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An Assessment of Recreational Use: The Wenaha Wild and Scenic River, Umatilla National Forest, Oregon

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The Wenaha Wild & Scenic River, Umatilla National Forest, Oregon.

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ABSTRACT

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The purpose of this study was to provide data to the US Forest Service about summer recreational use of the Wenaha Wild and Scenic River in eastern Oregon, and to determine if use and use levels were appropriate according to relevant legislation and policies. The Umatilla National Forest is the administrative authority of the river and is required to complete a Comprehensive River Management Plan for this river. At the time of data collection this Draft Environmental Analysis (EA) was being developed. The Final EA was implemented July, 2015.

Recreation surveys were collected at trailheads and other developed and undeveloped recreation areas that access the river corridor during the summer of 2014. The survey instrument asked visitors questions pertaining to sociodemographic items, group size and composition, trip characteristics, satisfaction with facilities and services, motivations to visit, and perceptions of crowding and conflict. Visitors were also asked about activities they participated in and where they recreated in the study area. Vehicle counts at trailheads were conducted to provide additional data about visitor capacity for the river and Wenaha-Tucannon Wilderness, which encompassed part of the study area. Observational data was recorded as supplementary if it was determined to be inconsistent with relevant management plans.

Quantitative data was analyzed in concert with relevant guiding documents and policies to determine if recreational use and use levels were appropriate for the study area, which included lands managed by the US Forest Service, Bureau of Land Management, state of Oregon, and private lands. The document review included analysis of federal legislation (Wilderness Act and Wild and Scenic Rivers Act), management plans (Forest Service, Bureau of Land Management, Oregon Department of Fish and Wildlife and county plans) and policies (including Forest Service directives, public use (fire) restrictions, and Oregon Parks and Recreation Administrative Rules). The Appropriate Use Protocol developed by Haas and the Federal Interagency Task Force on Visitor Capacity on Public Lands (2002) was used to determine if use and use levels were appropriate.

Quantitative data supported the conclusion that recreational use and use levels were appropriate in this low-use, highly protected area. Supplementary qualitative data included a small number of observations pertaining to vehicle and campsite use that were inconsistent with standards or guidelines as defined by legislation, management plans, or policies that apply in the area.

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CHAPTER 1: INTRODUCTION

Outdoor recreation in protected areas poses special challenges to federal land managers in the United States. The U.S. Forest Service (Forest Service) is one agency charged with simultaneously providing recreation opportunities to the public while protecting the land's resources. In summer 2014, 74 visitor surveys were conducted at trailheads and other areas which access the Wenaha Wild and Scenic River. This river, most of which runs through the federally designated Wenaha-Tucannon Wilderness, is managed by the Umatilla National Forest (NF). Several layers of federal and state legislation and policy are involved in the management of the river and surrounding areas. This thesis describes the recreationists and current recreational use taking place within the study area and analyzes whether this current use is appropriate according to relevant legislation and regulation.

Outdoor Recreation Research

The second half of the twentieth century was characterized by a period of economic prosperity and security for many Americans, which resulted in an increase in leisure time (Siehl 2008, USDA, 2005). As Americans developed an interest in protected lands, many conservationists, land managers, and scholars developed a growing concern for how increasing numbers of visitors were impacting the natural environment. This was not entirely new; Frederick Law Olmsted recognized this problem in his report on the management of Yosemite National Park in 1865 (Roper, 1952). However, the United States now had a larger population, with many citizens owning automobiles and therefore able to easily access public lands for recreational purposes. These recreationists might not only interfere with the health of the natural environments they visited, but could potentially interfere with each other in their enjoyment of these public lands (Lime & Stankey, 1971; Wagar, 1964). Wagar's (1964) discussion of this

social carrying capacity was an initial cornerstone for much outdoor recreation research, particularly with regard to Wilderness and the concept of crowding, both of which are important to this thesis.

The U.S. Forest Service

The background for the development of the Forest Service began during the second half of the nineteenth century as scholars and citizens in the United States questioned the sustainability of their natural resources due to certain land management practices. The 1891 Forest Reserve Act was an early piece of legislation which would attempt to address these concerns by granting the President of the United States authority to set aside specific public lands to be protected for the future. With the Transfer Act of 1905, administrative responsibility of these reserves was moved from the Department of the Interior to the Department of Agriculture, and the Forest Service was born (USDA, 2005).

As the first Chief Forester, Gifford Pinchot approached the task with a utilitarian philosophy to manage for "the greatest good, for the greatest number, for the longest time" (2005). The young agency developed quickly as a result of Pinchot's work combined with Theodore Roosevelt's political support and addition of approximately 100 million acres of Forest Service land during his presidency (2005). Today, the Forest Service has grown to manage 193 million acres of land in the United States. Management is guided by a rich tapestry of legislation informed by improvements in science and an increasingly diverse and interested public, all with the goal of striking the delicate balance required to manage this "land of many uses." The Multiple Use Sustained Yield Act (1960) specified these "uses" for which the Forest Service is responsible to manage: *wood, water, forage, wildlife,* and *recreation*. This paper focuses on the

legislation, policies, and tools which are relevant to Forest Service management of *recreation* in the study area.

The Wilderness Act and the Wild and Scenic Rivers Act

The American political environment of the 1960s and 1970s quickly and drastically shaped the future of land management in the United States. This period gave rise to the Clean Water Act (1972), Endangered Species Act (1973), and Forest and Rangeland Renewable Resources Planning Act (1974) in just three short years (USDA, 2005). Two key laws from this period were important for this thesis: the Wilderness Act of 1964 and the Wild and Scenic Rivers Act of 1968.

The year 2014 marked the 50th anniversary of the Wilderness Act. Approximately five pages long, this document is arguably the most significant piece of legislation to federal land managers in the United States. It defines Wilderness, in part, as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" (Wilderness Act section 2 (c)).These lands are the most highly protected lands of the United States, as use of these areas is most restricted and the terms of the Wilderness Act supersede those of other land management laws. Policy development, management plans, and day-to-day decisions are guided by the Act for all designated lands, including the Wenaha-Tucannon Wilderness which constitutes a large part of the study area.

The Wild and Scenic Rivers Act was signed into law just four years after the Wilderness Act, also reflecting contemporary public interest. The "big dam era" that had provided jobs and hydroelectric power in a post-war economy was ending, and Americans were looking at the value of rivers differently (Billington, Jackson, & Melosi, 2005). The Wild and Scenic Rivers Act states that designated rivers "shall be preserved in free-flowing condition, and that they and

their immediate environments shall be protected for the benefit and enjoyment of present and future generations" (Wild and Scenic Rivers Act section 1(b)). To be designated, a river must possess at least one "outstandingly remarkable value" which has been defined as "a unique, rare, or exemplary feature that is significant at a comparative regional or national scale" (USDA, 2015). Whether or not a river possesses such a value is to be determined by science conducted by a federal land management agency which manages that river. The Wenaha Wild and Scenic River was designated in 1988 and the Forest Service determined it to possess four outstandingly remarkable values: *recreation, scenery, wildlife,* and *fisheries* (USDA, 1992).

Background of the Study Area

The Umatilla NF is located in the Pacific Northwest of the United States, encompassing 1.4 million acres of the Blue Mountain region of northeastern Oregon and southeastern Washington. Elevation ranges from 1,600 – 8,000 feet, providing diversity for both wildlife habitat and recreational opportunities. Winters are long and some areas of the Forest are inaccessible through early summer due to snowpack. Summer days in the lower elevations can reach well over 100°F. Tree species include douglas fir, ponderosa pine, and western larch. Hundreds of miles of rivers and streams provide habitat for fish species such as bull trout, rainbow trout, chinook salmon, and steelhead. These forests and waters support an array of terrestrial wildlife species including large mammals such as mountain lion, black bear, bighorn sheep, mountain goat, and white-tail and mule deer. The Forest boasts one of the largest populations of Rocky Mountain elk in the United States (USDA, 2013a).

The study area for this thesis included the Wenaha Wild and Scenic River and areas which access the river corridor. The federally designated portion of the river is 21.55 miles long, and begins where the north and south forks meet as they flow east from the Blue Mountains.

There are 18.7 river miles within the Forest boundary, and 15.2 of these miles are also within the Wenaha-Tucannon Wilderness (Wilderness) (USDA, 2013b). This majority of the river corridor is characterized by remote wild landscapes. The river itself is relatively shallow and narrow and in many areas, dependent on time of year, one can cross it on foot with ease. It is not typically used for floating. Most of the river runs through a deep valley, with slopes on either side rising up to 2,000 feet to ridges. Basalt outcroppings and varying forest density are visible on the slopes from the river. At the last river mile, the community of Troy, Oregon greets the mouth of the Wenaha just before its confluence with the Grande Ronde Wild and Scenic River.

Though the majority of the river is contained within the Umatilla NF boundary, 2.85 miles of the Wenaha also run through lands managed by a variety of entities, including the Bureau of Land Management (BLM), the Oregon Department of Fish and Wildlife (ODFW), and private landowners. BLM-managed land includes several parcels within the corridor. ODFW also manages several parcels, including the Wenaha Wildlife Area and a public campground just across the river from Troy. Within Troy, private homeowners have land within the corridor, and one couple owns and operates the Shilo Troy Resort, which includes seven developed campsites on the bank of the Wenaha just before it meets the Grande Ronde.

The Oregon Omnibus National Wild and Scenic Rivers Act of 1988 amended the Wild and Scenic Rivers Act of 1968, granting federally-protected status to dozens of Oregon rivers and river segments and naming the Forest Serviceas ultimately responsible for the protection of the Wenaha (section 102). The Umatilla NF was thereby required to develop a Comprehensive River Management Plan for the river. However, the Forest Service may not enforce its rules outside of its boundaries. This means that it must work with other agencies and stakeholders in

order to ensure that river values are protected on the 2.9 river miles which extend beyond the Forest boundary.

Recreational Opportunities

The unique location and geography of the Umatilla NF allows for a variety of recreational opportunities. Fishing and big-game hunting are two of the primary recreational activities for the river (USDA, 1992). Over 30,000 big-game hunters visit the Forest each year, primarily as a result of an abundance of elk, tags for which are highly sought after by hunters throughout the U.S. (USDA, 2013a). Deer and elk seasons range from late August through late September. The entire Wenaha corridor is enveloped by one hunting unit which is administered by the Oregon Department of Fish and Wildlife (ODFW). The unit just north of the corridor lies in Washington and is managed by the Washington Department of Fish and Wildlife.

Anglers are also provided with unique opportunities in the corridor. The Wenaha's clean and cold fast-running waters create excellent habitat for a variety of fish. Fishing is also regulated by the ODFW, who manages special wild populations carefully; chinook salmon, steelhead, and bull trout are listed as threatened by the U.S. Fish and Wildlife Service (USFWS, 2015). Anglers are rewarded year-round on the river, but steelhead fishing in the fall is especially popular.

Both the Forest Service and ODFW have recognized that although hunting and fishing have dominated recreation in the area, there has been an increase in hiking, horseback riding, and other recreational activities in recent years (ODFW, 2007; USDA, 2013b). Camping is often an activity which takes place in the Wenaha corridor as complementary to these primary activities, or as a primary activity on its own.

Statement of the Problem

The purpose for this thesis was threefold. First, it aimed to find out about recreationists who visit the study area. Second, it sought to find out about recreational use of study area. The final goal was to analyze this recreational use as it pertains to applicable legislation and regulation. The study for this thesis was made possible by the Umatilla National Forest, for which West Virginia University conducted surveys for the National Visitor Use Monitoring Program for the fiscal year 2014. This value-add study was sponsored in an effort to contribute data about social carrying capacity in support of the development of the Wenaha River Comprehensive River Management Plan (CRMP) (USDA, 2015). Federal land managers must address social carrying capacity in order to uphold key components of the Wilderness and Wild and Scenic Rivers Acts. A capacity analysis was completed by the Umatilla NF in 2011 for the Wenaha River's CRMP (USDA, 2013b). This capacity analysis examined items related to social carrying capacity, including parking at trailheads, campsite use, and group size. A survey instrument was developed for this thesis to provide additional data about these items, and also to provide information about recreationists' characteristics and experiences while visiting the study area. Quantitative data were also collected in the form of vehicle counts at trailheads and other areas. Ocular data were used to supplement the quantitative results. A document analysis was performed and included relevant documents such as federal legislation, Forest Service management plans and policies, and other federal, state, and county documents. Results were analyzed in order to answer the research questions below.

Research Questions

RQ1: What does the sample of recreationists look like in the Wenaha River corridor and the areas that access this corridor?

1.1 Sociodemographics.

1.2 Group characteristics.

1.3 Trip Characteristics.

1.4 Motivations.

1.5 Satisfaction.

1.6 Crowding and Conflict.

RQ2: How are these areas currently being used by recreationists?

RQ3: How are trailheads being used by recreationists with vehicles, with regard to numbers of vehicles and parking locations?

RQ4: Is current recreational use appropriate according to applicable legislation and/or regulation?

Limitations

There were three primary limitations of this study: sample size, sampling methodology, and the time of year for data collection. Summer recreational use is relatively low for this area, and data collection between late June and early August 2014 yielded 74 surveys. Segmentation of the data was not performed as the sample size was too small to yield meaningful results (VanVoorhis & Morgan 2007).

A second limitation of this study regarded sampling methodology. Convenience sampling was employed in order to collect as many surveys as possible. Recreation data collected through convenience sampling are not as valid as probability sampling methods (Watson, Cole, Turner, & Reynolds, 2000). However, because recreational use during the sampling timeframe was very low, a strict systematic sampling schedule would have yielded much fewer data. As a result, higher use areas were sampled more frequently than the rarely used sites.

The third limitation was the time of year for data collection. Summer use is low compared to the use that takes place during peak hunting seasons, and it is also different. As discussed, a myriad of recreational opportunities are provided by this area of the Forest, and an adequate representation cannot be captured by this narrow sampling timeframe.

Definitions

Appropriate Use. Use that is "in accordance with management direction" (Haas, 2002). Management direction may include federal, state, or other legislation and/or regulations.

Outstandingly Remarkable Values (ORVs). "A unique, rare, or exemplary feature that is significant at a comparative regional or national scale" (USDA, 2015). According to the Wild and Scenic Rivers Act, ORVs can be related to scenery, recreation, geology, fish and wildlife, history, culture, or other similar values (section 1(b)), and administration of a Wild and Scenic River must "protect and enhance" these values (section 10(a)).

Recreational Segment. For Wild and Scenic rivers, "sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past" (Wild and Scenic Rivers Act, section 2(b)).

Scenic Segment. For Wild and Scenic rivers, "sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads" (Wild and Scenic Rivers Act, section 2(b)).

Social Carrying Capacity. "the level of recreational use an area can withstand while providing a sustained quality of recreation" (Wagar, 1964).

Sound Professional Judgement. "A reasonable decision that has been given full and fair consideration to all the appropriate information, that is based upon principled and reasoned

analysis and the best available science and expertise, and that complies with applicable laws" (Haas, 2002).

Visitor Capacity. "the supply, or prescribed number, of appropriate visitor opportunities that will be accommodated in an area" (Haas, 2002). More general than the social carrying capacity concept, visitor capacity is concerned with management of natural and cultural resources in addition to recreational experiences.

Wild and Scenic River. A river which is protected by the Wild and Scenic Rivers Act of 1968. This Act grants administrative authority for river management to specific public land management units.

Wild segment. For Wild and Scenic rivers, "sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted" (Wild and Scenic Rivers Act, section 2(b)).

Wilderness. Federal lands which are protected by the Wilderness Act of 1964. The Act calls for Wilderness areas to be "protected and managed so as to preserve its natural conditions" and to also provide "outstanding opportunities for solitude or a primitive and unconfined type of recreation" (Wilderness Act, section 2(c)).

CHAPTER 2: LITERATURE REVIEW

This chapter has three sections: the first section reviews concepts used in outdoor recreation research. The second section discusses what this research has suggested about recreationists and recreation in the United States. The third section reviews the documents important to this thesis, including the legislation, regulations, and other documents that guide management of the study area.

Concepts in Outdoor Recreation Research

Public land managers must rely on research conducted by natural and social scientists. In recent decades, social science research has become increasingly utilized by public land managers as it can often pick up where natural science research leaves off. Social sciences can offer insight to managers about visitor experience. When laws such as the Wilderness Act specify that opportunities for solitude must be provided, for example, outdoor recreation researchers can assist by assessing visitors' perceptions of crowding. Both quantitative surveys and qualitative interviews are used in outdoor recreation research. This section begins with a review of key concepts in the field. Following is a discussion about what the research suggests about recreationists and recreation at the national and Forest levels.

Social carrying capacity

Public land managers must determine what recreational uses and use levels are appropriate for the areas they manage. Social carrying capacity is a concept that was developed to aid in this process. Carrying capacity is a term originally used within the context of ecology in reference to questions regarding how many individuals that a defined space is able to sustain healthfully. Wagar (1964, 1974) formalized the concept of *social* carrying capacity (first described with the less precise term *recreational* carrying capacity in 1964), defining it as "the

level of recreational use an area can withstand while providing a sustained quality of recreation" (1964, p 3). Wagar's approach considers the perceptible impacts on the physical environment, but extends it to include the quality of human experience that can also be affected by increased recreational use. Wagar (1964, 1974), Lime and Stankey (1971), and others offer methods for managing for this "sustained quality," suggesting solutions such as zoning for different types of recreation, or interpretive techniques that can help visitors comply with regulations, keeping in mind that the complex values involved and management decisions employed are ultimately matters of human judgment. The more commonly used frameworks to assess social carrying capacity and define appropriate use and use levels include Visitor Experience and Resource Protection (VERP) (National Park Service, 1997); Visitor Impact Management (VIM) (Graefe, Kuss, and Vaske, 1990); Limits of Acceptable Change (LAC) (Stankey, Cole, Lucas, Petersen, & Frissell, 1985); and the Recreational Opportunity Spectrum (ROS) (Clark & Stankey, 1979; Driver & Brown, 1978). Both the LAC and ROS frameworks were heavily developed by and utilized within the Forest Service and are discussed here.

The Limits of Acceptable Change (LAC) is a nine-step process developed for the management of Wilderness recreational opportunities though it has proven useful when applied outside of Wilderness contexts (Cole & McCool, 1997). The process is naturally rooted in the concept of social carrying capacity (Stankey et al., 1985). However, LAC restates social carrying capacity's central question, refining the ambiguous inquiry of "how much [use] is too much?" and instead asking "how much change is acceptable?" (Stankey, McCool, & Stokes, 1984).Whether or not an action is considered "acceptable" is ultimately a value judgment (1984), and this subjectivity is inescapable when managing carrying capacity (Wagar, 1964). However,

the LAC process incorporates public input, thereby allowing for multiple perspectives about how areas should be managed (Stankey et al., 1985).

The Recreational Opportunity Spectrum (ROS) is another tool that is part of the LAC process and helps managers serve the diverse needs and tastes of the public. ROS is a framework developed in the 1970s by the Forest Service, and it has been applied by many agencies in many countries. It is based on the premise that outdoor recreation quality is most likely to exist if managers provide different types of opportunities for recreation to reflect the diversity of visitor preferences (Clark and Stankey, 1979; Driver & Brown, 1978). The framework gives managers specific criteria such as "remoteness" or "evidence of humans" by which to classify an activity, setting, or experience. The traditional model includes six classifications, ranging from "primitive" to "urban" (USDA, 1982). ROS is a mapping tool that has been appropriated in different ways. Pierskalla, Siniscalchi, Selin, and Fosbender (2007) added the dimension of *movement* in an ROS study, recognizing that recreation takes place in space and time and cannot necessarily be confined to "static" ROS zones (2007). Using the ROS framework helps the Forest Service meet legislative requirements, including the management of Wild and Scenic Rivers (Clark and Stankey, 1979).

Wagar (1964) pointed out that while the empirical evidence provided by social carrying capacity research is certainly useful for guidance, at the end of the day someone must make the final decisions. The Federal Interagency Task Force on Visitor Capacity on Public Lands (Haas, 2002) has provided practical tools specifically designed for making decisions about visitor capacity. Visitor capacity is different from (but inclusive of) social carrying capacity, as it is concerned with not just visitor experience but also with visitor impacts on resources. One tool

suggested by the task force is an "appropriate use protocol" which was adapted for this study and will be described in Chapter 3.

Crowding

Crowding is a concept that grew out of the more broad scholarship involving social carrying capacity. Concepts such as crowding are taken on with a "normative approach," based on the Return Potential Model of social norms (Jackson, 1965). Much of the empirical foundation for setting appropriate use levels rests on this approach which asks visitors to define what is acceptable (Cole, 2001). Degrees of crowding can be assessed using Likert-type scales, first developed in the field of psychology (Likert, 1932) and often used in surveys to assess levels of satisfaction or agreement with a statement. Using graded scales can be more helpful for understanding what visitors perceive as acceptable, as opposed to asking dichotomous yes or no questions (Shelby & Heberlein, 1986).

Heberlein and Vaske (1977) developed the most popular scale to date for measuring crowding in recreation research, rating the concept from 1 (not at all crowded) to 9 (extremely crowded). Degrees of crowding can vary dependent upon the variable examined. Vaske and Shelby (2008) analyzed 181 studies conducted over 30 years which used the traditional 9-point scale, finding significant differences dependent upon type of activity, region of the U.S., and country (including Canada, New Zealand and the U.S.). "Crowding" is not a universal concept nor does it translate into some other languages. Also, this concept may be more relevant for outdoor recreation research in the U.S., which generally takes a more anthropocentric approach to recreation management compared to other countries with a more ecocentric approach (Burns & Moreira, 2013; Ruschkowski, Burns, Arnberger, Smaldone, & Meybin, 2013).

The 9-point scale attempts to assess *perceived crowding*, which is used in outdoor recreation research to denote a "negative evaluation of density" (Shelby & Heberlein, 1986, p. 63). Both outside of and within the U.S., this negative implication is not always appropriate. For example, Heberlein and Kuentzel (2002) found that hunters might prefer a certain number of other hunters nearby to move game toward them. Giglioti and Chase (2014) used a scale ranging from "not enough hunters" to "very crowded," to address this. Bivalent scales such as these at times may be more appropriate for assessing the correlation between satisfaction and the number of people seen.

Conflict

Outdoor recreation researchers examine conflict both within and between user groups. Satisfaction can be affected when visitors encounter other groups participating in an activity that they do not perceive as appropriate, even if the activity encountered is appropriate according to other recreationists, managers, and policy and legislation (Stankey 1973). For example, Lucas' (1964) Boundary Waters study found that paddling canoeists are bothered by motorboatists. Hikers can be bothered by horseback riders (Stankey, 1973), and skiers can be negatively impacted by snowmobilers (Jackson & Wong, 1982). In all three cases, the latter groups were not bothered by the former. Also in all three cases, the former groups were not as bothered by encountering other groups that were like them (other canoeists, hikers, and skiers).

Satisfaction

Satisfaction is a complex concept that is difficult to measure, but measures of satisfaction are traditionally how researchers determine recreation quality (Manning, 2011). Items that can affect visitor satisfaction when recreating vary broadly, from campsite conditions to perceptions of crowding. When outdoor recreation researchers attempt quantitative

measurement of satisfaction, they often utilize tools developed within the field of consumer marketing research. Parasuraman, Zeithaml, and Berry (1985; 1988) developed the SERVQUAL model to examine satisfaction among consumers by measuring quality. They define *perceived service quality* as the "degree and direction of discrepancy between consumers' perceptions and expectations" (1988, pp. 16-17). This model focuses on the (intangible) *service* quality as opposed to (tangible) *product* quality. This naturally extends to the outdoor recreation field, where recreation (and the services that provide recreational opportunities) are often intangible products. The model has been tailored for quantitative analysis of recreation satisfaction (Burns, Graefe, & Absher 2003; Crompton, MacKay, & Fesenmaier, 1991; Graefe & Burns, 2013).

Motivation

While research on motivation dates to more general leisure research of the 1920s, Driver and associates began developing the concepts and measurement tools most specific to outdoor recreation beginning in the 1970s (Driver & Toucher, 1970 and others). Expectancy theory provides the theoretical foundation for much of the research, focusing on the idea that people are motivated to perform a behavior because they expect this to lead to desired psychological outcomes (Lawler, 1973). To measure motivations in outdoor recreation, researchers often adapt Driver's (1983) Recreation Experience Preference (REP) scales. In a meta-analysis of 36 studies utilizing REP scale items, Manfredo, Driver and Tarrant (1996) grouped individual motivational scale items (such as "to view the scenic beauty") into broader domains (such as "enjoy nature"). Many studies have utilized this approach in order to understand more general goals of recreationists (Manning, 2011).

Outdoor Recreationists and Recreation in the U.S.

The Outdoor Recreation Research Review Commission (ORRRC) was created by Congress in 1958 as a response to the postwar increase in outdoor recreation in the U.S. Though only in existence for four years, it helped create a permanent space for outdoor recreation research in the U.S., and it was a catalyst for many other programs and projects (Siehl, 2008). One of these programs was the National Survey on Recreation and the Environment (NSRE), a survey series begun in 1960. The Forest Service administers this today, collecting data about outdoor recreationists throughout the country (USDA, 2013a).

In 1993, the Executive Order "Setting Customer Service Standards" was put forth to ensure that federal agencies provide "the highest quality service possible to the American people" leading to the Forest Service's development of the National Visitor Use Monitoring Program (NVUM) (USDA, 2012). This standardized process is conducted every five years for each Forest, and provides quantitative data about recreationists and their activities (English, Kocis, Zarnoch, & Arnold, 2002). In the most recent NVUM Visitor Use Report for the fiscal year (FY) 2009 (USDA, 2012) for the Umatilla NF, at least 80.7% of recreationists interviewed were recreating on the forest.

Recreationists

Recreation research has suggested certain correlations between sociodemographic characteristics and recreational use. While income and level of education are not always strong indicators for outdoor recreation participation overall, both are positively correlated with specific recreational activities (Manning 2011; Bowker, Cordell, & Green, 2012). Women and ethnic and racial minorities are disproportionally absent from the data, especially when Wilderness areas are studied (Bowker et al., 2006 and others). This has sparked much research in the discipline to

examine what constraints these underrepresented groups may be facing and what preferences they may have when recreating. For example, several studies have shown that Asian American and Hispanic groups prefer to recreate in larger groups involving family (Burns, Covelli, & Graefe, 2008; Chavez, 2001). In a focus group study about ethnic and racial minority recreationists in Oregon, Burns et al. (2008) found that African Americans sought *solitude* as a benefit of recreation. This is a value often associated with Wilderness, but this study and others (Bowker et al., 2006; Tierney, Dahl, & Chavez, 1998) have concluded that African-American groups are less likely to visit remote areas, including Wilderness.

NVUM (USDA, 2012) Forest-wide data collected in 2009 for the Umatilla NF shows that more visitors were male (66.6%), the vast majority of visitors were Caucasian (99.0%), and only a small percentage (1.2%) identified as Hispanic. Over one-third (39.6%) were 20-49 years of age, and over half (62.8%) earned between 25k and 100k per year.

Wilderness Recreationists

Generally, Wilderness users are likely to be Caucasian, male, young to middle-aged, and possess higher incomes and especially education levels (Manning 2011; Bowker, Cordell, and Green, 2012), though not all studies have found higher income (Lucas, 1980) or education (Bowker et al., 2006) to characterize visitors. Several studies comparing multiple Wildernesses (Bowker et al., 2006; Cole & Hall, 2008; Lucas, 1980; Stankey, 1973) have revealed patterns about Wilderness users and preferences. Visiting groups are typically small (Cole & Hall, 2008; Lucas, 1980). Visits are more likely to be day trips (Cole & Hall, 2008; Lucas, 1980) though Lucas (1980) found the size of the area to correlate with length of stay.

Wilderness recreation studies often focus on the concepts of crowding and conflict, because Wilderness visitors tend to strongly value solitude and encountering other groups often

affect their trip enjoyment (Lucas, 1980; Stankey, 1973). Wilderness visitors usually would rather not encounter other groups (Lucas, 1980; Stankey, 1973). Often the type of group encountered is more important to visitors than the encounter itself. Stankey (1973) found that visitors' feelings about an encounter were related to the size and behavior of the group they encountered. The mode of travel was also important; hikers were bothered by horseback trail riders and paddling canoeists were bothered by motorboats.

Visitors to Wilderness areas often share preferences with one another and with recreationists in general. Wilderness users who camp prefer a campsite close to water (Christensen & Cole, 2000; Stankey, 1973), a characteristic shared with non-Wilderness users (Cordell & Sykes 1969; Lime, 1971). Campfires are also important to Wilderness and backcountry users (Christensen & Cole, 2000; Vagias, Powell, Moore, & Wright, 2014) as well as non-Wilderness users (Lillywhite, Simensen, & Fowler, 2013). Recreationists in Wilderness have been responsive to management transitions away from fire rings and toward cook stoves in many areas (Christensen & Cole, 2000). However, they will often build a campfire if given the opportunity and Manning (2011) cites many studies showing that Wilderness users object to the idea of campfire prohibitions.

NVUM data for Wilderness areas on the Umatilla NF are limited as sample sizes were small during the last two rounds (2004: n=8; 2009: n=26). For 2009, Wilderness visitors were more likely to be male (93.9%) and 51% were between 20 and 49 years of age.

Recreational Use

Outdoor recreationists enjoy many different activities dependent upon personal interest and opportunities provided. According to NSRE data, the most popular outdoor recreation activities in the U.S. between 2005 – 2009 were *sightseeing* (52.7%), *picnicking* (51.7%), and

visiting historic sites (44.1%) as shown in Table 1 which compares selected national and state (OR) recreational activities. It omits some popular activities if they were irrelevant (e.g. *swimming in an outdoor pool*). According to recent data collected in 2011 for Oregon's Statewide Comprehensive Outdoor Recreation Plan (SCORP), Oregonians reflect some nationwide trends; some of the top activities reported in 2011 included *sightseeing* (57.5%) and *picnicking* (49.7%). But in some ways, Oregon residents differ from national patterns. They are more likely to day hike, participate in developed camping, and backpack. They are less likely to fish.

Table 1. U.S. and State (OR) Participation Percentages Compared*

	NSRE (2005 – 2009)	OR - SCORP (2011)
Sightseeing	52.7	57.5
Picnicking	51.7	49.7
Visiting historic sites	44.1	43.1
Fishing	34.2	24.6
Day hiking	33.9	48.0
Gather mushrooms, etc.	32.8	20.9
Developed camping	23.8	51.4
Backpacking	9.7	12.0

*Data Source: Oregon SCORP 2013– 2017 (OPRD, 2013)

Table 2 shows the top ten activities reported in 2009 for the Umatilla NF (USDA, 2012). The top three activities that visitors reported participating in for 2009 were *viewing wildlife* (42.6%), *driving for pleasure* (42.6%), and *viewing natural features* (37.9%). The top three primary activities were *gathering Forest products* (16.7%), *driving for pleasure* (11.3%), and *hunting* (9.7%). *Hunting* was the eleventh activity listed for general participation (12.2%).

Table 2. Umatilla NF Participation and Main Activity Percentages (FY 2009)*

	% Participation	% Primary Activity
Viewing wildlife	42.6	3.0
Driving for pleasure	42.6	11.3
Viewing natural features	37.9	8.6
Hiking/Walking	32.6	4.7
Relaxing	31.8	4.0
Gathering Forest products	28.2	16.7
Picnicking	16.7	2.7
Developed camping	14.2	5.1
Fishing	12.6	7.5
Motorized trail activity	12.2	1.9

*Data Source: Umatilla National Forest Visitor Use Report FY 2009 (USDA, 2012)

A few useful conclusions can be drawn by contextualizing the Umatilla NF NVUM data (even if activity variables don't always use the same wording across data sets). For example, Umatilla visitors report about the same participation rates for *hiking/walking* (32.6%) as the national average for *day hiking* (33.9%), but less than the OR average (48.0%). *Gathering Forest products* is an important activity for Umatilla visitors, close to the national average for *Gathering mushrooms, etc.* (32.8%). *Developed camping* is far less reported generally (14.2%) or as a main activity (5.1%) on the Umatilla NF when compared to the U.S. or Oregon. *Primitive camping* was not a reported activity for the NSRE or SCORP and so could not be compared. However, all reported on *backpacking*, which was very rarely reported on the Umatilla generally (< 1%) or as a main activity (< 1%) compared to the U.S. (9.7%) or OR (12.0%).

Projections for the Future

Passel and Cohn (2008) have projected that by the year 2050 (compared to 2005), 29% of the U.S. population will be Hispanic, an increase from 14%. Adults 65 years of age and older will rise from 12% to 19% of the population. The White (non-Hispanic) population will drop from 67% to 47%. As previously discussed, the "traditional" recreationist profile has been that of

Caucasians with higher incomes and educational backgrounds, who are often younger to middle-aged. The sociodemographic shifts on the horizon have inspired research so that managers can provide recreational opportunities for underserved groups, and also continue to garner public support for public lands in general.

Bowker and Askew (2012) have made nationwide projections about recreational activities through 2060. Because population numbers will increase, this could put pressure on certain areas with limited recreational opportunities. If climate change patterns continue as expected, snow sports could be affected, as well as hunting and angling opportunities when fish and wildlife habitats change. Regardless of climate change, they conclude that participation in hunting and fishing will continue to decline. For activities most relevant to backcountry and Wilderness areas, there will be increases in horseback riding, challenge-related activities, and day hiking. Bowker and Askew (2012) projected that visits to primitive areas will decline overall, but English and Bowker (2015) have stated that population growth near Wilderness areas will lead to more visits in those areas. In addition, they expect day use to continue to increase compared to overnight use.

In conclusion of this section about recreationists and the activities they pursue, it is important to make one last point. It is noted throughout the literature that profiling recreationists can lead to the perpetuation of stereotypes and misconceptions of user groups. Shafer's 1969 study *The Average Camper Who Doesn't Exist* illustrated this quite clearly. The characteristics, preferences, and use patterns of recreationists are incredibly complex and generalities can be misleading. That being said, outdoor recreation research strives for better understanding in its analysis of sociodemographic data and patterns of use, with the end goal to better serve the

public, and better protect resources. Managers use this data in tandem with legislation, policy, and plans. Those documents that apply to the study area for this thesis are discussed below.

Document Review: Legislation, Forest Service, and Other Regulations

As discussed in Chapter 1, the study area for this thesis is complex in that many jurisdictions are involved. Table 3 shows which agencies or other stakeholders have direct administrative authority in different portions of the study area. It is important to note that administration is cooperative and collaborative in planning and regulation, and so each stakeholder is involved at different levels with the administration of many parts of the study area.

Table 3. Stakeholders with Direct Administrative Authority within the Study Area

Stakeholders	*Recreational* section	*Scenic* section	*Wild* section (non-Wilder-ness)	*Wild* section (Wilder-ness)	Non-Corridor (non-Wilder-ness)	Non-Corridor (Wilder-ness)
U.S. Forest Service	--	--	✓	✓	✓	✓
BLM	✓	✓	--	--	--	--
Oregon Dept. of Fish & Wildlife (ODFW)	✓	✓	✓	✓	--	--
Wallowa County	✓	✓	--	--	--	--
Private Residents & Business Owners	✓	✓	--	--	--	--

This section of Chapter 2 describes the documents which guide management of the study area. This thesis organized the documents into three levels for analysis: primary, secondary, and tertiary, which will be discussed more in Chapter 3. Primary documents include federal legislation. Secondary documents include Forest Service plans, policies, and directives. Tertiary documents are other federal (namely, Bureau of Land Management), state, and county plans and regulations that also are important for managing the study area.

Primary Documents: Federal Legislation

The Wilderness Act. The Endangered American Wilderness Act of 1978 established the federal status of the Wenaha-Tucannon. However, it is the Wilderness Act of 1964 that guides the management for all Wilderness areas in the U.S. The Wilderness Act created a definition for Wilderness and outlined the terms of how Wilderness should be designated and managed. The brevity of the document leaves many unanswered questions about how exactly managers should carry out the terms of the Act. Hendee, Stankey and Lucas (1978) point out that initially "wilderness management" was approached with the idea: "draw a line around it and leave it alone," and that any further action was often confusing to the public. However, management that involves Wilderness does not seek to control natural processes that occur, but rather the human use of that Wilderness (p. 6). Each of the four land management agencies which manage Wilderness (the Bureau of Land Management, National Park Service, Forest Service, and U.S. Fish and Wildlife Service) have developed their own agency policies which provide direction. For the Forest Service, agency directives such as the Forest Service Manual (USDA, 1997) and Forest Service Handbooks (USDA, 2000a) provide guidance for Wilderness management. The Forest Service manages the most Wilderness units (439) in the U.S., and is second only to the National Park Service in acres managed totaling over 36 million (USDA, 2014). Much of the development of monitoring methods that help administrators manage recreation in Wilderness stems from the work of Cole (1983, 1989), among others.

The Interagency Wilderness Character Monitoring Team (IWCMT) was created to develop a strategy to help standardize a definition for qualities of "wilderness character" and provide indicators and measures for these qualities (Landres et al., 2005; 2008). Interagency teams and task forces are helpful in public land management because they develop common

language, methods, and standards across different agencies sharing the same objectives. The IWCMT defined four qualities of Wilderness character in 2005. These four qualities summarize Section 2(c) of the Wilderness Act, and define Wilderness as:

- *Untrammeled* – wilderness is essentially unhindered and free from modern human control or manipulation.
- *Natural* – wilderness ecological systems are substantially free from the effects of modern civilization.
- *Undeveloped* – wilderness is essentially without permanent improvements or modern human occupation.
- *Outstanding opportunities for solitude or a primitive and unconfined type of recreation* – Wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge. (Landres et al., 2005).

Many initiatives and programs have been developed in order to protect these Wilderness qualities. The Aldo Leopold Wilderness Research Institute and the Arthur Carhart Wilderness Training Center have been instrumental in recent years in training and educating Wilderness managers and disseminating information to the public.

The Wild and Scenic Rivers Act. The 1988, the Oregon Omnibus National Wild and Scenic Rivers Act designated the Wenaha as a Wild and Scenic River, but managers rely on the Wild and Scenic Rivers Act of 1968 (the Act) to guide action in protecting river values. The Act specifies that a Wild and Scenic River is to be designated by Congress, should be "preserved in free-flowing condition," and that its immediate environment contains one or more "outstandingly remarkable values (ORVs)" pertaining to *scenic, recreational, geologic, fish and wildlife,*

historic, cultural, or other similar values (Sections 1 and 2). Throughout the designation process of a particular river, several responsibilities are given to federal agencies. The agency deemed responsible for the river conducts studies to determine if the river contains ORVs and if so, which ones (section 4(a)). The agency establishes boundaries for the river corridor per guidelines outlined in the Act (section 3(b)), and determines how each section of the river should be classified: wild, scenic, or recreational (section 3 (b)). The definitions for each section are listed here:

- *Wild river areas* - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- *Scenic river areas* - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- *Recreational river areas* - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past" (Wild and Scenic Rivers Act, section 2(b)).

When a river is designated, the responsible agency or agencies will develop a Comprehensive River Management Plan (CRMP) (section 3(d)). The Act states that designated rivers shall be "administered in such a manner as to protect and enhance the values which caused it to be included…" (section 10 (a)). Yet, like the Wilderness Act, it gives great freedom to federal agencies in how exactly they carry this out. It is expected that each will apply its own

agency policies and best judgment. Agency directives and other planning documents enable CRMP development.

The Act also states that the CRMP should be developed within three years of the time of designation (section 3(d)(1)). The Wenaha was designated in 1988; the CRMP was implemented in 2015. A Forest Service employee and representative for the Interagency Wild and Scenic River Coordinating Council was contacted to find out if this was common. His response was as follows:

> The 3 year date for CRMP's *(sic)* has always been a strawman. A goal worth shooting for but generally unrealistic given the amount of work and the vagaries of federal funding and priorities. Agencies try to do their best to meet it, but since Congress has not done any extensive follow-up on late CRMP's they often take much longer. It takes agency champions and external interests to combine to help bring these plans to completion (personal communication, January 13, 2015).

In 1993, the Interagency Wild and Scenic River Coordinating Council was created and is comparable to the Wilderness interagency councils in that it seeks to develop strategies for all public land managers to carry out the terms of federal legislation. The River Management Society currently works with federal agencies in the development of the National River Recreation Database, designed to provide information such as recreational access points, regulations and restrictions, and fees (River Management Society, 2015).

The National Environmental Policy Act. Since the late 1960s, agencies often find themselves under the scrutiny of an increasingly aware and involved citizenry. The National Environmental Policy Act of 1969 (NEPA) requires all federal agencies to report the potential environmental impact of a "proposed action" that is planned, along with "alternative actions"

(National Environmental Policy Act Title I section 102 (C)). They are also required to make this information available for the public's review and comment, and to consider public comments before the implementation of a final decision. This legislation came about during what Leong, Decker, Lauber, Raik, and Siemer (2009) identified as a legislative shift from "top-down governance" to "public input governance." A third shift toward "public engagement governance" has occurred with the Federal Advisory Committee Act of 1972 and the Negotiated Rulemaking Act of 1996 (Leong et al., 2009). This era is defined by more collaborative processes in rulemaking as it "emphasizes dialogue and mutual learning between agencies and multiple stakeholders to identify common interests, broaden the decision space, and develop sustainable alternatives" (Leong, Emmerson, & Byron, 2011).

Before a new management action can be implemented on public land, either an Environmental Assessment (EA) or the more complex Environmental Impact Statement (EIS) must be conducted in accordance with NEPA. Two of these documents important for this thesis are the Wenaha Wild and Scenic River CRMP (EA) (2015) and the Blue Mountains National Forests Revised Land Management Plan (EIS) (2014) which are discussed in the next section.

Secondary Documents: Forest Service

The Forest Service is tasked with developing the Comprehensive River Management Plan (CRMP) for the Wenaha Wild and Scenic River (Omnibus Act section 102). The agency is also required to cooperate with other agencies and parties which are involved with the river, but the Forest Service is not allowed to exercise authority outside of Forest boundaries. A multitude of documents are utilized by the Umatilla NF in support of the goal of upholding legislation that guides the management of both the Wenaha Wild and Scenic River (river) and the Wenaha-Tucannon Wilderness (Wilderness). The Forest Service uses agency directives and existing plans

to manage the *wild* section of the river which exists within its boundaries, and collaborates with other parties and their resources with regard to the *scenic* and *recreational* river sections.

Agency Directives. The Forest Service has two primary directives: the Forest Service Manual (FSM) (USDA, 1997) and Forest Service Handbooks (FSH) (USDA, 2000a). The FSM provides more general guidance regarding legislation, policy and procedures for line officers and staff; FSH gives specific direction on how to execute objectives and is utilized primarily by technicians and specialists (USDA, 2000b). The FSM and FSH help guide all Forest Service activities, such as managing public participation during the NEPA process, executing a Forest plan revision, and managing Wilderness and Wild and Scenic Rivers.

Wenaha Comprehensive River Management Plan (CRMP). The Forest Service conducted a resource assessment in 1992 which determined that the river exhibits four outstandingly remarkable values (ORVs): *scenery, recreation, wildlife,* and *fisheries* (USDA, 1992). Earlier studies had determined the appropriate *wild, scenic,* and *recreational* section classifications. The CRMP presents two alternatives: Alternative A (No Action) and the Proposed Action. The Proposed Action describes what the Umatilla recommends be included in the CRMP for river management. Like all EAs, these recommendations were available to be reviewed and commented upon by the public. Much of the supporting data and documentation for the development of the CRMP are from the Wenaha Wild and Scenic River Capacity Analysis conducted in 2011 (USDA, 2013).

The purpose for the capacity analysis (completed in 2013) was to analyze visitor capacity for the river in support of the development of the CRMP. It proposed the desired conditions for each of the four ORVs. It also named *consistent* and *inconsistent* uses that could have an effect on the ORVs in terms of visitor capacity. These uses include both visitor activities and Forest

Service administrative activities. The capacity analysis defines *inconsistent (*or "inappropriate") use as "either occurring or potential threats to ORVs that could limit capacity by requiring additional regulations and limitations" (USDA 2013b, p. 14). *Consistent* (or "appropriate") uses, alternatively, are "uses and activities that are consistent with protection of … [an] ORV" (p. 8). The inconsistent uses, along with specific management indicators (number of vehicles at trailheads, number and condition of semi-primitive campsites, and group size) were discussed in the capacity analysis and helped guide the study design for this thesis.

Wenaha-Tucannon Wilderness Management Plan. The Wenaha-Tucannon Wilderness was designated as such in 1978. The 1989 Wilderness Plan provides specific direction for the management of this area, and was used as a supporting document for the development of the Blue Mountains National Forests Proposed Revised Land Management Plan.

Blue Mountains National Forests Proposed Revised Land Management Plan. The National Forest Management Act (NFMA) (1976) requires that each National Forest develop and operate based on its own land management plan. The Blue Mountains National Forests Proposed Revised Land Management Plan (Revised Forest Plan) (2014) has been under development since 2004 as a joint effort between the Umatilla, Wallowa-Whitman, and Malheur National Forests. All respective Forest plans were approved in 1990, and all were in need of revision according to the NFMA. The Umatilla Forest Plan (USDA, 1990) was one of the supporting documents for the revised plan that would replace it.

The complexities involved in the Forest Plan Revision required an EIS. It presents six alternatives: Alternative A (No Action) and Alternatives B, C, D, E, and F. In 2010, a revised plan was proposed that was most similar to Alternative B. However, during the public review process, the public expressed concerns with the plan, and six themes arose from these concerns.

The 2010 proposed revision was determined unsuitable as it did not adequately address the public's concerns. As a result, the Forest Plan Revision Team developed all of the alternatives, and each address these six themes in various ways. Alternative E was been named the "Preferred Alternative" by the Forest Service (USDA, 2014).

A major part of the Revised Forest Plan is the addition of standards, guidelines, and other components to direct management on each Forest. There are hosts of proposed components, representing nearly one-quarter of a century of the changing needs of three Forests. One outcome of the implementation of this plan will be the recommendation of the addition of 8,880 acres of Wilderness north of the study area. Further, the north and south forks of the Wenaha have been determined as eligible for addition to the Wild and Scenic Rivers system. These areas which are adjacent to the study area for this thesis will be protected by the Revised Plan pending designation. The CRMP for the Wenaha will amend the Revised Forest Plan.

Tertiary Documents: Bureau of Land Management, State, and County.

Bureau of Land Management (BLM). The BLM is involved with administration of several different areas of the Wenaha's *scenic* and *recreational* river sections. The north side of the *scenic* section of the corridor includes a small parcel of land which was identified as an Area of Critical Environmental Concern (ACEC) and is managed by the BLM. Some of the areas of the south side of the *scenic* section of the corridor were put under the authority of the Department of Energy in 1920 with the Federal Power Act, but have been managed by BLM since 1966 (Wallowa and Grande Ronde Rivers Management Plan, 1993 p. 5). Finally, just as the Forest Service is the administrative authority for the Wenaha, the BLM is the authority for the Grande Ronde Wild and Scenic River, and the corridors of these rivers overlap. The entire Wenaha *recreational* section (0.15 mile) and a small portion of its *scenic* section (0.10 mile) falls

within the Grande Ronde River corridor. When the Wallowa and Grande Ronde Rivers Management Plan was completed in 1993, it included the *recreational* section of the Wenaha because the Wenaha CRMP had not undergone development yet and because "that sector of the Wenaha has the same issues and concerns common to the Grande Ronde corridor" (1993, p. 2-3). The BLM administers these areas utilizing this and the Baker Resource Management Plan (RMP) (BLM, 2011). Development for the Revised RMP was on hold during the time this thesis was written as planning for the Greater Sage Grouse, a candidate species for listing, took precedence. The 2011 Draft Revised RMP was used for this thesis.

State of Oregon. Several state governing bodies have an interest in the study area and work with other agencies and citizens to manage it. For example, Oregon's Department of Forestry and the Forest Service share and enforce Public Use Restrictions each fire season (ODF, 2015; USDA, 2013a). The state authority most intricately involved with the study area is the Oregon Department of Fish and Wildlife (ODFW). As is typical for state agencies, the ODFW regulates all hunting and fishing for the state of Oregon, working closely with the U.S. Fish and Wildlife Service in the interest of sustainable habitat management with special attention to endangered and threatened species. The ODFW is responsible for management of the Wenaha Wildlife Area, a checkerboard of lands which includes portions of the *wild*, *scenic*, and *recreational* sections of the Wenaha river corridor. These lands include the Mill Bar Campground (also known as "Griz Flatts") on the south side of the *scenic* and *recreation* sections of the corridor, and it is used frequently for its campsites and by the Troy Muzzleloaders shooting club. The ODFW's Wenaha Wildlife Area Management Plan provides management direction for the area's 12,419 acres, along with an additional bordering 1,329 acres of BLM lands (2007, p. 3). This 2007 plan is scheduled to be updated in 2017. It prioritizes management

for wildlife habitat diversity, conflicts between landowners and elk and deer, and wildlife-related recreational an educational opportunities for the public (2007, pp. 2-3).

Oregon's state lands obtain management guidance from Oregon Administrative Rules (OARs) put forth by the Oregon Parks and Recreation Department (OSOS, 2015). OAR 736-040-0047 applies specifically to the Grande Ronde River, because it is a Scenic Waterway protected by the state of Oregon in addition to its status as a federally designated Wild and Scenic River. This OAR also applies to a portion of the Wenaha because the two corridors overlap (even though the Wenaha is not designated as a Scenic waterway). The rule contains a section (section 4) dedicated to the Troy River Community Area. The majority of this section pertains to new development guidelines for the area. Specific rules for public use, including recreational use, are provided by another section (section 5).

Wallowa County. The Wallowa County Comprehensive Land Use Plan (2005) provides direction about appropriate land use in Wallowa County, which includes the town of Troy. Two articles in the plan pertain to general recreation allowances, and one article provides direction that is specific for Troy.

CHAPTER 3: METHODS

The purpose of this thesis was to better understand recreationists who visit the study area, recreational use of the study area, and to analyze whether recreational use during the sampling timeframe was appropriate according to applicable legislation and regulations. This chapter describes the methods used and has three sections. First, the study area is reviewed. Second, the methods for data collection are described. Third, the methods for addressing the research questions are described.

Study Area

The Wenaha Wild and Scenic River runs east from the Blue Mountains. The federally protected portion is 21.6 miles long, and begins in Wilderness at the confluence of the north and south forks of the river. Its corridor includes land managed by the U.S. Forest Service, BLM, state of Oregon, and private landowners and business owners. The river terminates in the town of Troy as it meets the Grande Ronde River (Figure 1).

The study area was divided into five smaller subunits for analysis: the *wild* section of the river corridor (in Wilderness), the *wild* section of the corridor (*not* in Wilderness), the *scenic* and *recreational* corridor sections, and *non-corridor* areas. All are described below.

Wild River Section (Wilderness)

The majority (15.2 miles) of the wild section's 18.7 miles runs through the Wenaha-Tucannon Wilderness (Wilderness) (Figure 2). This entire portion is within Forest boundaries. Four of the six trailheads sampled for this study provide direct access to this segment; they are the Cross Canyon, Hoodoo, Elk Flat, and Three Forks trailheads. These are located just outside of the Wilderness boundaries and provide limited parking and facilities. Visitors leave these areas on foot or on horseback and descend as much as 3,000 feet to the river. All trails reach the

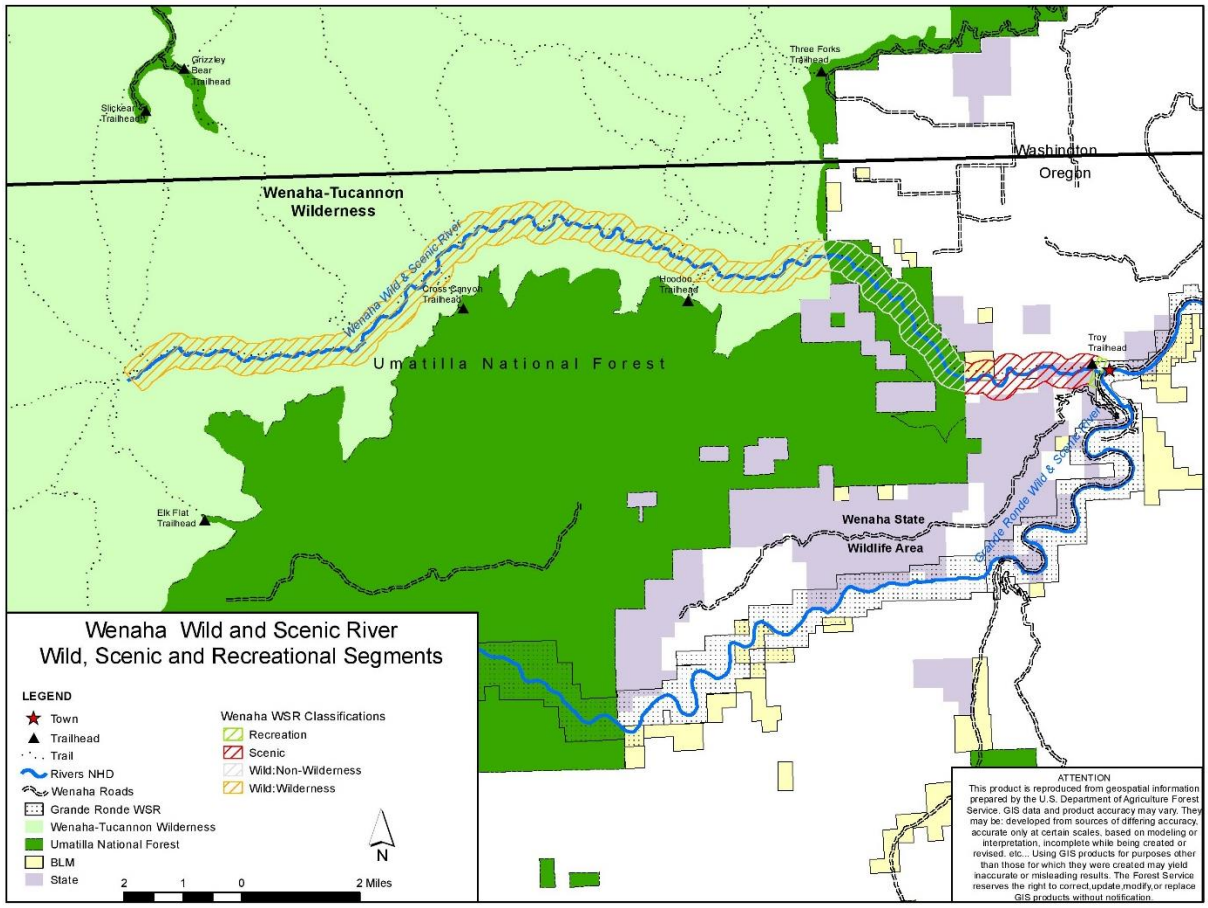

Figure 1. The Study Area. Map courtesy of the Umatilla National Forest (USDA, 2015).

river within five miles, except for the Three Forks Trail which is 22.4 miles north of the river. Each trail contains a number of switchbacks and various levels of exposure. Upon reaching the river, visitors can follow the Wenaha River Trail, which runs 31.3 miles from the town of Troy to the Timothy Springs trailhead. The Wenaha River Trail runs along the north side of the river, but can still be accessed from the south simply by crossing the river. While there are no bridges, the water is low enough much of the year to cross in many places.

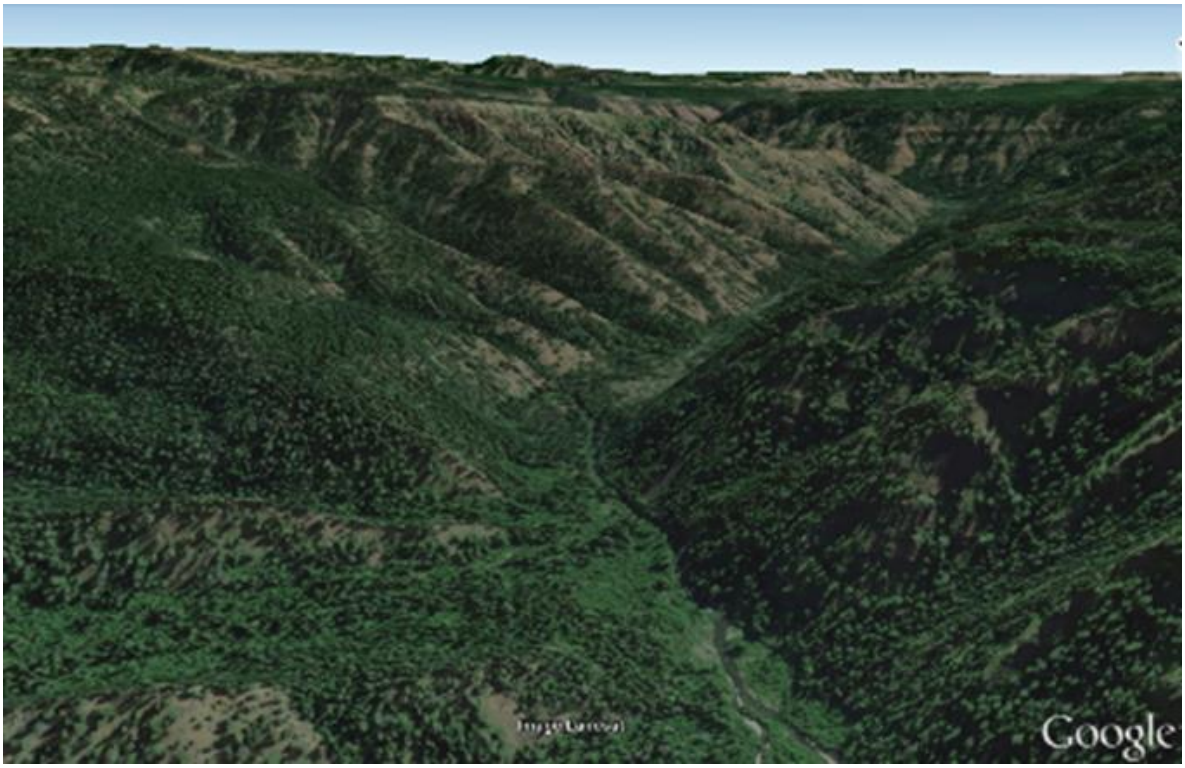

Figure 2. Google Earth Image of a Portion of the *Wild* Corridor Segment. A view downriver from the "Wenaha Forks" area, where the *wild* section begins in the Wenaha-Tucannon Wilderness. Source: Google Inc. (2015).

Wild River Section (non-Wilderness)

The remainder of the wild section (3.5 miles) is outside of Wilderness, but still within Forest Service boundaries. It is most directly accessed by the Troy trailhead. This non-Wilderness area is similar in character to the wild river section within Wilderness.

Scenic River Section

The 2.7 mile scenic section (Figure 3) is outside of Wilderness and outside of Forest boundaries. There are BLM, state, and private land in this part of the corridor. Much of this section is remote, providing opportunities for solitude similar to those provided by the wild section. From the north, the scenic section of the river is most easily accessed from the Troy TH. From here, visitors can travel on foot or horseback on the Wenaha River Trail which intercepts the scenic section and continues into the wild section. On the south side of the river, a portion of the scenic section is easily accessed and utilized frequently by recreationists camping on state

lands. Car camping is common in this area, which is a short walking distance from the center of the town of Troy. This area is also utilized frequently used by the Wenaha Muzzleloaders Club for target practice and competitions.

Figure 3. A Semi-Primitive Campsite on the *Scenic* Section. Much of this section of the Wenaha is remote and offers recreational opportunities comparable to the *wild* river section.

Recreational River Section

This small 0.15-mile section (Figure 4) joins the Grande Ronde and exists within the town of Troy. Though summer months can be quiet in Troy compared to hunting and steelhead fishing seasons, this is a popular take-out location for rafters floating the Grande Ronde. On the south side of the river, state-managed campsites extend into the recreational section of the corridor. On the north side, the Shilo Troy Resort is a privately-owned business which provides

developed camping opportunities on the recreation section of the river. Seven of these twenty developed campsites available are located on the Wenaha. (The remaining 13 are on the Grande Ronde.) In addition, several rental cabins and a few private homes are located within the .25 miles of the river corridor boundary and on adjacent lands. At the time of data collection, eight individuals lived year-round in the town of Troy, and utilized the corridor in their daily lives. The Shilo Troy Resort also leases land in Troy to hunters who come every fall. These hunters pay monthly rent to leave their wall tents up year-round in this convenient location that accesses the Wenaha Hunt Unit and provides big game processing equipment.

Figure 4. Google Earth View from the Troy Trailhead. The town of Troy is shown with a a portion of the Wenaha's *recreational* section (pictured right) before it flows into the Grand Ronde (pictured left). Visitors can cross the bridge to the State campground directly across the Wenaha from Troy or climb FS Road 62 to more remote access points such as the Hoodoo, Cross Canyon, and Elk Flat trailheads.

Non-corridor Areas

Not all parts of the study area were within the corridor. These non-corridor areas included the trailheads and trails discussed above. Respondents who used these trailheads or trails were included in the study even if they did not enter the river corridor.

Data Collection

Quantitative data collected for this thesis included data obtained through surveys and vehicle counts. Ocular data was recorded in the field to supplement the discussion of these quantitative data. Details about data collection are described in this section. Details about data analysis will be discussed in the next section.

Recreation Surveys

Instrumentation. The survey instrument (Appendix A) was five pages long and included quantitative items pertaining to sociodemographics, group characteristics, trip characteristics, activity participation, satisfaction, motivations, and crowding/conflict.

Sociodemographic items included gender, age, education, income, racial and ethnic group identification, and zip code. Local/non-local status was assessed by defining local visitors as those with a home zip code with a centroid within a 100-mile radius of the coordinates of the most central survey site location, which was the Cross Canyon Trailhead (Chang & Burns, 2012; English et al., 2002). A 100-mile radius was chosen rather than the more typical 50-mile radius because of the rural nature of this part of the Pacific Northwest; very few towns were within 50 miles of the centroid of the study area. Group characteristics included group type (private or commercial), and the number of adults and children in the group. Trip characteristics included whether this was a first or repeat visit, year of first visit, number of days spent here or other Wildernesses or Wild and Scenic Rivers, whether this visit was a day trip or overnight visit, time

spent trip planning, primary destination, and length of stay. Visitors were also asked where they started their trip, where they parked their vehicle(s), and how many vehicles were in their group. The final three items in this category included whether or not the visitor recreated on Forest lands, the river corridor section(s) within which the visitor recreated, and where applicable, the location of the visitor's campsite. For these last three items, a modified version of the Pomeroy Ranger District Forest map was created in order to communicate with the visitor about exactly where they recreated. The map showed Forest/non-Forest lands, the three river corridor sections (*wild, scenic*, and *recreational*), and seventeen camp "zones." Zones were created after consulting Forest managers and staff about how zones should be defined in order to be meaningful to managers. Zone boundaries were logically created by utilizing natural features (such creek confluences with the river) and important distinctions (such as Wilderness boundaries).

Recreationists were asked to choose from a list all of the activities participated in and also one primary activity. For the satisfaction items, Likert-type scales were used to assess service quality items (5-point scale), overall satisfaction (6-point scale), and trip experience items (5-point scale). Motivation items included the most important reason for visit and the importance of specific reasons for recreating in the study area (5-point scale). Visitors were also asked if they were aware of the river's federal designation and if that awareness had any influence on their decision to visit.

For crowding and conflict, a battery of items was used and included multiple Likert-type scales. This included a bivalent scale, modified from the traditional 9-point crowding (Heberlein & Vaske, 1977) scale. It asked visitors how the number of people they saw affected their trip enjoyment (1 = *enhanced my enjoyment*, 9 = *reduced my enjoyment*) regarding the number of

people seen at trails, at the visitor's campsite, on the river, and overall. Finally, the survey included a few qualitative items in the forms of open-ended questions that asked visitors about suggestions for management and what they liked most and least about the area.

Data Collection. Recreation surveys were conducted from mid June through early August 2014 at trailheads and other locations which provide access to the river. Forest Service managers were consulted in order to determine the best locations and times of day for conducting surveys. They identified six trailheads that were believed to provide the most popular access to the Wenaha river corridor. However, only four of these sites were sampled regularly for this study, for two reasons. First, one trailhead (Three Forks), showed little to no sign of use throughout the period of data collection, and so it was sampled less frequently. Second, the Grizzly Bear trailhead was not sampled as it was located far from the other sampling locations and was inaccessible by passenger car throughout most of the data collection period. However, field employees were consulted regularly throughout the summer regarding both sites to find out if visitor use was increasing at these locations, and it was not. Timothy Springs was suggested as a potential sampling site. Managers expected this site to have lower use and to provide less information about use in the Wenaha corridor because of its relatively long distance (11 miles) from the river's protected portion. This trailhead was visited twice. Locations are described in Table 4.

Table 4. Survey Sites Included in Study

Location	Access Description
Cross Canyon TH	Accesses *wild* section
Elk Flat TH	Accesses *wild* section
Hoodoo TH	Accesses *wild* section
Three Forks TH	Accesses *wild* section
Timothy Springs TH	Accesses Wenaha River Trail (from west)
Troy TH	Accesses Wenaha River Trail (from east)
Troy (Private)	Developed campsites (privately owned) on *recreational* section
Troy (Public)	Developed campsites (state public lands) on *recreational* and *scenic* sections
Troy (Other)	Accesses the *recreational* section; these include all areas within the river corridor that are not included in the privately-owned or state-managed camping areas

For trailhead surveys, recreationists were approached as they exited the trail. For the other survey sites in Troy, recreationists were approached at or near the end of their visits. A total of 74 surveys was collected. Only one visitor declined to be interviewed for a response rate of 98.7%. Respondents were randomly selected from each group and only included those 16 years of age or older. Efforts were made to sample each survey location at various times of day and on weekdays and weekends. However, due to the low use nature of the study area it did not make sense to sample each location within strict time blocks as trailheads were often empty. Ultimately convenience sampling was used in order to obtain the largest sample possible. Sampling decisions were made based on use patterns that the interviewer noted early in the sampling timeframe for each location. For example, recreationists camping in Troy were likely to exit the study area earlier in the day than the overnight visitors (or day use visitors) coming out of the river corridor, and therefore the interviewer was positioned accordingly. Because sites were not randomly sampled and equal time was not spent at each site, the percentage of hours spent at each location is shown in Table 5. (All survey site locations for Troy were combined

regarding time spent there because of their close proximity; all sites could be monitored simultaneously by the interviewer.)

Table 5. Percentage of Survey Hours Spent at each Sampling Location

		Valid Percent
Survey Site Location		
	Cross Canyon TH	32.7
	Elk Flat TH	27.9
	Hoodoo TH	8.3
	Three Forks TH	2.9
	Timothy Springs TH	<1
	Troy (All locations)	27.8

Percentages may not equal 100 percent because of rounding.

The survey was conducted using either traditional paper-and-clipboard method (n=38) or electronically (n=36). For both modes, the interviewer recorded all responses. The hardware used for electronic data collection was a *Nextbook Android* tablet. Prior to data collection the survey instrument was typed into the *droidsurvey* software application. This application was then used to conduct the actual survey in the field. Last, the application was used to automatically upload the results into the Statistical Package for the Social Sciences (SPSS). Paper survey results were typed into the same application on the tablets and then uploaded into SPSS.

Vehicle Counts

Vehicle counts can be used in relation to people at one time (PAOT) in an area which helps inform visitor capacity decisions (Lawson, Manning, Valliere, Wang, & Badruk, 2002). Vehicle counts were conducted upon arrival and departure from the same locations as survey sites. Following the same method as this Forest Service capacity analysis (USDA, 2013), vehicles at trailheads or other locations with attached trailers (of all types) were counted as one vehicle. Separate counts were also conducted as very often trailers were not present. While

vehicle counts were recorded for public/street parking in Troy, it was determined early in data collection that vehicles parked at this location were vehicles staged for Grand Ronde private rafters or commercial outfitters, and were not vehicles utilized by visitors accessing to the Wenaha. Counts for these areas are not reported in this thesis. Also following the capacity analysis methodology, vehicles at all 20 campsites were included for the Troy private campground count, though 13 of these are technically on the Grande Ronde River just past the mouth of the Wenaha. For the Elk Flat Trailhead (TH), vehicles or trailers are often parked on Road 290 in a location approximately 0.25 miles from the actual trailhead. These vehicles were included in the Elk Flat TH count. Counts were recorded on paper to be entered into a spreadsheet every time the interviewer arrived or departed a survey site location. Counts were later uploaded from Excel into SPSS.

Ocular Data

Reporting field observations can supplement quantitative research. This provides context and can result in richer explanations than quantitative reporting alone (Sieber, 1973), and the combination qualitative and quantitative research methods has garnered support among many scholars (Axinn & Pearce, 2006; Onwuegbuzie & Leech, 2005). Ocular data were collected for this thesis via field notes and photographs at survey locations and on trails within the study area. Observations were determined noteworthy based on knowledge gathered both prior to and during data collection, especially if observations were made that were not addressed by the survey. For example, the presence of campsite litter was noticed but the survey instrument did not include items related to this issue. This was considered important as results from the 2011 capacity analysis defined this as inappropriate use and a threat to visitor capacity.

Addressing the Research Questions

RQ1: What does the sample of recreationists look like in the Wenaha River corridor and the areas that access this corridor?

This question was answered with quantitative survey results. SPSS was used to run frequencies, means, and medians where each is applicable. The statistics to be reported in Chapter 4 for the variables are shown in Tables 6-11.

1.1 Sociodemographics.

Table 6. Sociodemographic Statistics

	Variable	Statistic
1.1 Sociodemographics		
	Gender	Frequencies
	Age	Frequencies, Means
	Income	Frequencies
	Education	Frequencies
	Racial group identification	Frequencies
	Hispanic or non-Hispanic ethnic identification	Frequencies
	U.S./non-U.S. residency	Frequencies
	State of residency	Frequencies
	Local/non-local	Frequencies

1.2 Group characteristics.

Table 7. Group Characteristics Statistics

	Variable	Statistic
1.2 Group characteristics		
	Group type (commercial/private)	Frequencies
	Number of adults in group	Frequencies, Means, Medians
	Number of children in group	Frequencies, Means, Medians
	Total number in group	Frequencies, Means, Medians

1.3 Trip characteristics.

Table 8. Trip Characterisitics Statistics

	Variable	Statistic
1.3 Trip Characteristics		
	First/repeat visit	Frequencies
	Year of first visit	Frequencies, Means
	Days spent here	Frequencies, Means, Medians
	Days spent other Wildernesses/Wild and Scenic Rivers	Frequencies, Means, Medians
	Day/overnight	Frequencies
	Length of stay	Frequencies, Means
	Trip planning	Frequencies
	Primary destination	Frequencies

1.4 Motivations.

Table 9. Motivation Statistics

	Variable	Statistic
1.4 Motivations		
	Motivation items (5-point scale)	Frequencies, Means
	Most important reason for visit	Frequencies
	Awareness/influence of Wild and Scenic River designation	Frequencies

1.5 Satisfaction.

Table 10. Satisfaction Statistics

	Variable	Statistic
1.5 Satisfaction		
	Service quality items (5-point scale)	Frequencies, Means
	Overall satisfaction (6-point scale)	Frequencies, Means
	Trip experience items (5-point scale)	Frequencies, Means

1.6 Crowding and conflict.

Table 11. Crowding and Conflict Statistics

	Variable	Statistic
1.6 Crowding and Conflict	Effect of number of people seen	Frequencies, Means
	Crowding expectations	Frequencies
	Actual group sightings	Frequencies, Means
	Preferred group sightings	Frequencies, Means
	Percentage for preferred group sightings	Frequencies
	Trip experience items (5-point scale)	Frequencies, Means
	Conflict Occurrence	Frequencies

RQ2: How are these areas currently being used by recreationists?

This question was answered mostly by quantitative survey results. SPSS was used to run frequencies as shown in table 12. Ocular data from the field supplemented the quantitative data and will be discussed.

Table 12. Recreation Activities and Locations Statistics

	Variable	Statistic
Activities		
	Activity participation	Frequencies
	Primary activity	Frequencies
Areas recreated		
	Forest/non-Forest recreation	Frequencies
	Trip start location	Frequencies
	Areas where visitor recreated (which river section(s) or non-corridor)	Frequencies
	Zone where visitor camped	Frequencies

RQ3: How are trailheads being used by recreationists with vehicles, with regard to numbers of vehicles and parking locations?

The first part of this question (regarding *number* of vehicles) was answered by quantitative survey results and quantitative vehicle count results. SPSS was used to run frequencies, means, and medians as shown in Table 13. Ocular data regarding parking locations of vehicles supplemented the quantitative data and will be discussed.

Table 13. Vehicle Count Statistics

	Variable	Statistic
Vehicle Counts		
	Vehicle/trailer counts by interviewer	Frequencies, Means
	Vehicle/trailer counts reported by respondent	Frequencies, Means, Medians

RQ4: Is current recreational use appropriate according to applicable legislation and/or regulation?

For this research question, first "current recreational use" was determined, and then what is considered "appropriate" was determined. Last, an evaluation was performed.

Determining current recreational use: selecting items for evaluation. "Current recreational use" was defined by the data collected for Research Questions 1-3 supplemented by ocular data. These individual items were grouped into categories for ease of reporting and discussing results in Chapters 4 and 5. Table 14 shows each category and specific quantitative items measured.

Table 14. Recreational Use Categories Evaluated

Recreational Use Categories	Items
Group Size	
	Visitor reported group size
Group Encounters	
	Visitor reported number of encounters with other groups
Vehicle Use	
	Vehicle counts at survey sites
Recreational Activities*	
	Camping in a pre-existing campsite
	Primitive or dispersed camping without fire ring
	Backpacking (overnight)
	Day hiking (not overnight)
	Resorts, cabins, and other accommodations on Forest Service-managed lands (private or Forest Service)
	Picnicking and family gatherings in developed site (family or group sites)
	Viewing natural features such as scenery, wildlife, birds, flowers, fish, etc.
	Visiting historic and prehistoric sites/areas
	Viewing a nature center, nature trail, or visitor center
	Nature study
	General/other-relaxing, hanging out, escaping heat, noise, etc.
	Fishing—all types
	Hunting—all types
	Hiking or walking
	Horseback riding
	Bicycling, including mountain bikes
	Nonmotorized water travel (kayaking)
	Nonmotorized water travel (rafting)
	Nonmotorized Water travel (canoeing)
	Other nonmotorized activities (swimming, games, etc.)
	Climbing
	Gathering mushrooms, berries, firewood, antlers, or other natural products
	Work (volunteer or other work)

*Recreational activities include all activities as chosen by respondents from a list on the survey instrument.

Determining appropriate use: organizing the documents. Next, what is considered "appropriate use" was determined. The first step of the analysis was to obtain the documents which guide management of the study area. First, relevant Forest Service management plans were obtained. Reading these documents led to understanding of what other management plans, regulations, and legislation needed to be obtained in order to execute a comprehensive analysis.

The second step was to organize these documents into three categories: primary, secondary, and tertiary. These categories are described by Figure 5. Primary documents include the federal legislation. These documents are the most authoritative. However, not all current use was addressed by these documents; they give loose direction but also grant agencies authority to manage details. Secondary documents were therefore used, and included Forest Service documents that provide specific management direction. For those areas of the river corridor that lie outside of the Forest boundary and are under other federal, state, or county jurisdiction, tertiary documents were consulted to determine appropriate recreational use.

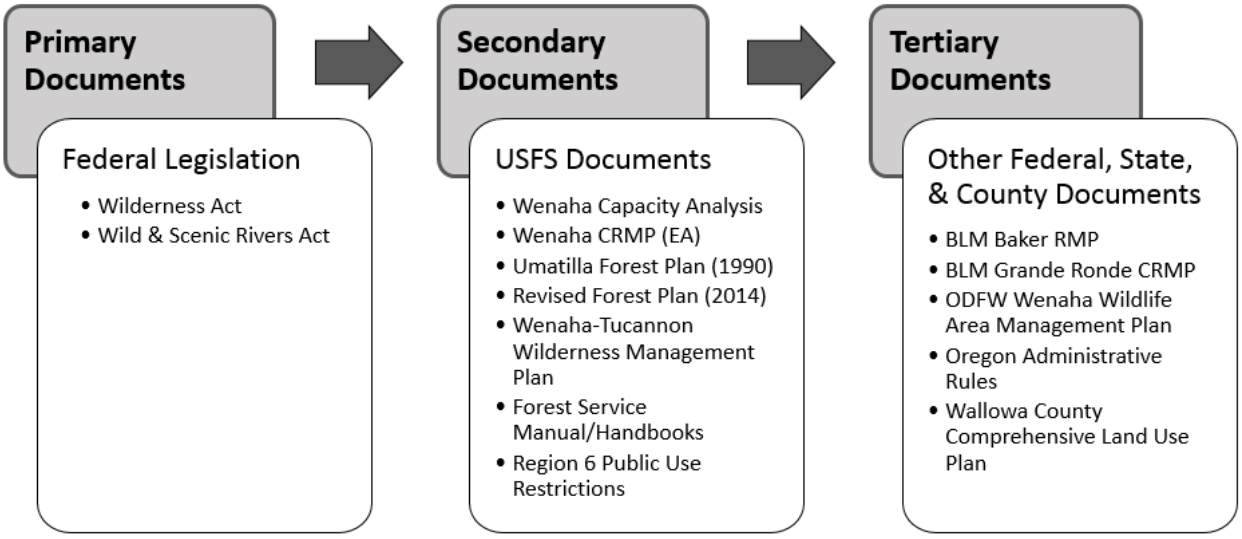

Figure 5. Document Organization for RQ4.

Different documents provide management direction for different portions of the study area. Table 15 shows the primary, secondary, and tertiary documents were organized for this thesis according to the areas for which they apply. It should be noted that because these documents often complement one another, all are arguably applicable to the entire study area. For example, the Forest Service Manual and Handbooks discuss general management of Wild and Scenic Rivers. However, the documents noted in the following tables provide the most specific and relevant criteria by which to evaluate appropriate use.

Table 15. Documents Used to Evaluate Appropriate Use in the Study Area

	←Non Forest Service →		← Forest Service →			
Guiding document	*Recrea-tional* section	*Scenic* section	*Wild* section (non-Wilder-ness)	*Wild* section (Wilder-ness)	Non-Corridor (non-Wilder-ness)	Non-Corridor (Wilder-ness)
Wilderness Act	--	--	--	✓	--	✓
Wild & Scenic Rivers Act	✓	✓	✓	✓	--	--
Wenaha Capacity Analysis	✓	✓	✓	✓	✓	✓
Wenaha CRMP	✓	✓	✓	✓	✓	✓
Umatilla Forest Plan	--	--	✓	✓	✓	✓
Revised Forest Plan	--	--	✓	✓	✓	✓
Wenaha-Tucannon Wilderness Management Plan	--	--	--	✓	--	✓
Forest Service Manual & Handbooks	--	--	✓	✓	✓	✓
Region 6 Public Use Restrictions	--	--	✓	✓	✓	✓
BLM Baker Resource Management Plan	✓	✓	--	--	--	--
Wallowa & Grande Ronde River Management Plan	✓	✓	--	--	--	--
State of Oregon Administrative Rules	✓	✓	--	--	--	--
OR Dept. of Forestry Public Use Restrictions	✓	✓	--	--	--	--
ODFW Wenaha Wildlife Area Management Plan	✓	✓	✓	✓	--	--
Wallowa County Comprehensive Land Use Plan	✓	✓	--	--	--	--

Conducting the evaluation. After current recreational use was defined and the applicable documents were organized, a method was selected for evaluating recreational use to determine whether or not it was appropriate. The method adapted was based on the "Appropriate Use Protocol," suggested by the Federal Interagency Task Force on Visitor Capacity on Public Lands (Haas, 2002).The method involves completing a worksheet that uses criteria that can help managers decide whether a specific recreational use is appropriate for an area. In the protocol, there are 21 decision criteria and examples include: "Does the use comply with applicable statutory requirements? (Yes/No)" and "Will the use significantly impact desired future conditions? (Yes/No)". At the conclusion of the document the decision maker reports whether use is *appropriate* or *not appropriate*.

The protocol's criteria was modified and further simplified for this thesis in order to determine appropriate use for the study area. The order of the questions reflects the organization of the documents (primary, secondary, and tertiary) used to determine what is considered appropriate use. (The "Not Applicable" category was added as often Forest Service documents and state/other federal documents did not apply to the area being evaluated.)

1. Does the use comply with applicable *federal legislation*? (Yes / No / N/A)
2. Does the use comply with applicable *Forest Service documents*? (Yes / No / N/A)
3. Does the use comply with applicable *other federal and/or state policies*? (Yes / No / N/A)

The data collected for this study were analyzed according to all relevant documents. Ocular data will also be reported in Chapter 4 as supplementary and contributes to the discussion and conclusions in Chapter 5.

CHAPTER 4: RESULTS

This chapter lists the results of the study and is organized in order of the research questions. A discussion of the results is provided in Chapter 5.

RQ1: What does the sample of recreationists look like in the Wenaha River corridor and the areas that access this corridor?

1.1 Sociodemographics. The sample was predominately male (79.7%). Over half of all respondents (56.2%) were between 21 and 50 years of age, and the mean age was 44.21. A small percentage (15.2%) reported an annual household income of under $25K, while the majority (72.6%) reported earnings of between $25K and $150K. Approximately one-quarter of the sample (25.4%) had an education level of High School or less, with nearly half (56.2%) having a Bachelor's degree or higher. All respondents identified as Caucasian, with a small number (n=3) reporting that they also identified racially with non-Caucasian groups. Only one person reported Hispanic ethnicity. Table 16 details these results.

Table 16. Sociodemographic Profile of Respondents

		Frequency	Valid Percent
Gender			
	Male	59	79.7
	Female	15	20.3
Age			
	16-20	3	4.2
	21-30	15	20.1
	31-40	14	19.4
	41-50	12	16.7
	51-60	16	22.2
	61-70	10	13.9
	71 and over	2	2.8
		Mean = 44.21	
Household Income			
	Under $25,000	10	15.2
	$25,000-$49,999	16	24.2
	$50,000-$99,999	23	34.8
	$100,000-$149,999	9	13.6
	$150,000-$199,999	4	6.1
	$200,000 and over	4	6.1
Education Level			
	High School or less	18	25.4
	Technical School/2 year college	13	18.3
	Bachelor's Degree	30	42.3
	Master's Degree	7	9.9
	Ph.D./Professional Degree	3	4.2
Race/Ethnicity*			
	Caucasian	69	100
	Non-Caucasian	3	4.1
	Hispanic	1	1.4
	Non-Hispanic	70	98.6

Percentages may not equal 100 because of rounding.
*Respondents could choose more than one response. Percentages may not add up to 100.

All respondents reported a home zip code within the United States. Over half of respondents (54.8%) reported a home residence in Oregon, and nearly one third (34.2%) reported a home zip code in Washington. A small number (n=5) of visitors were from Idaho, and a few were from other states. Local visitors, defined as those living within a 100-mile radius of the central trailhead of the study area, represented 54.8% of visitors and 23 different zip codes. Washington locals most often came from the Walla Walla area (n=9) or Dayton (n=3). The most highly represented Oregon locations were the communities of Troy or Enterprise, which share a zip code, (n=4) Echo (n=3) or La Grande (n=3).

Table 17. Sociodemographic Profile of Respondents (cont.)

		Frequency	Valid Percent
Visitor is from outside of the United States			
	Yes	--	--
	No	73	100
Visitor's Home State			
	OR	40	54.8
	WA	25	34.2
	ID	5	6.8
	Other*	3	4.1
Local vs. Non-Local			
	Local	40	54.8
	Non-Local	33	45.2

*Other states included OH, MT, and ND
Percentages may not equal 100 because of rounding.

1.2 Group characteristics. This sample consisted of all private groups; no respondents associated with commercial groups were interviewed. Most groups (67.6%) consisted of only one or two adults. The number of children (17 years of age and younger) per group was low (mean = 0.86). When adults and children are considered together, over half (58.2%) of groups consisted of one or two person(s), and 18.2% of groups include 3-6 people. About 16.2% of groups were parties of seven or more, with one group of 30. More than half (53.8%) of these

larger groups and all groups of 12 or larger recreated on the state, public or private lands outside of the Forest boundary.

Table 18. Group Characteristics Profile of Respondents

		Frequency	Valid Percent
Group Composition			
	Private	74	100
	Commercial	0	--
Number of Adults in Group			
	1	17	23.0
	2	33	44.6
	3	5	6.8
	4-6	12	16.2
	7-9	4	5.4
	10-12	2	2.7
	13 or more	1	1.4
		Mean = 3.11	
		Median = 2.00	
Number of Children (up to 17 years) in Group			
	0	54	73.0
	1	5	6.8
	2	5	6.8
	3	3	4.1
	4-6	6	8.1
	7-9	--	--
	10-12	1	1.4
		Mean = 0.86	
		Median = 0.00	
Total number in Group			
	1	13	17.6
	2	30	40.6
	3	8	10.8
	4-6	10	7.4
	7-9	6	8.1
	10-12	6	8.1
	13 or more	1	1.4
		Mean = 3.97	
		Median = 2.00	

Percentages may not equal 100 because of rounding.

1.3 Trip characteristics. Over three-fourths (77.8%) of respondents were repeat visitors to the river or Wilderness, and the mean year of first visit was 1996. Over half of visitors (57.1%) reported recreating between one and 14 days in this area in a typical year. The mean number of days was 17.29, and the median (5 days) is shown here because a small number of visitors reported very high numbers of recreation days. When asked about how often they recreated on other Wild and Scenic Rivers or Wilderness areas, 59.4% of respondents reported 15 or more days per year. Most respondents (71.6%) were visiting overnight, and the mean number of nights stayed was 3.28. For day trips, the mean number of hours visited was 4.43.

Table 19. Trip Characteristics Profile of Respondents

		Frequency	Valid Percent
First Visit vs. Repeat Visitor			
	First Visit	16	22.2
	Repeat Visitor	56	77.8
Year of First Visit			
	Prior to 1971	4	7.1
	1971-1980	1	1.8
	1981-1990	12	21.4
	1991-2000	15	26.8
	2001-2010	16	28.6
	2011 or later	8	14.3
		Mean = 1996	
Days spent recreating in the study area (typical year)	0	11	19.6
	1-7	21	37.5
	8-14	11	19.6
	15-21	3	5.4
	22 or more	10	17.9
		Mean = 17.29	
Days spent recreating at other Wild and Scenic Rivers or Wilderness areas (typical year)	0	9	13.0
	1-7	19	27.5
	8-14	12	17.4
	15-21	8	11.6
	22 or more	21	30.4
	Mean = 26.99		
Type of Visit			
	Overnight	53	71.6
	Day Trip	21	28.4
Overnight: Number of Nights			
	1 night	16	30.2
	2 nights	20	37.7
	3-4 nights	14	26.4
	5-6 nights	3	5.7
		Mean = 3.28	
Day Trip: Number of Hours			
	1-2 hours	8	38.1
	3-5 hours	4	19.0
	6-7 hours	5	23.8
	8 or more hours	4	19.0
		Mean = 4.43	

Over half (61.2%) of respondents spent two weeks or more planning their respective trips. A relatively small percentage (16.6%) spent three or less days planning. The river was the primary destination for 70.3% of respondents. Only two respondents agreed that the Wilderness was their primary destination. Some visitors (27.0%) specified other primary destinations for their trips. These destinations included the Wenaha hunt unit for a small percentage of hunters (9.5%) who were interviewed while scouting late in the summer recreation season, and a small percentage (5.4%) of respondents whose primary destination was the town of Troy's annual festival held in July. These respondents were interviewed in the recreational section corridor.

Table 20. Trip Characteristics Profile of Respondents (cont.)

		Frequency	Valid Percent
Amount of time spent planning this trip	Less than 24 hours	5	6.9
	1-3 days	7	9.7
	4-7 days	9	12.5
	8-14 days	7	9.7
	15 days – 1 month	10	13.9
	1-3 months	12	16.7
	More than 3 months	22	30.6
Primary Destination for this trip			
	Wenaha River	52	70.3
	Wilderness	2	2.7
	Other	20	27.0

Percentages may not equal 100 because of rounding.

1.4 Motivations. Visitors were asked about their motivations to visit the river or Wilderness (Table 21). The strongest motivation items related to being in nature, relaxing, or getting away. On a 1-5 scale, where 1 = *not at all important* and 5 = *extremely important*, the top motivators were *to be outdoors* (mean = 4.57), *to experience natural surroundings* (mean = 4.49), *for relaxation* (mean = 4.4), and *to get away from the regular routine* (mean = 4.29).

Respondents were less motivated by items related to challenge; these items included *challenge or sport* (3.68), *physical exercise* (3.51), and *to develop my skills* (mean = 3.24). Social motivators also were less important to visitors. Of these, *to be with my friends* (mean = 3.92) scored higher than *family recreation* (mean = 3.36).

Table 21. Motivations for Recreation on the River or Wilderness

Motivation Item	Not at all Important	Somewhat Important	Moderately Important	Very Impor-tant	Extremely Important	
	(1)	(2)	(3)	(4)	(5)	Mean
To be outdoors	--	--	2.8	37.5	59.7	4.57
For relaxation	--	--	9.7	40.3	50.0	4.40
To get away from the regular routine	2.8	--	9.7	40.3	47.2	4.29
For the challenge or sport	12.5	5.6	18.1	29.2	34.7	3.68
For family recreation	23.6	4.2	11.1	34.7	26.4	3.36
For physical exercise	18.1	5.6	16.7	26.4	33.3	3.51
To be with my friends	12.5	1.4	6.9	40.3	38.9	3.92
To experience natural surroundings	--	--	2.8	45.8	51.4	4.49
To develop my skills	23.6	6.9	18.1	25.0	26.4	3.24

*Due to small sample size, frequency of responses is reported.
Percentages may not equal 100 because of rounding.
Response Code: 1 = Not at all important and 5 = Extremely Important
Results are based on answers from 72 total respondents.

When asked to specify the most important reason (out of four given reasons) for this visit to the river or Wilderness (Table 22), respondents were almost evenly split among three: *to enjoy the place itself* (30.6%), *it's a good place to do the outdoor activities I enjoy* (34.7%), and *to spend more time with my companions* (33.3%). Only one person expressed that the most important reason was because *it's close to home.*

Table 22. Primary Motivations for Recreation on the River or Wilderness

		Frequency	Valid Percent
Most Important reason for visit			
	To enjoy the place itself	22	30.6
	It's a good place to do the outdoor activities I enjoy	25	34.7
	To spend more time with my companions	24	33.3
	It's close to home	1	1.4

Percentages may not equal 100 because of rounding.

All visitors were asked the question: *Did you know that the Wenaha is a federally designated Wild and Scenic River?* If the respondent's answer was *yes*, the respondent was asked: *Did this knowledge influence your decision to visit the river?* Three-fourths (75%) expressed awareness of the river's federal designation (Table 23). Of these visitors, the majority (70.4%) said that their decision to visit was not influenced by this awareness.

Table 23. Respondent Awareness of Wild and Scenic River Designation

		Frequency	Valid Percent
Respondent aware of federal designation of river			
	Yes	54	75.0
	No	18	25.0
Influence of awareness on decision to visit the river			
	Yes	16	29.6
	No	38	70.4

Percentages may not equal 100 because of rounding.

1.5 Satisfaction. Recreationists were generally satisfied with service quality items (Table 24). Respondents rated these on a scale of *1* (*awful*) to *5* (*excellent*). All items had a mean rating above 4.00, and the highest rating was reported for *recreation setting* (mean = 4.63). The lowest rating was for *condition of facilities* (mean = 4.13). However, for *condition of facilities* and

responsiveness of staff, many respondents felt that these items were *not applicable* to their trip experience (36.1% and 80.6%, respectively).

Table 24. Satisfaction Percentages for Service Quality Items

	Awful	Fair	Good	Very Good	Excellent	Not Applicable	
	(1)	(2)	(3)	(4)	(5)	N/A	Mean
Health and Cleanliness	--	1.4	12.5	23.6	61.1	1.4	4.46
Safety and Security	1.4	1.4	22.2	20.8	48.6	5.6	4.21
Condition of Facilities	--	--	20.8	13.9	29.2	36.1	4.13
Responsiveness of Staff	1.4	1.4	1.4	1.4	13.9	80.6	4.29
Recreation Setting	--	--	12.5	11.1	75.0	1.4	4.63

Percentages may not equal 100 because of rounding.
Response Scale: 1 = Awful and 5 = Excellent
Results are based on answers from 72 total respondents.

For overall trip satisfaction (Table 25), 70.9% of respondents reported that the trip was *very good* or *excellent*, and 22.2 % reported their trips as *perfect.*

Table 25. Percentages of Overall Trip Satisfaction

Overall Trip Satisfaction Rating (6-point scale)						
Poor	Fair	Good	Very Good	Excellent	Perfect	
(1)	(2)	(3)	(4)	(5)	(6)	Mean
--	1.4	5.6	30.6	40.3	22.2	4.76

Percentages may not equal 100 because of rounding.
Response Scale: 1 = Poor and 6 = Perfect
Results are based on answers from 72 total respondents.

Visitors were asked to rank specific satisfaction items on a scale of 1 *(strongly disagree)* to 5 *(strongly agree)* (Table 26). All respondents were in general agreement with the statement *I thoroughly enjoyed my visit to the river or Wilderness* (mean = 4.70), and most *agreed* or *strongly agreed* that *the trip was worth the money spent to take it* (mean = 4.75). Most respondents *disagreed* or *strongly disagreed* with the statement *I was disappointed with some*

aspects of my visit (mean = 1.69). The vast majority generally agreed that *the recreational areas are in good condition* (mean = 4.28) and most respondents agreed that the facilities at the trailhead where they were interviewed were in *good condition* (mean = 4.24). Those with neutral feelings on the topic (n=10) were interviewed at locations other than trailheads. Most respondents *disagreed* or *strongly disagreed* that they *avoided some places because of trail impacts* (mean = 1.94) and with the statement that *non-natural noise had a negative impact* on their respective visits (mean = 1.69). For those that did *agree* (6.9%), specified noises included aircraft (n=1), noise associated with motorized vehicles (n=3), human voices (n=1), and gunfire (n=1). Most respondents *agreed* or *strongly agreed* with the statement *there is a good balance between social and biological values in the management of the river or Wilderness* (mean = 4.10). Of the 14.1% of visitors with neutral feelings, some commented that they did not possess adequate knowledge to evaluate the situation appropriately. Therefore, this item had a lower mean response.

Table 26. Satisfaction Percentages for Trip Experience Items

Trip Experience Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	
	(1)	(2)	(3)	(4)	(5)	Mean
I thoroughly enjoyed my visit to the river or Wilderness	--	--	--	29.6	70.4	4.70
I avoided some places because of trail impacts	40.3	40.3	8.3	6.9	4.2	1.94
My trip was well worth the money I spent to take it	--	--	1.4	22.2	76.4	4.75
I was disappointed with some aspects of my visit	45.8	44.4	4.2	5.6	--	1.69
There is a good balance between social and biological values in the management of the river or Wilderness	--	2.8	14.1	53.5	29.6	4.10
Non-natural noise (aircraft, motorboats, etc.) impacted my visit in a negative way	44.4	48.6	--	6.9	--	1.69
The recreational areas are in good condition	1.4	--	8.3	50.0	40.3	4.28
The facilities or general area at this trailhead are in good condition	--	--	14.1	47.9	38.0	4.24

Percentages may not equal 100 because of rounding.
Response Code: 1 = Strongly Disagree and 5 = Strongly Agree
Results are based on answers from 72 total respondents.

Open-ended questions were asked to give respondents the opportunity to describe what they like most and least about the area, and also offer suggestions for management. Common themes about what visitors liked most related to natural beauty, peace and solitude, fish and wildlife, the river itself, and cleanliness of the area. Not all respondents reported on what they liked least; they could not think of anything. Of those that did have comments a small number (N = 6) mentioned the need for trail maintenance and two people reported seeing trash. The most common suggestion for management involved trail maintenance (N = 19) either generally or with regard to vegetation overgrowth, and two visitors specified horse-related erosion as their cause for concern. Five visitors suggested better signage on the Forest.

1.6 Crowding and conflict. A 9-point scale was used to ask visitors about how the number of people seen affected their trip enjoyment, with '1' indicating that the number of people *enhanced* enjoyment, '9' indicating that the number *reduced* enjoyment, and '5' indicating that the number of other people seen had *no effect* on enjoyment during the trip. Visitors used this scale to report specifically about the effect of number of people seen on the trails, at their campsites, on the river, and then how the number of people seen in total affected their overall trip enjoyment (Table 27). Mean responses indicated that the number of people seen tended to increase visitor enjoyment on trails (mean = 2.65), at campsites (mean = 2.85) and on the river (mean = 2.89), and overall (mean = 2.76).

Table 27. Effect of Number of People Seen on Trip Enjoyment

	How number of people seen at specific locations affected trip enjoyment (9-point scale)										
	Enhanced my Enjoyment				No Effect				Reduced my enjoyment		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	N/A	Mean
On trails	41.9	11.6	16.3	--	30.2	--	--	--	--	34.8	2.65
At campsite	42.3	15.4	5.8	3.8	25.0	3.8	1.9	--	1.9	22.4	2.85
On the river	46.3	7.4	3.7	7.4	27.8	3.7	3.7	--	--	19.4	2.89
Overall	46.3	10.4	4.5	3.0	32.8	1.5	1.5	--	--	--	2.76

Percentages may not equal 100 because of rounding.
Results are based on answers from 67 total respondents.

Nearly half (43.3%) of respondents reported that the number of people seen on this trip was about what was expected (Table 28). Only 9.0% saw a lot less people than expected, and 13.4% saw a lot more. Only one person reported that they did not know what to expect.

Table 28. Crowding Expectations

		Frequency	Valid Percent
Number of People Seen Compared to Number Expected			
	A lot less than you expected	6	9.0
	A little less than you expected	15	22.4
	About what you expected	29	43.3
	A little more than you expected	7	10.4
	A lot more than you expected	9	13.4
	You didn't have any expectations	1	1.5

Percentages may not equal 100 because of rounding.

In general, respondents did not encounter very many other groups (Table 29). When asked *how many times did you see other groups (today)*, the majority (86.6%) had seen other groups twice or less. A small percentage (10.5%) reported seeing others three or four times, and

an additional 3.0% saw other groups five or more times. On average, visitors reported seeing other groups one time (mean = 1). When visitors were asked *how many times is it OK to see other groups*, the mean response was 1.48.

Table 29. Actual and Acceptable Group Sightings

		Frequency	Valid Percent
Number of times other groups seen (today)			
	0 times	27	40.3
	1-2 times	31	46.3
	3-4 times	7	10.5
	5 or more times	2	3.0
		Mean = 1.00	
Number of times OK to see other groups			
	0 times	8	12.3
	1-2 times	10	15.4
	3-4 times	7	10.8
	5 or more times	6	9.2
	It doesn't matter to me	34	52.3
		Mean = 1.48	

Percentages may not equal 100 because of rounding.

Respondents were asked about an acceptable percentage of time to see other groups while recreating in the study area (Table 30). Nearly one third (29.9%) of the sample stated that it is acceptable to see other groups 100% of the time that they are recreating, and an additional 23.9% said that it is ok to see other groups 90% of the time. Only 13.4% stated that it is unacceptable to see other groups.

Table 30. Acceptable Percentages for Group Sightings

Acceptable percentage of time to see other groups										
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
13.4	--	14.9	7.5	--	6.0	--	1.5	3.0	23.9	29.9

Percentages may not equal 100 because of rounding.
Results are based on answers from 67 total respondents.

Positively and negatively worded statements were used to ask recreationists about crowding and conflict (Table 31). Visitors answered with a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Visitors were likely to be in agreement with the statements *I had the opportunity to recreate without feeling crowded* (mean = 4.67) and *I could find places to recreate without conflict from other visitors* (mean = 4.72). Visitors also were likely to agree that the area *provided outstanding opportunities for solitude* (mean = 4.68). Responses varied for the level of agreement with the statement *the other people at the river or in the Wilderness increased my enjoyment* (mean = 3.00); one third (33.3%) *neither agreed nor disagreed*. Respondents generally disagreed with negatively worded statements such as *hearing other groups impacted my visit in a negative way* (mean = 1.57) and *I avoided some places because there were too many people there* (mean = 1.75). Additionally, most did not agree that *the number of people reduced my enjoyment* (mean = 1.64).

Table 31. Crowding and Conflict Percentages for Trip Experience Items

Trip Experience Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	
	(1)	(2)	(3)	(4)	(5)	Mean
I had the opportunity to recreate without feeling crowded	1.5	--	3.0	20.9	74.6	4.67
I could find places to recreate without conflict from other visitors	--	--	1.5	25.4	73.1	4.72
Hearing other groups impacted my visit in a negative way	50.7	44.8	1.5	3.0	--	1.57
I avoided some places because there were too many people there	43.3	47.8	3.0	3.0	3.0	1.75
The number of people reduced my enjoyment	40.3	55.2	4.5	--	--	1.64
Recreation activities at the river or in the Wilderness were NOT compatible	37.3	62.7	--	--	--	1.63
The river or Wilderness provided outstanding opportunities for solitude	--	--	--	31.8	68.2	4.68
The behavior of other people interfered with the quality of my experience	48.5	48.5	1.5	--	1.5	1.58
The other people at the river or in the Wilderness increased my enjoyment	15.2	15.2	33.3	27.3	9.1	3.00

Percentages may not equal 100 because of rounding.
Response Code: 1 = Strongly Disagree and 5 = Strongly Agree
Results are based on answers from 67 total respondents.

Only one respondent reported conflict during their trip, with 98.5% expressing that they experienced no conflict with other parties (Table 32).

Table 32. Social Conflict Occurrence

	Frequency	Valid Percent
Conflict occurrence reported by respondent		
Yes	1	1.5
No	66	98.5

RQ2: How are these areas currently being used by recreationists?

Visitors were asked to use a list to specify activities that they participated in during their trip to the river or Wilderness. The top activities reported (in order of popularity) were: *viewing natural features such as scenery, wildlife, birds, flowers, fish, etc*. (91.7%); *general/other-relaxing, hanging out, escaping heat, noise, etc.*(88.9%); *camping in a pre-existing campsite* (72.2%); *hiking or walking* (68.1%); *fishing* (52.8%); and *gathering mushrooms, berries, firewood, antlers, or other natural products* (43.1%). For this last activity, visitors most often specified natural products gathered as berries (n=12) and/or firewood (n=15).

Respondents were then asked to specify one of these as the primary recreational activity for their respective visits. By far, the primary activity reported most often was *fishing* (36.5%) followed by *camping in a pre-existing campsite* (16.2%), *general/other-relaxing, hanging out, escaping heat, noise, etc.* (13.5%), and *hiking or walking* (12.2%).

Table 33. Activity Participation and Primary Activity

	Participation*		Primary Activity	
	Frequency	Valid Percent	Frequency	Valid Percent
Camping in pre-existing campsite	52	72.2	12	16.2
Primitive or dispersed camping without fire ring	3	4.2	--	--
Backpacking (overnight)	23	31.9	4	5.4
Day hiking (not overnight)	17	23.6	5	6.8
Resorts, cabins, and other accommodations on Forest Service managed lands (private or Forest Service)	--	--	--	--
Picnicking and family gatherings in developed site (family or group sites)	6	8.3	--	--
Viewing natural features such as scenery, wildlife, birds, flowers, fish, etc.	66	91.7	--	--
Visiting historic and prehistoric sites/areas	1	1.4	--	--
Viewing a nature center, nature trail, or visitor center	--	--	--	--
Nature study	--	--	--	--
General/other-relaxing, hanging out, escaping heat, noise, etc.	64	88.9	10	13.5
Fishing—all types	38	52.8	27	36.5
Hunting—all types	1	1.4	1	1.4
Hiking or walking	49	68.1	9	12.2
Horseback riding	4	5.6	1	1.4
Bicycling, including mountain bikes	--	--	--	--
Nonmotorized water travel (kayaking)	--	--	--	--
Nonmotorized water travel (rafting)	3	4.2	1	1.4
Nonmotorized Water travel (canoeing)	--	--	--	--
Other nonmotorized activities (swimming, games, etc.)	15	20.8	--	--
Climbing	1	1.4	--	--
Gathering mushrooms, berries, firewood, antlers, or other natural products	31	43.1	--	4.1
Work (volunteer or other work)	2	2.8	1	1.4

Percentages may not equal 100 because of rounding.

*Respondents could choose more than one response. Percentages may not add up to 100.

Visitors were asked if they recreated on Forest Service land during their visits. Only the *wild* section of the corridor is within Forest Service boundaries and 64.9% of visitors reported that they recreated here. The remaining 35.1% of respondents recreated in the river corridor on the *scenic* and *recreational* sections which are outside of Forest Service boundaries but still the administrative responsibility of the Forest Service.

Table 34. Forest/Non-Forest Recreation

		Frequency	Valid Percent
Respondent recreated on Umatilla NF land			
	Yes	48	64.9
	No	26	35.1

Percentages may not equal 100 percent because of rounding.

Most respondents (73.0%) reported that they started today's trip at their campsite. Those who did not camp were most likely to have started today's trip at the Cross Canyon TH (n=6). *Other* locations included locations in the town of Troy that were not at a trailhead (n=6).

Table 35. Trip Start Location

		Frequency	Valid Percent
Location of trip start (today)			
	Campsite	54	73.0
	Cross Canyon TH	6	8.1
	Elk Flat TH	3	4.1
	Hoodoo TH	1	1.4
	Troy TH	3	4.1
	Other	7	9.5

Percentages may not equal 100 percent because of rounding.

Respondents were asked to report all of the sections of the river corridor within which they recreated during this trip. Nearly half (47.3%) recreated in the *wild* section corridor. Visitors were not asked to differentiate between Wilderness and non-Wilderness areas of this section. Nearly one-third of visitors (29.7%) recreated within the *scenic* section, and 33.8% reported recreating in the *recreational* section. Some respondents (n=13) that were interviewed recreated only in areas that were outside of the river corridor.

Table 36. Recreational Use by River Section

		Frequency	Valid Percent*
Recreation reported for each river section			
	Recreational section	25	33.8
	Scenic section	22	29.7
	Wild section**	35	47.3
	Non-Corridor recreation (only)	13	17.6

Percentages may not equal 100 because of rounding.
*Respondents could choose more than one response. Percentages may not add up to 100.
**Includes both Wilderness and non-Wilderness areas of the *Wild* river section

The largest percentage (41.5%) of overnight visitors camped within the *wild* section of the river corridor. The remaining visitors who camped in the corridor were evenly split between the *recreational* section (20.8%) and *scenic* section (20.8%).

Table 37. Campsite Use by River Section

		Frequency	Valid Percent
Location of campsite within corridor			
	Recreational section	11	20.8
	Scenic section	11	20.8
	Wild section (Wilderness)	22	41.5
	Non-Corridor campsite	9	17.0

Percentages may not equal 100 percent because of rounding.

Camping opportunities varied within river sections. Developed camping takes place on the north side of the *recreational* section on the private campsites in Troy, and 15.1% of campers camped here. Developed camping also occurs on the south side of the *recreational* and *scenic* sections on state public campsites. Only three campsites fall within the *recreational* section; the remaining campsites on these state lands fall within the *scenic* section. In all, nearly one-fourth (22.7%) of overnight visitors camped on this state campground. Only two recreationists reported camping on the more remote *scenic* north section of the corridor. For the *wild* section campers, all (n=22) camped within Wilderness. No overnight visitors reported camping in the portion of the *wild* section which is located outside of Wilderness.

Table 38. Campsite Use by River Section (continued)

		Frequency	Valid Percent
Location of campsite within river section			
	Recreational North (Troy private)	8	15.1
	Recreational South (State public)	10	18.9
	Scenic South (State public)	2	3.8
	Scenic North	2	3.8
	Wild (in Wilderness)	22	41.5
	Wild (not in Wilderness)	--	--
	Non-Corridor campsite	9	17.0

Percentages may not equal 100 percent because of rounding.

RQ3: How are trailheads being used by recreationists with vehicles, with regard to numbers of vehicles and parking locations?

Over half of respondents (62.2%) reported having one vehicle for their entire group for this trip, and 20.3% were using two vehicles for their group. A small percentage (5.4%) did not have a vehicle in their group, because they had either temporary or permanent homes in Troy and walked to their destination for recreation (n=3) or were shuttled to their destination (n=1). The mean number of vehicles per group was 1.74. (The median of 1.00 is reported here because of some larger numbers of vehicles reported at developed campsites that were not at all typical for other areas). Approximately one fourth (23.1%) of respondents reported one or more trailers (of any type) for their group. Most of these visitors (n=11) had one trailer, and a small number (n=6) reported two or more. The mean number of trailers was 0.43 and the median was 0.

Table 39. Number of Vehicles and Trailers Reported by Respondent

		Frequency	Valid Percent
Number of cars, trucks, or motorcycles per group			
	0	4	5.4
	1	46	62.2
	2	15	20.3
	3	3	4.1
	4 or more	6	8.1
		Mean = 1.74	
		Median = 1.00	
Number of trailers (any type) per group			
	0	57	77.0
	1	11	14.9
	2	2	2.7
	3	3	4.1
	4 or more	1	1.4
		Mean = 0.43	
		Median = 0	

Percentages may not equal 100 percent because of rounding.

Vehicle counts were conducted by the interviewer upon arrival to and departure from survey locations. “Vehicles” included cars, trucks, and motorcycles. The highest vehicle counts occurred for the Cross Canyon TH, where the mean number of vehicles upon arrival was 2.31 and upon departure, 1.84. Elk Flat TH was also one of the busier trailheads with a mean of 2.22 vehicles at arrival and 1.66 at departure. The Troy (Private) vehicle count included those vehicles counted at the 20 private campsites on the recreational section of the Wenaha. This area had a mean vehicle count of 1.45 at arrival and 1.42 at departure. No vehicles of any type were counted at Three Forks TH at any time.

Table 40. Vehicle Counts by Interviewer at Survey Locations

		Number of Vehicles at Arrival	Number of Vehicles at Departure
Location for vehicle count (cars, trucks, and motorcycles)		Mean	Mean
	Cross Canyon TH	2.31	1.84
	Elk Flat TH	2.22	1.66
	Hoodoo TH	0.76	0.73
	Three Forks TH	0	0
	Timothy Springs TH	1.5	1.5
	Troy TH	0.50	0.50
	Troy (Private)	1.45	1.42
	Troy (Public)	0.98	1.00

"Trailers" included trailers of all types, and were counted separately from vehicles. These were rarely counted. The highest mean counts occurred at the Elk Flat TH (arrival mean = 1.10; departure mean = 0.78) where trailers transporting pack stock are common. The Troy (Private) location was the second most frequented area for trailers (mean = 0.85), followed by the Troy (Public) location (mean = 0.63). Popular trailer types in these developed camping areas include motorhomes or "5th wheel" recreational vehicles.

Table 41. Trailer Counts by Interviewer at Survey Locations

		Number of Trailers at Arrival	Number of Trailers at Departure
Location for trailer count (all types)		Mean	Mean
	Cross Canyon TH	0.16	0.13
	Elk Flat TH	1.10	0.78
	Hoodoo TH	0	0
	Three Forks TH	0	0
	Timothy Springs TH	0	0
	Troy TH	0.09	0.09
	Troy (Private)	0.85	0.85
	Troy (Public)	0.63	0.63

As explained in Chapter 3, Umatilla NF resource managers counted vehicles with attached trailers as one vehicle when developing standards and guidelines for trailhead parking capacity (USDA 2013b, 2015). Table 42 shows the maximum number of vehicles including attached trailers that were counted at each trailhead during the sampling period. The high numbers for Cross Canyon and Elk Flat were recorded the same day. On this day nine of the 11 vehicles at Elk Flat were those of a pack string of volunteers and the Forest Service doing trail work. At least one group at Cross Canyon reported relocating from Elk Flat as a result. A July 4th count at Cross Canyon also showed nine vehicles. The high numbers reported for Troy (Public and Private) occurred during July 4th weekend during an annual festival held here. The means reported are for the entire sampling period.

Table 42. Maximum Count Recorded by Interviewer at One Time

		Maximum Count*	Mean
Site location			
	Cross Canyon TH	9	2.31
	Elk Flat TH	11	2.22
	Hoodoo TH	4	.76
	Three Forks TH	0	--
	Timothy Springs TH	3	1.50
	Troy TH	2	.48
	Troy (Private)	21	1.95
	Troy (Public)	12	1.03

* Count includes vehicles or vehicles with attached trailers; corresponding numbers are for maximum count upon arrival to location.

RQ4: Is current recreational use appropriate according to applicable legislation and/or regulation?

This research question was answered through the evaluation of group size, group encounters, vehicle use, and recreational activities.

Group Size

Data collected during the sampling period suggested that group sizes were appropriate for the areas evaluated. Group size is regulated in Wilderness in order to provide "outstanding opportunities for solitude" as specified in the Wilderness Act. Regulating group size also can be used to uphold the Wild and Scenic Rivers Act for those rivers that have been identified as possessing *recreation* as an outstandingly remarkable value, because regulating group size protects social carrying capacity. While federal legislation does not specify group sizes in Wilderness, land management agencies do so. Therefore, Forest Service (secondary) and other agency (tertiary) documents were used to evaluate appropriate group size for the area.

The Wenaha-Tucannon Wilderness Management Plan (Wilderness Plan) (1989) specifies the maximum group size as 12 persons/18 head of stock for those areas in Wilderness. The Revised Forest Plan (2014) and the Comprehensive River Management Plan (CRMP) (2015) reflects this. The CRMP also proposed a new standard that would extend this limitation of 12 persons/18 head of stock for that portion of the *wild* river segment that is outside of Wilderness. While the CRMP cannot enforce group size for lands outside of Forest boundaries, another guideline proposed by the CRMP is that those non-Forest entities which manage the *scenic* river section should incorporate a group size limit that is consistent with these limits within the *wild* section. However, this limit has yet to be determined. No known state or other document addresses group size limits for the *scenic* nor *recreational* segment, and therefore this measure

could not be applied in these areas. The CRMP does recommend a maximum number of people at one time (PAOT) for the entire river corridor, a measure used in tandem with vehicle capacity recommendations. This will be discussed later in the section "vehicle use."

The mean group size reported by this study was 3.97. Only one group was larger than 12 and was a party of 30 on the private campground in Troy on a holiday weekend. There were only three groups as large as 12 people that were interviewed and these also recreated outside of the Forest boundary. Larger groups recreating within those areas with group size regulations included two parties of 11 at the Elk Flat trailhead (a volunteer pack string and another group on horseback), and one group of 11 backpacking via the Cross Canyon trail. No groups included more than 12 people or 18 head of stock. Group sizes were thus determined as appropriate as shown in Table 43.

Table 43. Appropriate Use: Group Size (by River Corridor Section)

←Non Forest Service →			← Forest Service →			
	Recreational	*Scenic*	*Wild* (not in Wilder-ness)	*Wild* (Wilder-ness)	Non-Corridor (not in Wilder-ness)	Non-Corridor (Wilder-ness)
Group size evaluation	N/A	N/A	A	A	NE	A

NA: Not Applicable. Group size is not regulated for these areas.
A: Appropriate. Group sizes are exclusively appropriate for the area specified.
NE: Group size was not evaluated in areas outside of the corridor or Wilderness. (These parking areas were evaluated in terms of vehicle capacity for which results are provided below.)

Group Encounters

The number of times recreationists encounter other groups is another indicator that managers can investigate in order to protect opportunities for solitude in Wilderness and social carrying capacity in general. The CRMP and the Wilderness Plan were the only documents that

addressed group encounters for the study area. Table 44 shows that use is appropriate for all areas that could be evaluated using this measure. The CRMP states that encounters of no more than 3-6 other groups within the river corridor (excluding the recreational section) are appropriate, allowing for more encounters during "peak visitation" which includes about 10 days per year. The mean number of encounters with other groups during the sampling period in the corridor was < 1.00 (0.97). This number excludes those who only used the recreational section and/or that portion of the scenic section which is the state campground. As this mean number of encounters was well below the 3-6 group encounter threshold identified in the CRMP, use was appropriate in the corridor according to this measure. Use outside of the corridor in Wilderness was also appropriate. For those visitors who recreated in non-corridor, Wilderness areas (n=11) the mean number of other groups encountered was 1.00. This number is appropriate according to the standard set by the Wilderness Plan (1989), which states that this semi-primitive Wilderness area should maintain an 80% probability of encountering 10 or less other groups per day.

Table 44. Appropriate Use: Numbers of Other Groups Encountered (by River Corridor Section)

	←Non Forest Service →		← Forest Service →			
	Recreational	*Scenic*	*Wild* (not in Wilder-ness)	*Wild* (Wilder-ness)	Non-Corridor (not in Wilder-ness)	Non-Corridor (Wilder-ness)
Evaluation of numbers of other groups encountered	N/A	A	A	A	N/A	A

N/A: Not Applicable. Numbers of other groups encountered not regulated for these areas.

A: Appropriate. Numbers of other groups encountered are exclusively appropriate for the area specified.

Vehicle Use

Appropriateness of vehicle use was assessed by comparing vehicle counts during the sampling period with thresholds outlined by Forest Service documents. This quantitative data showed that use is appropriate pertaining to numbers of vehicles as shown in Tables 45, 46, and 47. Ocular data revealed some inappropriate use regarding the exact locations of where visitors are choosing to park at trailheads and other locations, and also two isolated cases where vehicle use violated specific Wilderness restrictions (Table 47).

Vehicle count data collected were compared to the recommended standard set by the CRMP (2015). One method used by the Forest Service to estimate visitor use and to set use limits is through associating numbers of vehicles with numbers of people at one time (PAOT), where one vehicle represents a count of four PAOT. Specific thresholds were identified in this document and were based on results from the capacity analysis conducted in 2011. The CRMP focused on the total vehicle capacity for only those trailheads which most easily access the corridor, and set this standard at 50 vehicles. This includes the total number of vehicles parked at the Troy, Hoodoo, Cross Canyon, Elk Flat, and Grizzly Bear trailheads. It does not include the Three Forks trailhead. Table 45 displays how the maximum use recorded during the sampling period compares to the Forest Service's recommended standard. Even when considering the maximum number recorded for all trailheads simultaneously, the total count (N=26) of vehicles is only half of the set standard (50 vehicles). While the Grizzly Bear trailhead was not sampled during data collection for this thesis, contact with Forest Service employees during the sampling period about this trailhead suggested little use and it is doubtful that its exclusion would affect results shown here.

Table 45. Vehicle Counts at Trailheads Compared to Capacity Standard

		Maximum Count Recorded (Summer 2014)	Recommended Capacity (USDA 2015)
Site location			
	Cross Canyon TH	9	--
	Elk Flat TH	11	--
	Hoodoo TH	4	--
	Three Forks TH	0	N/A
	Grizzly Bear TH	N/A	--
	Troy TH	2	--
Total		26	50

The Forest Service did not set a standard for the private campground in Troy and the state campground, as the agency cannot enforce standards on non-Forest lands. No known state or other document reports vehicle capacity or sets standards for vehicle capacity for these areas. However, the capacity analysis (USDA, 2013) examined these areas because high use levels could negatively affect visitor capacity in the study area, and the results of this analysis are helpful for the comparison of vehicle counts collected during the sampling timeframe in these areas. The Forest Service lists 20 vehicles as the capacity for the private campground in Troy (which includes the seven campsites on the Wenaha and 13 campsites which are on the Grande Ronde River.) The maximum count recorded at one time by this study was 21 vehicles (including trailers) but the mean for the entire sampling period was 1.95. For state lands, capacity is reported as 10 vehicles. Again, one high use day yielded 12 vehicles, but the mean here was 1.03. Table 46 compares the maximum vehicle counts recorded on state and private lands compared to the existing capacity reported in the capacity analysis (2013).

Table 46. Vehicle Counts on State and Private Lands Compared to Existing Capacity

	Maximum Count Recorded (Summer 2014)	Existing Capacity (USDA 2013)	Mean*
Site location			
Public	12	10	1.03
Private	21	20	1.95

*The mean reported is for the count of vehicles (including trailers) upon arrival and is for the entire sampling period.

The comparison of vehicle counts during the sampling period with thresholds outlined in Forest Service documents led to the conclusion that use of vehicles and parking areas, with regard to numbers of vehicles is appropriate for the study area, as shown in Table 47.

Ocular data regarding exact locations of parked vehicles supplement the quantitative data in the evaluation of appropriate use of vehicles. Exact locations of vehicles are important because the 2011 capacity analysis identified one inappropriate use as "parking capacity exceeded and visitors choosing to park in vegetation, illegally on private lands, and in other undesirable locations" (p.11). For the areas which are outside of Forest Service jurisdiction, which include the Troy private campground and the state (public) campground, vehicles are allowed in all areas and so this measure is not applicable. For those trailheads managed by the Forest Service (which are included in Table 5 under non-corridor, not in Wilderness, photographs were taken when vehicles were parked in areas other than those specifically designated for parking. When vehicles were observed parked outside of the designated parking area at Cross Canyon, they were typically parked just off of the road under trees, within the vicinity of the trailhead. Figure 6 is an example. Even when parking space was ample, this behavior was observed on several occasions at the Cross Canyon and Elk Flat trailheads, and occasionally at the less-used Hoodoo trailhead. At Elk Flat, two areas are designated as parking

for visitors, at the trailhead and also a location where vehicles with trailers can use a pull out area approximately 0.20 miles from the trailhead, on the south side of FS 290. Vehicles that parked outside of these two designated parking locations were observed parked under trees either in the immediate trailhead vicinity or on the north side of FS 290. One group scouting for elk season

Figure 6. Visitors Parked in Vegetation. The access road for the Cross Canyon trail ends just past the trailhead. Visitors sometimes park in vegetation here, presumably seeking shade on hot summer days.

reported that they chose to park and camp along FS 290 rather than at the trailhead campsite in order to avoid paying the fee. (Elk Flat was the only fee site other than the Three Forks trailhead in the study area.) At the Hoodoo trailhead, vehicles sometimes parked outside of the turnaround at the trailhead where shade is provided, rather than the pullout on FS 6214 where parking is available. No ocular data was collected at the Three Forks trailhead as no vehicles were counted here. While no vehicles were observed at the Troy trailhead outside of the designated parking

area, some Troy residents reported that parking in this area has been a problem in the past. The parking area is small and located at a hairpin turn on Bartlett Road. It was said that vehicles often park along this narrow and steep road making it difficult for traffic to navigate.

Exact locations of vehicles are also important with concern to federally designated Wilderness. Ocular data showed some isolated yet notable cases of violations of the Wilderness Act. On one occasion, a vehicle with a trailer was parked in Wilderness on the north side of FS 290 in the Elk Flat trailhead area (included in Table 47 under Non-corridor, Wilderness). One other isolated example was a group that was unique in their chosen recreational activity of transporting an inflatable raft via the Hoodoo trail to the river and floating to the town of Troy (included in Table 47 under Wild river section, in Wilderness). While this is an appropriate use, the wheeled vessel utilized to transport the raft through Wilderness violates the Wilderness Act's prohibition of mechanical transport (section 4(c)), and the Revised Forest Plan's more specific prohibition of "wheel vehicles such as wagons or game carts" (USDA, 2014).

Table 47. Appropriate Vehicle Use (by River Corridor Section)

←Non Forest Service →			← Forest Service →			
	Recreational	*Scenic*	*Wild* (not in Wilder-ness)	*Wild* (Wilder-ness)	Non-Corridor (not in Wilder-ness)	Non-Corridor (Wilder-ness)
Number of vehicles in parking areas	A	A	N/A	N/A	A	N/A
Locations of vehicles (ocular data)	N/A	N/A	N/O	I	I	I

N/A: Not Applicable. Either parking areas are not available in these areas or locations of vehicles are not regulated for these areas.
A: Appropriate. Numbers of vehicles are exclusively appropriate for the area specified.
N/O: Not observed. No ocular data suggested inappropriate use, though not all areas were assessed.
I: Some inappropriate use - at least one instance of use of vehicles and parking areas was inappropriate for the area specified. Ocular data revealed two isolated cases of use of a vehicle or mechanical transport (Wild section, Wilderness and Non-Corridor, Wilderness), and several instances of parking in vegetation outside of designated parking areas (Non-Corridor, not in Wilderness).

Recreational Activities

Recreational activities in the study area were generally appropriate as shown in Table 48, with ocular data noting exceptions. “Recreational activities” included all recreational activity survey items listed on the survey instrument. Respondents chose which activities they participated in. Each activity was evaluated to ensure that the activity was appropriate for all areas of the river corridor and non-corridor areas during the sampling timeframe. All were appropriate. (Note: Three exceptions would have occurred had visitors reported participation, but no respondents reported these activities. They were: *bicycling* (in Wilderness), and *hunting* (outside of appropriate hunting seasons). A third exception would have occurred had fire restrictions increased from Phase A to Phase B during the sampling timeframe, in which case the

activity of *gathering firewood* would have been cause for concern. However, public use restrictions did not increase until after the sampling timeframe was over.)

Ocular data supplemented survey results and did identify some instances of inappropriate use. The most notable pertained to campsites. The 2011 capacity analysis conducted by the Forest Service included an impact assessment of 131 campsites (USDA, 2013). Each campsite was rated based on the presence of ground disturbance, tree damage, area disturbance, litter, human waste, weeds, user-created trails, and an overall impact rating (Cole, 1983). Results showed a "low" overall impact rating for 128 of the 131 campsites of the corridor, and the remaining three showed "moderate" impact.

The interviewer visited a small number of these campsites, and photographs were taken to supplement as ocular data. Campsites that were visited were generally located at trail intersections, where Umatilla managers expected the most use to be occurring. Campsite impact ratings from the data collected in 2011 showed that sometimes these were the areas that were more heavily impacted, though this was not always the case (USDA, 2013c). Photographs were often taken to document inappropriate use, but these were exceptional cases and should not be interpreted as representative of campsite use of the study area.

Some corridor campsites were within a few steps of the river. While the CRMP does not directly address campsite proximity to the river, the Revised Forest Plan (2014) prohibits camping and campfires "within 200 feet of lakes, streams, or other camps within wilderness areas." The CRMP does address campsite litter. Campsite litter within close proximity to the river was identified in the capacity analysis as a threat to all of the river's ORVs (*recreation, scenery, wildlife,* and *fisheries*) (USDA, 2013b). The interviewer did not utilize the methodology employed by the Umatilla NF for the capacity analysis, but the presence of litter at campsites

that were visited was noted. It is probable that the littered campsites that were noted during the sampling timeframe would have had higher impact ratings than the ratings recorded for the capacity analysis. In fact, data recorded in 2011 pertaining to litter in the corridor was rated as very low. On a scale of '1' (low) through '8' (high), only one of 131 assessed sites rated as '4' and one rated as '2.' The remainder rated as '1' or below. Some of the littered sites observed were in the *wild* section of the corridor, in Wilderness, as displayed in Figure 7. These were often very close to the river, much closer than the 200 foot distance required in the Revised Forest Plan (Two were within ¼ mile of the Cross Canyon/Wenaha River Trail intersection; two were within one mile of the Hoodoo trail's intersection with the unofficial trail along the south bank of the Wenaha; and two were at the base of the Elk Flat trail in the Wenaha Forks area.) No littered campsites were observed in the *wild* section, not in Wilderness. One time litter was recorded at the campsite at the Hoodoo trailhead (non-corridor, not in Wilderness).

Figure 7. A Littered Campsite Along the *Wild* River Section in Wilderness. While littered campsites were rarely encountered during the sampling timeframe, these were documented as littered campsites are a threat to all of the Wenaha's ORVs.

The south side of the *scenic* section of the river includes most of the State campsites, and two of these contained litter. This area is defined as "related adjacent land" for the Grande Ronde Scenic Waterway (OAR 736-040-0015) and therefore the specific Oregon Administrative Rule (OAR) for this state protected land applies (766-040-0047). This OAR prohibits littering (5)(d)(A). Further, it is notable that most of the campground's fire rings are rock rings, and this OAR specifies that "fire shall be contained in a fireproof container with sides of a height sufficient to contain all ash and debris" (5)(c)(A). This will be discussed more in Chapter 5. On the northern and more remote bank of the river, one littered campsite was noted. The south side of the *recreational* section includes three campsites on State lands. An example showing the proximity of some sites to the river is illustrated by Figure 8. Two of the three were

photographed for the presence of litter. No littered campsites were observed at any time on the north side of the *recreational* section, where the seven private campsites exist in Troy. For these *recreational* and *scenic* sections, there are no restrictions pertaining to campsite proximity from the river.

Figure 8. A Campsite on the State Campground. While this site contains a metal fire ring to contain ash and debris, many state campsites only have rock rings. This figure illustrates the close proximity of campsites in this area to the Wenaha.

Some user-developed trails and trail impacts were noted through ocular data. According to the capacity analysis, one inappropriate use identified as having a higher potential impact on visitor capacity is "unmanaged recreation use causing excessive permanent destruction of vegetation or multiple user-developed trails; especially along the banks of the river" (pp. 9, 11). Some evidence of user-developed trails were noted in all sections of the river corridor. The interviewer hiked all of the trails at least once during the sampling timeframe searching for these

and also for trail impacts on official trails. Only portions of the Three Forks and Wenaha River trails were hiked. Very rarely were user-developed trails or trail impacts observed. Exceptions included some unofficial trails that appeared in the north scenic section of the corridor, leading from the Wenaha River trail to campsites and river access areas. Some trail impacts were observed along the trails leading into the corridor (Non-Corridor, Wilderness). The Cross Canyon trail included an isolated muddy area where trail widening may be beginning to occur. Braiding has occurred in one spot within one mile of the trailhead. The Elk Flat trail contains several areas within its five miles where impact is occurring. This could be due to a number of factors, such as pack animals (as this is a popular trail for horse packers) and soil characteristics such as depth to water table.

Two isolated cases (shown as "other ocular evidence" in Table 48) are reported here. A portion of the sampling period included fire restrictions (USDA, 2014; ODF, 2014) which are posted and enforced by state and federal agencies. It was a violation (at both levels) to use a chainsaw between the hours of 13:00 and 20:00 beginning July 15, 2014. On one occasion this was observed near the Cross Canyon trailhead (Non-Corridor, not in Wilderness) and was reported to law enforcement by the interviewer. Another group included pack goats on the Elk Flat trail (*Wild* river section, Wilderness). "Grazing of domestic sheep and/or goats" is considered to be an inappropriate use with lower potential impact on visitor capacity as it could have an effect on the wildlife ORV (USDA, 2103).

Table 48. Appropriate Use: Other Recreational Activities (by River Corridor Section)

←Non Forest Service →			← Forest Service →			
	Recreational	*Scenic*	*Wild* (not in Wilder-ness)	*Wild* (Wilder-ness)	Non-Corridor (not in Wilder-ness)	Non-Corridor (Wilder-ness)
Recreational activity survey items*	A	A	A	A	A	A
Proximity of campsites to river	N/A	N/A	N/A	I	N/A	N/A
Campsite impacts (ocular data)	I	I	N/O	I	I	N/O
User-developed trails or trail impacts (ocular data)	I	I	N/O	I	N/O	I
Other ocular evidence**	N/O	N/O	N/O	I	I	N/O

**Recreational activity survey items* include all other recreational activity survey items. A full list of these activities are shown in Chapter 4 (Table xx).

***Other ocular evidence* included two isolated cases of inappropriate use: chainsaw use in violation of fire restrictions (Non-Corridor, not in Wilderness) and grazing of domestic goats (Wild section, in Wilderness).

N/O: Not observed. No ocular data suggested inappropriate use, though not all areas were assessed.

N/A: Not Applicable. Either proximity of campsites to river was not regulated by any document relevant to the area specified, or the area was outside of the river corridor.

A: Appropriate. Recreational activity items are exclusively appropriate for the area specified.

I: Some inappropriate use - at least one instance of use of recreational use was inappropriate for the area specified.

CHAPTER 5: CONCLUSIONS

The purpose of this chapter is to summarize and discuss the results reported in Chapter 4 and make recommendations. This discussion is organized by research question, and general conclusions are offered at the end of the chapter.

RQ1: What does the sample of recreationists look like in the Wenaha River corridor and the areas that access this corridor?

1.1 Sociodemographics. Recreationists in the study fit a general profile that is suggested in the literature. Visitors were almost exclusively non-Hispanic Caucasians. Visitors were most often male, and male representation was larger (79.7%) when compared to Forest wide NVUM data (66.6%) (USDA, 2012). Age appeared to be slightly older (mean = 44.21) than typical Umatilla visitors, however only respondents' ages (not those of other group members) were recorded for this study and only individuals who were 16 years of age or older were interviewed. Education levels were not exceptionally high, but more highly educated than the general American population (U.S. Census, 2013) with slightly over half (56.4%) possessing a Bachelor's degree or higher. Almost all reported a home residence in Oregon or Washington. Over half (54.8%) were defined as locals living within 100 miles of the most central trailhead for the study area. These local visitors were spread throughout 23 zip codes of this rural portion of Oregon and Washington.

The Forest Service as an agency faces the same challenges as other federal land management agencies as new initiatives emerge in an effort to serve an entire American public that includes racial and ethnic minorities and youth. Initiatives include *Let's Go Outside* (U.S. Fish and Wildlife Service), *Find Your Park* (National Park Service), and *Children's Forest Network* (Forest Service), among many others. However, developing programs or sites to engage

minority groups can be a daunting task for managers of federal lands such as the Umatilla where surrounding communities are relatively homogeneous, and larger city centers are far away. Counties bordering the study area include Wallowa (Oregon) and Asotin, Garfield, and Columbia (Washington). Each of these counties' census data (2013) show more Caucasian residents than is average for their respective states. These areas surrounding the Umatilla have small populations. Many newer and promising programs that are being developed nationwide to engage minorities and youth are focused on doing so by drawing from nearby city centers. The Umatilla NF is challenged to serve underserved Americans and this goal should be considered in the development of recreation programs. Regarding youth engagement, the recreational activities that data have proven popular for the area might be used to increase numbers of younger visitors. While hunting and fishing were noted in Chapter 2 as two recreational activities which will decline in the near future (Bowker & Askew, 2012), both are very strong traditions in the study area (Burns, Graefe, & Woodruff, 2011) and youth programs could succeed. In addition, as activity participation in horseback riding, hiking, and other backcountry activities are expected to increase nationwide, these offer additional opportunities. All programs would benefit from incorporating Leave No Trace principles, and can focus on specific principles that address actual or potential threats to the river's outstandingly remarkable values.

1.2 Group Characteristics. Groups in the study area were generally small and all were private (non-commercial) groups. When larger groups did occur, they were outside of the Forest boundary on the *scenic* and *recreational* river sections. The implications of how this relates to crowding and appropriate use in the study area was discussed in Chapter 4 within the context of Research Question 4. This will also be addressed by the discussion of this same research question below.

1.3 Trip Characteristics. Many visitors were familiar with the study area. Three-fourths of visitors were repeat visitors, and over half of these visitors reported recreating in the study area eight or more days in a typical year. Some visitors have been visiting the study area for a long time, as the mean year of first visit was 1996. Even though almost half of visitors (45.2%) were defined as "non-locals," almost all had home residences in Washington or Oregon. Because these visitors tend to be familiar with the Forest and come from the surrounding geographic area, managers can expect many visitors to be knowledgeable about the Forest, and concerned about Forest plan revisions, policy changes, and the larger social and political context within which the Forest exists.

While the river was the primary destination for most visitors, areas (such as trailheads) were used for other purposes. For example, these were convenient areas for hunters to park their vehicles while scouting on the Wenaha hunt unit. Most visits (71.6%) were overnight, which is atypical as past studies and future projections highlight day trips as more common for Wilderness visits (Cole & Hall, 2008; English & Bowker, 2015; Lucas, 1980). For day trips, the mean number of hours (4.43) was much shorter than what is typical for the Umatilla when considering Wilderness (mean = 8.2 hours) or undeveloped site visits (mean = 10.6 hours); this length of stay is more comparable to day use developed site visits (mean = 3.4 hours) (NVUM, 2012). While length of stay varies in the study area, more overnight visits mean more camping in the study area. Details about the implications of this are discussed later in this chapter.

1.4 Motivations. Visitors to the study area were very motivated by items related to nature and relaxing or getting away, more so than items related to challenge or being social. Interestingly, primary motivations reported do not support the same conclusion; visitors were evenly split between three of four primary reasons to visit (also related to nature, challenge, and

being social): *to enjoy the place itself*, *it's a good place to do the outdoor activities I enjoy*, and *to spend more time with my companions*. Nevertheless, this information could be useful for the development of educational or interpretive materials. Understanding your audience is a key component for successful environmental interpretation (Ham, 1992). If one is motivated to recreate because of nature-related reasons, they also might be convinced to modify behavior or accept management decisions for the same reasons. For example, in this area visitors might be in favor of decisions that are suggested to directly protect natural resources or opportunities for solitude. Arguments made to increase the number of more challenging recreational opportunities or to support larger group sizes in the area may not receive as much support.

The majority of visitors were aware of the federal designation of the Wenaha as a Wild and Scenic River. However, very few reported that this knowledge influenced the decision to visit the study area. As discussed above, many visitors are repeat visitors who visit the area often. In addition, many were visiting long before the 1988 designation. While it is expected that repeat visits are not correlated with the river's status, it is also expected that the protection that this status affords provides a quality of recreation that keeps visitors coming back.

1.5 Satisfaction. Visitors to the study area reported high levels of satisfaction with all items asked on the survey. The open-ended responses also indicated satisfaction among recreationists; all visitors made comments about what they liked *most* about the area, and on many occasions visitors spent a lot of time explaining these answers during the interview. When asked what they liked *least*, 54 respondents either specified "nothing" or made jokes about the steep hike out or other similar comments.

Better trail maintenance was by far the most popular response when asked about suggestions for management. Most often visitors were specifically referring to overgrown

vegetation along the trails. They were often specifically concerned about rattlesnakes or injury to either their horses or themselves. Also, while many fewer visitors suggested it, better signage directing visitors to trailheads was mentioned several times.

1.6 Crowding/Conflict. The survey instrument included multiple crowding measures, and the data suggests that crowding is not a problem in the study area. A bivalent crowding scale was used and respondents reported that the number of people seen generally enhanced their enjoyment. This is different from the statement *the other people at the river or in the Wilderness increased my enjoyment* for which visitors gave a neutral rating (mean = 3.00 on a scale of 1-5). The bivalent scale allows for the visitor to more easily rate enjoyment based upon the instance of seeing 0 other people, an important distinction when researching visitation to remote areas. Most people saw less people or the same amount of people they expected. (Most of those that saw more than expected were recreating either in Troy on the *scenic* or *recreational* section on a particularly busy day, or in the Cross Canyon or Elk Flat area on particularly busy days). Overall, the actual group sightings (mean = 1.00) were less than the number reported as acceptable (1.48). However, when asked about an acceptable percentage of time to see other groups while recreating, over half of respondents stated that seeing others 90%-100% of the time is acceptable. These respondents represented different locations within the study area, not exclusively the higher use *recreational* and *scenic* sections, as might be expected. Conflict was only reported by only one visitor with an unleashed dog, who perceived discomfort of another group with a dog. Group sizes are discussed further within the context of appropriate use later in this chapter.

RQ2: How are these areas currently being used by recreationists?

Popular activities in the study area generally reflected those that are popular Forest wide, according to recent NVUM data (USDA, 2011). Because the sample for the study area was small and convenience sampling was employed, conclusions are limited when comparing the two data sets. However, some general comparisons are helpful for contextualizing use.

Camping is not a popular activity for the entire Umatilla NF. Data from 2009 shows that 14.2% of visitors reported using a developed campsite and 5.1% reporting this as their primary activity. Less than 1% of visitors reported backpacking. However, in the study area, nearly three fourths (72.2%) of visitors camped with 16.2% identifying this as their primary activity. Nearly one-third of visitors (31.9%) backpacked. Fishing is more popular than camping on the Umatilla, but it is especially popular in the study area. Over half (52.8%) of visitors to the study area reported fishing and 36.5% said that this was their primary activity, compared to Forest-wide percentages of 12.6% and 7.5 percent, respectively (USDA, 2011). Another notable activity was gathering Forest products. This is a popular Umatilla recreational activity in general, with 28.2% of visitors reporting that they participate in this. In the study area, 43.1% of respondents reporting doing this, though none identified it as their primary activity. Visitors most often specified gathering berries – specifically, huckleberries, or firewood (for use at their campsite). Wood cutting with chainsaws was observed in the Cross Canyon and Elk flat (non-corridor) areas by two different parties. These parties were not interviewed. Details about appropriate firewood gathering and woodcutting will be discussed later in this chapter.

The distribution of recreationists during the sampling timeframe was also reported. Visitors reported all areas within which they recreated. Some respondents (17.6%) only recreated outside of the river corridor, and many of these visitors were scouting for the upcoming elk

hunting season. Approximately one-third of visitors reported recreating in the *recreational* section of the corridor, and also about one-third recreated in the *scenic* section. Almost one-half of visitors recreated in the *wild* section. The CRMP (2015) noted that recreational use within the river corridor tends to be well-distributed and the same was noted for the Wenaha-Tucannon Wilderness (USDA, 1989). While it is possible that use within these sections of the study area was concentrated, it is doubtful due to the low use nature of the area and the small number of group encounters reported by respondents. The distribution of locations where overnight visitors camped was also consistent with the CRMP's assertion that recreationists are distributed throughout the study area. Overnight visitors were spread out, with 20.8% camping on the *recreational* section, as well as 20.8% camping on the *scenic* section, and 41.5% camping on the wild section. All of these last overnight visitors camped in Wilderness. The smaller camp "zones" that were defined for the purpose of effectively communicating with visitors about exactly where they camped within each section also provided strong evidence that overnight use was distributed. Of the 17 zones identified for the corridor, use was only relatively heavy in the zone associated with the Wenaha Forks area, where 6 groups camped, and another zone where 9 groups camped. (These totals were for the entire data collection period.) This last zone was the largest geographical zone defined for the study area and included the entire portion of the south side of the river corridor from Wenaha Forks to the Forest boundary. The remaining higher concentrations of groups occurred on the private campground in Troy (n=8) and the state public campground (n=12). Implications about distribution of use is discussed more below within the context of appropriate use.

RQ3: How are trailheads being used by recreationists with vehicles, with regard to numbers of vehicles and parking locations?

The quantitative results reported in Chapter 4 show that numbers of vehicles at trailheads and other locations during summer 2014 were well below the standard set by the CRMP (2015). For those areas in Troy where no standards are set, numbers of vehicles also are low (USDA, 2013). However, ocular data revealed during the sampling timeframe suggest that managers should also consider exactly *where* vehicles are parking within specific areas, in addition to how many are there at one time. Vehicle capacity is not being exceeded numerically, and the interviewer's judgement was that while some vehicles were not parked in ideal locations, there was no rampant misuse occurring. A few recommendations follow from the ocular data regarding location of vehicles parked and will be addressed in the section "vehicle use" within the discussion of Research Question 4 below.

RQ4: Is current recreational use appropriate according to applicable legislation and/or regulation?

In general, the answer to this research question is yes. The CRMP (2015) developed for the Wenaha defines what uses (and use levels) are appropriate or inappropriate for the study area. When data collected for this thesis were compared to these thresholds, recreational use within the study area was determined to be appropriate with very few exceptions. The use categories that were used to answer this research question are summarized and discussed below, along with the ocular data that are helpful for identifying potential concerns. Some recommendations are made to proactively address these potential concerns.

Group Size

Group sizes in the study area were appropriate as they were well below the thresholds identified by the CRMP (2015). The CRMP proposed a new standard to limit group sizes to 12 people/18 head of stock in the *wild* section outside of Wilderness. It also proposed a new guideline to work with non-Forest entities to incorporate a group size limit in the management of the *scenic* section of the river corridor. This is important as no other federal, state, or county document addresses group size on non-Forest lands in the study area. This action would help protect and enhance the recreation ORV as these remote areas are comparable to the regulated *wild* section. Data collected for this thesis support these proposals as use levels in these areas were low at the time of data collection.

The values protected by Wilderness Act and Wild and Scenic Rivers Act are being upheld through the Forest Service's regulation of group size. Should recreational use in the study area increase, it is recommended that the Umatilla NF monitor group sizes within the corridor to ensure that visitor capacity is not exceeded. The potential for changing recreational use of the study area is discussed in the conclusions section below.

Group Encounters

The numbers of other groups encountered by recreationists are appropriate for the study area, as these encounters were well below the CRMP thresholds. Group encounters are only addressed by Forest Service documents, and though the scenic section of the river lies outside of Forest Service boundaries the CRMP suggests that three to six should be the maximum number of encounters in this and the *wild* section of the corridor. Use levels were well below this threshold during the time of data collection.

As with group size data, the number of group encounters is a measure that shows that applicable federal legislation that aims to protect visitor experience is being upheld in the study area. Further evidence showing strong support for this conclusion was provided by the 14 additional crowding items that the survey instrument measures. As with group size, the number of encounters of other groups should be monitored should recreational use in the study area increase.

Vehicle Use

It was shown that the number of vehicles parked at trailheads and other parking areas was appropriate for the study area, as it was well below the numeric limitation proposed by a new guideline in the CRMP (USDA, 2015). Ocular data revealed that sometimes visitors chose to park in vegetation or just outside of designated trailhead parking. Summer temperatures are hot in the study area, and it is presumed that visitors who chose to park in certain areas were often seeking shade for their vehicles while they recreated. However, as parking in vegetation can harm native species and contribute to the spread of invasive species, monitoring trailheads for invasive species and assessing vegetation impacts could be helpful.

It is recommended that Wilderness boundary signs be placed on the north side of FS 290 near the Elk Flat trailhead. (During the time of data collection these were only clearly observed on the south side). If signs are visible and visitors understand Wilderness boundaries, this might discourage many from parking here. Other than the isolated example reported in Chapter 4, signs of visitors using motorized vehicles in Wilderness were not observed at any time during the sampling timeframe. However, managers should consider that well-intentioned recreationists often have outdated maps. One experienced outdoorsman interviewed had in his possession a map of the area with seemingly reliable and up-to-date GIS mapping layers. However, many

widely-used GIS layers include outdated or non-existent Wilderness boundaries because the layer's sources pre-date the Wilderness designation. This was the case with his map, which showed jeep trails throughout the Wenaha-Tucannon Wilderness. The interviewer found this problem on many different mapping layers found through online research.

Signage could help at other trailheads, such as the Hoodoo trailhead, if managers would prefer to concentrate vehicle parking at the one pull off location along the road. In addition, suggesting where to park using strategically placed logs could have a positive effect and would be inexpensive to implement. Signage or attention from Law Enforcement could help in the case of visitors avoiding fees. Fee avoidance means less agency funding and also could mean that recreational use is underestimated at Elk Flat.

Recreational Activities

Recreational activities in the study area were generally appropriate, with ocular data noting some exceptions to be discussed, particularly regarding campsite use. Even though a high percentage of respondents were overnight visitors, and a high percentage of overnight visitors camped in Wilderness, the low use numbers overall support the conclusion that numbers of campers are appropriate for the study area and that opportunities for solitude are being protected. However, even small numbers of campers can negatively impact the river's outstandingly remarkable values. The presence of litter at some campsites threatens all four of the Wenaha's ORVs (USDA, 2015). In addition, the location of some campsites in Wilderness near the river was inconsistent with the newly proposed guideline of the Revised Forest Plan (USDA, 2014).

Umatilla NF managers are very aware of and attentive to the potential effects of litter on river values. Three guidelines proposed by the CRMP refer to campsite management. One guideline proposed the reduction of the number of campsites through resting or closing those

sites which are more highly impacted in the corridor, an expected 38% overall reduction of campsites in the corridor. While it is not explicitly stated in the CRMP that the campsites that are close to the river will be closed, the "desired future conditions" section of the CRMP proposes the reduction of streamside sites. While the study for this thesis did not assess how many campsites were within close proximity to the river, the CRMP notes approximately 20 (though it is unclear if there are more sites that are within the 200 feet limitation). It was the original recommendation of this thesis that these sites be prioritized as part of the 38% reduction strategy. The Grizzly Bear Complex Fire, which was lightning-caused and began August 13, 2015, burned at least 82,600 acres including most of the corridor and study area. As completion of this thesis approached its final phases, Forest Service staff were focused on building a Burned Area Emergency Response (BAER) team to begin to address potential long-term effects of this large-scale wildfire on human health and property as well as natural resources. When the appropriate time comes for managers to begin rebuilding opportunities for recreation in the future, it will be an opportunity to establish campsites in a way that protects and enhances river values.

Data collection about campsites conducted for the 2011 capacity analysis was comprehensive and labor-intensive. Annual monitoring of all corridor campsites, most of which are backcountry, is costly and probably unnecessary for this area. However, it is suggested here that at least the more convenient campsites located at trail intersections be monitored when possible. These are often, although not always, more popular sites and are likely to be reestablished when recreation resumes in the corridor. Further, this should be done at different times of year, as ocular data showed that even during the lower use summer months campsites sustained impacts from visitors.

Some of the campsites on the state public campground adjacent to Troy also contained litter during the sampling period. The campsites on the state campground cannot be relocated in an effort to move them further from the river, as this would put the sites within the Wenaha muzzleloaders shooting range. The Forest Service should consider recommending to the Oregon Department of Fish and Wildlife the installation of metal fire rings for those sites that do not have them. This would help protect Wenaha river values as well as meet the campfire restrictions outlined by the state's OAR pertaining to the Grande Ronde Scenic Waterway (OAR 736-040-0047). These are already utilized on the private campground in Troy, though no littered sites were documented here at any time during data collection. Metal fire rings are a way to anchor a fire site which has been shown to concentrate fire sites, minimize their size, and make them easier to clean (Reid and Marion, 2005). Metal rings with sides higher than rock fire rings will better contain litter and ash, an important point considering the close proximity of campsites to the river.

A last recommendation regarding camping is that visitors be encouraged throughout the study area to use portable camp stoves instead of building campfires. This has been shown to reduce campsite impact (Cole, 1992; Christenson and Cole, 2000) and visitors have been responsive to education on this topic (Christenson and Cole, 2000).

Ocular data also revealed information about some user-created trails in the study area. Managers are aware of this and have addressed the issue through two proposed guidelines in the CRMP (USDA, 2015) which focus on attending to user-created trails in riparian areas that have the potential to negatively affect ORVs. Much of these trails, as well as those trails exhibiting some impact as shown in Chapter 4, also were burned. Rebuilding trails will necessarily require the same consideration that all new trails require pertaining to depth to water table, intended use

(e.g. hiking, horseback riding, or both), and other factors that contribute to sustainable trail design. The trails that were burned over by the Grizzly Bear Complex Fire could be reestablished as they met visitor needs by providing opportunities for solitude as well as river access, and also appeared to be well-designed based on the fact that so few impacts were noted during data collection.

The distribution of recreational use throughout the study area showed that recreationists during the sampling timeframe were well-distributed, which was consistent with the general expectations of relevant management plans. Results showed that nearly half of users used the *wild* section of the river corridor while recreating. One might expect more easily accessed areas (i.e. the *recreational* and *scenic* sections) to be used more heavily than the less accessible *wild* section, especially since most of the *wild* section is located within Wilderness. Yet the *wild* section comprises the majority of the corridor - approximately 18 of the 22 protected river miles, while the other sections make up a much smaller area.

Some potential implications for management regard access to the *wild* section of the river corridor. It is not extremely challenging to access the *wild* section; there is very little elevation change when hiking the Wenaha River Trail west from the town of Troy to the *wild* section and Wilderness (though exposure and rattlesnakes may deter some visitors). The other trails leading to the corridor are steep, but short - approximately three to five miles one-way. Because the *wild* river section and Wilderness are easier to access than some other *wild* sections of rivers and Wildernesses, less skilled recreationists may be inclined to visit. Less skilled recreationists may be less knowledgeable about regulations, use restrictions, camping practices, and trail etiquette than more seasoned recreationists. According to the CRMP, “Leave No Trace” principles are encouraged in the area. These should continue to be encouraged. For brevity and to be most

relevant to issues in this study area, materials could focus on two of the seven principles: "Pack it in/Pack it out" and "Minimize campfire Impacts" (Leave No Trace, 2015). Posting information at visitor centers and at Wilderness trailheads could be beneficial. Public use restrictions should also be posted. Research on non-personal interpretation show that simple messages can be the most successful delivery methods (Ham, 1992). Research also shows that emotional appeal can be an effective interpretation method. While the Grizzly Bear Complex Fire was not human-caused, a potential positive outcome of this very destructive event could be opportunities for successful public education about fire.

Discussion and Conclusions

Two broad discussion items follow from those outlined in the discussion for each research question above. First, throughout the course of this study it became very clear that this unique location is meticulously managed. Evidence supporting this firm conclusion is abundant. As results showed, recreationists are very satisfied and recreational use is generally appropriate for this low-use, highly protected area. Ocular data that suggested otherwise have been clearly and thoughtfully addressed by the new standards and guidelines developed long before the study before this thesis took place, and which were incorporated into the Final CRMP implemented in July of 2015. Managers and other Forest Service personnel, many of which have worked on the Forest for many years, were very engaged throughout the course of this study, exhibiting a breadth of knowledge of the study area along with tireless dedication to resource and river value protection.

The second discussion item regards the overlapping jurisdictions within the study area and how this can be approached, especially if recreational use increases in the future, and especially in the wake of the Grizzly Bear Complex Fire. The study area for this thesis, like

many protected areas, included multiple overlapping jurisdictions. The inherent administrative complications that can arise in these situations have presented challenges for land managers for a long time (Lewis & Marsh, 1977). The most specific direction for the study area comes from Forest Service documents, which is not surprising as the Forest Service is named as the administrative authority of the Wenaha. However, the Forest Service cannot enforce regulations outside of its boundaries, and few specific rules and regulations pertaining to recreation in the Wenaha corridor are defined for those portions of the study area which are on non-Forest lands.

In cases of areas with overlapping jurisdictions, agencies tend to default to the more specific management plans and policies developed by other agencies for a given area, and rightly so. Nevertheless, confusion can still occur. For example, on one occasion during a conversation with an agency representative it was explained that on the state campground, BLM rules are followed (because of the Grande Ronde River's federal designation). On a separate occasion but regarding the same topic, a BLM employee explained that the BLM has no authority over state land at all, and that the state must regulate its own lands. If the State wished to follow BLM rules here, then regulations should have been developed requiring mandatory firepans as prescribed by the Wallowa and Grande Ronde Rivers Management Plan (BLM, 1993, p. 138). If the state were to follow its own Oregon Administrative Rules (OARs), the rock fire rings still are inappropriate for this area, as they violate the OAR which specifies that fire should be contained within fireproof containers within the state-protected Grande Ronde Scenic Waterway (section (5)(c)(A) which includes this portion of the Wenaha river corridor.

This is an example that illustrates the difficulties that can arise when multiple agencies are involved in managing an area. Interagency councils have been created in recent decades to help coordinate management of complex areas such as Wildernesses (Interagency Wilderness

Policy Council) and Wild and Scenic Rivers (Interagency Wild and Scenic Rivers Coordinating Council) and recently, the Interagency Visitor Use Management Council was formed to focus specifically on visitor use management on federal lands (IVUMC, 2015). However, all three of these councils are comprised of exclusively federal land management agencies. No state or other entities are included. Therefore, it is up to federal agencies to engage these other entities to ensure that the details of management plans are understood and applied.

As previously mentioned, the Forest Service is very aware of other agency plans and activities in the study area and have incorporated that consideration into Forest Service management plans. Further, the CRMP (2015) proposed a "cooperative management" guideline, which will encourage other agencies to adopt a group size limit on non-Forest lands (in the *scenic* river corridor section) that is comparable to Forest Service limitations. Cooperative management will be very important for the non-Forest lands of this study area, especially if recreational use increases, which is possible according to some of the plans analyzed for this thesis. Numbers of visitors would likely increase on the more accessible *scenic* and *recreational* sections of the river corridor which are outside of Forest Service boundaries. Therefore, future collaboration among agencies might be warranted in order to ensure those visitor capacity thresholds defined for the CRMP are not exceeded. In September 2015 the U.S. Fish and Wildlife Service decided to not add the Greater Sage Grouse to the list of federally endangered species. The Baker Resource Management Plan (BLM, 2011), which applies to a portion of the study area, was on hold for development pending this decision. The BLM can now resume progress on the draft plan, offering an opportunity for the Forest Service and the BLM to ensure consistency in agency planning.

Cooperative management also must consider those private citizens and landowners in Troy and surrounding communities. These relationships should continue to be nurtured in order to effectively manage non-Forest lands. As previously stated, it is one couple that currently owns and maintains Troy's only restaurant and bath/laundry, all rental cabins in the river corridor, a big game processing building, the land which is leased to hunters and anglers for seasonal wall tent occupation, and the private campground. As noted in Chapter 4, not once was litter reported or observed at these campsites. It is also this couple that stayed in Troy after a Level 3 evacuation notice (representing the most severe circumstances) in order to provide additional support to firefighters for the Grizzly Bear Complex Fire. The Forest Service would do well to ensure that the relationship with this family remains open and supportive. Should ownership and management of this property change hands in the future, the Forest Service should be very attentive to new actions and development that takes place in this most accessible area of the river corridor.

Suggestions for Future Research

It is appreciated here that all management plans, policies and legislation (as well as theses) are developed within a dynamic context. Future research about recreation in the study area should be developed as progress moves forward in response to the Grizzly Bear Complex Fire. At the time this thesis was written it was too soon to speculate about potential outcomes. However, this event will undoubtedly offer opportunities to strengthen interagency collaboration, reinforce relationships with the public, and proactively address any management concerns that existed prior to the incident when the Forest Service begins reestablishing recreational facilities.

As previously noted, future research in the study area should reevaluate use and use levels if recreation increases in the study area. Some of the indicators utilized by the capacity

analysis (USDA, 2011) and the resulting Comprehensive River Management Plan (USDA, 2015) regarding group size limitations, number of other group encounters, campsites, and vehicle capacity provided measures for the comparison of data collected for this thesis. Future research could also use these measures for evaluating visitor capacity.

Last, while no place attachment items were included for this study, future research deserves this consideration as visitors who exhibit place attachment can be helpful in public land management (Smaldone, Harris, Sanyal, & Lind, 2005). Local recreationists often exuded a certain reverence for the study area during interviews. One Troy resident described her community as feeling “fiercely protective” of the river. In fact, she admitted initially having felt suspicious about the interviewer’s intentions upon her arrival to the study area, as data collection came about after a Troy Town Hall meeting with the Forest Service during the scoping phase for the development of the Revised Forest Plan. The Incident Commander for the aforementioned wildfire incident commented that he was "humbled by the community response” (East Oregonian, 2015, August 24). Area residents are clearly dedicated to the protection of the outstandingly remarkable values of the Wenaha Wild and Scenic River in this treasured portion of the Blue Mountains.

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APPENDIX: SURVEY INSTRUMENT

1. Gender 79.7% M 20.3% F 2. Location OPEN 3. Date/Time OPEN 4. Interviewer OPEN

2014 Wenaha Wild & Scenic River and Wenaha-Tucannon Wilderness Areas Survey

The Forest Service and West Virginia University are conducting interviews of visitors about the recreational use on the Wenaha Wild & Scenic River (WSR) and Wenaha-Tucannon Wilderness (WT). The information collected will help us better serve visitors by knowing what activities they do, how long they stay, and how satisfied they are with the facilities and services provided. Your participation is voluntary and all information collected is confidential.

[If more than one person] Which of you had the most recent birthday and is 16 years of age or older?

5. Was this your first visit to the WSR or WT? 22.2% Yes 77.8% No
6. [If no] In what year did you make your first visit to the WSR or WT? Mean=1996 (year)

7. In a typical year, how many days do you spend recreating on the WSR or WT? Mean=17.29
8. In a typical year, how many days do you spend recreating at other Wild and Scenic Rivers or Wilderness areas besides these? Mean=26.99

9. Was this trip… 71.6% an overnight visit to this area 28.4% a day trip [check one]
10. If overnight, how many people were in your group (that stayed overnight)? Mean=4.70
11. If overnight, where did you camp? Zone # OPEN
12. In total, how many days (or hours) was this trip? Mean=3.28 days (13) Mean=4.43 hours (if day trip)

14. Was the river your primary destination for this trip? 70.3% Yes 29.7% No
15. [If no] was the WT your primary destination? 9.1% Yes 90.9% No
16. [If no] what was your primary destination? (Specify): OPEN

17. Which type of user group did you visit the area with? <1% Commercial trip (outfitter) 100% Private group <1% Other (please list) OPEN

18. Where did you start your trip today? 1.4% Hoodoo TH 4.1% Elk Flat TH 8.1% Cross Canyon TH >1% Three Forks TH 4.1% Troy TH <1% Timothy Springs TH 73.0% Campsite 9.5% Other TH (Specify): OPEN

19. Did you recreate on Umatilla NF lands? 64.9% Yes 35.1% No <1% I don't know
20. Did you know that the Wenaha is a federally designated Wild and Scenic River? 75.0% Yes 25.0% No
21. [If yes] did this knowledge influence your decision to visit the WSR area? 29.6% Yes 70.4% No

22. How far in advance did you plan your trip to the WSR or WT? (Enter number) Mean=6.00 months (23) Mean=1.67 weeks (24) Mean=3.60 days (25) Mean=8.40 hours
26. Overall, how would you rate your trip to the WSR or WT today? Mean=4.76
<1% Poor
1.4% Fair, it just didn't work out very well
5.6% Good, but I wish a number of things could have been different
30.6% Very good, but it could have been better
40.3% Excellent, only minor problems
22.2% Perfect
27. Comments: OPEN

28. How long did you have to wait for other parties to leave before you could start your trip? Mean= <1.00 minutes

29. How did the number of people you saw while on this trip compare with what you expected to see?

9.0% A lot less than you expected	10.4% A little more than you expected
22.4% A little less than you expected	13.4% A lot more than you expected
43.3% About what you expected	1.5% You didn't have any expectations

30. How many times did you see other groups while you were on the WSR or WT today? If you saw the same group more than once, count each time separately. Mean=1.00 times

31. If you have to wait for other parties before you can start your trip, it would be O.K. to wait as long as…… Mean=16.79 minutes 44.9% it doesn't matter to me

32. While recreating on the WSR or WT, how many times would it be O.K. to see other groups? Mean=1.48 times 49.3% it doesn't matter to me

33. What would be an acceptable percentage of time to see other groups while you are on the WSR or WT? (circle ONE number only)

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
13.4%	--	14.9%	7.5%	--	6.0%	--	1.5%	3.0%	23.9%	29.9%

34. If you have to wait for other parties at choke points or crowded areas before you can continue with your trip, it would be O.K. to wait as long as….. Mean=11.00 minutes 48.4% it doesn't matter to me

35. How did the number of people you saw on the trails today affect the overall enjoyment of your trip? [Circle one number] 34.8% N/A Mean=2.65

1	2	3	4	5	6	7	8	9
Enhanced my enjoyment				No Effect				Reduced my enjoyment

36. If camping, how did the number of people you saw at your campsite affect the overall enjoyment of your trip? [Circle one number] 22.4% N/A Mean=2.85

1	2	3	4	5	6	7	8	9
Enhanced my enjoyment				No Effect				Reduced my enjoyment

37. If you recreated at the river, how did the number of people you saw on the river affect the overall enjoyment of your trip? [Circle one number] 19.4% N/A Mean=2.89

1	2	3	4	5	6	7	8	9
Enhanced my enjoyment				No Effect				Reduced my enjoyment

38. How did the number of people you saw today in total affect the overall enjoyment of your trip? Mean=2.76

1	2	3	4	5	6	7	8	9
Enhanced my enjoyment				No Effect				Reduced my enjoyment

39. During your trip, did you have any conflicts with other parties? 1.5% Yes 98.5% No
40. [If yes] briefly describe who was involved and the nature of the conflict OPEN

41. Which activities did you participate in during this visit to the WSR or WT?		42. Which of those is your **primary** activity for this recreation visit to the WSR or WT?
Question 41 answers		Question 42 answers SELECT ONE
72.2%	Camping in pre-existing campsite	16.2%
4.2%	Primitive or dispersed camping without fire ring	<1%
31.9%	Backpacking (overnight)	5.4%
23.6%	Day hiking (not overnight)	6.8%
<1.0%	Resorts, cabins, and other accommodations on Forest Service managed lands (private or Forest Service)	<1%
8.3%	Picnicking and family gatherings in developed site (family or group sites)	<1%
91.7%	Viewing natural features such as scenery, wildlife, birds, flowers, fish, etc.	<1%
1.4%	Visiting historic and prehistoric sites/areas	<1%
<1.0%	Viewing a nature center, nature trail, or visitor center	<1%
<1.0%	Nature study	<1%
88.9%	General/other-relaxing, hanging out, escaping heat, noise, etc.	13.5%
52.8%	Fishing—all types	36.5%
1.4%	Hunting—all types	1.4%
68.1%	Hiking or walking	12.2%
5.6%	Horseback riding	1.4%
<1.0%	Bicycling, including mountain bikes	<1%
<1.0%	Nonmotorized water travel (kayaking)	<1%
4.2%	Nonmotorized water travel (rafting)	1.4%
<1.0%	Nonmotorized Water travel (canoeing)	<1%
20.8%	Other nonmotorized activities (swimming, games, etc.)	<1%
1.4%	Climbing	<1%
43.1%	Gathering mushrooms, berries, firewood, antlers, or other natural products (choose all that apply) Specify: OPEN	4.1%
2.8%	Work (volunteer or other work)	1.4%

43. If you recreated within the WSR corridor (including the river or within ¼ mile of the river), please indicate on the map the area(s) where you recreated (choose all that apply) 47.3% wild 29.7% scenic 33.8% recreational 17.6% N/A

44. What do you like MOST and LEAST about the WSR or WT? OPEN MOST (45) OPEN LEAST

46. If you could ask resource managers to improve the quality of the experience on the WSR or WT, what would you ask them to do? OPEN

47. Overall, how would you rate the quality of each of the following at the WSR or WT:

	Awful	Fair	Good	Very Good	Excellent	N/A	Mean
Health and cleanliness	<1	1.4	12.5	23.6	61.1	1.4	4.46
Safety and security	1.4	1.4	22.2	20.8	48.6	5.6	4.21
Condition of facilities	<1	<1	20.8	13.9	29.2	36.1	4.13
Responsiveness of staff	1.4	1.4	1.4	1.4	13.9	80.6	4.29
Recreation setting	<1	<1	12.5	11.1	75.0	1.4	4.63

48. Please look at this list of statements that address your feelings about this trip to the WSR or WT. Please indicate your level of agreement with each of the statements listed below.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Mean
I thoroughly enjoyed my visit to the WSR or WT	<1	<1	<1	29.6	70.4	4.70
I had the opportunity to recreate without feeling crowded	1.5	<1	3.0	20.9	74.6	4.67
I could find places to recreate without conflict from other visitors	<1	<1	1.5	25.4	73.1	4.72
My trip to the WSR or WT was well worth the money I spent to take it	<1	<1	1.4	22.2	76.4	4.75
I avoided some places at the WSR or WT because of trail impacts	40.3	40.3	8.3	6.9	4.2	1.94
Hearing other groups in the WSR or WT impacted my visit in a negative way	50.7	44.8	1.5	3.0	<1	1.57
I was disappointed with some aspects of my visit to the WSR or WT	45.8	44.4	4.2	5.6	<1	1.69
I avoided some places at the WSR or WT because there were too many people there	43.3	47.8	3.0	3.0	3.0	1.75
There is a good balance between social and biological values in the management of the WSR or WT	<1	2.8	14.1	53.5	29.6	4.10
The number of people at WSR or WT reduced my enjoyment	40.3	55.2	4.5	<1	<1	1.64
Recreation activities at the WSR or WT were NOT compatible	37.3	62.7	<1	<1	<1	1.63
Non-natural noise (aircraft, motorboats, etc.) impacted my visit in a negative way [if agree, specify noise OPEN](49)	44.4	48.6	<1	6.9	<1	1.69
The recreational areas in the WSR or WT are in good condition	1.4	<1	8.3	50.0	40.3	4.28
The WSR or WT provided outstanding opportunities for solitude	<1	<1	<1	31.8	68.2	4.63
The behavior of other people at the WSR or WT interfered with the quality of my experience [if agree, specify behavior OPEN] (50)	48.5	48.5	1.5	<1	1.5	1.58
The other people at the WSR or WT increased my enjoyment	15.2	15.2	33.3	27.3	9.1	3.00
The facilities or general area at this trailhead are in good condition	<1	<1	14.1	47.9	38.0	4.24

51. Here is a list of possible reasons why people recreate on the WSR or WT. Please tell me how important each is to you as a reason for recreating here.

REASON	Not at all Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Mean
To be outdoors	<1	<1	2.8	37.5	59.7	4.57
For relaxation	<1	<1	9.7	40.3	50.0	4.40
To get away from the regular routine	2.8	<1	9.7	40.3	47.2	4.29
For the challenge or sport	12.5	5.6	18.1	29.2	34.7	3.68
For family recreation	23.6	4.2	11.1	34.7	26.4	3.36
For physical exercise	18.1	5.6	16.7	26.4	33.3	3.51
To be with my friends	12.5	1.4	6.9	40.3	38.9	3.92
To experience natural surroundings	<1	<1	2.8	45.8	51.4	4.49
To develop my skills	23.6	6.9	18.1	25.0	26.4	3.24

52. Which of the following was the most important reason for this visit to the WSR or WT? [Please check only one]
30.6% I went there because I enjoy the place itself
34.7% I went there because it's a good place to do the outdoor activities I enjoy
33.3% I went there because I wanted to spend more time with my companions
1.4% I went there because it was close to home

53. The last questions are about you personally and will be used only to categorize responses for different groups of visitors. Your answers are anonymous and cannot be linked to you individually.

54. What is your home ZIP/postal code? OPEN -or- <1% visitor is from another country (Specify): (55) OPEN

56. What is your age? Mean=44.21

57. How many people are in your group today? Mean=3.11 adults (58) Mean=<1.00 children up to 17 years

59. How many cars/trucks/motorcycles are in your group today? Mean=1.74 cars/trucks/motorcycles

60. If you parked your cars/trucks/motorcycles at a trailhead, which trailhead did you park at? (for multiple trailheads, please choose all) 4.1% Hoodoo TH 14.9% Elk Flat TH 27.0% Cross Canyon TH <1% Three Forks TH 6.8% Troy TH 1.4% Timothy Springs TH 39.2% N/A 6.8% Other TH (Specify) OPEN
(61) Other(s): OPEN

62. How many trailers (any types) are in your group today? Mean=<1.00 trailers (any type)

63. If you parked your trailer(s) at a trailhead, which trailhead did you park at? (for multiple trailheads, please choose all) <1% Hoodoo TH 1.4% Elk Flat TH 4.1% Cross Canyon TH <1% Three Forks TH <1% Troy TH <1% Timothy Springs TH 87.8% N/A 6.8% Other TH (Specify) OPEN
(64) Other(s): OPEN

65. What is your highest level of education? 25.4% High school or less 18.3% Technical school/ 2 year college 42.3% Bachelor's degree 9.9% Master's Degree 4.2% Ph.D./Professional degree

66. What is your annual household income? 15.2% under $25,000 24.2% $25,000-49,999 34.8% $50,000-99,999 13.6% 100,000-149,000 6.1% 150,000- 199,999 6.1% $200,00 or over

67. Are you? (choose one) 1.4% Hispanic or Latino(a) 98.6% Not Hispanic or Latino(a)

68. With which racial group(s) do you closely identify? (please choose one or more) 2.7% American Indian or Alaska Native 1.4% Asian <1% Black/African American <1% Native Hawaiian or Pacific Islander 93.2% White