during this visit** on Mount Shasta? (please circle one number)

1	2	3	4	5
Not at all Crowded	Slightly Crowded	Moderately Crowded	Very Crowded	Extremely Crowded

7. Did the presence of other people make you feel rushed or slow you down at any point during your trip today?
- No (Go to question 8)
 - Yes

If yes, at which location(s)? (Please specify) _____

8. Please rate how crowded (with traffic/people) each of the following areas was during your visit. (Please circle only one response for each type of area.)

Areas	Not at All	A Little	Very	Extremely	Not applicable
Roads leading to your recreation destination	1	2	3	4	0
Parking lots at National Forest trailheads/sites	1	2	3	4	0
Trails	1	2	3	4	0
Panther Meadows	1	2	3	4	0
Mount Shasta Wilderness	1	2	3	4	0
Bunny Flat	1	2	3	4	0

9. Do you feel the current number of people recreating along the Everitt Memorial Highway corridor is acceptable?
- Yes
 - No
 - Don't know

If no, what do you feel needs to change? _____

10. During your trip, did you have any conflicts with other parties?
- No (Go to question 11)
 - Yes

If yes, briefly describe who/what was involved and the nature of the conflict.

How did the conflict affect the quality of your experience?

Your Opinions about Recreation Opportunities on Mt. Shasta

11. Overall, how would you rate your trip today? (Please circle one)
- Poor
 - Fair, it just didn't work out very well
 - Good, but I wish a number of things could have been different
 - Very good, but it could have been better
 - Excellent, only minor problems
 - Perfect

Please provide any comments in regards to your trip rating:

12. Please look at this list of statements that address your feelings **about this trip** to Mount Shasta. Please indicate your level of agreement with each of the statements listed below.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No Opinion
My trip to Mount Shasta was well worth the money I spent to take it	SD	D	N	A	SA	N.O.
I avoided some places on Mount Shasta because there were too many people there	SD	D	N	A	SA	N.O.
The number of people recreating on Mount Shasta reduced my enjoyment	SD	D	N	A	SA	N.O.
The recreation areas on Mount Shasta are in good condition	SD	D	N	A	SA	N.O.
Current restroom cleanliness meets my group's needs	SD	D	N	A	SA	N.O.
Current safety and security at the recreation sites meet my group's needs	SD	D	N	A	SA	N.O.
Current parking at recreation sites along the Everitt Memorial Highway meets my group's needs	SD	D	N	A	SA	N.O.
Current facilities (i.e. restrooms, picnic tables, developed campgrounds) meet my group's needs	SD	D	N	A	SA	N.O.
Current directional signage to recreation sites meets my group's needs	SD	D	N	A	SA	N.O.
Current interpretation/educational signage meets my group's needs	SD	D	N	A	SA	N.O.

13. If you experienced any problems with the items listed in Question 12, please identify the locations where you had problems and describe what the problems were:

14. Were you able to easily access the various recreation activities you participated in today?
- Yes
 - No

If No, what prevented you from easily accessing your recreation activity?

15. Thinking about your trip, would you have liked to have seen more of, the same, or less of each of the following on Forest Service System lands that you visited on Mount Shasta? (Please circle one response for each item.)

	Less	Same	More
Trails for hiking	1	2	3
Trails for mountain biking	1	2	3
Trails for snow machines	1	2	3
Roads suitable for passenger vehicles	1	2	3
Parking at trailheads	1	2	3
Developed campgrounds	1	2	3
Directional and wayfinding signs	1	2	3
Informational and interpretation signs	1	2	3
Accessible-friendly (e.g., for wheelchairs) sites and facilities	1	2	3
Other (please specify):	1	2	3

16. If you could ask the resource managers to change/modify any recreation opportunity or facilities on Mount Shasta to improve your experience, what would that be?

17. Currently fees are not charged at sites along the Everitt Memorial Highway. In the future, a day-use standard amenity pass may be considered, with most (95%) of the funds collected remaining on the Mount Shasta/McCloud Management Unit to help pay for maintenance costs, provide more Forest Service presence, and improve recreation facilities. If a fee of \$5 for a daily pass (per vehicle) or \$25-30 for an annual pass (per vehicle) was charged in the future, would you be willing to pay it? (Please circle only one)

- Yes, likely
- No, unlikely
- Not sure

General Information

18. **On this visit**, were you and your personal group with the following type of organized groups? (please circle yes or no for each)

Commercial guided tour group	<u> </u> Yes	<u> </u> No
School/educational group	<u> </u> Yes	<u> </u> No
Other organized group (such as business group, scout group, etc.)	<u> </u> Yes	<u> </u> No

19. How many people were in your (personal, organized, tour) group today, including you?

Adults: _____ Children (under 18): _____

20. When you made plans to visit Mount Shasta (the mountain), how far in advance did you make that decision?

(Please circle one)

- a. months (> 1 month ago)
- b. weeks (1-4 weeks ago)
- c. days (1-7 days ago)
- d. hours (<24 hours ago)

21. Which of the following best describes your visit to Mount Shasta? (please circle only one)

- a. It was the primary purpose or sole destination of my trip
- b. It was one of multiple planned destinations for my trip
- c. It was just an incidental or spur-of-the-moment stop on a trip taken for other purposes or to other destinations

22. Have you visited Mt. Shasta before?

- a. No (Go to question 25)
- b. Yes

If Yes, approximately how many times?

- a. 1-5
- b. 6-20
- c. 21-50
- d. 51+

23. If you have visited Mount Shasta before, during what season do you normally visit?

Please mark (x) all the seasons that you have visited Mount Shasta:

Winter	Spring	Summer	Fall
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What year was your first visit? _____

24. Have you noticed any changes related to recreation of visitation on Mount Shasta in the last five years?

- a. No
- b. Yes

If yes, what changes have you seen?

Socio-demographic characteristics

To characterize the types of people who visit Mt. Shasta, we have a few questions about you and your group.

25. What ethnicity do you consider yourself? (please circle one)

- a. Hispanic or Latino
- b. Not Hispanic or Latino
- c. Prefer not to answer

26. With which racial group(s) do you most closely identify? (please circle as many that apply)
- a. American Indian/ Alaska Native
 - b. Asian
 - c. Black/ African American
 - d. Native Hawaiian or other Pacific Islander
 - e. White
 - f. Prefer not to answer
27. Which one language do you and members of your group primarily use to communicate with each other?
- a. English
 - b. Other (Specify) _____
28. What is your gender? (Please circle only one)
- a. Male
 - b. Female
 - c. Other
29. Please indicate the highest level of education you have completed. (Please circle only one)
- a. Less than high school
 - b. High school graduate/GED
 - c. Vocational or Technical School certificate
 - d. Associates Degree
 - e. Some college
 - f. Bachelor's degree
 - g. Graduate degree or professional degree (MA, MS, PhD, JD, MBA etc.)
30. Which category best represents your annual household income (before taxes) last year? (Please circle one)
- a. Less than \$24,999
 - b. \$25,000-\$34,999
 - c. \$35,000-\$49,999
 - d. \$50,000-\$74,999
 - e. \$75,000-\$99,999
 - f. \$100,000-\$149,999
 - g. \$150,000-\$199,999
 - h. \$200,000 or more
 - i. Do not wish to answer
31. Do you live in the United States?
- a. Yes (What is your Zip Code? _____)
 - b. No (In what country do you live? _____)

APPENDIX B: FULL LIST OF RECOMMENDATIONS FROM THE SURVEY

Survey Respondent Recommendation	Category	Summary of Recommendation	Potential Options
It's hard for me to get around, need more places to sit to meditate around Bunny Flats. I come 4 times a year. Benches facing Mount Shasta. I have bad joint pain.	accessibility	<ul style="list-style-type: none"> • More benches at Bunny Flat; • wheel chair options 	<ul style="list-style-type: none"> • Install a couple more benches at Bunny Flat that face the mountain; • Evaluate areas that can accommodate wheel chair opportunities, some options include: Everitt Vista, Old Ski Bowl, overlook into Panther Meadows
wheel chair options	accessibility		
higher ski park	additional facility	<ul style="list-style-type: none"> • Build higher ski park; • Build an altar; • Snowshoe/ski rental shop; • Designated sledding area; • Build lodge/facility for food and drink; • Create designated picnic area; • Design designated meditation vortexes; 	<ul style="list-style-type: none"> • Create interpretive plan for popular 'vortex' location which may include collaborating with local new age groups to create a brochure with information about sites; • current work is being done to create better separation between Red Fir Flat day use and group use site; • more picnic tables can be installed at day use sites for use: Bunny Flat, Old Ski Bowl, Everitt Vista
build an altar	additional facility		
snowshoe/ski rental	additional facility		
Designated sledding area, like eskimo hill on Lassen Co.	additional facility		
build lodge somewhere for food and relaxation	additional facility		
my mom wants a hot chocolate shop	additional facility		
create/add a designated picnic ground	additional facility		
design designated meditation vortexes	additional facility		
refreshment center	additional facility		
maybe a gun shooting range	additional facility		

have a coffee/ice cream shop near summit	additional facility	<ul style="list-style-type: none"> • Build a way to the top 	
build a way to get to the top :)	additional facility		
campgrounds with showers and fire pit	campground	<ul style="list-style-type: none"> • More campgrounds on Mount Shasta; • potential for online reservation; • more campground amenities like showers and water 	<ul style="list-style-type: none"> • Currently working on the NEPA for expanding McBride Campground; • evaluate and design campground options at locations such as Bunny Flat, Sand Flat, Red Fir Flat; • evaluate ability to install water source at Bunny Flat
more small campgrounds like McBride Springs above and below it	campground		
more developed campgrounds	campground		
one more campground, McBride gets filled up easily	campground		
more offsite camping	campground		
a campground with showers	campground		
more camping opportunities	campground		
seems campgrounds are over used	campground		
more camping opportunities	campground		
more campgrounds	campground		
more campgrounds (we find them almost booked)	campground		
more developed campgrounds ideally with water	campground		
bookable camping perhaps	campground		
more camping grounds	campground		
more camp sites	campground		
I don't like campground on Mount Shasta; Too many people who are disrespectful	campground		
more campgrounds	campground		
more campfire stoves	campground		

Value freedom; please reconsider prohibiting camping in McBride Plantation I had been responsibly camping there for over 13 years and was shocked and significantly inconvenienced to be pushed out. Ranger left very large rock on truck with warning. Terribly disrespectful	camping	<ul style="list-style-type: none"> • More dispersed camping opportunities; • reconsider camping regulations in plantations; • continue no camping regulations in plantations; • move Red Fir Campground away from Ascension rock; • open up camping at Red Fir Flat 	<ul style="list-style-type: none"> • Develop map with locations that dispersed camping can occur along the Everitt Memorial Highway and coordinate signage on the ground to assist with appropriate locations
either eliminate or adhere to forest camping regs. Especially in the everitt memorial plantations	camping		
sad that some of national forest roads were closed to camping	camping		
more camping allowances for responsible hikers	camping		
more dispersed camping	camping		
Improved camping option	camping		
I'd like no camping or pets at Bunny Flat	camping		
Move Red Fir Campground away from Ascension rock and open it to individual camping	camping		
Let poor people camp.	camping		
continue no camping or campfires in areas outside developed campgrounds	camping		
protect from overuse	crowding	<ul style="list-style-type: none"> • Lottery system for climbing; • lottery system only on holiday weekends; • limit the number of people camping at Helen Lake; 	<ul style="list-style-type: none"> • Develop a permit system for climbing Mount Shasta during peak climbing season.
tent limit at Lake Helen - too many people trying to summit Mt Shasta today	crowding		
permits for campgrounds over holiday weekends	crowding		
limit # of people camping at Helen Lake	crowding		

less traffic to Panther Meadows to help preserve the sacred peace and beauty. Thank you	crowding	<ul style="list-style-type: none"> limit number of cars at Bunny Flat or provide shuttle service 	
maybe consider climbing quota for holiday weekends (based on ranger talk there were 500 climbers over memorial and july 4th weekend)	crowding		
Limit number of cars on some days. Provide a shuttle service for a fee	crowding		
more space for solitude	crowding		
Limit access in wilderness	crowding		
lottery for climbing mount shasta	crowding		
allow dogs off leash above bunny flat	dogs	<ul style="list-style-type: none"> More dog friendly areas/trails; enforce no dog rule in wilderness; enforce clean up after dogs; no pets at Bunny Flat 	<ul style="list-style-type: none"> Create a map/brochure of the Forest Service System trails where dogs are welcome. Currently the only areas that restrict dogs are the Mount Shasta Wilderness and Panther Meadows, both because of resource concerns.
more dog access	dogs		
more trails for dogs	dogs		
more pet friendly	dogs		
more dog areas	dogs		
allow dogs on leash	dogs		
provide more hiking trail that allow dogs	dogs		
enforce no dogs rule in wilderness	dogs		
limit dogs and enforce limits, encourage people to clean up after animals and enforce when they don't	dogs		
no pets at Bunny Flat	dogs		
Eliminate dogs	dogs	<ul style="list-style-type: none"> Provide ranger led hikes; 	<ul style="list-style-type: none"> Continue to coordinate ranger led hikes to Horse Camp with local schools.
educating hikers (i.e. need to take sufficient water)	education		
ranger led walks	education		

Instruct more about the responsibility of each camper to put out campfire completely when they are not present and what is required!!	education	<ul style="list-style-type: none"> • provide educational outreach to local schools; • provide ranger/docent station at Bunny Flat; • more educational outreach opportunities to people recreating 	<ul style="list-style-type: none"> • Develop outdoor education program for the certain days throughout the summer months and at different locations for the public to attend (i.e. Panther Meadows, Old Ski Bowl, Grey Butte, Horse Camp). • Continue to staff the visitor information trailer.
A friendly way to bring awareness to caring for meadows	education		
Educational outreach to local schools for 3rd-8th or high school level.	education		
only thing is respect the outdoors interpretation but not really signs, maybe people	education		
ranger/docent station at bunny flats	education		
education of user population on proper engagement with wilderness	education		
I would like to have someone at Bunny Flat or on the way to guide people especially in winter	education		
to educate mountain goers to take care of the mountain	education		
encourage greater respect for this special place	education		
will reluctantly be likely to pay fees	fee	<ul style="list-style-type: none"> • Do not want fees; • do not want locals to pay fees; • fees or day limits are essential 	<ul style="list-style-type: none"> • Continue to evaluate a fee structure based on outcome of voluntary donation tubes that are installed in 2018-2019.
perhaps acquire maintenance volunteers instead of charging money - shasta is good as she is!	fee		
locals deserve free access	fee		
keep mt. shasta free for camping, day use keep it simple	fee		
To eliminate the 'free' indefinite camping on the mountain which encourages people squatting on the	fee		

mountain. Fees and/or day limits is essential to the mountain.			
free education no more fees for camping	fee		
keep land free. Everything is great!	fee		
keep Shasta museums open more hours; more staff to mentor unacceptable damaging behavior	FS presence	<ul style="list-style-type: none"> • More FS patrolling; • extend climbing ranger season and add more climbing rangers; • enforce staying on trails in South Gate Meadows; • more campground supervision; • monitoring of Sand Flat for unacceptable behavior 	<ul style="list-style-type: none"> • Continue FS patrolling and conduct more patrols with seasonal staff.
a bit more supervision on campgrounds (some long-term campers were smoking weed)	FS presence		
monitor sand flats during camping season for certain human behavior: trash, heavy drug use, noise	FS presence		
more patrols by rangers on horseback/mountain bike/and patrol cars	FS presence		
extend the climbing ranger season and increase the numbers of climbing rangers as they are often spread to thin on such a large mountain	FS presence		
enforcement of staying on trails at South Gate Meadow	FS presence		
open panther meadows for us to experience! Thank you for everything you do.	gate		
I would have liked to visit some where closer to the summit than where the road is closed, not sure if that's possible	gate		
open it early if you can	gate		

I suppose to open access to Panther Meadows earlier in the year	gate				
Open the Bunny Flat gate earlier in the summer (this year was exceptionally late)	gate				
keep road open all the way to the old ski park until it is snowed in	gate				
better maps at trail head	maps	<ul style="list-style-type: none"> • Provide maps at trailheads 	<ul style="list-style-type: none"> • Provide maps at the following trailhead locations: Bunny Flat, Panther Meadows, Sand Flat 		
provide maps at sites	maps				
more trail head map	maps				
maybe the FS can have more of the maps like the ones at the visitor center - one page handouts. Those make hiking and sight seeing easy.	maps				
more maps and brochures	maps				
maps on posters at trailheads	maps				
more maps available more readily	maps				
trail maps would be fantastic	maps				
keep it as it is!	nothing			<ul style="list-style-type: none"> • Keep everything as it currently is; • keep it natural; • keep it pure 	<ul style="list-style-type: none"> • Ensure any upgrades maintain the natural feel to not take away from the surrounding natural beauty.
perfect as is	nothing				
nothing leave as is	nothing				
leave it as is!!	nothing				
no change needed	nothing				
don't change anything	nothing				
no changes requested	nothing				
nothing!	nothing				
no change	nothing				
we love it, don't change a thing	nothing				
no change necessary	nothing				
don't change!	nothing				

I love Mount Shasta the way it is	nothing		
I would not change anything	nothing		
nothing keep up the good work	nothing		
Mount Shasta is perfect the way it is. Too many humans!	nothing		
no more development please and no logging please!	nothing		
Leave it as it is! Make snow?	nothing		
please keep it so pure and simple is possible	nothing		
keep it natural	nothing		
I think the natural beauty is best to watch mount shasta.	nothing		
provide more information online	online	<ul style="list-style-type: none"> • Provide more information and 'seasonal favorites' online; • provide ability to purchase summit passes online; • fix google maps navigation to Bunny Flat 	<ul style="list-style-type: none"> • Continue to update the Shasta-McCloud Management Unit information on the Shasta-Trinity National Forest webpage. • Contact google maps to remove the route option to Bunny Flat that takes people up the 31 Road and up to Bunny Flat on the dirt roads. • Look into opportunities to have summit passes issuance online. This should be part of the "Modernization of Recreation Special Uses" in regards to getting certain permits online.
better online info	online		
on-line summit passes	online		
Provide "seasonal favorites" list of sites to see in park	online		
yearly summit pass available at trailhead/online	online		
Get the navigation to Panther Meadows fixed with google and apple maps	online		
less logging	other	<ul style="list-style-type: none"> • Add gates at Sand Flat during snow season; • less logging; 	<ul style="list-style-type: none"> • Look into usage of gate at Sand Flat for the non-motorized snow trails.
gates at sand flat during snow season	other		
Bunny Flats is a great area to sled. Too many trees blocking most of the good hills. Safety.	other		

put a website or phone # on a sign so we can report problems found in the moment. Info can be conveyed quicker. We don't need a response to the communication. The FS can respond per situation. Add a bench every 2 miles on EMH for walkers to rest. Keep the McBride spring running its beautiful. have 1 gallon trash bags available for walkers to pick up small trash and leave bags on side of road for FS vehicles to pick up.	other	<ul style="list-style-type: none"> • remove trees for sledding safety at Bunny Flat; • plant native plants, cure tree disease and no fires; • provide more avalanche funding; • more funding in general; • concern with businesses operating paid tours on the mountain; • keep working with partners and county to enhance facilities along the Everitt Memorial Highway; • provide meditation retreat on the mountain; • allow campfires near the campgrounds on Mount Shasta; • focus on spiritual and energy centers; • provide mushroom hunting locations; • no Christmas tree cutting along the Everitt Memorial Highway;
preservation of the historical artifacts that are held here	other	
do this survey in peak of tourist time it was so much less crowded today in September	other	
always add more native plant species; cure tree disease; no fires!	other	
more avalanch funding	other	
great job! My primary concern are businesses operating paid tours on mountain.	other	
keep working with partners to improve and make accessible the resources we have. Everitt memorial highway is key to so many rec. opportunities in winter and summer - encourage/finance/enhance the roadway and facilities along it and work with county to make it happen	other	
allow camp fires near shasta campgrounds	other	

meditation retreat mountainside	other	<ul style="list-style-type: none"> alternative locations for when tribes have their ceremony 	
Keep it pure. Make it accessible but not overtly. Otherwise people come and they stay asleep unconscious. I like that you have to do your research before coming to Mt Shasta	other		
spiritual guide groups need to be open to all forms of outdoor recreation (i.e. mountain bikes)	other		
focus more on the spiritual, energy centers, etc.	other		
take the wishes of the native people on how to conduct yourself respectfully at springs and on mountain	other		
areas for mushroom hunting specified, very complicated procedures	other		
more not less funding for NFS	other		
no Christmas tree cutting on EMH	other		
Alternatives for times when tribes are in ceremony - better notice to non-natives or some way to include; solar chargers and more picnic areas at horse camp for emergencies; solar phones on east and north sides for emergencies/fire	other		
would love to see less logging	other		
a little more parking	parking	<ul style="list-style-type: none"> More parking at Bunny Flat, Black Butte, Panther Meadows; 	<ul style="list-style-type: none"> Address the parking lot situation at Bunny Flat. This could involve expanding the parking lot, creating a separate snowmobile parking lot, looking at
more parking	parking		
parking at black butte was limited	parking		
parking	parking		

better parking in crowded areas (Panther Meadows and Campground)	parking	<ul style="list-style-type: none"> Separate parking at Bunny Flat for snowmobile trailers 	<p>alternative snowmobile parking and launching location such as at Wagon Camp Road during big snow seasons (this won't work when the snow is not deep or when the snow starts to melt).</p> <ul style="list-style-type: none"> Address parking situation at Black Butte Trailhead to create more parking. Create a better parking and trailhead kiosk location at the Upper Panther Meadows trailhead.
Parking is an issue at Bunny Flat @ snowmobile ramp, need better signage so people do not block ramp/confusing signs at Bunny about where snowmobiles are allowed. I know its to the right of the EMH but others have been confused	parking		
A separate parking area for trailers	parking		
I think there could be improvements to Bunny Flat parking area. In winter, especially weekends, the area is too small to meet needs of many different user groups (skiers, snowmobiles, climbers, families playing in the snow, mountain gazing new agers, etc) it gets extremely crowded.	parking		
more parking	parking		
more parking at Bunny Flat	parking		
parking at bunny flat	parking		
separate ohv parking. This is a large/growing user group at bunny, especially on years of high snow levels. It is their only access point for a long ways.	parking		
additional parking	parking		
more parking	parking		
more parking at Bunny Flat	parking		
separate parking/unloading area for snowmobiling so we don't bother hikers/campers/meditators	parking		

parking at bunny flat needs improvement - crowding issues	parking		
better parking, established for snowmobilies in winter	parking		
it's great; sometimes Bunny Flat parking lot is very crowded but keep it small	parking		
just a little more parking but it was ok	parking		
need to address high season parking issues at Bunny Flat	parking		
parking	parking		
When removing snow from the road give space for parking at side roads	parking		
improved parking	parking		
bigger parking area at bunny flat	parking		
parking	parking		
better parking lots	parking		
mainly more parking	parking		
more parking	parking		
more parking	parking		
Minor changes for improvements like good parking	parking		
music restrictions; disruption of natural environment - tents, labrynth;	people	<ul style="list-style-type: none"> • Keep Mount Shasta local; • keep people on trails; • keep out homeless/transients; • separation of non-motorized and motorized use; 	<ul style="list-style-type: none"> • Continue to monitor use areas along the Everitt Memorial Highway for inappropriate activities. • Create map for winter recreation opportunities along the Everitt Memorial Highway so people understand the areas that are motorized versus non-motorized.
keep shasta local!!	people		
make it a locals only mountain! Haha I wish	people		
Is there separation between non-motorized and motorized recreation use?	people		
keep people on the trail	people		

keep the transients out	people	<ul style="list-style-type: none"> more restrictions on music and disruptive behavior 	<ul style="list-style-type: none"> If a fee is established for the Everitt Memorial Highway corridor, look at opportunities to provide money to the Siskiyou County for plowing parking lots at the recreation locations along the Everitt Memorial Highway. 	
noise control at bunny flats campground	people			
keep out homeless	people			
please return plowing to Old Ski Bowl in winter!	plowing	<ul style="list-style-type: none"> Continue to plow to Bunny Flat; return plowing to Old Ski Bowl; plow road to Old Ski Bowl if snow is present by July 1st 		
continue to plow to bunny flat	plowing			
plow the road by July 1 if snow still present	plowing			
extend road with snow plough to make accessible	plowing			
Make it accessible for anyone to get to Bunny Flat without chains	plowing			
In winter have roads plowed	plowing			
continued timely snow removal on the EMH	plowing			
improved winter plowing	plowing			
the restrooms	restrooms	<ul style="list-style-type: none"> More restrooms; add restroom to Old Ski Bowl; add restroom to Gateway Trailhead; add composting toilet to Helen Lake; add hand sanitizer to restrooms; better cleanliness in restrooms; better toilet paper holders in restrooms 		<ul style="list-style-type: none"> Add a restroom at Old Ski Bowl, Sand Flat Trailhead and Gateway Trailhead. Add hand sanitizers to restroom facilities.
maybe composting toilets at Lake Helen?	restrooms			
more restrooms!	restrooms			
more restrooms	restrooms			
out houses	restrooms			
improve bathroom	restrooms			
more restrooms	restrooms			
outhouse at Old Ski Bowl	restrooms			
Bathrooms open more	restrooms			
Better restroom	restrooms			
more restrooms	restrooms			
hand sanitizer in restrooms	restrooms			

have more restrooms	restrooms
have better bathrooms	restrooms
bathrooms have rats in the bottom, stinky bathrooms need updated, vista point bathroom is 80% cleaner than bunny flat bathrooms	restrooms
hand washing station at restroom	restrooms
better restroom maintenance (especially in summer)	restrooms
bathrooms	restrooms
better care of restrooms	restrooms
better TP holders	restrooms
heated toilets	restrooms
more restrooms	restrooms
more accessible bathrooms at Bunny Flat and a composting toilet at Helen Lake	restrooms
panther meadows upper parking lot bathroom.	restrooms
possible restrooms at top parking lots	restrooms
Provide garbage and bathrooms for the mountain bikers.	restrooms
add hand sanitizer to bathroom	restrooms
cleaner bathrooms	restrooms
work on conditions of restrooms	restrooms
flush toilets at trailheads	restrooms
Restrooms at Gateway trailhead	restrooms
restrooms at spring hill (portipoti)	restrooms
cleaner restrooms	restrooms
Clean bathrooms.	restrooms

more restrooms	restrooms		
another restroom at Bunny Flat	restrooms		
more restrooms/showers	restrooms		
bike lane up EMH	roads	<ul style="list-style-type: none"> • Add bike lane on Everitt Memorial Highway; • improve roads in to Sand Flat; • fix potholes; • improve road to North Gate, Brewer Creek, Whitney and Bolum trailheads; • add gravel to dirt roads; • improve road conditions; • reopen roads 	<ul style="list-style-type: none"> • Get potholes fixed on the road between Upper Panther Meadows trailhead and Old Ski Bowl. • Improve road condition to North Gate, Brewer Creek, Whitney and Bolum Trailheads. • Improve road condition on loop road to Sand Flat.
improve road condition	roads		
better dirt roads to dispersed camping (sand flat)	roads		
Some roads have potholes way too large for passenger vehicles	roads		
the road into sand flats is sometimes so rutted we can rarely take our trailer in there	roads		
Improved road access to N. Gate, Brewer Ck., Whitney, and Bolum trail heads	roads		
reopen forest service roads	roads		
road improvement	roads		
improve the roads (need gravel down)	roads		
better info on climbing routes from BF	signage		
lower speed limits and post them more frequently	signage		
road signage	signage		
signage	signage		
better information on trails and interpretation, mileage etc. to trail points of interest	signage		
more signage along the way	signage		
more trailhead signs	signage		
signs	signage		

Bigger signs or more instructions about staying on the trail and honoring the sacredness of the mountain to the Native Americans	signage	<ul style="list-style-type: none"> • more elevation signs; better trail marker signage; • more directional signs to the summit of Mount Shasta; • informational signs of spiritual places of interest (Ascension Rock, big foot); • better directional signage to Black Butte; • more/better informational signage with floral/fauna/geological history/points of interest/wilderness; • more signage in Panther Meadows about staying on the trail and honoring the sacredness of the mountain to the Native Americans; • better signage to Panther Meadows trail from the campground; • sign about gate closure at Bunny Flat earlier on the road; 	<ul style="list-style-type: none"> • Post sign close to Gateway Trailhead stating road closed at Bunny Flat. • Clear out vegetation that blocks signs along the Everitt Memorial Highway. • Address signage issue at Gateway Trail as many people pass the trailhead and have to turn around. • Improve trail location signage.
more signs	signage		
more elevation signs, more history info	signage		
elevation signs	signage		
signs to declare clearly the exact trail	signage		
more directional signs to reach mount shasta summit	signage		
more signs on trees	signage		
places where sightings of big foot	signage		
information about spiritual rock	signage		
more road closure notice and info/detour info	signage		
increased number of directional signs	signage		
improve trail signage	signage		
better signage to black butte trailhead	signage		
signs	signage		
we were satisfied other than the signage	signage		
more signs with facts about the flora/fauna native to Shasta, history	signage		
more information signs (wildlife present, sightings, geological history, points of interest along trails etc)	signage		
signage on trail heads; increase in signage on trails and what can be seen along the trails will be helpful	signage		
more marked trails	signage		

More interpretive signage and historical information i.e. a viewpoint pointing out geological features from Bunny Flat	signage	<ul style="list-style-type: none"> • sign for when it is appropriate to camp 	
It would be cool to have flower ID info at trailhead	signage		
snow shoe trails and guide markers	signage		
more indication	signage		
More signs pointing out the particularly sensitive ecological areas under redevelopment so people know not to hike there. Also sacred native American sites e.g. Panther Meadows	signage		
an easy way to get from the parking area just past the Panther Meadows Campground to the trail. The signage is confusing.	signage		
more info on fragility of wilderness	signage		
more trail information/signage/waymarking	signage		
for those of us who visit the area one thing that would be helpful is clear marking when beyond city limits to camp.	signage		
In general, more weather proof educational signs designating how to behave on trails. I see a lot of people ignoring signs and trampling through sensitive areas like Panther Meadows or driving 4x4s to cut cookies at Sand Flat, not good.	signage		

information for the everyday consumer about site history or spiritual significance. Maybe on a really thorough map?	signage		
mark trails in Panther Meadows a bit clearer	signage		
trail head signs	signage		
more road signs	signage		
early sign of road closure	signage		
better signs and indication	signage		
add descriptive signage at top	signage		
more signs	signage		
work on the signs	signage		
poor upkeep of broken Forest signs everywhere	signage		
more trail markers and map signs	signage		
more signage	signage		
signage, explanation of wilderness - educational	signage		
information on geological landmarks along the way	signage		
a speed limit sign besides "end 35 mph speed limit" would be helpful	signage		
move the boundaries for snowmobiles, cant hurt anything	snowmobiles	<ul style="list-style-type: none"> eliminate snowmobiles; increase snowmobile boundary, more signs for snowmobiles; 	<ul style="list-style-type: none"> Provide some separation at the Bunny Flat parking lot for snowmobile trailers. Provide maps at Bunny Flat to show motorized and non-motorized winter recreation areas.
less snowmobiles	snowmobiles		
just more signs for snowmobile	snowmobiles		
limit jetskis to two weekdays only	snowmobiles		
new snowmobile parking lot - too many trailers; keep road plowed	snowmobiles		

other snow mobile areas besides bunny flat need to be maintained and increased to take pressure off of Bunny Flat	snowmobiles	<ul style="list-style-type: none"> • new snowmobile parking lot so it is separate from main lot; • eliminate snowmobile off the road (above gate) 	
continue access for hunters and anglers but less motorized access for atv and snow machines	snowmobiles		
more snow mobiling	snowmobiles		
no skidoos	snowmobiles		
no snowmobiles	snowmobiles		
consider snowmobiles and pedestrians above Bunny Flat	snowmobiles		
blow up the snowmobiles!	snowmobiles		
Alternative access for snowmobiles or more parking at or near Bunny Flats	snowmobiles		
more snowmobiling access	snowmobiles		
Keep out snowmobilers above timberline. More parking at Bunny Flat.	snowmobiles		
snowmobiling foot print is destructive and ruins the tranquility. The exhaust, noise and overall presence of the snow machines is the exact opposite of what many people chose these areas for	snowmobiles		
create a separate staging area for snowmobiles. Or better yet ban them from mt shasta	snowmobiles		
eliminate snowmobiles off road	snowmobiles		
I would like not allowing the snowmobiles beyond bunny flat area so we can walk in peace without the noise and smell of exhaust	snowmobiles		

the noisy snowmobiles are a great nuisance	snowmobiles		
some form of greater control (isolation?) on snowmobile activity especially up the snow covered roadway beyond Bunny.	snowmobiles		
Eliminate snowmachines	snowmobiles		
Get rid of snowmobiles	snowmobiles		
no snowmobiles out panther meadows road after winter (i.e. May 1st)	snowmobiles		
suggest rotating trails (like 3 trails used in rotation so that others can revegetation and recover)	trails	<ul style="list-style-type: none"> • South Gate and Hummingbird Meadows need work because of trail braiding; • Lower Panther Meadows needs rock trail to the water; • more trails; • increase short interpretive trails for aging population; • More mountain bike trails; • restore Whitney Creek Trail; • make 8 mile a legal trail; • approve user created mountain bike trails; • more OHV trails; 	<ul style="list-style-type: none"> • The mountain biking trails are currently being evaluated in the Gateway Phase II project. • Re-route and improve the trail in Southgate Meadows and Hummingbird Meadows and restore the meadows from the trail braiding that is currently occurring in the meadows. • Improve the short interpretive trails along the Everitt Memorial Highway and evaluate locations for additional accessible trails. • Create trail maps of the trails along the Everitt Memorial Highway and provide them at trailheads. These trail maps should have information about which trails allow pets as well as trail mileage. • Restore the Whitney Creek trail.
Please take care of South Gate and Hummingbird Meadows, do more to protect fragile areas and keep from so much trail braiding	trails		
Panther Meadows - make a few pathways with rocks to be closer to the water on lower Panther	trails		
more trails	trails		
Increase short interpretive trails for aging population	trails		
more mountain bike trails	trails		
restore whitney creek trail	trails		
better trails	trails		
more mountain biking make 8 mile trails legal!!!!	trails		
more hiking trails	trails		
more ohv trails	trails		
more mountain bike trails	trails		

add more bike trails	trails	<ul style="list-style-type: none"> • more easy mountain bike trails; • build trail to the waterfall at ski bowl; • more dirt bike riding; • need trails dedicated to small children/family friendly and dogs on leash; • create round the mountain trail (circumnavigation); • create an equestrian only trail in the wilderness
mountain biking trails	trails	
approve mountain bike trails that aren't currently legal so that they can be properly maintained by bike shasta and prevent more erosion	trails	
more mtn bike trails would be great. Saying that, however, I must also say that you have done a great job with the gateway trail system. It is wonderful.	trails	
more easy mt bike trails	trails	
more trails	trails	
junior nature explorer! Trail to the waterfall at ski bowl	trails	
more dirt bike riding	trails	
more mountain bike trails	trails	
trails dedicated to small children and/or dogs (on leash)	trails	
sanction and develop the illegally built downhill MTB routes. Create more downhill trails	trails	
would love a trail round the whole mountain and a few other decent access points	trails	
more family friendly trails	trails	
a few more hiking trails would be great!	trails	
4WD off road trails; motor cross riding tracks	trails	
stop converting roads to trails.	trails	

more mountain bike trails; specific trail or two for horses only in wilderness area with heavy access	trails		
maintenance on McCloud R.Trail; develop trails that connect to Hwy 89;	trails		
more trails	trails		
add more mountain biking trails	trails		
more signs for picking up garbage. More cleanup of trash can at campground	trash	<ul style="list-style-type: none"> • More signs for picking up trash; • Provide garbage bags; • Provide more trash cans 	<ul style="list-style-type: none"> • Provide garbage cans at all trailheads along the Everitt Memorial Highway.
more trash cans maybe	trash		
refuse bags	trash		
move unimproved campsite trash can so people use it and not the side of the road	trash		
more vista points - public use binoculars	vistas	<ul style="list-style-type: none"> • More vista points along the Everitt Memorial Highway and have view finders at vista points 	<ul style="list-style-type: none"> • Install view finders at Bunny Flat trailhead • Improve the view at Everitt Vista • Assess the potential of new vista point locations
more vistas for good view	vistas		
viewpoint turnouts toward the west	vistas		
restore the viewpoint aprox. 2.5 miles down from bunny flat th. It would be a nice star gazing site	vistas		
view finders at Everitt Vista	vistas		
running water at Bunny Flat	water	<ul style="list-style-type: none"> • Provide drinking water at Bunny Flat; • Provide water near trailheads 	<ul style="list-style-type: none"> • Evaluate and provide potable water at Bunny Flat and potentially Sand Flat if use numbers at this location show a need.
water at the trailhead	water		
more water fountains	water		
H2O	water		
water source at Bunny Flat Trailhead	water		
water availability on mountain	water		
drinking water at Bunny Flat	water		

water available near trailheads	water		
water bottle station to fill up	water		
Water fountains would be nice!	water		
to have more drinking water	water		

APPENDIX C: MOUNT SHASTA WATERSHED ANALYSIS RECREATION POTENTIAL OPPORTUNITIES

Develop and provide more recreational facilities to accommodate visitors:

- **Trails**
 - Evaluate all user-created trails and routes for possible improvement and addition to the Forest Service Trail System. Consider opportunities to connect trails to access points and to collaborate with communities and the Mt. Shasta Board and Ski Park to create connected systems from existing access points.
 - Panther Meadows Traditional Cultural Properties
 - Design and complete construction of the trail system in the mid and lower portions of the meadow
 - Consider establishing an 8 person maximum group size
 - Evaluate options to curtail use during the wet period of the spring season and restrict use to authorized trails (e.g. new regulations in Forest Order)
 - Consider eliminating dog use in the meadow except on the through trail to Gray Butte
 - Evaluate opportunities to communicate with and educate local and non-local groups about impacts occurring in Panther Meadows and methods to minimize impacts (e.g. off-trail use, wet season use, illegal commercial use, illegal dumping of cremations, leaving of offerings, entering the upper spring, etc.).
 - South Gate Meadows
 - Design and build a Forest Service trail system and rehabilitate existing and poorly located user-created trails
 - Develop and institute regulations to restrict camping in meadow.
 - Hummingbird Meadows
 - Redesign trail system to avoid the meadow

- Ski Bowl
 - Remove and restore sites with remaining infrastructure from the Ski Shasta installation (including roads) and create loop trail system to vista sites within the Ski Bowl.
- Mountain Bike Trails
 - Manage and expand current single track trail system
- Evaluate suitability for a downhill trail along Everitt Memorial Highway
 - Consider relocating downhill biking trails to Rainbow Ridge
- John Muir Trail (Sisson Trail)
 - Re-develop the Sisson trail along or near the historic route
- Nordic Trails
 - Evaluate opportunities to expand the Forest Service Nordic trail system and potentially connect trails in Bunny Flat or Red Fir Flat areas to the Nordic Center trail system.
- Consider a Mt. Shasta perimeter trail (circumference)
- Bolum Creek Trail
 - Relocate user trails and develop a Forest Service system trail
- ***Campgrounds/Recreation Locations***
 - Look for opportunities for additional developed and dispersed camping sites both along the Everitt Memorial Highway and elsewhere (consider health and safety at recreation sites). Examples could include:
 - Evaluate opportunities to redesign Panther Meadows Campground to define campground boundary, establish a maximum campsite occupancy of 8 people. Consider limitation to length of stay to three nights, consider restricting dogs from the campground
 - Consider the elimination of camping in the entire Ski Bowl basin except at Panther Meadows Campground and camping associated with climbing

- Consider restricting use of the Upper Ski Bowl to day use between 6:00 am and 12:00 am
 - Consider restricting overnight parking in the Lower Ski Bowl Parking lot to no more than seven consecutive days
 - Expansion of McBride Springs Campground
 - Evaluate possible additional campgrounds in: Swamp Creek, Bunny Flat, Red Fir Flat, Sand Flat areas and the McKenzie Butte Road (31 Road)
 - Develop water sources along Everitt Memorial Highway at developed recreation sites
 - Expand campground capacity in areas outside the watershed boundary in order to disperse some use away from the mountain
 - Partner with the Ski Park to review opportunities along the Ski Park Highway alignment to improve/increase facilities
 - Evaluate support facilities for new recreation pursuits (e.g. paraglide use on the Military Pass Road)
 - Map and evaluate dispersed shooting area on North side of mountain off Hotlum road and elsewhere for safety
- Develop partnerships with local organizations (e.g. Trail Association, Bioregional Association, Sierra Club Foundation, etc.) to provide multiple avenues and collaborative efforts to support managed public use including grant funding and matching funds.
- ***High concentrated use areas***
 - Map and evaluate concentrated use areas (camping, parking, etc.)
 - Design and implement a capacity study for both traditional recreation and non-traditional metaphysical or spiritual uses on the mountain (including commercial uses)
 - Pilot studies for high concentration use areas that manages and limits use
 - Identify protocols
 - Plan and create a Recreation Strategy (minimum 5-years) that:

- Identifies the full complement of current uses and volume of users and identifies Capital Improvement Project needs to manage current and expected use.
 - Include a visitor education strategy and structure including awareness of history, indigenous peoples, volcanic geologic hazards and actions to take when hazardous events occur
 - Continue the “pack out” program within the wilderness area; seek opportunities for additional funding or partnerships for support
 - Update the Forest Orders for wilderness and wet meadows
 - Evaluate opportunities for a recreation pass or use fee to support infrastructure management (e.g. toilet pumping, signing, pack-out, water testing, etc.) and management
 - Develop partnerships with groups for restoration work and trail development
 - Seek partnerships provide increase awareness of outdoor forest ethic
 - Collaborate with the communities for use and safety of Forest margins shared with residential users (e.g. illegal dumping, illegal residency, shooting, etc.)
 - Restore and re-vegetate of Panther Meadows Karuk Tribe ceremonial location
 - Old Ski Bowl
 - Clean-up of Old Ski Bowl Area (pavement, garbage, pipes)
 - Redesign and develop destination parking area with educational/interpretive information and trail system for day users.
 - Based on capacity information, implement outfitter guide policy direction for appropriate mix of guides and user days
 - Develop a Historic Properties Management Plan for all eligible properties on Mt. Shasta
- ***Interpretation***
 - Develop a comprehensive Sign Plan that includes: directional, informational, regulatory and interpretive information for all recreation sites and update current signs