My Mountain, Your Mountain, Our Mountain:

Incorporating Emotional and Sensory Experiences in Mapping Sense of Place in Mount Hood National Forest

by

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Abstract

Understanding the complex connections humans have with landscapes is necessary for successful land management and planning practices. Only within the last few decades has mapping the values of forest users been used to produce data that can be incorporated into forest planning as a means to better understand social and environmental dynamics. This research used sense of place web mapping coupled with interviews to understand forest users' emotional and sensory experiences within the Mount Hood National Forest and to improve future sense of place mapping research. Two objectives were addressed in this research: 1) develop a typology of individuals' emotions experienced and triggers of those emotions associated with their places of importance within the Mount Hood National Forest, and 2) develop methods and recommendations for effectively incorporating emotional and sensory questions into larger sense of place surveys with or without interviews to create a more comprehensive assessment of human landscape interactions.

Through the process of thematically coding the emotions participants expressed, it was found that certain mapped emotions revealed key associations that could be integrated with traditional values mapping methods, leading to a better understanding of why participants value certain places identified in the forest. Additionally, an evaluation of the results found that the senses of sight and sound in relationship to landscape values proved to be the most relevant senses for forest planning. The resulting conclusions demonstrate that emotional and sensory experiences should be considered an integral component of sense of place mapping techniques aimed at making better informed decisions for future management of public lands.

Acknowledgements

This research was conducted in what we now call Portland, OR, Multnomah County, Hood River County, Clackamas County and Wasco County, and which were the traditional lands of the Tygh, Wyam, and Dock-spus bands of the Warm Springs Tribe; The Dalles (Ki-gla-twal-la) and Dog River bands of the Wasco Tribe; the Multnomah, Kathlamet, Clackamas, Tumwater, Tualatin, Kalapuya, Wasco, Molalla, Cowlitz and Watlala bands of the Chinook, and many other Tribes who made their homes along the Columbia River. Today, people from these bands have become part of the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of Grand Ronde, the Confederated Tribes of Siletz Indians, as well as the Chinook Nation and Cowlitz Nation in Washington State.

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Preface

I feel it is important to tell my own story of Mt. Hood and sense of place to set the tone for why sense of place research is so valuable for understanding how people are connected to certain places. Mt. Hood has been such a prominent feature in my life for creating a sense of place. For one, I was born and have lived in Portland my entire life, as well as being accustomed to having the presence of the mountain in my daily view. As a child, my parents would frequently take me to Mt. Hood to go on hikes, paddle the lakes, fish, camp, and experience a variety of nature the forest offers. My Father was deeply connected to the landscape being an avid mountain and ice climber, hiker, and general explorer of nature. I saw his emotional response to the landscape when he gazed upon the mountain, and I knew this landscape held a magical, special place in his heart. When my father suddenly passed away at the age of 49, I felt like he became part of the mountain and my own emotional attachments to Mt. Hood strengthened and provided a place that I could still feel connected to my father. There are many stories like mine that help explain and understand why people value certain places in the forest and I hope to uncover other individuals' sense of place in Mount Hood National Forest with this research.

Chapter 1: Introduction

Many people experience strong emotions in the presence of a mountain's grandness, or they feel soothed by the meditative qualities of a babbling stream. But how are these emotional connections to landscapes described in terms of sense of place or values, and how can they be used to convey the importance of place? Sense of place can be described as an individual's meanings and interpretations derived from experiences and interactions with a specific place (Tuan 1974; Relph 1976; Eisenhauer, Krannich, and Blahna 2000).

Sense of place (SOP) mapping, a type of Public Participation GIS (PPGIS), is an effective approach to understanding the complex ways in which humans are connected to landscapes and provides essential information for effective land stewardship and management (McLain et al. 2013). However, it still remains difficult to understand and analyze these important individual experiences, demonstrated by mapping, that create a sense of place because of the intimate details that contribute to developing that importance.

In the Pacific Northwest, Mount Hood National Forest provides a landscape for visitors and local residents to engage in many activities, make a living from forest resources, and attach meaning to places of importance. Key factors of this research focused on how associations between senses experienced, emotions evoked, landscape types and values associated with places of importance in Mount Hood National Forest, could contribute to improving future SOP mapping research.

Purpose

This research uses SOP mapping paired with participant interviews to understand individual meanings and interpretations of places of importance identified within the Mount

Hood National Forest. Methods of data collection used in PPGIS studies of public lands include mailed surveys sent to random households, focused workgroups, or interactive online surveys. These data collection methods typically use paper maps or web map surveys, allowing participants to mark points, lines, or polygons and attribute values, to gather information about participants' places of importance (Brown and Reed 2009; Pocewicz et al. 2012; Brown 2017). A majority of approaches use quantitative methods of analysis; the research presented here uses a qualitative analysis approach to sense of place mapping.(McLain et al. 2013). The benefit of this qualitative approach to mapping meanings and understandings of place, is to better understand the intricate ways humans are connected to landscapes.

Often times, a technique called values mapping employs the use of quantitative analysis techniques to evaluate relationships between landscape values and other variables, such as activities; however, this technique seldom capture enough information to make conclusions about participants' true sense of place and why they value these places of importance (Brandenburg and Carroll 1995). While quantitative methods are beneficial for understanding the distribution or frequency of variables, such as values or activities, in a particular landscape, integrating qualitative investigations of participants' emotional and sensory experiences of places with traditional analysis techniques of values mapping approaches, provides land managers with a better perspective not only of the ways in which the forest is valued, but also why these places hold special meanings to individuals.

Research Objectives

The objective of this research was to gain a deeper understanding of how and why people attach value and meaning to landscapes that influence the importance they assign to place, and ultimately contribute to one's sense of place. My curiosity about how incorporating emotional and sensory experiences into sense of place research could be done, particularly with Public Participation GIS (PPGIS), stemmed from my involvement in a project evaluating human landscape interactions in the Deschutes and Ochoco National Forests and Crooked River Grasslands located in Central Oregon (Banis et. al, 2019). An abundance of analysis results demonstrated where people enjoyed recreating, the types of activities they engaged in, benefits of the place, what they felt threatened their places of importance, and suggestions for improving land management in the area. While evaluating the themes and analysis techniques that appeared in the study, I noticed that there were limited associations of participants' emotional and sensory experiences related to their places of importance in the forests. Although that study was focused on human landscape interactions to inform land managers in future planning decisions, I saw a need to incorporate questions into SOP mapping surveys that could lead to a better understanding of the ways in which people create a sense of place and deep connection to the land.

In contrast to the considerable research in values mapping focused on quantitative analysis of values, activities and how people engage in recreation in our forests or on public lands, this research involves the less frequently employed qualitative approach using web map surveys and personal interviews as data collection methods. I endeavored to develop an understanding of how to enhance the individual meanings of values by incorporating emotional and sensory based questions into SOP map surveys. To achieve this, I analyzed

qualitative data by using thematic coding of responses to help interpret and analyze how participants' perceptions and experiences in the forest were associated with other variables, such as landscape values, vegetation types and length of time visiting the forest, to name a few. To gain a detailed awareness of human-landscape interactions and how understanding emotional and sensory experiences could improve future SOP mapping, the following research objectives were addressed:

1) Develop a typology of individuals' perceived emotions experienced and triggers of those emotions associated with their places of importance within the Mount Hood National Forest.
2) Develop methods and recommendations for effectively incorporating emotional and sensory questions into larger sense of place surveys with or without interviews to create a more comprehensive assessment of human landscape interactions

This document is organized with the following structure. Chapter 2 describes the study area – Mount Hood National Forest – in terms of its physical features and biogeography, recreational uses, and attraction to the area from surrounding communities. Chapter 3 discusses the relevant literature, general theories and methodologies supporting the framework for this research. The theoretical literature reviewed examines themes from humanistic geography, public participation GIS, and sense of place mapping, which together provide the foundation for this research.

In Chapter 4, the description of the methods used for data collection and analysis details the structure for this research. Chapter 5 presents the results grouped into four parts: the demographics of participants, values of meaningful places, sensory experiences, and interpretation of emotions experienced. Finally, in Chapter 6 I discuss the importance of the

findings relevance for incorporating emotional and sensory experiences in future sense of place mapping.

Chapter 2: Wonders of Wy'east

Geography and History of Mount Hood National Forest, Oregon

Mt. Hood, which has an elevation of 11,240 feet and is the tallest mountain in Oregon, is an impressive feature of Oregon's landscape. This magnificent stratovolcano is part of the Cascade mountain range, which extends from southern British Columbia to northern California (Mt. Hood National Forest - About the Forest n.d.). Wy'east is generally assumed to be the Native name for Mt. Hood, although the name may have been invented by writer Frederick Balch, who published a book over 100 years ago to create romanticized stories using details about tribal life and which still have an influence on the public's understanding today (Lewis 2014). Many indigenous histories were reinterpreted to fit into American culture, producing compelling fictional stories that replaced Native histories, such as this one about the creation of Mt. Hood (Matarrese 2017). Two sons of the Great Spirit Sahale fell in love with a beautiful maiden Loowit, who could not choose between the two sons. The two brave sons, Wy'east and Klickitat, burned forests and villages in their battle for her love. Sahale became enraged and smote the three lovers. Realizing what he had done, he erected three mountain peaks to mark where each fell. Sahale made the beautiful mountain, which is now called Mount St. Helens, for Loowit; proud and erect Mt. Hood for Wy'east; and the somber Mt. Adams for the mourning Klickitat (Mount St Helens 1980). This is just one of many interpreted versions of this tale explaining the formation of fiery volcanos prevalent in the Cascade landscape.

The name, Mt. Hood, was given to this mountain by Lt. William Broughton during the Western colonialization period on October 29, 1792 (Bell 2011). Broughton was a member of Captain George Vancouver's exploration expedition, who documented and

named the peak after Lord Samuel Hood, an admiral of the British Royal Navy, who never set foot on the mountain (Bell 2011; Mt. Hood National Forest - About the Forest n.d.). Mount Hood National Forest has a traumatic and disgraceful history embedded in early white colonialism, beginning with the Oregon Donation Land Claim Act of 1850. The "first prerequisite step" to settling Oregon's land under the Oregon Donation Land Claim Act involved first extinguishing Native claims to the land, ultimately forcing Natives to cede land rights and live in designated reservations (Lewis 2014; Robbins 2021). This land law set forth eligibility requirements that were "granted to every white settler or occupant of the public lands, American half-breed Indians included … in effect, benefiting incoming whites and dispossessed Indians" (Robbins 2021). The many bands and tribes belonging to the land on what we now call Mount Hood National Forest, became part of the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of Grand Ronde, the Confederated Tribes of Siletz Indians, and possibly many others.

As the country's economy grew in the 19th century, designating certain areas as public lands became important to preserve forests for resources, such as timber and forest products, and later for recreation. Portions of Mount Hood National Forest were originally established as part of a federal policy to protect Portland's proposed water supply. President Benjamin Harrison signed a proclamation on June 17, 1892 declaring the Bull Run watershed a National Forest reserve (Short 2011). In September of 1893, the Cascade Range Forest Reserve of Oregon was established and included forests extending from the Columbia River Gorge in the north, southward almost to the California state boundary (Langille et al. 1903). Subsequently, in 1908, the Cascade Range Forest Reserve of Oregon was divided into several national forests with the northern portion in Oregon and the Bull Run Forest Reserve

combining to become the Oregon National Forest. The forest's name was changed to its present-day name of Mount Hood National Forest in 1924 and it is managed by the U.S. Forest Service.

The Mount Hood National Forest begins in the north at a section of the Columbia River Gorge and extends south to Olallie Scenic Area, a high lake basin north of Mt. Jefferson. Mount Hood National Forest covers an area of 1.2 million acres, and includes a diverse array of forest ecosystems (Mt. Hood National Forest - About the Forest n.d.). The relative position of the Cascades to the Pacific Ocean creates a west to east climatic variation resulting in much greater precipitation on the western slopes and at higher altitudes of the forest. Air masses descend the eastern flanks of the mountain retaining moisture creating a rain shadow effect, yielding drier environments to the east (Burtchard and Keeler 1991). Zones of vegetation oriented north-south follow the orientation of the Cascades and largely consist of Pacific maritime forests, which include western hemlock and Pacific silver fir west of the Cascade crest; mountain hemlock with various forest meadows and subalpine parklands below the timberline (6,200 feet in northern Oregon); alpine tundra above the timberline; and grand fir, interior pine, and upper shrub steppe zones east of the Cascade crest (Burtchard and Keeler 1991; Price n.d.).

Recreational Activities

Although timber extraction dominated the first half of the forest's history, which peaked in the 1950s and 1960s, it has since transitioned to offer more recreational opportunities (Bell 2011; Short 2011). Roughly one-third (311,448 acres) of Mount Hood National Forest is designated as wilderness areas and a little over 65,000 acres are federally

protected in the Bull Run Watershed (City of Portland Water Bureau 2011; Mt. Hood National Forest - About the Forest n.d.). Eight designated wilderness areas (Badger Creek, Bull of the Woods, Clackamas, Lower White River, Mark O. Hatfield, Mt. Hood, Roaring Riving, and Salmon Huckleberry), are federally protected under the Wilderness Act of 1964. According to the Wilderness Act of 1964, wilderness areas must have minimal human imprints, must cover at least five thousand acres, have no enterprises or motorized travel, provide opportunities for solitude and unconfined recreation, and contain ecological, geological, educational, scenic or historic value (The Wilderness Act 1964). Mount Hood National Forest's combination of wilderness areas, rivers, lakes, and diverse landscape features provide plentiful opportunities for a range of recreational activities. Mt. Hood offers a place for engaging in winter activities such as, skiing, snowboarding, snowshoeing, and snowmobiling. Additionally, the diverse landscape of the entire forest provides places for other seasonal activities, such as hiking, backpacking, camping, biking, horseback riding, water sports, climbing, and more. These recreational opportunities draw over two million annual visitors to the Mount Hood National Forest and generate a significant portion of forest revenue in addition to forest products and ecosystems services (USFS 2017).

One of the more popular destinations on Mt. Hood is Timberline Lodge, which was built in the 1930s as part of a Works Progress Administration project. The historic lodge is well known for its grand architecture, rustic style, and adornment of the traditional Arts and Crafts period (Munro 2016). It opened to the public in February of 1938, and still operates as a ski lodge today. At an elevation of 6,000 feet, it regularly draws many tourists to the mountain because of its history, preservation of original interior art and furnishings, and the sense that one could reach out and touch the top of the mountain.

The study area, displayed in Figure 1, outlines the area of interest in this research of Mount Hood National Forest, the location of designated wilderness areas, and surrounding communities. Mount Hood National Forest is heavily used thanks to its close proximity to communities of varying population sizes and diverse demographics. State Highway 26 and State Highway 35 transect the mountain, making it easily accessible from the Portland-Vancouver Metropolitan area, Hood River area, and Madras-Redmond-Bend rea in Central Oregon. The northern border of the forest shares boundaries with the Columbia River Gorge National Scenic Area which is accessible by Interstate 84 and the Columbia River Gorge Historic Highway. The concentration of trails, campgrounds and recreation sites in close proximity to these major highways makes them accessible for short day trips or overnight camping trips. Ultimately, the northern part of the forest attracts the majority of visitors because of the accessibility of numerous and diverse recreational sites, including developed campgrounds, ski areas and trailhead access. The southern portion of the forest tends to have far fewer visitors in part because there is less development, the recreational sites are not in close proximity to major roads, and the poor condition of forest roads impedes accessibility for some visitors.

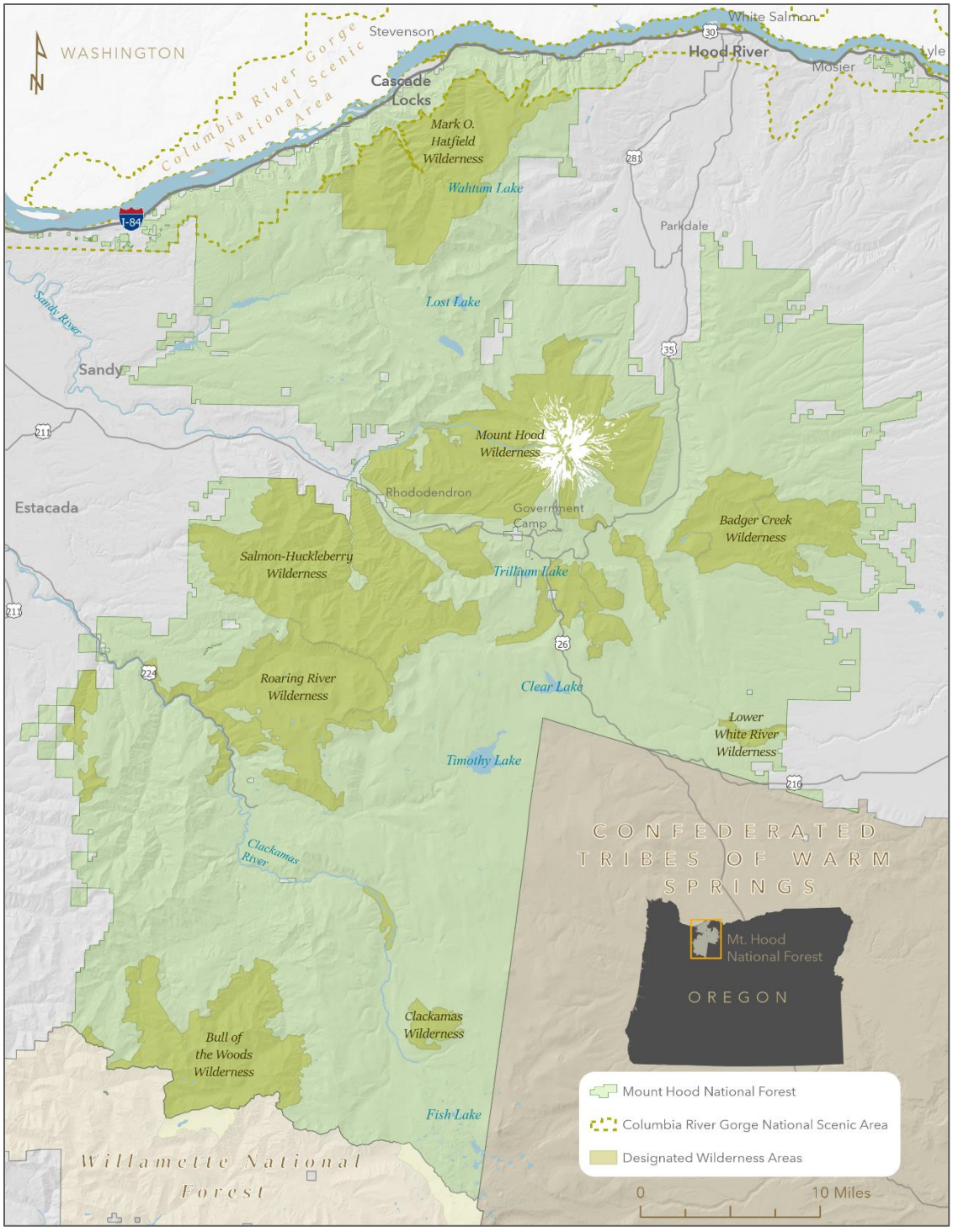

Figure 1 - Mount Hood National Forest study area

Chapter 3: Literature Review

Humanistic Geography

One of the most influential humanistic geographers, Yi-Fu Tuan, defines humanistic geography as achieving "an understanding of the human world by studying people's relations with nature, their geographical behavior as well as their feelings and ideas in regard to space and place" (1976, 266). Humanistic geography draws from phenomenology, the study of individuals' lived experiences of the world (Neubauer, Witkop, and Varpio 2019). Integrating mixed methods of quantitative and qualitative data in research approaches has been a historically challenging undertaking for geographers. Humanistic geographers critique the methods often associated with spatial quantitative analysis, a prevalent technique during the 1960s, seeking more qualitative approaches for understanding how people perceive space and place (Cresswell 2013). Qualitative methods can be just as rigorous and trustworthy as quantitative statistical methods, though each method follows their own set of standards and guidelines for practice and representation (Cope and Hay 2021, 10).

Sense of Place

The original concepts of sense of place emerged in the 1960s and 1970s during the humanistic movement in geography (Tuan 1976; Cresswell 2013). Yi-Fu Tuan theorized that sense of place is the idea that people attach meanings to places based on a variety of experiences and interactions with place that occur over time, such that "what begins as undifferentiated space becomes place as we get to know it better and endow it with value" (1977, 6). Tuan discusses space and place as inseparable terms. Space is more abstract and can be envisioned as an area that allows movement, where place is a pause in space. These pauses lead to the creation of place through indirect conceptual knowledge and direct

experiences (Tuan 1977). The conceptual and experiential interactions with place are then given meanings and values. Both emotion and thought are the driving factors for all human experiences. To interpret how people feel about space and place, consideration of their perceptions of place through their sensory experiences are taken into account. Tuan incorporates the basic human senses of sight, sound, smell, touch, taste, and even emotion to explain how sensory experiences are connected to the creation of sense of place (Tuan 1974). Much of this study will draw from Tuan's theoretical framework of environmental perceptions, attitude and values for understanding differences in sense of place.

How one creates a sense of place is highly contested in the literature. Some theorists argue that in addition to individual feelings and meanings, sense of place is also socially constructed and largely influenced by external influences of social, cultural, economic, or political environments (Pred 1983; Greider and Garkovich 1994; Massey 1994; Rose 1995; Eisenhauer, Krannich, and Blahna 2000). Other perspectives in place theory, such as Stedman's, argue that attributes of the physical environment, psychological processes, and human behaviors should not be ruled out when trying to understand individuals' sense of place (2003b). Furthermore, Stedman suggests that sense of place is multidimensional entailing aspects of physical environment, social relationships and other human behaviors, and human cognitions and emotions (2003b).

Broad approaches to understanding individuals' sense of place range from measurements of place attachment and evaluations of place satisfaction to mapping landscape values and content analysis of open-ended questions related to feelings about a place (Eisenhauer, Krannich, and Blahna 2000; Stedman 2003a; Brown, Raymond, and Corcoran 2015). An approach taken by Stedman that focuses on sense of place, utilizes

measurements of place attachment and satisfaction by conducting a survey of place attachment questions using a 7-point Likert scale (2003a). Place attachment measurements have commonly been used in land management research because they provide a way of measuring "how strongly people feel a sense of connection to a place, as well as capturing distinctions between the goods and services provided by that place" (Brown, Raymond, and Corcoran 2015, 42).

Another approach, taken by Eisenhauer, Krannich, and Blahna, used interviews for data collection and attempted to understand participants' attachments to place by measuring frequencies of activities, as well as cross-tabulating activities and reasons places are considered special. Their approach required qualitative data analysis consisting of thematically coding responses into typologies of activities and reasons attached to meaningful places. However, the reasons for attachment to a place seemed to be more related to activities engaged in at these places rather than true emotional attachments or experiences. One limitation noted in their research was that the limited number of responses obtained by interviews alone could potentially benefit from implementing a larger randomly sampled survey with open-ended questions (Eisenhauer, Krannich, and Blahna 2000). Nevertheless, their survey methods directly contributed to the importance of including emotional and sensory-based questions that this research is interested in accomplishing.

Public Participation Geographic Information Systems

One approach that geographers have used for combining quantitative and qualitative research methods is PPGIS, a subfield of geographic information systems (GIS), that provides a path for communicating spatial relationships from a variety of scientific and non-

scientific perspectives. There are varying accounts of who coined the term "public participation GIS", but there is general agreement that the term likely emerged out of a collaborative series of workshops sponsored by the National Center for Geographic Information and Analysis (NCGIA) held at Friday Harbor in November of 1995 (Obermeyer 1998). An assemblage of scholars including John Pickles, Michael Curry, Nick Chrisman, Michael Goodchild, and Tom Poiker, developed the goal of focusing concerns on the growing importance of GIS technology and understanding the relationships between it (GIS) and society (Obermeyer 1998). The outcome of the collaborative process, PPGIS, is defined by Renee Sieber as "pertaining to the use of geographic information systems (GIS) to broaden public involvement in policymaking as well as to the value of GIS to promote the goals of nongovernmental organizations, grassroots groups, and community-based organizations" (2006, 491). PPGIS provokes change in how our society interacts with geospatial data, by forcing a critical examination of GIS and its purpose (Elwood 2006a). Taking a PPGIS approach to geospatial analysis can help to effectively describe human-landscape interactions while at the same time reduce "power differences and encouraging sharing of meaning-making between researchers and participants" (DeLyser and Pawson 2021, 401).

There are numerous terms used to describe PPGIS approaches, including sense of place mapping, values mapping, place attachment mapping, wilderness mapping, and collaborative mapping, to name a few (Beverly et al. 2008; Brown and Reed 2012; McLain et al. 2013). McLain et. al use the term Human Ecology Mapping (HEM) to describe approaches to spatial data collection that have the goal of addressing important questions related to human-landscape interactions and providing data to be used in land management (McLain et al.

2013). They suggest three approaches to HEM, each of which address particular questions and types of human-landscape interactions.

1.) Tenure and Resource Use (TRU), addresses spatial relationships such as, land ownership rights and access, land use activities, who exerts claims over lands and resources, by "engaging politically and economically marginalized groups through the production of maps representing *their* conceptions of their territories rather than the boundaries imposed on them by nation-states or other outside entities" (2013, 653).
2.) Local Ecological Knowledge (LEK) mapping is described as, "knowledge, practices, and beliefs regarding ecological relationships that are gained through extensive personal observation of and interaction with local ecosystems, and shared among local resource users" (Charnley 2008, 2).
3.) Sense of Place (SOP) mapping is an approach to the understanding of the complex ways in which humans are connected to landscapes and provides essential information for effective land stewardship and management (McLain et al. 2013).

These three HEM themes illustrate the complexity of individual PPGIS projects and provide direction for addressing important questions related to mapping particular forms of human-environment interactions. Determining an appropriate participation model, the primary goal of the project, and primary data collection method(s) are critical steps in the planning process for a successful PPGIS project (McLain et al. 2013).

The approach relevant to this research is SOP mapping. What is gained from SOP mapping is an entirely different viewpoint of how landscapes are valued and used based on a combination of personal experiences, cognitive memories, and perspectives from a collective of voices in a community (McLain et al. 2013). Awareness of these perceptions contributes

toward better informed decisions in how lands are managed through collaborative and inclusive efforts. This research will draw from the SOP approach to PPGIS as it best fits the application of this project.

Although each PPGIS approach has flaws in the extent to which it can represent locations accurately and represent the full range of public perspectives, its foundational principles emphasize facilitating input from the public at large and can include marginalized communities and the socially excluded in public decision-making processes. Engaging these communities can be challenging, especially where communities are hesitant to provide their perspective out of fear that the information they provide will be used to make decisions that affect them adversely. However, despite its limitations, PPGIS provides a means for enhancing communication between physical geographers, human geographers, other academics, planners, and communities at large.

Land Management Perspectives and Influence

Within the last few decades, integrating sense of place with land management planning policies has gained increased interest among natural resource, recreation and land management planners. Sense of place research offers land managers a way to identify the emotional attachments people form with certain places, as well as ways to build relationships with the public (Williams and Stewart 1998). Extensive human-environment interaction research in ecosystem management by Williams and Stewart strongly suggests that sense of place is in fact the key to being the "shared language that eases discussion of salient issues and problems that affirms the principles underlying ecosystem management" (1998, 18). In contrast, Farnum, Hall and Kruger argue that managing areas from a broad, holistic ecosystem based approach is not always compatible with approaches that incorporate sense

of place (2005, 36), as a balance in perspectives can be difficult to achieve when applying them to management practices. Farnum et. al suggest the greatest challenge land managers are faced with when assessing sense of place in planning decisions is the "promotion of an idea in research and its adoption in practice", as well as the site-specific differences in place (2005, 39). Manzo counters this thinking stating that for land managers to develop effective policies that foster stewardship, they must begin with a better understanding of place meanings and peoples' relationships to place (2008). Even though there is a growing recognition of the importance of sense of place for land management planning, settling on consistent methodologies of analysis seems to be the biggest hurdle to effectively integrating sense of place into planning metrics. Sense of Place Mapping attempts to address this challenge.

Approaches to Understanding Sense of Place

Attempts to understand sense of place has been approached in various ways, including through the use of qualitative, quantitative or mixed methods. Not much sense of place research involves a mapping component and are primarily based on theoretical concepts. However, these various methodologies can be useful for incorporating into a mapping focused study. An increasingly popular option for structuring a PPGIS project combines the use of a variety of data collection methods, such as workshops, personal interviews, targeted surveys, web maps, and random sampling surveys. Hybrid approaches allow for a greater diversity of knowledge production methods addressing the challenge of how public data input is at times viewed as not being legitimate or relevant as the knowledge produced through traditional scientific practices (Elwood 2006b).

A common PPGIS data collection method, known as values mapping and which can use surveys or workshops and paper or internet-based maps, captures the values that participants assign to the places they mark on a map (Pocewicz et al. 2012). Greg Brown was most influential in the development of this approach where participants were given a map and color-coded dots representing a particular landscape value, and then asked to mark places on the map with the dots that corresponded with their values (Brown and Reed 2009; Brown 2012, Brown 2017). The spatial data was then analyzed in a GIS to identify densities of values, grouping patterns for values, and associations with other variables of a particular place.

Landscape values mapping generally uses 12 to 18 pre-defined value categories (Alessa, Kliskey, and Brown 2008; Brown 2012), such as those shown in Table 1.

Table 1 - Examples of landscape value categories

Aesthetic/scenic	Biological	Subsistence	Social
Economic	Spiritual	Therapeutic	Special places
Recreation	Intrinsic	Cultural	
Life sustaining	Historic	Wilderness	
Learning/scientific	Future	Marine	

Nielsen-Pincus evaluated landscape values similar to the listed categories in Table 1, however, their approach divided the values into two categories of material (socioeconomic quality) and postmaterial (personal | environmental quality) values (Nielsen-Pincus 2011). Brown's approach to values mapping is one of many which can be applied to PPGIS projects. His approach of using points to identify places of importance has been widely adopted, perhaps because associating a coded value with points eases digitizing and evaluating the data in a GIS. This approach was applied in van Riper et. al's (2012) research

of mapping and comparing two subgroups of outdoor recreationists' perceived social values at Hinchinbrook Island National Park in Australia.

The total number of values offered as choices and exact language need careful consideration to avoid providing too many values with similar meanings and values which aren't truly values, such as recreation, which is more of a broad description of activities (Biedenweg et al. 2019). For instance, in the study of HEM of socio-ecological interactions in Central Oregon National Forests and Grasslands, a benefit category (term used instead of values) of Recreation and Fitness dominated this analysis and was naturally selected by participants because they were engaged in an activity at that location (Banis et al. 2019). Most people will be engaged in some activity while at a location and it was found the value of Recreation was not a value rather an activity. Furthermore, Gunderson and Watson (2007) claim that Brown's development of values mapping methods has limitations in addressing the complex reasons why someone values a particular place, because it focuses on quantitative analysis of a predetermined set of values rather than gathering data in way that allow one to understand the complexity of human interactions with place that influence their sense of place.

An example of how hybrid methods could be combined is shown in a PPGIS study for environmental planning in western Washington. Researchers engaged with visitors and residents by establishing community mapping workshops and hosted an online interactive mapping survey to capture a greater diversity of participants throughout a large study area (McLain, Cerveny, et al. 2017). Although this study doesn't strictly inform sense of place, their conclusions suggest that using hybrid data collection methods and public engagement strategies can reveal different perspectives in how the public interacts with their

environment, as well as provide more inclusive participation options for those lacking technical skills associated with GIS applications. Their findings helped to understand how to combine data collection methods in this research.

Some PPGIS projects use interactive mapping tools to gather input about participants' places of importance. A human ecology mapping study of the National Forests and Grasslands of Central Oregon used a combination of an online interactive web map survey and intercept surveys (using the same survey questions and map as the interactive web map survey) to gather participants' input on landscape benefits, activities, threats, features, and social environment for up to five important places (Banis et. al 2019). The main benefit of using web-based map surveys is that a greater number of responses can typically be gathered than is possible through workshops. Additionally, the combination of workshop data and online data introduces data compatibility issues during analysis if the two methods contain differences in spatial relationships or questions asked (McLain, Banis, et al. 2017).

An alternative data collection method, taken by Brandenburg and Carroll, used semi-structured interviews and observation to understand the process of place creation. Their approach attempted to capture the nuances of attitudes and behaviors of human landscape interactions that may otherwise be excluded by researchers using other methods, such as surveys (1995, 383). Additionally, they attempted to gain an "understanding of the worldview of rural residents surrounding the national forest and to describe the meanings of actions from participants' perspectives" (1995, 383). They found that the data their participants were willing to share during interviews and observations extended beyond that of what could be collected through the use of traditional surveys, which are not typically structured in a way to allow people to readily share in-depth stories and details. Although Brandenburg and

Carroll's research did not include a mapping component, it was effective at revealing meanings that participants assigned to a particular place, which helped to inform my research of how to thematically code interview data about emotions and senses.

The benefit of using interviews as a method for data collection is that it allows the participants to share deep and rich stories related to place that can be thematically coded to highlight particular themes that emerge from the stories. This approach was taken in a study conducted by Manzo which evaluated the nuances and complexities in participants' "relationships to place and the significance of these relationships for outdoor recreation and public management through an in-depth study of people's place experiences" (2008, 135). Although Manzo does not use GIS for mapping in their study, they engage participants in interviews which focused on exploring the nature of participants' relationships to significant places in their lives. From these interviews, Manzo developed themes such as the meanings and importance of different places, social implications of those places, feelings participants experienced in those places, and significance of childhood experiences, as well as whether these experiences affected feelings about current places in the participants' lives (2008, 146). Integrating interview information into sense of place mapping has the potential to provide rich context that expands the understanding of individuals' experiences, and provides a useful supplement to other approaches for mapping sense of place.

One study that attempts to map the data collected from interviews and focus groups is the work of Lowery and Morse (2013). They use a qualitative approach to PPGIS data collection that involves conducting personal interviews and focus group sessions where participants hand draw points, lines, or polygons on a map and are asked to provide input on why those places are important. The rich textual information from the interview or

workshop can then be coded and embedded in a GIS linking it to the spatial location of the important place. Ultimately, the greatest challenge of analyzing data collected from an interview or focus group in a GIS application with certain non-spatial elements, is representing them spatially. Using interviews or focus groups are useful for collecting rich textual information about larger areas, but do not always capture detailed information about specific locations, as most mapping studies do.

Integrating the measurement and aggregation of public perspective of landscape values into land management planning has been historically difficult (Williams and Stewart 1998). No one model for measuring values has been standardized for use in land management planning. Brown states that "Qualitative research on forest values, while providing contextually rich data, has yet to be systematically included into a decision support system. For better or worse, qualitative research on forest values has not achieved the same 'science-based' status of other quantitative research within public management agencies" (Brown, G., Reed, P., 2011). Although Brown has been influential in developing quantitative values mapping analysis methods related to public participation in land management planning, the underlying assumption that the research is fundamentally qualitative and as such does not meet the same scientific standards as quantitative research still prevails.

Government agencies are often reluctant and slow to adopt PPGIS approaches thanks to a consistent framework for evaluation of PPGIS-derived data not yet existing, a limited understanding of how to use social science data, as well as mistrust in the data collected not using randomly sampled surveys (Farnum, Hall, and Kruger 2005; Brown 2012; Brown and Kyttä 2014; personal communication - Rebecca McLain 2021). Additionally, Brown suggests that a "lack of familiarity with PPGIS as a new consultation methodology

and concerns with the accuracy and validity of lay knowledge in environmental decision processes serve to reinforce a propensity toward agency inertia" (2012, 15). Another possible explanation of the hesitancy to adopt PPGIS methods into planning practices is fear of engaging the public, lack of the agencies' experience with participatory planning, as well as regulatory barriers that inhibit moving away from top-down planning methods most common in government agencies (Brown and Kyttä 2014).

In a recent study of how PPGIS outcomes were assessed in Finland and Poland, researchers interviewed land management planners of urban areas to understand their perspectives of the benefits and usefulness of PPGIS in future planning practices. Ultimately, the study revealed that what was most useful about PPGIS approaches for land management planners was the broad outreach and increased collection of diverse public opinion that was made possible through their use of these techniques (Jankowski et al. 2021). Although much of the information collected in these studies in Finland and Poland was not new, the data collected confirmed planners' expectations, thereby leading to more confident decision making (Jankowski et al. 2021). Further collaboration in sense of place research using PPGIS approaches may not lead to restructuring of planning practices, but may supplement expert knowledge, leading to more informed decisions.

Drawing from the various methods for conducting sense of place research, I determined the hybrid approach to data collection to be the most appropriate method to achieve my research objectives. This collection of literature informs my approach of using data collected from interviews to help explain mapping survey results, with the goal being to develop more robust mapping survey questions that can provide a better understanding of sense of place construction. Determining what emotional and sensory types of questions can

be asked in future surveys can help advise land managers about the ways that forest users develop a strong sense of place and this can ultimately lead to more informed planning decisions.

Chapter 4: Methods

This section explains the methods for both data collection and analysis. Data collection methods will be discussed first followed by data analysis methods.

Innovative Data Collection Methods

A benefit of building an interactive mapping tool is the ability to collect large quantities of responses compared to in-person workshops and even some mailed surveys. Similar studies have used web map surveys to collect data from forest users engaging hundreds of participants (Beverly et al. 2008; Brown 2017; Banis et al. 2019). There is no doubt the ability to reach a broader audience is beneficial for PPGIS research, although this study is primarily concerned with integrating meaningful questions about emotional and sensory experiences into interactive participatory mapping projects. Coupled with interviews, the interactive web map survey used in this study served as a guide to explore how the questions asked could lead to a deeper understanding of place and the how wording of questions could evoke experiential responses not often captured in sense of place research.

This approach began with an original research partnership between the Mazamas and US Forest Service. The Mazamas, originally a group of mountain climbers, have a strong interest in stewardship for protecting natural areas for future generations of outdoor enthusiasts (Stewardship | Mazamas n.d.), and were interested in producing beneficial forest use and values analysis to help plan for future management and restoration efforts in Mount Hood National Forest. The first phase of funding provided by the Mazamas supported the development of an interactive web map application survey, an online non-spatial survey, and one participatory mapping workshop. Even though the Mount Hood Forest Use and Values

Analysis project was not concluded, the development of the interactive web map application survey provided a tool for collecting a portion of the data needed for my research. Furthermore, I used the workshop as a way to observe participant interactions with the mapping activity to better inform the questions asked in the web map application and interview process for my research.

The data collection process involved three steps: 1) participants engaged with a web map application survey placing points on up to 5 places of importance and answering questions in a popup pertaining to that location, 2) participants completed a demographic survey, and 3) participants scheduled an interview to further discuss questions related to the places they listed in the web map survey.

Building the Online Interactive Web Map Tool

The first step in the data collection process involved an online mapping tool, which was a web-based application viewed in any web browser. As simple as the web map application looks, this interactive map had multiple components that relied on an assortment of software applications and stored on multiple servers. ESRI's ArcGIS Desktop used in conjunction with ArcGIS Online (AGOL) were the primary systems used to build the web map application. The following sections detail the steps taken to create the interactive online web map survey.

Custom Designed Basemap

The Mount Hood National Forest includes many landscape features and recreation sites that do not appear on standard basemaps such as those provided by ArcGIS. To address this issue, I developed a custom basemap for use in the web map application. The

custom basemap of the Mount Hood National Forest included the following features such as national forest boundaries, state and local parks, designated wilderness areas, reservations, trail heads, trails, lakes, rivers and streams, climbing areas, river put in and take out points, sno-parks, campgrounds, points of interest, peaks, OHV areas, forest roads, roads and highways, and a few surrounding communities for context. By removing most features outside the forest boundary, I encouraged participants to place their points inside the forest boundary to avoid inadvertent point placement outside the forest. Additionally, I removed points placed outside of the forest boundaries in the mapping survey from the final analysis.

I used ESRI's GIS software ArcGIS Desktop 10.6 to build the custom basemap, which had three zoom levels. Point placement accuracy depends on the zoom level at which a point is placed and can potentially introduce error in the collected data (Hitchins 2018). For example, if a participant placed a point on a location when fully zoomed out, upon zooming into the point location, the location marked could be greatly skewed from where the participant intended to place the point. To mitigate some errors in point placement, three scales were used, with each zoom level (increasingly larger scale) having greater detail in feature availability shown on the basemap (See appendix A). Skewed point placement is not completely solved by scalability, although it does limit the errors. In addition, I asked the question on the web map survey, "*What is the name of this place*", to serve as a place identifier in case it was unclear where certain points were placed.

Interactive Web Map Survey

Once the custom basemap was completed, with assistance from my colleague Spencer Keller, I published it as a hosted tile layer on AGOL to quickly render visualization

of the large dataset using a collection of pre-drawn map tiles. A geodatabase was developed to serve as a tool for point creation and collecting survey responses associated with participant's points placed on the map. The geodatabase was then uploaded to AGOL as an editable feature service, which was then integrated with the custom web map application using custom Web App Builder, available from ESRI's suite of products. Finally, the custom basemap hosted as a tile layer and the feature service were combined to create the web map application for the map survey portion of the study. The customized web map application displayed a splash screen upon opening the web map survey to give participants detailed mapping instructions about the general process and details of placing points of places of importance. Editing tools allowed participants to add points to the map and respond to questions about each point placed via a popup box.

For ease of finding and taking the survey, I felt it was necessary to host the web map application on a user-friendly website containing a detailed background of my research goals, as well as steps for participating in the survey and interview process. WIX website builder provided a free and accessible platform to host the web map application. Before participants could proceed with the map survey, they were asked to sign a consent form and agree to take the survey (Appendix B). Once they consented to the survey, participants could begin the web map spatial survey, which was followed by a demographic survey.

Table 2 shows the questions that were asked in the web map survey with the type of field as either open-ended or pre-determined questions and the purpose of asking each question. These questions and responses were compared with the follow up interview questions to evaluate ways experiential questions could be asked in future sense of place mapping surveys.

Table 2 - Questions asked in the online mapping survey

Questions	Field Type	Purpose
What is the name of this place?	Open-ended	This question was important for understanding point placement errors, and what they call the location
What values do you associate with this place?	Predetermined Set of Values: Challenge-Achievement, Ecological, Escape, Fun, Learning, Physical Well-Being, Relaxation, Scenery-Beauty, Social-Family, Solitude, Spiritual, Tradition-Heritage, Wilderness	Participants could choose up to three values for each location
What activities do you do at this place?	Open-ended	This question allowed participants to list any activities they engaged in
Why do you feel attached to this place?	Open-ended	Used to determine what place meanings could be derived from an open-ended question
When visiting this place, which of the senses (sight, sound, smell, touch, taste, or emotion) does it trigger for you?	Open-ended	Open-ended because of the functionality of the pop-up box not allowing multiple choices
What emotions do you feel when visiting this place?	Open-ended	Used as an experimental question to understand what emotions were listed versus what was asked of emotions in the interviews

Online Non-Spatial Survey

Understanding who the participants are in a sense of place mapping study is crucial for evaluating the attitudes and perceptions that different categories of individuals hold about meanings of place. The non-spatial survey that followed the web map survey was a simple Google Form that was embedded in the Mapping Sense of Place study website. Ideally, land managers would want to know a great deal about demographics, affiliated organizations or groups, forest activity, visitation information, activity, or land access to aide in their framework for making land management decisions. The questions asked in the non-

spatial survey were useful for determining whether certain types of sense of place variables were associated with different demographic categories. The questions asked were:

1) What is your gender?
2) When were you born?
3) Select the following you best identify with? (Race/Ethnicity)
4) What is the zip code of your primary residence?
5) How many years have you lived at your primary residence?
6) What device are you using to take the survey?
7) How many years have you been visiting the Mount Hood National Forest?
8) How often do you visit Mount Hood National Forest?
9) Which seasons do you typically visit Mount Hood National Forest? (select all that apply)
10) What type of group are you with when you visit Mount Hood National Forest? (select all that apply)

Interviews

I initially planned to combine an interactive web map application survey, demographic survey, and in-person interviews to collect data, however, I had to restructure my approach due to the 2020 COVID-19 global pandemic and need to restrict in-person interactions. What was gained from this new approach of conducting research provided me with the opportunity to test the use of online interviews for PPGIS research. The interview process collected rich qualitative data by engaging participants in dialogue to improve understanding of the meanings attached to their valued places and experiences listed in the web map survey. The responses to the questions asked in the interview provided further information about ways to integrate emotional and sensory experiential questions into web based spatial surveys. The following questions provided a structure for analysis in this study:

Forest Use Questions:

1) What got you interested in the outdoors?
2) How has COVID-19 restrictions and situations impacted your perceptions of the importance of these places?

Location Specific Questions:

1) When you placed this point, how big of an area or length of trail/river does it represent?
2) Of the senses experienced when visiting this place, which is the strongest and why?
3) Of the emotion(s) you listed for this place, what is it about that place that triggers that/those emotion(s)?
4) In what ways, do these emotions make this an important place? (What memory(ies) make this place meaningful to you?)
5) After you marked this place, you gave it value(s) 1, 2, or 3. What do/does these/this value(s) mean to you?
6) Are there any other values you would have liked to have marked, but that were not there? If yes, what would they be?
7) What type of group are you with when you visit this location? (Select all that apply)
    - Alone
    - Family Members
    - Friends
    - Recreational Clubs
    - School, church, or civic group
    - Tribal members
    - Other

Interviews were conducted over a span of 9 months until the data collected started to repeat the same ideas, reaching a point of saturation. The literature suggests that roughly 15 to 30 interview participants are needed before saturation is reached (Crouch and Mckenzie 2006; Guest, Bunce, and Johnson 2006; Latham 2014). The interviews were organized using Zoom online meeting tools to provide a safe environment for conducting interviews during the COVID-19 pandemic. Each interview lasted between 15 and 60 minutes depending on the number of locations a participant marked in the web map spatial survey. The interviews were recorded and transcribed using built-in speech-to-text tools available with Zoom.

Participant Outreach

I used a combination of purposive and nonprobability sampling techniques, such as snowball sampling, to identify participants that interact with the forest (Guest, Bunce, and Johnson 2006). Snowball sampling is a technique where survey participants suggest others to take the survey, then those suggested are recruited to participate in the survey (Scott 2021).

One challenge of sense of place research is obtaining participants from a diverse range of backgrounds, ethnicities, interests and perspectives. Of course, all perspectives will never be captured, but recruiting a diverse group of participants was my ultimate goal. Participants needed to have familiarity and use the Mount Hood National Forest, so a targeted population sample was necessary. A mix of forest users, such as Hood River Stewardship Crew, Vive NW, Oregon Wild, forestry and timber fallers, Mt. Hood Search and Rescue, equestrian clubs, OHV groups, recreation related clubs, conservation and wilderness stewards, hunting groups, and local sporting stores were just a few of the groups from which I attempted to recruit. Additionally, I advertised the survey on Portland area listservs inviting members to participate.

A few months into promoting participation in the research survey, COVID-19 pushed me to investigate alternative techniques for continued outreach. Prior to COVID-19, the planned outreach methods included recruiting participants through direct engagement at local sporting goods stores, recreational athletic clubs, forest stations, etc. However, creative measures became necessary for recruiting the remaining participants needed for this research, so the outreach method of what I call "Instagram Bombing" came to life. Instagram leverages hashtags and geolocations of photographs that users post to their social media accounts. I created an Instagram account specifically for Mapping Sense of Place in

Mount Hood National Forest and searched for photo hashtags related to Mt. Hood and activities people engaged in there. As I found users who posted photos with the keywords I searched for in the hashtags, I would send them direct messages asking if they would be interested in participating in my research. This proved to be a valuable method for outreach given that over half of my participants were found using "Instagram Bombing".

Data Analysis Methods

I used an inductive approach to data analysis as it was most suited to the nature of the spatial data I collected. Inductive reasoning is a bottom-up approach starting with observations and recognizing patterns in data, then building up to hypotheses and general theories (Cresswell 2013). One type of inductive reasoning is the grounded theory approach, which focuses on the nuances of peoples' experiences to develop concepts and theories, and utilizes a cyclical mode of both inductive and deductive reasoning (Glaser and Strauss 1967; Baxter 2021). Theories generated from inductive reasoning are not based on just observations; in some way they are informed by theoretical constructs as well (Cresswell 2013; Baxter 2021).

One inductive approach in grounded theory involves coding data as an exploratory process for developing new theories (Baxter 2021). To be able to analyze the data collected in this research it was necessary to transcribe interviews and thematically code data to derive common themes from the verbal transcriptions presented in the data. The various interview responses about emotions and senses were categorized into similar groups. These categorical groups were linked with web map survey data to identify spatial patterns and connections that help interpret sense of place meanings. The analyses examined in this research were

grouped into three main themes relating to associations with landscape values, sensory, and emotional experiences.

Values Analysis

I developed a set of landscape values by reviewing the literature and determining values that were specific to Mount Hood National Forest. Table 3 details the landscape values and descriptions applied in this research compared to an example of similar landscape values used in studies by Alessa et. al (2008) and Brown (2012); however, there are more landscape values that have been applied in other studies not listed here. Determining a set of landscape values and possible descriptions used in analysis is an evolving process, ultimately determined by the scope of a project and developed from the specific nature of the study area. These 15 landscape values were used to identify patterns and relationships among the other themes of sensory and emotional experiences. Additionally, a comparison of landscape values and vegetation types of individual places of importance was conducted in attempt to learn whether certain values tended to be associated with a particular landscape type. I used an ArcGIS Spatial Analyst tool to extract values from a LandFire dataset (See Spatial Data References) of Oregon's existing vegetation types and appended those values to the point features collected in the web map survey. However, some additional data reclassification was necessary to reassign vegetation types if the point happened to fall in one cell of a particular vegetation type, but was surrounded by cells of another vegetation type. The reassigned vegetation types for the points were compared to the place name listed by the participant and activities they engaged in to ensure the most realistic representation of related vegetation types for each location and adjusted as needed.

*Table 3 – Comparison of landscape values used in *Alessa et. al and Brown's values mapping studies*

Landscape Value	Description	*Others' Values	*Others' Descriptions
Scenery-Beauty	Ability to engage the senses with the sights, sounds, or smells of nature	**Aesthetic**	Valued for the scenery
Solitude	Allows me to be alone in nature		
Social-Family	Allows me to connect with friends, family, neighbors or community	**Social**	Provide opportunities of social interaction
Tradition-Heritage	Connects me to culture, history, community, or tradition	**Cultural**	Valued because people can continue to pass down wisdom, traditions, and a way of life
Escape	Provides an opportunity to step away from everyday life.		
Economic	Allows me to work, earn an income, make a living, or support my household	**Economic**	Valuable because they provide timber, fisheries, minerals, or tourism opportunities such as outfitting and guiding
Spiritual	Allows me to connect to a force larger than myself	**Spiritual**	Valuable because they are sacred, religious, or spiritually special places or because I feel reverence and respect for nature here
Ecological	Provides clean air, fresh water; habitat for wildlife, fish, vegetation; ecosystem health	**Biodiversity or Biological**	Areas valued because they provide places for a variety of plants, animals and wildlife
Learning	Provides opportunities to discover nature, learn new skills, or gain knowledge	**Learning-Scientific**	Valuable because they provide places where we can learn about the environment through observation or study
Provisions	Allows me to gather food, fuel, materials, or supplies from nature that I need	**Subsistence**	Valuable because they provide necessary food and supplies to sustain my life
Wilderness	Is wild, pristine, or relatively untouched by human influence	**Wilderness**	Valuable because they are wild, uninhabited, or relatively untouched by human activity
Physical Well-Being	Enhances my physical health, provides opportunities for exercise, exertion, movement	**Therapeutic**	Valuable because they make me feel better, physically and/or mentally
Fun	Provides opportunities for enjoyment, excitement, or exhilaration		
Relaxation	Allows me to feel calm, reduce stress, slow down; enhances my emotional well-being		
Challenge-Achievement	Offers a chance for me to test my skills or knowledge, push my limits, accomplish my goals		

Sensory Interpretation

Analysis of the senses experienced were derived from the data provided in the answers to two questions. One question on the web map survey asked, "*When visiting this place, which of the senses (sight, sound, smell, touch, taste, or emotion) does it trigger for you?"* and the other was asked during the interview, *"Which of the senses experienced at this location is the strongest and why?"*. The basic senses experienced at a location helps to interpret what an individual is experiencing, as well as how their experiences lead to understanding more about the other associated variables like landscape values. The strongest sense experienced was interpreted as an individual's most heightened sense when visiting that location. The reasons why a sense was the strongest were coded into sensory triggers for each sense. Although not strictly speaking a sense, emotion was listed as a choice in the sensory questions as a way to determine if emotions could be extracted from an online web mapping survey.

Classifying Emotions

Emotions are valuable for understanding one's sense of place and how places are experienced. Emotions and thoughts are constructs of human experiences and so understanding individual experiences helps us to learn from what one has undergone (Tuan 1977). Emotional experiences can greatly influence the perceived importance of these places. The open-ended question on the mapping survey, "*What emotions do you feel when visiting this place?*" provided a starting point for evaluating participants' emotions. The interview portion of the research further investigated participants' emotions for each important place by asking "*What is it about this place that triggers these emotions?*" and "*In what ways, do these emotions make this an important place?*". Because of the open-ended nature of the map survey question and variety

of emotions that could be listed, it was necessary to create a process for categorizing emotions.

In psychology, there are many theories that inform structures for classifying basic emotions. The emotional structure adopted in this research is modeled after Parrott's 6 basic emotions tree structure, which groups emotions into primary, secondary, and tertiary emotions (Parrott 2001) – See Appendix C. Parrott's structure of basic emotions was edited to reflect the emotions participants listed in the survey and interview. Emotion words were extracted from the responses to the question "*What emotions do you feel when visiting this place?*", and they were compared to emotions in Parrott's structured tree of emotions to build an emotion structure that reflected words participants more commonly listed, as shown in Table 4.

The tree structure of basic emotions starts with primary emotions of Love, Joy, Anger, Sadness, and Fear. Surprise was originally included in Parrott's structure as a primary emotion, however, in this research it was found that Surprise type emotions were more commonly associated with the primary emotion of Joy. I placed Surprise in the tree structure as a secondary emotion of Joy. Secondary emotions are subsets of primary emotions and tertiary emotions are subsets of secondary emotions. This amended emotional categorization structure simplified the process of analysis when comparing emotions with other variables in the data such as senses experienced, landscape types, and landscape values.

Table 4 - Structured Tree of Emotions: Primary, Secondary and Tertiary modeled after Parrott's 6 basic emotions

Primary	Secondary	Tertiary
Anger	Frustration	Confusion
	Irritability	Annoyance | Agitation
Fear	Nervousness	Anxiety
	Shock	Panic | Fright
Joy	Cheerfulness	Accomplished | Achieved | Appreciation | Elation | Gratitude | Happiness Inspired
	Contentment	Aesthetic Pleasure | Calm | Humility| Peace | Pleasure | Relaxed | Satisfaction
	Enthusiasm	Adventurous | Curiosity | Determination | Excitement | Exhilaration
	Optimism	Confidence | Hope
	Pride	
	Relief	
	Surprise	Amazement | Awe | Fascination | Impressed | Wonder
Love	Affection	Fondness | Sentiment
	Desire	Passion
	Longing	Wistfulness
Sadness	Disappointment	
	Neglect	Loneliness | Embarrassment | Isolation
	Sadness	Depression | Grief | Loss | Unhappiness |
	Shame	Regret | Guilt |

The interview responses to the questions "*What is it about this place that triggers these emotions?*" and "*In what ways, do these emotions make this an important place?*", informed the development of three themes for identifying types of emotional triggers. These themes were landscape triggers, experience triggers, and memory triggers. The grouping of emotional triggers allowed for easier analysis with other variables from the data collected, such as types of emotions that landscapes trigger.

Overall, the inductive qualitative approach allowed for comparative analyses between these three themes of landscape values, senses and emotions to develop recommendations for integrating sensory and emotional experience questions into a larger survey for mapping sense of place.

Chapter 5: Results

I interviewed a total of **29 participants** who collectively placed for a total of **138 points** within Mount Hood National Forest (Figure 2). Useable points are points placed by participants that were able to be discussed further during the interview. Approximately 15-18 points were removed from analysis either because participants did not have enough time to discuss all of their locations placed during the interview or the locations were placed outside of the forest boundaries.

Participant Profile

Part of understanding sense of place in the forest is determining whose sense of place is being evaluated and potentially used in making decisions about land management or forest recreation. Of the 29 participants, gender was a fairly evenly divided with participation of those identifying as female at 48% and those identifying as male at 52%. The race-ethnic composition of the group that participated in this research was primarily Caucasian, a group that comprised 86% of the participants. The remaining racial categories of participants included those identifying as Asian (7%), Black/African (4%) and Hispanic/Latinx (3%). Obtaining perspectives from certain marginalized groups, such as indigenous communities, in research such as this would require establishing relationships of trust beforehand and would ultimately need to be organized in collaboration with those communities.

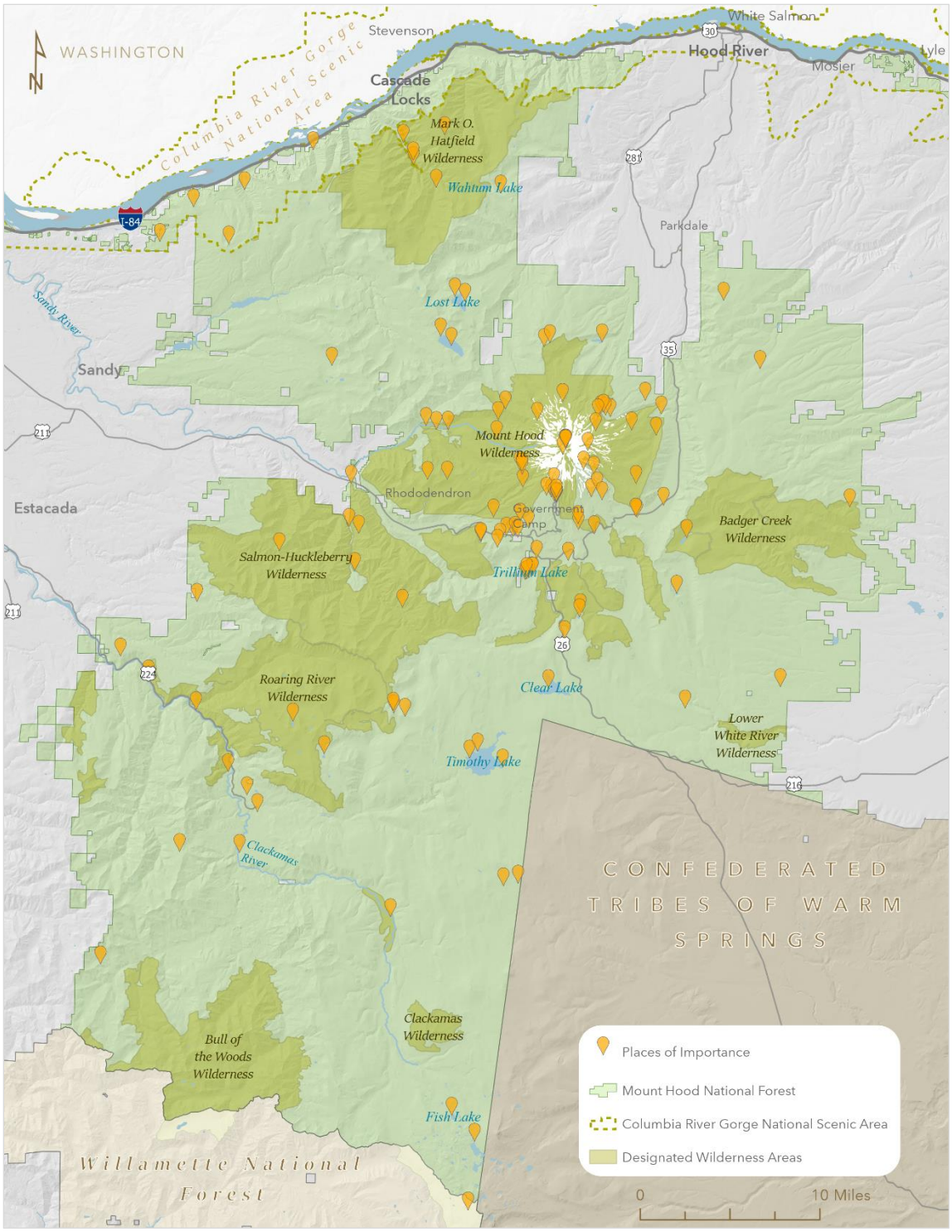

Figure 2 - Overall distribution of participants' places of importance

A large majority of participants were from Portland and surrounding communities of Beaverton, Clackamas, Hood River, Sandy, Welches, Happy Valley, and Madras, Oregon, as well as Vancouver, Washington. All of these communities are within a few hours' drive from Mount Hood National Forest. The furthest travel time recorded from a participant's place of residence in Beaverton to a place in the far southeast of the forest would be approximately three and a half hours. Other participants live in communities within minutes of the forest boundary. Approximately 14% of participants live outside of Oregon or Washington and visit the forest once a year or less, or have recently moved, but had experienced the forest for many years prior to their relocation.

Participants were classified into age groups spanning approximately 10-year increments. The greatest number of participants was in the 46-55 years of age range, with the youngest participant being 26 years of age and the oldest being 74 years of age (Figure 3). Figure 4 displays the frequency of forest use during each season, as well as year-round use. It is apparent from these results that the forest is primarily used year-round with frequent visits also occurring during the summer and winter seasons.

In conjunction with seasonal use, knowing how often participants visit the forest could provide further insight into how they experience the forest. As shown in Figure 5, over half of the participants visit the forest at least once a month or more, with 22% visiting once a week or more. The frequency of use not only speaks to how experience in a place can lead to a strong sense of place, but may also provide land managers with an idea of how important these places are to people based on how frequently they are visited.

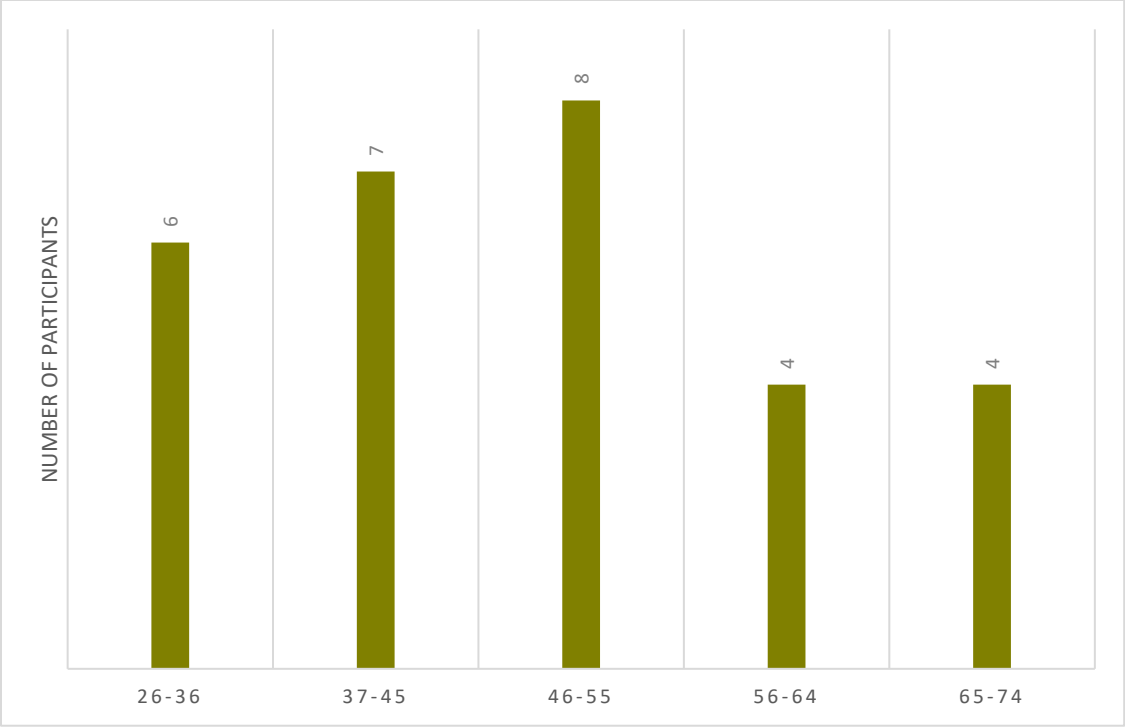

Figure 3 - Age ranges of participants

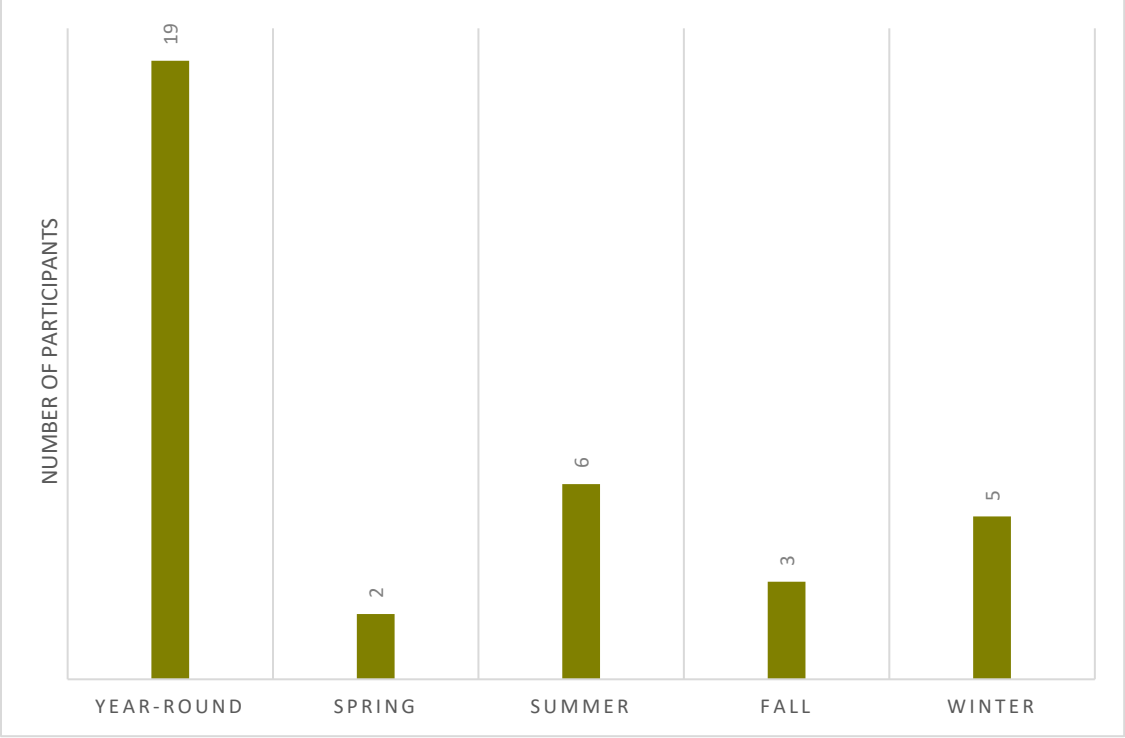

Figure 4 - Season's participants visit the forest

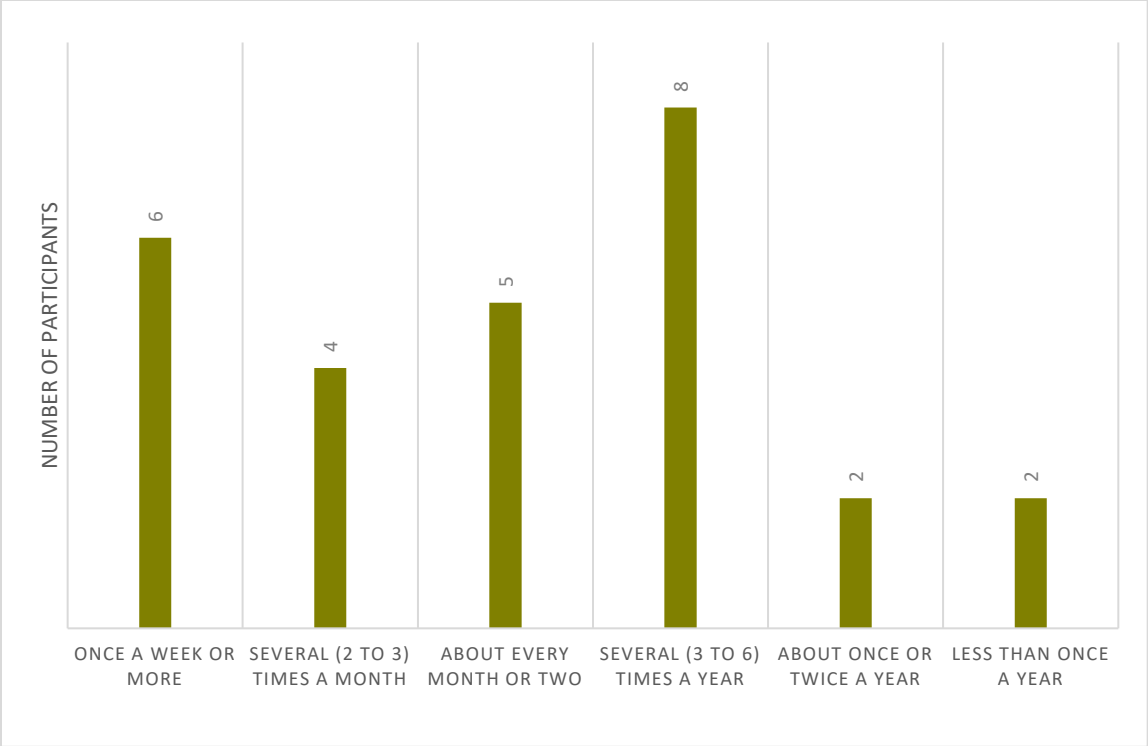

Figure 5 - Frequency of visits to the forest

As expressed earlier, sense of place is developed through experiences with space over time that become endowed with value (Tuan 1977). Another potential factor contributing to sense of place is how long participants have been visiting Mount Hood National Forest, shown in Figure 6 as locations marked by groups with different levels of experience using the forest. There are very few patterns that initially appear upon evaluating the distribution of points placed based on three ranges of years visiting the forest grouped by 1 to 6 years (6 participants), 7 to 20 years (4 participants), and over 21 years (18 participants). It should be noted that length of time experiencing the forest did not coincide with age of participants. For instance, participants who had been visiting the forest from 1-6 years were between 28 and 49 years of age, whereas those that had visited the forest for more than 21 years were between 26 to 74 years of age.

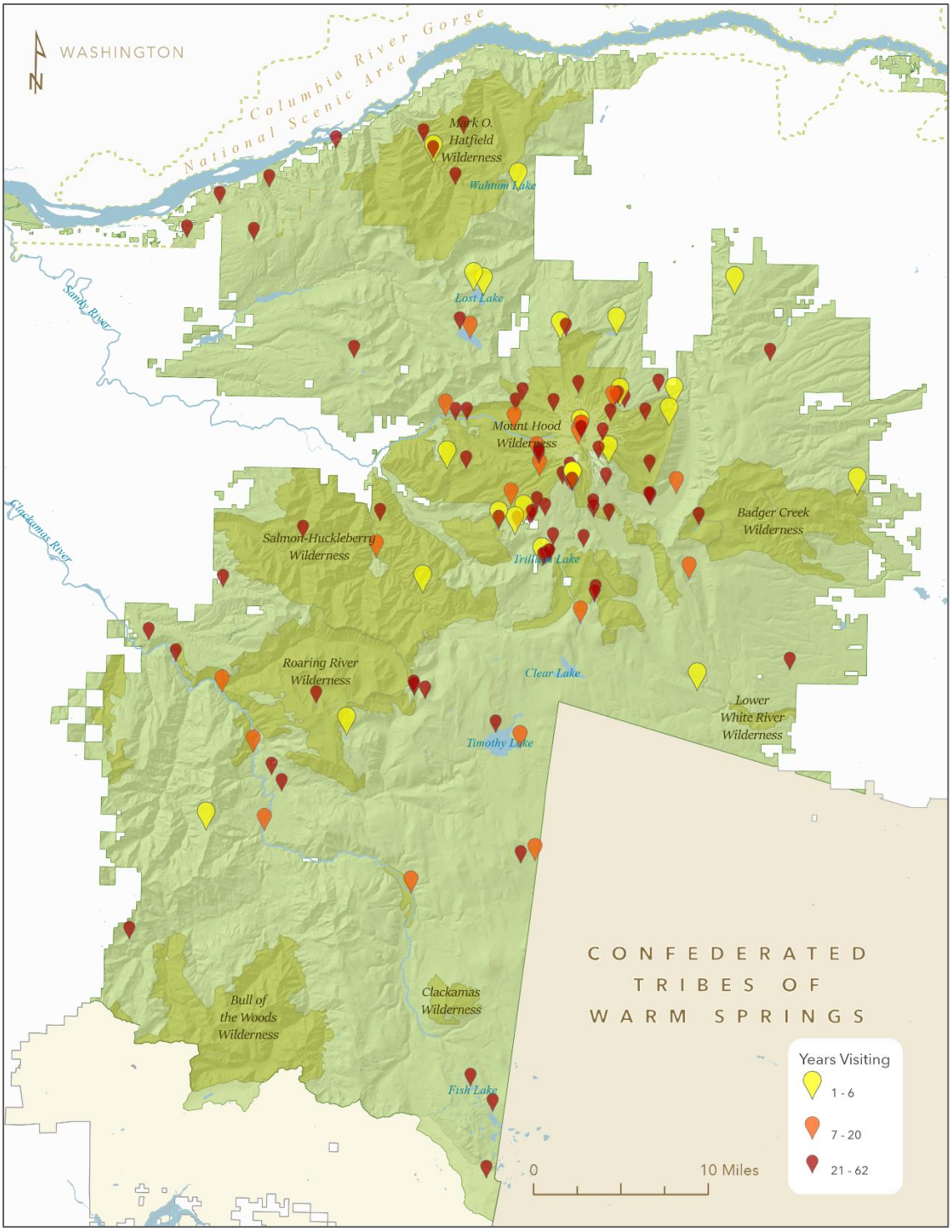

Figure 6 - Places marked by years visiting the forest

The points are generally spread throughout the forest and simply reflect the distribution of specialized recreation. One might expect that participants grouped in the 1 to 6 year range may visit popular destinations in Mount Hood National Forest, which is the case for some of the points placed; however, there does seem to be a pattern of points placed on the flank of Mt. Hood and periphery of the forest boundaries. The 7 to 20 years group tended to be clustered near the center and southwest portions of the forest, whereas the over 21 years group showed a greater distribution of points in the Mark O. Hatfield Wilderness area near the Columbia River Gorge National Scenic Area, but these are not strong patterns.

Values of Meaningful Places

Participants could choose up to 3 landscape values for each location from a list of 15 predetermined values. Figure 7 shows how often participants marked a value associated with places of importance. The top five values were Scenery-Beauty (87), Social-Family (59), Challenge-Achievement (41), Fun (31), and Escape (27). Scenery-Beauty and Social-Family values were most commonly marked by all participants with varying years of experience in the forest. Subsequent values differ widely depending on how recently participants began visiting the forest (Table 5). For instance, the value of Challenge-Achievement is listed 8th by participants visiting the forest in the range of 1-6 years, where it is listed 3rd by participants visiting the forest for over 21 years. Forming conclusions based on the results of the majority of all values listed does not reflect nuances in the order of values of participants ranging in length of time visiting the forest.

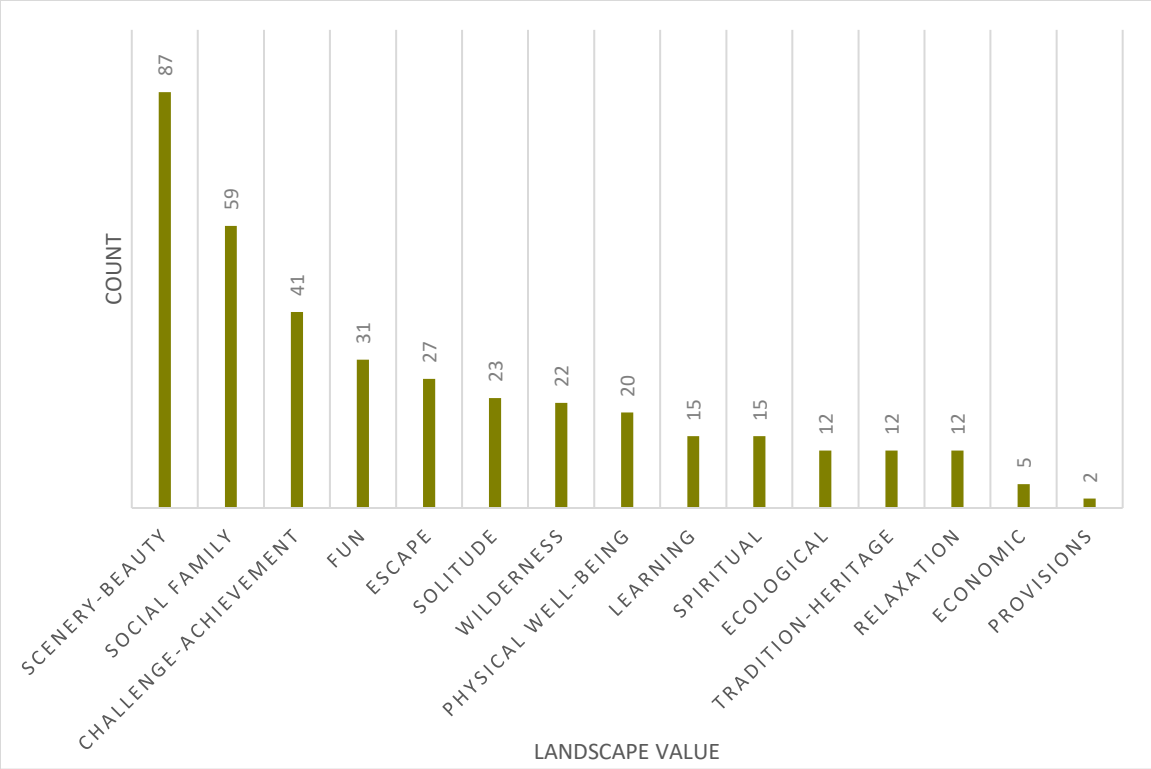

Figure 7 - Landscape values chosen by participants for all locations

Table 5 - Comparative list of differences in values experienced by participants visiting the forest for three groups of year ranges

Values: Years Visit 1-6 (6 participants – 30 places)	**Count**	**Values: Years Visit 7-20** (4 participants – 17 places)	**Count**	**Values: Years Visit 21+** (17 participants – 81 places)	**Count**
Scenery-Beauty	20	Scenery-Beauty	8	Scenery-Beauty	54
Social Family	12	Social Family	8	Social Family	35
Escape	9	Fun	8	Challenge-Achievement	33
Learning	7	Wilderness	6	Fun	16
Wilderness	6	Physical Well-Being	6	Solitude	16
Fun	5	Challenge-Achievement	4	Escape	13
Ecological	5	Escape	4	Spiritual	10
Challenge-Achievement	4	Learning	3	Physical Well-Being	9
Solitude	4	Spiritual	3	Wilderness	8
Physical Well-Being	4	Ecological	3	Relaxation	8
Tradition-Heritage	3	Solitude	2	Learning	5
Spiritual	2	Relaxation	2	Tradition-Heritage	5
Relaxation	1	Economic	1	Ecological	3
Economic	1	Provisions	1	Economic	3
Provisions	1	Tradition-Heritage	0	Provisions	0

Lists of pre-determined landscape values are typically provided to participants in values mapping studies. The values may or may not have a description associated with the values listed. These descriptions are often developed from a researcher's perspective and could potentially hold different meanings for participants. The question *"what do these values mean to you"* was asked during the interview to better understand how participants interpret the value meaning. Most participants' description of values closely matched the provided description, although there were some differences in opinion of how some values were grouped together. Additionally, the question "*were there any values not on the list that you would have liked to mark"* allowed participants to suggest potential value categories that may be of importance, but not included in traditional values mapping categories. Table 6 lists the set of values, associated descriptions, and differences (if any occurred) in how participants described the values.

Differences in meanings mainly occurred in the Social-Family and Provisions values. In the following quote, the participant marked social-family, however, they expressed the location they marked was a social experience they would only share with their friends.

> *"It's always just been with friends on this trip, so it's a time to get together...More of the social aspect, but wouldn't bring my family here."* (Interview 2)

Splitting the value into two separate values, such as Social and Family, could make the distinction between two different senses of place.

Table 6 - Noted differences in landscape values

Landscape Value	Description	Participants' Differences in Description
Scenery-Beauty	Ability to engage the senses with the sights, sounds, or smells of nature	
Solitude	Allows me to be alone in nature.	
Social-Family	Allows me to connect with friends, family, neighbors or community.	Suggestion that these two should be separated
Tradition-Heritage	Connects me to culture, history, community, or tradition.	
Escape	Provides an opportunity to step away from everyday life.	Include escape from routine sounds or sights.
Economic	Allows me to work, earn an income, make a living, or support my household.	
Spiritual	Allows me to connect to a force larger than myself.	
Ecological	Provides clean air, fresh water; habitat for wildlife, fish, vegetation; ecosystem health	Interconnection between ecosystem
Learning	Provides opportunities to discover nature, learn new skills, or gain knowledge.	Learning about self through reflections
Provisions	Allows me to gather food, fuel, materials, or supplies from nature that I need.	Provisions would be better termed forage or subsistence, provisions was a less familiar term
Wilderness	Is wild, pristine, or relatively untouched by human influence.	
Physical Well-Being	Enhances my physical health, provides opportunities for exercise, exertion, movement.	Incorporate mental well-being into description or create a new category of physical/mental well-being.
Fun	Provides opportunities for enjoyment, excitement, or exhilaration.	To feel like a kid or have no cares, responsibilities in the moment
Relaxation	Allows me to feel calm, reduce stress, slow down; enhances my emotional well-being.	
Challenge-Achievement	Offers a chance for me to test my skills or knowledge, push my limits, accomplish my goals	

A very low number of participants associated the value, Provisions, with their place of importance, even though many participants listed activities such as foraging, berry picking, mushroom hunting, and shed hunting. The two participants that listed Provisions

associated their value with huckleberry picking and the Bull Run Reservoir for providing surrounding communities with their water source, but there were 12 locations that were associated with an activity of foraging. The words Forage, Gathering, or Subsistence may be a more appropriate choice for the value instead of Provisions. Although, the problem with the terms Forage and Gathering is that they are activities rather than values. This is not to say that Provisions is not an important value, but perhaps if worded differently it would be chosen more as an associated value.

The Economic value was associated with only two locations, but this is likely because the survey participants were mainly recreationists. Economic may be a value better suited for studies with a higher concentration of employment opportunities in the study area rather than Mt. Hood, with its recreation focus. Values such as Learning provided some insight as to what participants felt contributed to learning experiences. The participants' description of Learning remained consistent with the provided definition, although some participants included that they valued a place as a way to reflect and learn about one's-self, as noted in the following quote.

> *"I will always take that experience I had and make different choices the next time. We learn until the day we stop breathing if you stay open to it and stay humble. You know you will always have these little benchmarks with these little hotspots in your life, where certain things happen and you don't go back and make that same mistake again. So, for me, that's how it breaks down for me in that particular location and that experience."* (Interview 28)

One value in particular, Wilderness, was defined in several ways. Most participants defined the value similarly to the description provided (i.e., wild, pristine, or relatively untouched by human influence). However, of the 22 locations associated with the value, Wilderness, only nine fell within a designated Wilderness boundary. The locations that fell outside a wilderness boundary ranged from 95 feet to 4.5 miles away from a wilderness

border. All but three of the locations mapped outside of the wilderness boundaries are more or less surrounded by designated wilderness areas. This suggests that participants often choose the value of Wilderness not because of its official designation, but for reasons that reflect the aesthetics of the landscape.

Most of the suggested values do not appear in other values categories lists such as, Alessa et. al (2008) and Brown's (2012). The descriptions participants listed for the suggested landscape values are detailed in Table 7. There are similarities between the values Play and Fun, but, one participant who listed Play as a value noted that there is a clear distinction between play and fun, with play being intentional and fun being an outcome from engaging in the experience.

Table 7 - New landscape values

Landscape Value	Description
Emotional Capital	Closely relates to mental and emotional well-being
Play	There is a clear distinction between the value of play and fun, being that play is intentional where fun is an outcome from engaging in the experience
Philosophical	Valued for the fundamental nature of knowing, reality and existence
Restoration-Preservation	Allows me to engage in or appreciate restoration and preservation actions that lead to greater stewardship of the land
Accessibility	Provides ease of access through transportation, convenience, or accessible in engaging in activities
Justice	Acknowledging and honoring the original people of the land and their traditional practices of caring for the land

Many of the participants who belonged to stewardship or restoration groups suggested that the value of Restoration-Preservation could potentially be of importance for understanding why they value particular areas. Justice was on the forefront of many minds and a participant suggested Justice as a value to acknowledge the original peoples' land and

their traditional practices of caring for the land. Even though this may be a possible interpretation of the value Heritage. Accessibility as a value addresses transportation and convenience factors, as well as accessibility to equipment needed for recreational activities and areas of the forest that may or may not provide access to disabled individuals and could be particularly useful for land managers.

Another way of analyzing the values data was through identifying vegetation classification types at each location. Approximately 91% of Mount Hood National Forest is dominated by the vegetation type of conifer forests. The remaining types of vegetation are far less substantial in area, but still important to the composition of the forest are riparian (2.5%), sparsely vegetated (1.5%), and snow-ice (1.2%). The patterns in Figure 8 suggest a few relevant findings pertaining to the relationship between vegetation types and landscape values.

The value of Learning was often associated with conifer forest types, suggesting that conifer forests provide a place for learning about local flora and fauna, wilderness skills, ecological and biological processes, as well as providing a landscape where one can be grounded in for self-reflection. Similarly, the value of Solitude was often associated with conifer forest types and were places where many participants noted they practiced self-reflections and being alone in their thoughts. In contrast, Relaxation, Escape, and Tradition-Heritage were closely associated with open water or riparian environments, which indicates water may be a landscape feature that promotes relaxation or a place that provides a feeling of comfort. The value of Spiritual had a higher association with landscapes of snow-ice than any other value, and the associated points were primarily located around the summit of Mt.

Hood. Several quotes from the interviewees expressed a deep attachment to place and highly value the landscape because it provided a spiritual sense or awareness.

> *"The view of Mt Hood can be seen from almost anywhere in Portland. Growing up here, it was like a visual representation of everything I believed in, watching over my life. To this day, I smile every time I see her. She is the physical embodiment of everything I believe in and have built my life around."* (Interview 25)

> *"Definitely a spiritual feeling just getting near it...sight - views from that altitude, sound - "winds of solitude", emotion - achievement and that spiritual sense that I've just underwent an upgrade - I'm a better person for having achieved the climb."* (Interview 3)

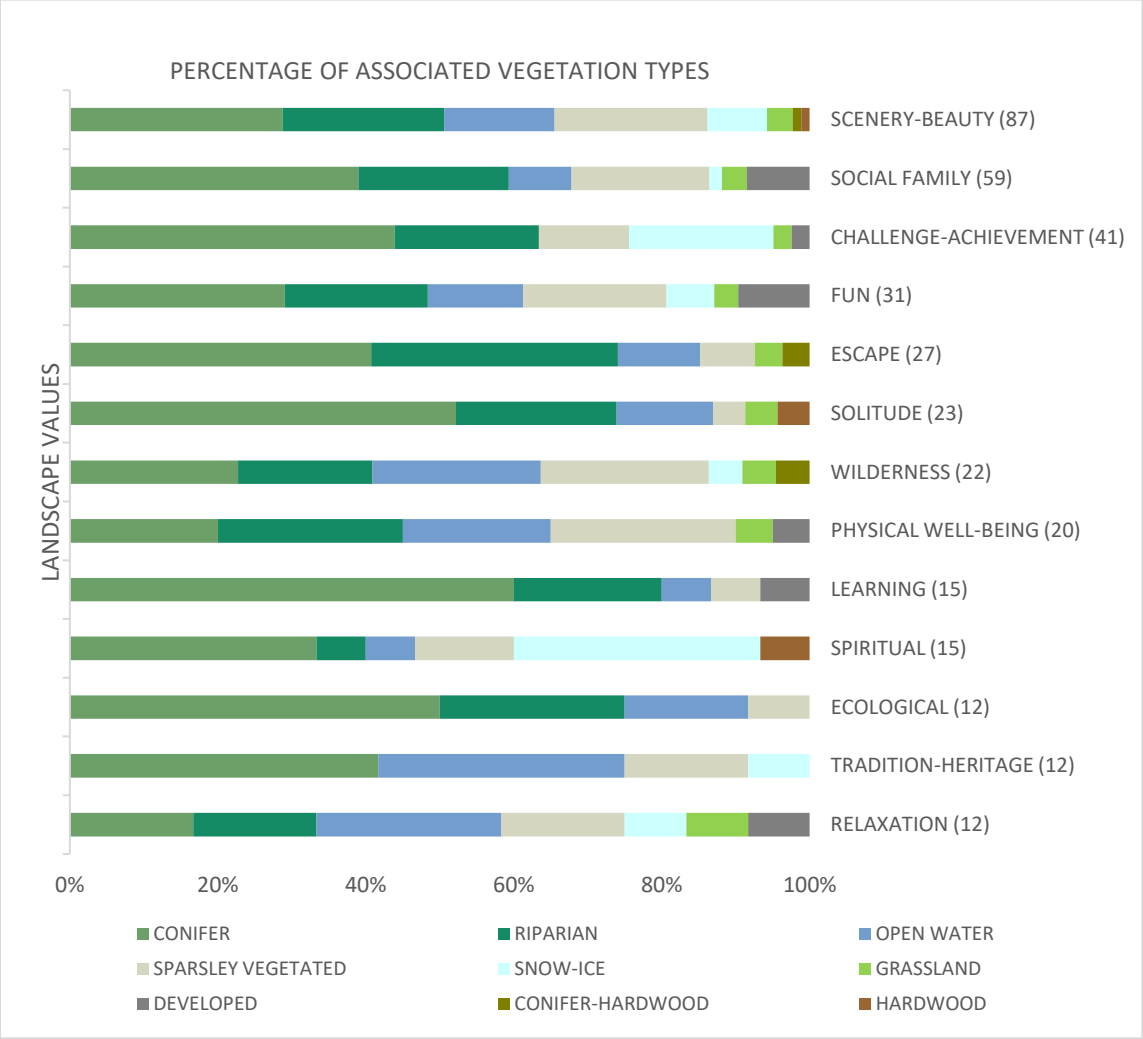

Figure 8 - Vegetation types associated with landscape values

Mount Hood National Forest is a landscape where many diverse activities take place and a large number of points would be needed for statistical spatial analysis. However, it is still useful to know the diversity of types of activities that participants engage in. Figure 9 shows the listed activities, some of which were categorized into groups of similar activity types.

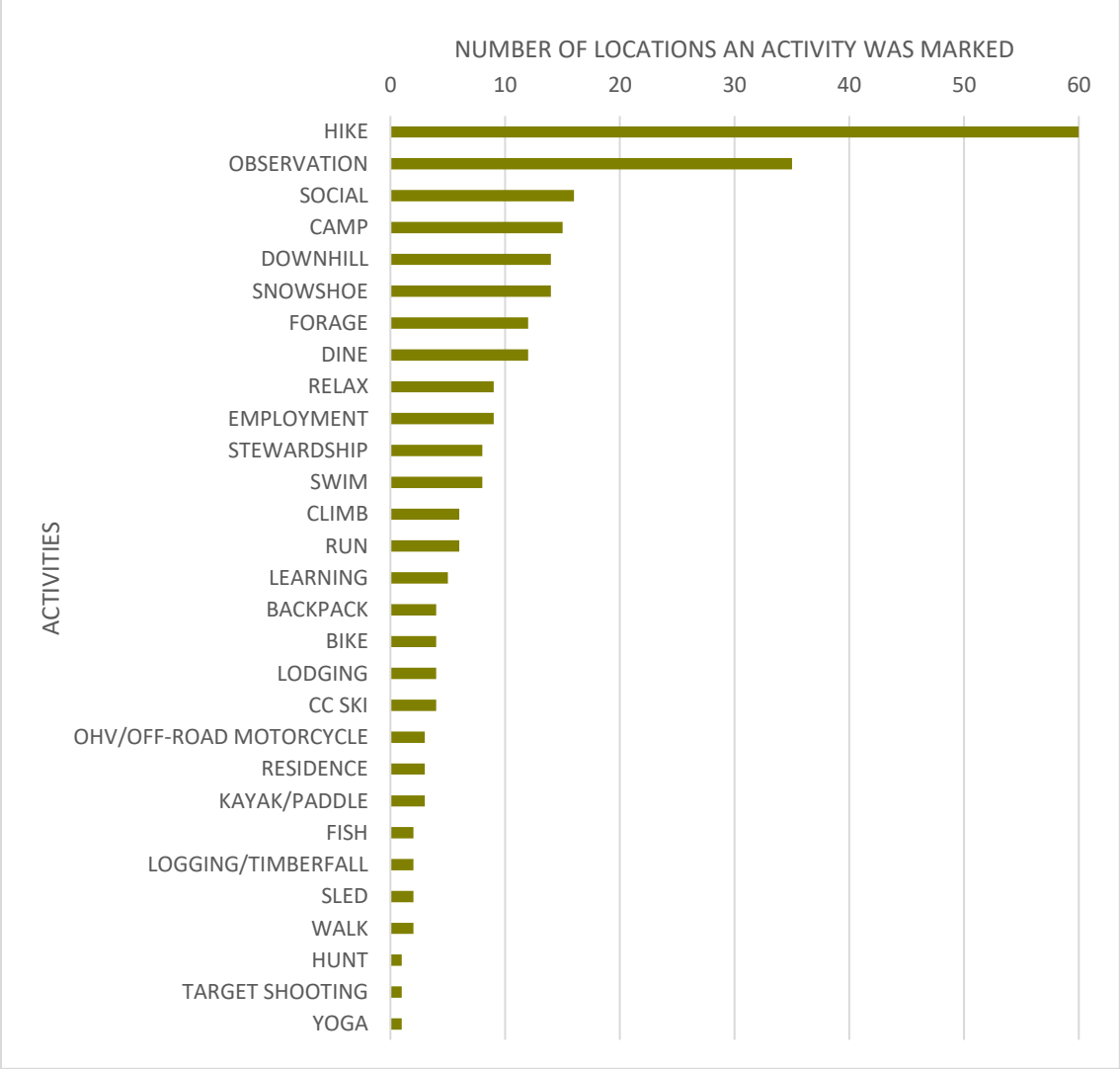

Figure 9 - Activities participants engaged in at their places of importance

The activity categories Observation, Social, Downhill, Forage, Stewardship, Bike and Sled were constructed from related activities, as a way to somewhat minimize the list of singularly listed activities. The grouped categories of individual activities are shown in Table 8.

Table 8 - Grouped categories of similar activity types

Observation	Social	Downhill	Forage	Stewardship	Bike	Sled
Photography	Weddings	Ski	Berry	Trail Management	Mountain	Inner tubing
Birdwatching	Picnics	Snowboard	Picking	Advocacy	Road	Sledding
Wildlife	Gatherings			Restoration		Discing
Observation	Tours		Mushroom			
Listening	Camps		Hunting			
Exploring	Group					
Sight Seeing	Activity		Shed Antler			
Flora	Play		Hunting			
Reflecting						

Hiking tends to be one of the top activities in other human-environment interaction mapping research and that pattern also occurred in this study. However, Observation is second in the list of activities, whereas this category is often less commonly listed in other human ecology mapping studies (Banis et al. 2019). Grouping activities into similar categories of activities can be beneficial for analysis, however, interpretation of these groups can be problematic. For instance, if activities were grouped by level of exertion, such as strenuous or non-strenuous activities, the researcher begins to introduce bias in groupings through a perspective based on individual abilities. Ultimately, the top four or five activity categories provide an idea of how a forest is generally used. Mount Hood National Forest is close to many communities so is amenable to shorter day trips.

Sensory Experiences

Inquiring about sensory experiences in SOP mapping research provides a starting point for accessing participants' memories of place-based experiences. When asking the

question *"what senses do you experience at this location"*, participants mentally seem to place themselves in the location and begin to visualize, hear, and feel what they remember about that place, a process similar to cognitive mapping (McLain et al. 2013). This question alone seemed to spark the imagination of reliving that place and all the details, which was very useful for leading into emotional experience questions. Of the five basic senses, humans are predominantly dependent on sight more than the other senses (Tuan 1974). The senses experienced by participants in this research suggest that sight, sound and smell are most commonly experienced, with sight being the most dominant. While touch and taste were far less likely. Emotion was included in the list of senses experienced as a way of stimulating thoughts about sensory experience, but it was analyzed separately. Additionally, questions asked about the strongest sense experienced and why that sense was the strongest led to understanding more about individual experiences occurring at these locations. From the charts in Figure 10 one can see that 54% of the strongest senses experienced was sight, however, emotion accounted for 23% of the strongest sense experience.

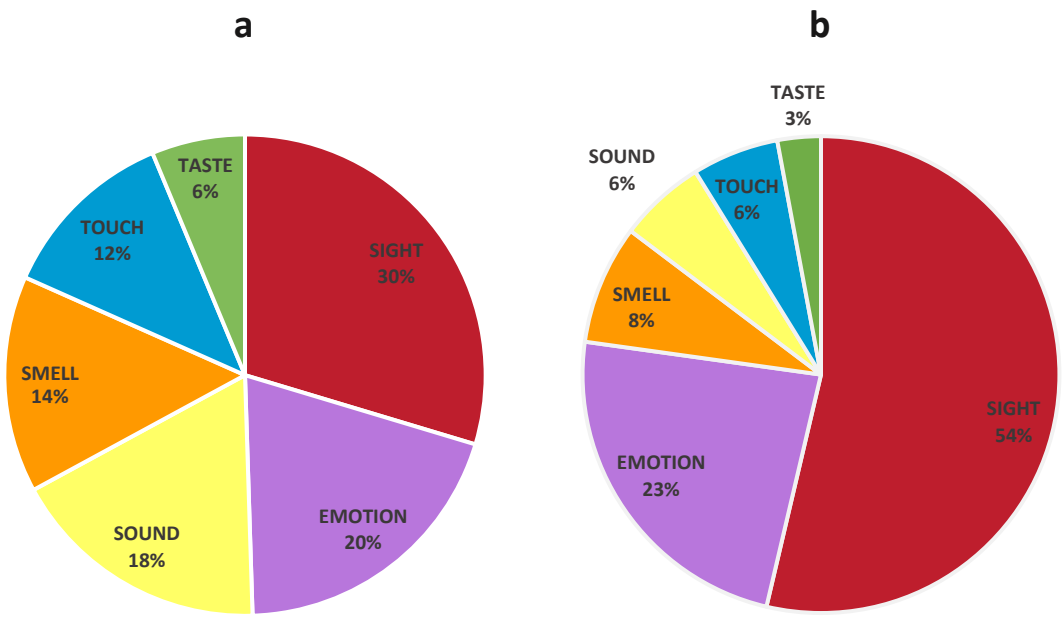

Figure 10 - Percentage of all sensory experiences (a) and strongest sense experienced (b) at each location

The question *"which sense experienced was the strongest and why"* provided some insight into triggers of sensory experiences. Based on the results, the two senses most useful for analysis from a land management perspective would be sight and sound. Figure 11 and Figure 12 show where participants experienced the strongest senses of sight, sound, smell, and touch occurred, as well as quotes regarding why those were the strongest senses experienced. Taste was not included in the figures since only four locations were listed as having taste as the strongest sense experienced.

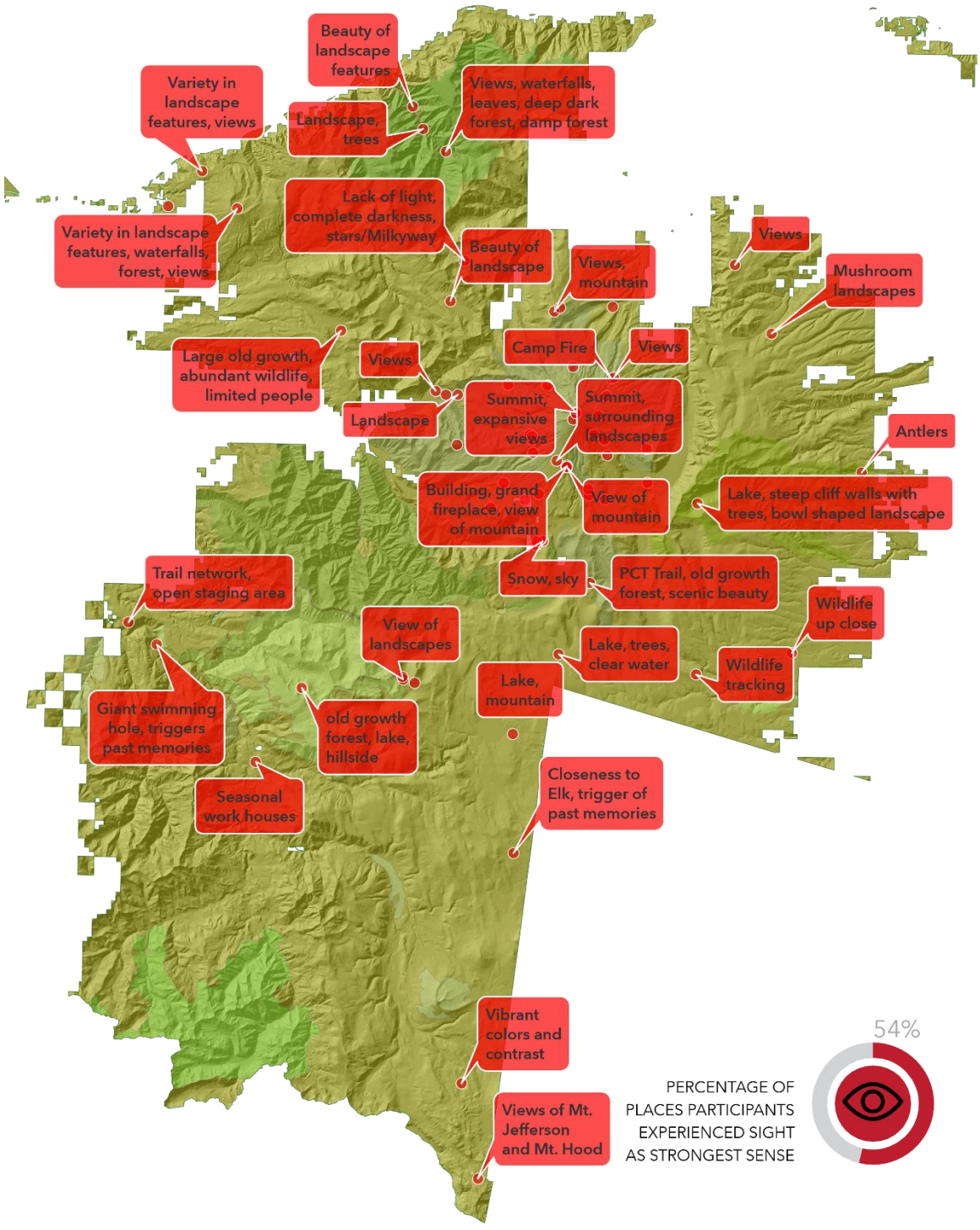

Figure 11 - Places where participants experienced Sight as strongest sense and Sight triggers

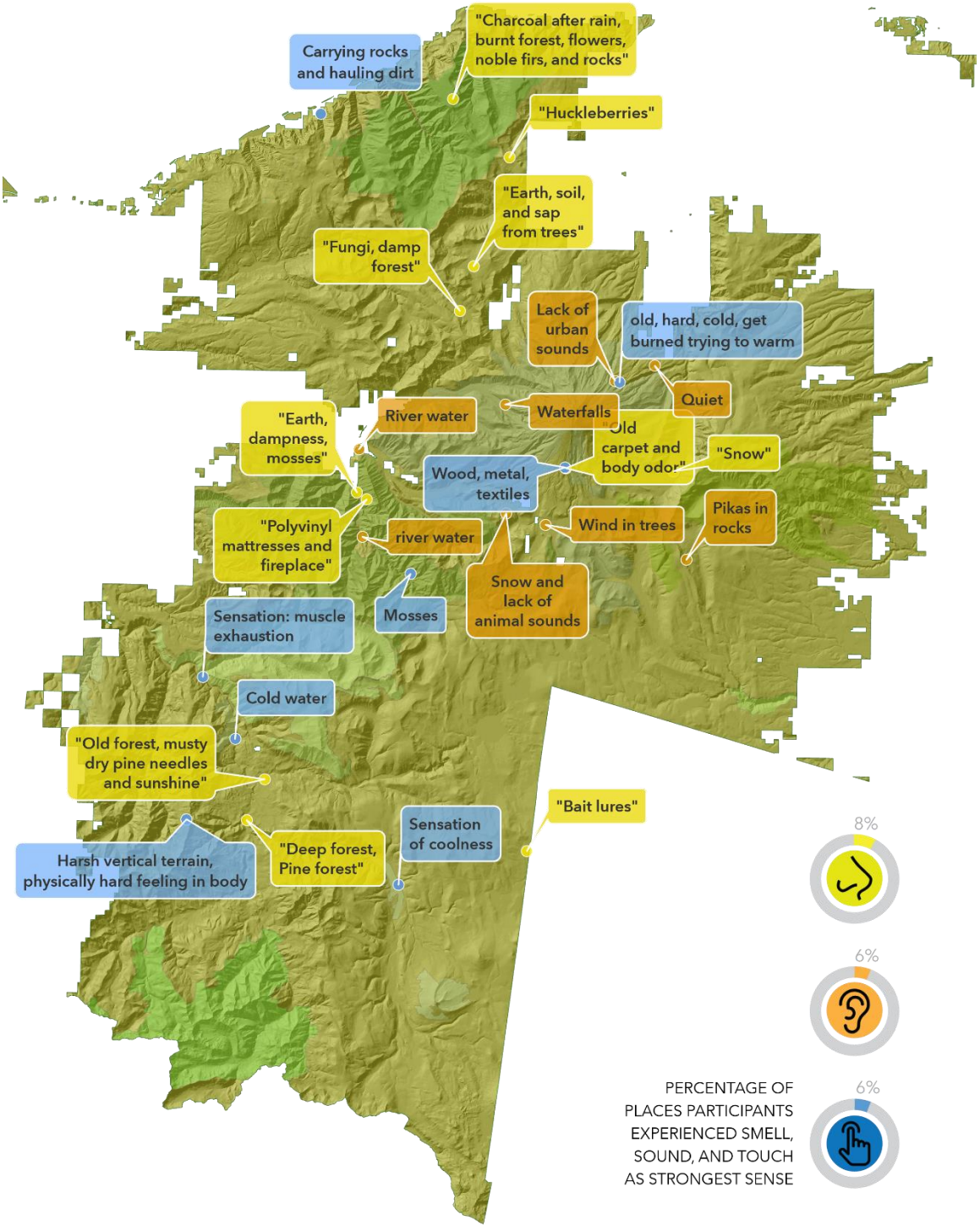

Figure 12 - Places where participants experienced Smell, Sound, and Touch as the strongest sense and Triggers

It was found that senses tended to be triggered by landscape features or objects in the landscape. Table 9 describes frequently occurring sensory triggers, excluding the emotions. These triggers were taken directly from the quotes listed in the map survey and the interview question *"what was your strongest sense experienced and why"* and used to develop the categories of sensory triggers. Emotions and emotional triggers will be discussed in the following section.

Table 9 - Types of sensory triggers

Sight	**Sound**	Smells	**Touch**	Taste
Summit Vast landscape view/scale Campfire Architecture/built environment Mountain Sky or moon People Wildlife Snow Lake Forested terrain Conifer/oak forests River/waterfalls	Wind though trees Lack of urban sounds Quiet People River water Waterfalls Pikas or animals Snow	Sap Earth Huckleberries Snow Minerals Mosses Pine needles Mushrooms Dampness Burnt earth Musty/old smells	Cool or damp sensation Textures of objects Bark Rocks Wood Metal Textiles	Huckleberries Memories associated with eating food/ drinking Negative associations with food because of certain experiences

When comparing all senses experienced at each location to values, a few patterns emerge (Figure 13). Not surprisingly, sight is commonly listed in conjunction with Scenery-Beauty and dominates most other categories. Sound is the primary sense most frequently associated with the value of Relaxation, and is the second most frequently listed sense for places valued for Scenery-Beauty, Escape, Wilderness, Spiritual, Tradition-Heritage, and Relaxation. There is a different pattern occurring for the value of Ecological with smells being listed as the greatest occurring sense group.

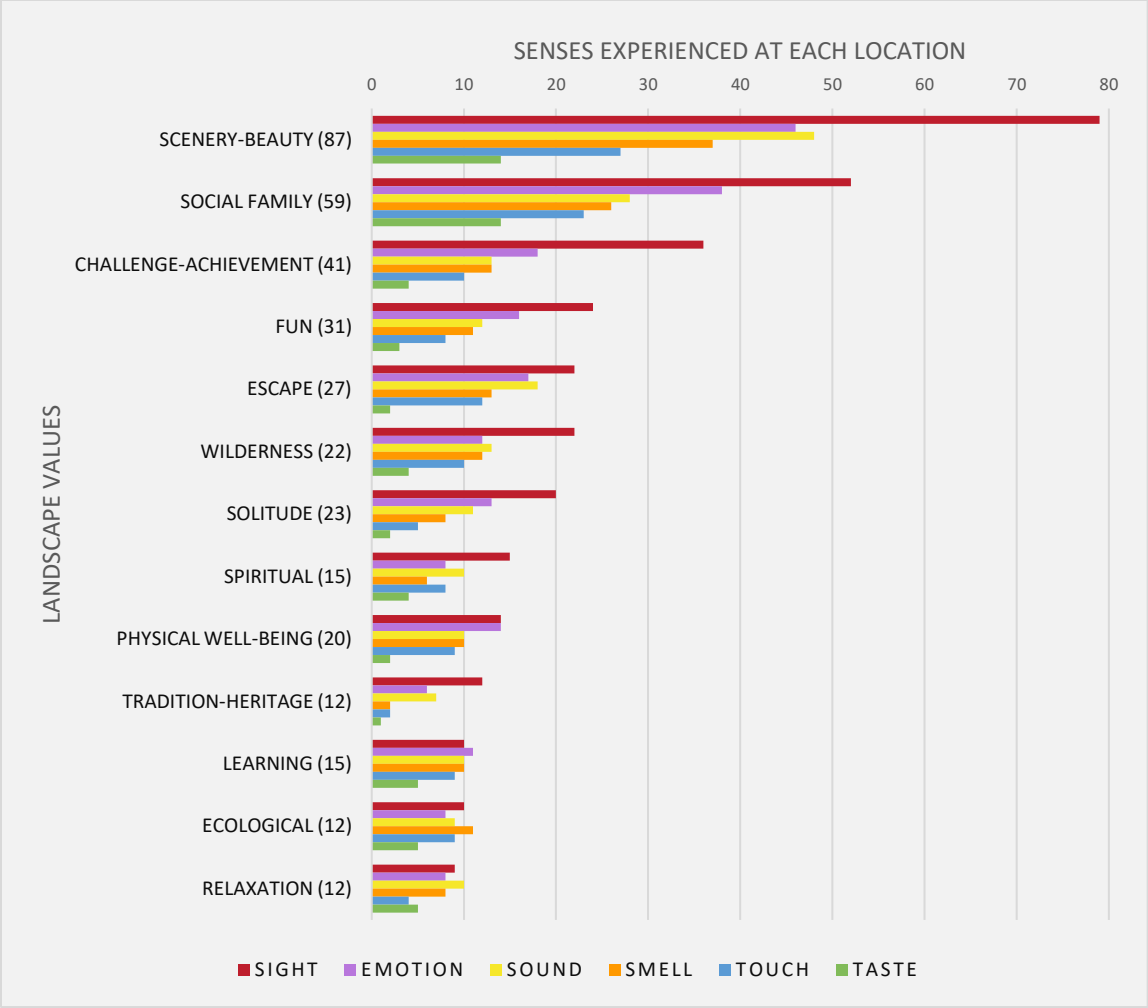

Figure 13 - Senses experienced in association with each landscape value

State of Emotions

Emotions and emotional experiences are one of the most difficult aspects of sense of place to incorporate into land management and recreational planning. The variable and individualistic nature of emotions make it difficult to standardize an approach to understanding and measuring emotions. Additionally, the difficulties that participants may have in recalling how they felt and the stimuli that triggered those emotions, may lead to uncertainty in the details of events that occurred in the past compared to being interviewed

in the moment, such as in intercept surveys. At the same time, distance from the events experienced may provide a more nuanced and less visceral reflection. Ultimately, to evaluate emotions, a structure for making measurements and comparisons needed to be established. Using a model of similarly grouped emotions, I was able to show the relationship of emotions to values, senses and other variables.

A few of the most frequently listed emotions experienced at certain places in the forest were Sentiment (Nostalgia), Joy, Happiness, Excitement and Love. Table 10 highlights the total frequency individual emotion words were listed, regardless of how they are grouped in the emotional tree structure.

Table 10 - Frequency individual emotion words were listed

Primary	Secondary	Tertiary
Anger	Frustration (5)	Confusion (1)
	Irritability	Annoyance (3) | Agitation
Fear (4)	Nervousness (1)	Anxiety (3)
	Shock	Panic | Fright
Joy (22)	Cheerfulness	Accomplished (7) | Achieved (3) | Appreciation (8) | Elation (2) | Gratitude (6) | **Happiness (21)** |Inspired (1)
	Contentment (6)	Aesthetic Pleasure (1) | Calm (6) | Humility (1) | Peace (3) | Pleasure | Relaxed (12) | Satisfaction (6)
	Enthusiasm	Adventurous (4) | Curiosity (8) | Determination (6) | **Excitement (16)** | Exhilaration (3)
	Optimism (1)	Confidence (2) | Hope (1)
	Pride (6)	
	Relief (1)	
	Surprise	Amazement (1) | Awe (11) | Fascination (1) | Impressed (1) | Wonder (5)
Love (15)	Affection	Fondness (2) | **Sentiment (22)**
	Desire (2)	Passion
	Longing	Wistfulness (2)
Sadness (5)	Disappointment (1)	
	Neglect	Loneliness (2) | Embarrassment (1) | Isolation
	Sadness	Depression (1) | Grief (1) | Loss (1) | Unhappiness
	Shame (1)	Regret (1) | Guilt

Some of the emotions do not have a count because they were not specifically listed by a participant, but as part of a grouping of emotion words. For instance, take the word Anger, which had not been directly listed as an experienced emotion; however, Frustration is a secondary emotion of Anger and was listed five times. This allows one to view the nuances in experienced emotions, especially if only the primary emotions are used in other analysis comparisons.

Overall, Mount Hood National Forest tends to trigger positive primary emotions of various types of Joy. Of the 138 places of importance, 124 of those places were associated with the primary emotion of Joy. Following Joy, the emotion of Love was related to 43 locations of importance. Approximately half of the emotions relating to Love had a secondary and tertiary emotion of Affection-Sentiment, which mainly related to emotions or feelings of nostalgia. Several participants described nostalgic emotions as:

> *"It reminded me of living with a community back in Syracuse NY who valued learning from the environment, and renewed interest in how I interact with "natural" areas. It also made me want to try the PCT someday."* (Interview 26)
>
> *"Lots of memories visiting this place - Hood to Coast, hiking the Timberline Trail, skiing, drinking a TERRIBLE old fashioned."* (Interview 7)

Other types of emotions related to the primary emotion of Love were Desire, Fondness, Wistfulness, and overall feelings of Love. While general feelings of Love were triggered by memories, some feelings of Love were triggered by the experiences encountered, such as:

> *"I love the solitude early in the morning before humans are active. I've photographed some incredible sunrises here."* (Interview 21)

The negative emotions of Anger, Fear and Sadness were far less commonly mentioned having an association with 12 or fewer locations for each of these 3 negative emotions. Places associated with the negative emotion of Anger, tended to be related to

annoyance or frustration of other people or other people's actions, such as trash or vandalism. Additionally, the expression of Anger was often associated with one's own frustrations of self or inability to achieve their goals. When negative emotions of Sadness were expressed, these tended to be related to loss of land from fires or what is called solastalgia; being lonely, memories of a lost one, or not wanting to return to a location because of overcrowding. The primary emotion of fear was most closely related to nervousness and anxieties about the unpredictable and often dangerous landscape terrain. Participants expressed fear when engaging in challenging activities or being in a very "wild" landscape setting such as these comments below:

> Nervousness – *"unpredictable how people in the group are going to handle the journey"* (Interview 2)
>
> Fear – *"climbing on my hands and knees because I was experiencing vertigo…fear of laying on a cornice, having a 500 ft drop from the walking path that was 1 foot wide…having anxiety of getting to the top (Mt. Hood Summit)"* (Interview 7)
>
> Nervousness – *"…get too nervous to get too far on the trail because of cougars' presence. Feeling of being too wild to continue on the trail alone."* (Interview 25)

Those who had experienced fear also expressed gaining respect and awareness of the dangers of the landscape, while at the same time experienced pride for having overcome such great challenges, such as summiting the peak of Mt. Hood.

For many, looking at the mountain from a distance is a reminder of the emotions experienced there. These emotional responses were evident during the interviews in the participants' body language and tone when they were describing how they felt. The detailed descriptions obtained from the interviews pertaining to emotions experienced at the marked locations, are part of the piece to understanding how people create a sense of place in Mount Hood National Forest.

Upon investigating the responses to the interview question *"What is it about this place that triggers these emotions?"*, I found that emotions were triggered by either landscape features, past memories, or experiences at their places of importance. Physical landscape, wildlife, flora and fauna were types of features aggregated into the *landscape feature trigger*. *Experience triggers* pertain to the overall experience of being at the place, such as activities engaged in or social interactions with people while being there. Lastly, feelings of nostalgia, reflections, or memories of past events, people, or activities were aggregated into the *memories trigger* category. Out of all the points placed, 40% of the emotions were triggered by landscape features, 35% were triggered by experiences, and 25% were triggered by memories (Figure 14). What's most influential for land management in the connections between emotions and triggers is understanding how triggers relate to landscape types and experiential activities or interactions.

The rich interview dialogue provided insight about participants' emotional experiences and triggers of their emotions. Without this dialogue, determining the underlying reason(s) people experience certain emotions in the forest, may not have been possible. Responses to emotion-based questions like these can't be captured in an online survey:

> *"The snow was knee deep and I just jumped in it like a puppy…just running through snow, I just felt invigorated, felt like a puppy. I just had a pure sense of joy playing in the snow. We went to the east coast because of a good job opportunity, but I really missed the topography and the way that nature looks in the Pacific Northwest. And so, you get there (Timberline Lodge) and there's a massive volcano right there. I was just taken aback and overwhelmed, and felt a strong sense of nostalgia for things I used to do, just great gratitude, excitement, joy and all these other emotions…All the sights feed into a strong emotional experience of feeling like, here I am again in the Pacific Northwest that I missed a lot. The emotional experience felt very visceral. Deep, deep, deep in your heart, soul and mind."* (Interview 20)

"The emotion of being able to make a difference for somebody. Having pride because we provided a service, me and my three team mates, hiked up in the middle of the night across country on snowshoes and found some people. And, pride that we had the ability. And that's where the determination comes in. We said no matter what we are going to find these people, and there is no feeling like when you're out in the middle of the wilderness in the middle of the night, snowshoeing, calling out their name, and then they call back to you." (Interview 28)

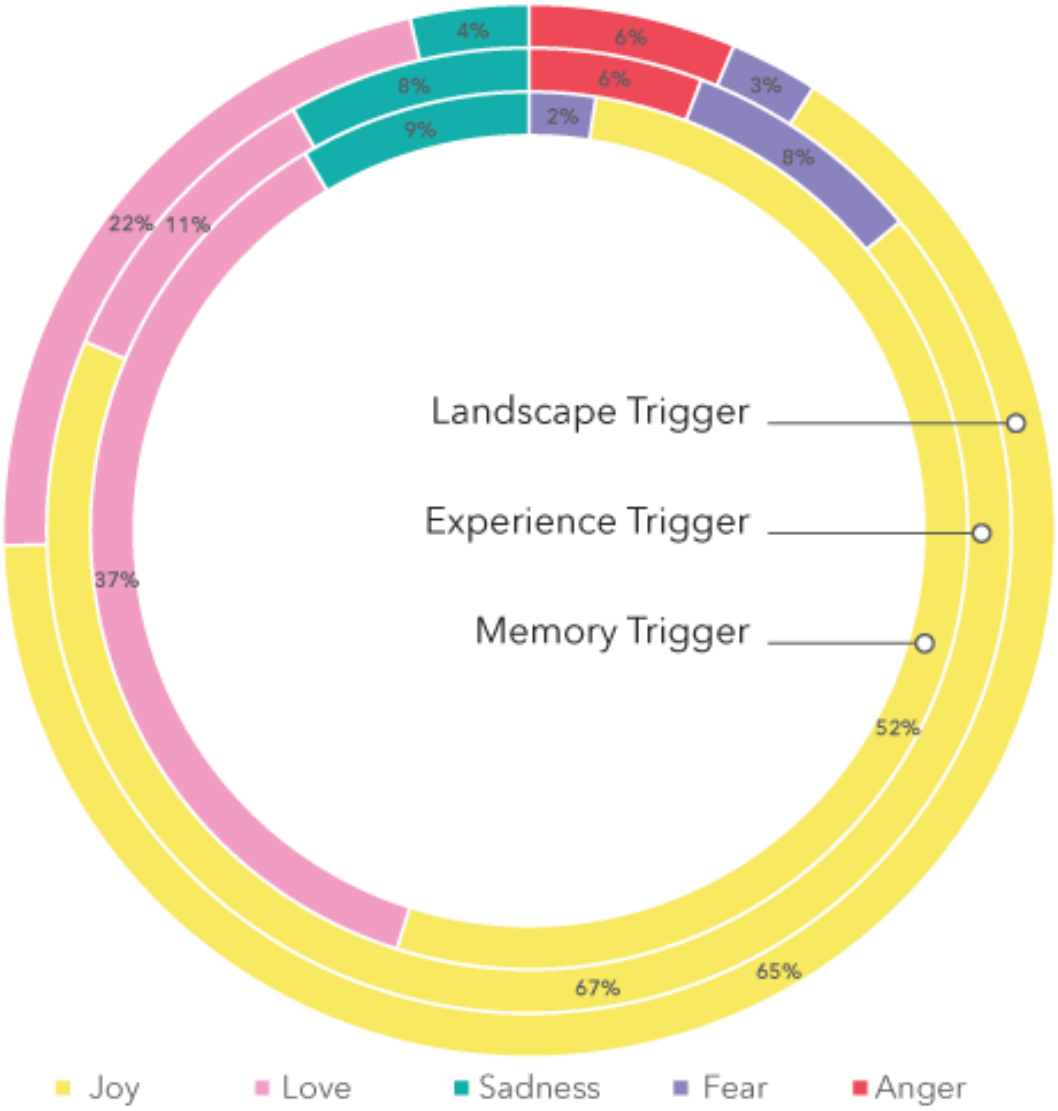

Figure 14 - Emotions experienced and associated types of triggers

Comparing the types of emotions experienced to the values listed for each location was another approach I used to understand the connection between values and emotions. Although the emotion of Joy was the most commonly expressed emotion, looking at the least expressed emotions related to values can help describe the feelings people experience in these places, as well as identify connections to certain values. Figure 15 displays the variety of primary emotions associated with each value type, as well as the frequency of those emotions. The value of Spiritual is associated with Fear more than other values. If you remember the relationship between the value of Spiritual and the vegetation type of snow-ice, there were a number of people that experienced fear at the summit of Mt. Hood, as well as a spiritual sense. Also, the value of Challenge-Achievement is rarely associated with the emotion of Love, and has more of an association with Fear and Anger than some of the other values.

As mentioned previously, Anger tended to be related to one's frustration with self or physical inabilities of accomplishing their challenge. I found that participants who listed Sadness as an emotion often visited these locations to be in Solitude and grieve lost loved ones or grieve lost landscapes, as shown in the following quotes:

> *"My Mom, Grandparents came to Wildwood [Huckleberry Mountain/Boulder Ridge Trail]. I came to this trail the day after my Mom passed."* (Interview 24)
>
> *"It [Riverside Trail] has since been burned in the Riverside Fire of 2020. Haven't been able to visit. I feel sadness but also curiosity to visit as soon as possible and see how much it was changed."* (Interview 25)

Connecting emotions with related landscape values can provide insight as to the diverse reasons why people value these locations, rather than assuming people feel the same way about a particular value.

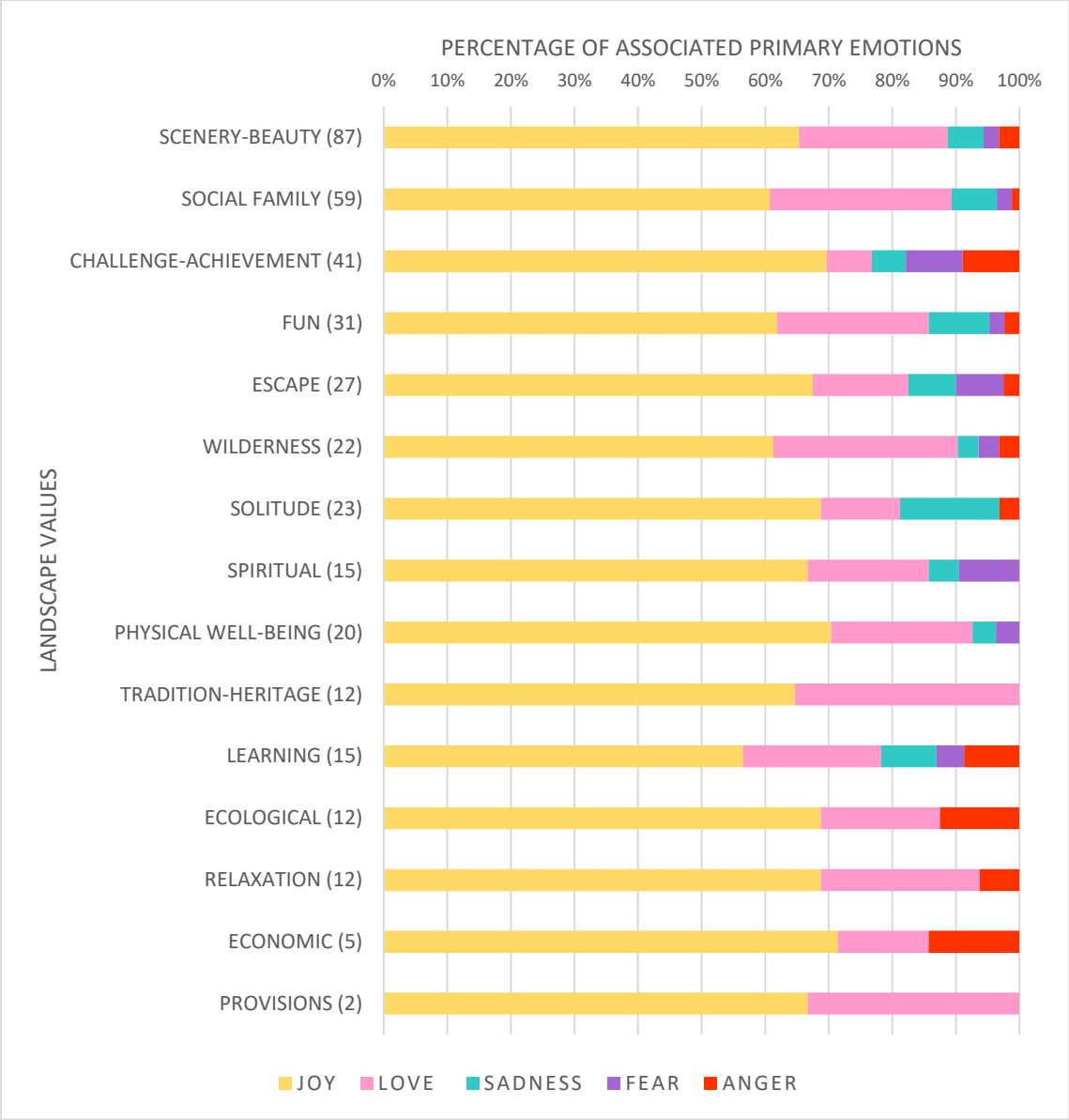

Figure 15 - Percentage of emotions experienced associated with each landscape value category

The conclusions formed from the results of my research show promise of innovative techniques that can be implemented in sense of place mapping to enhance the understanding human landscape interactions and place meanings. Further development of these techniques to integrate questions of experienced emotions and senses in future mapping surveys is discussed in the following chapter.

Chapter 6: Discussion

The methods I used in this research aim to improve sense of place and values mapping by incorporating better understandings of participants' emotional and sensory experiences in landscapes. There were two main lessons learned from simultaneously conducting surveys and interviews that can be applied to future sense of place research. The first lesson is the nuances of sense of place learned from this study and the second lesson is what types of emotional or sensory questions could be asked in SOP mapping surveys. The rich personal narratives captured by interviews were useful in understanding how to simplify these complex concepts that could be evaluated for the future of successful land management planning.

Lessons Learned about Sense of Place

The following sections about first experiences with the outdoors, differences in length of time visiting a place, landscape values and vegetation types, sensing the senses, and unpacking emotions provide examples of how these analyses help to provide a better understanding of sense of place and evaluating alternative ways to approach analyzing the collected data.

First Experiences that Create Lasting Impressions

Leading the interviews with the question, *"what got you interested in the outdoors?",* sparked responses in most participants that brought them back to a place in time where someone or something influenced their love for the outdoors. Such as in these responses:

> *"Well, I grew up in southern California, where I didn't really have outdoors, I mean as in the city. My grandmother she liked to travel and she liked to take us places so, she always took us to places that were in nature. So, she kind of sparked my interest in that as a child and then, as I got older, I realized that nature was a very important part of my life and if I didn't have it, I didn't feel grounded or have a sense of place in life. Which it's really strange how I ended up on Mt. Hood. My grandmother my mother had taken a trip to Mt. Hood and they went to Timberline Lodge and did the whole thing, not with me by themselves, and they came home with these place mats. And, I sat and ate my meals that these place mats for like a year and then I just decided one day that I was going to move to Mt. Hood. And so, and I did that by myself at 20 with no place to live, no friends, no job, no connection to the place at all, never been there before. And it all just unfolded in such a beautiful way that I mean I'm still here 23 years later, so."* (Interview 29)

> *"My uncle, he used to take me hiking all the time as a kid, we climbed to the top of South Sister mountain when I was about 15 in Central Oregon. And then just growing up, even as a grade schooler, he taught me how to backpack and how to cook on a camp stove. So, I was his cameraman and he was a professional photographer … he sold his work and he did a lot of landscape and wildlife photography, so we climbed all over Mount Hood Wilderness, in Mt. Rainier, and all kinds of different places."* (Interview 8)

> *"I have always loved the outdoors. My family and I would go hiking every chance we got. We would just go to the same trail, but we would just go out there like as often as we could. We went through several years of going like almost every weekend. I don't think I appreciated it as much, I was kind of like a teenager and I just thought 'I gotta go to the same trail again' … but, I did … start to appreciate it after some time. Just getting that time with my family, especially, was really like invaluable now that I look back on it."* (Interview 18)

Igniting these memories seemed to put participants in a position where they were more in-tune with their emotions when discussing their places of importance in the interview.

Throughout the interviews, I found myself wondering how do these first experiences with the outdoors inform one's sense of place in any outdoor landscape or public lands. The majority of the participants remembered their first impressionable experiences with the outdoors as children (21), with a few expressing first experiences as a teen (5), young adult (2), or adult (1). Understanding how they were introduced to the outdoors was of interest as well. Half of the participants were introduced to the outdoors through family trips or forest related activities (12), while others were inspired by growing up near Mt. Hood (6), through education (i.e., higher education, homeschooling), mentors, or group activities (6), through

upbringing on a farm or in rural forested areas (5), from a related family member like an aunt, uncle, or grandparents (3), by photos or visual representations of landscapes (3), or experiences introduced by friends (2).

Now the question is, how does this relate to sense of place? Obviously, experiences introduced in childhood leave lasting impressions that continue into adulthood. Furthermore, family trips and educational experiences become deeply engrained in a person's path to creating sense of place in the outdoors. Perhaps forest and land management could glean from this analysis that more efforts in promoting outdoor engagement could foster a sense of care and stewardship of the environment for future generations. Further research might explore the following questions. How do prior experiences with the outdoors influence the choices people make in connecting with the forest? How might experiences and values differ in those exposed to the outdoors at a later age than those who were immersed during childhood? The value of these questions should not be overlooked, but integrated in understanding the connection forest users have with places.

Key Differences in Length of Time Experiencing a Place

An attribute that is rarely explored in values mapping, but which was found valuable in this research, is the length of time a participant had been visiting the forest. The values associated with a place varied depending on how long a participant had been visiting the forest. These differences could be incorporated into future values mapping analysis as they describe variances in patterns of values that may not be reflected in the overall trend in values, in this case neglecting the values of those newer to experiencing the forest.

Additionally, it accommodates multiple perspectives rather than just reporting the majority (McLain, Cerveny, et al. 2017).

Landscape Values and Vegetation Types

Understanding vegetation types associated with importance places and how they directly correspond to contributing to the values people hold for these places, could help promote stewardship and conservation of these types of important landscapes. Landscape types that may be important to evaluate in association with certain values are those that are in or near open water or riparian types of vegetation. As demonstrated in this study, these types of vegetation are closely associated with the values of Relaxation, Escape, Tradition-Heritage, Ecological and Physical Well-Being. Recognizing this connection between values and landscape types of specific places provides some guidance to managing areas in the forest that tend to be highly valued.

Sensing the Senses

The analysis of senses experienced at individual locations in association to landscape values demonstrated how certain senses tended to dominate other senses. The results can be interpreted as informative knowledge in planning decisions that may have an influence on visual or auditory experiences.

Senses experienced also play an important role in understanding an individual's sense of place. Senses experienced evaluated on their own are somewhat predictable, however, when combined with other variables provide a more holistic understanding of experiences are presented. One example is where sound is listed more frequently than other senses. Looking at Figure 13, one can see that sound is listed frequently for values of Escape,

Wilderness, Spiritual, Ecological, Tradition-Heritage and Relaxation. If sound is an important quality in contributing to one's sense of place in these locations, planners may want to be aware of these experiences so as to not develop certain activities or types of infrastructure that would disrupt these senses. Evaluating senses in relation to values further enhances the ability to understand why and how people experience and value the forest for various reasons.

Even though sight will most likely be the dominating sense experienced in places, it is still important to know where visual experiences are particularly valued in the forest. Similar to sound, if drastic alterations were implemented in the landscape, such as clear cuts, the visual value could be greatly diminished. Knowing where places are valued visually can help land managers avoid potential conflict or negative feelings toward those places. In contrast, senses such as taste and touch are not as useful as sight and sound in analysis for land management planning. Additionally, the sense of smell is not be particularly useful in land management, although associations with other variables such as vegetation types and values would be more advantageous for understanding any commonalities.

Unpacking Emotions

The results of primary emotions experienced by participants were not surprising. The majority of emotions were very joyful experiences. However, when evaluating emotions in relationship to values, landscape types, or other variables, they proved to be a significant factor in contributing to a better understanding of individuals' sense of place. Negative emotions although not commonly noted of Sadness, Anger, and Fear could be a very informative variable for knowing if certain locations in the forest may need more attention.

Or perhaps, sacred areas people are closely attached to need more protection from being disturbed. A similar question related to perceived threats was asked in the Central Oregon Forests and Grasslands study, and was useful to the Forest Service for addressing places where people tended to express negative feelings about certain locations (Banis et al. 2019). Further research could include a variety of combinations that investigate the relationships between landscape types and emotional triggers, or why participants tended to have negative emotions and what triggered those emotions.

Integrating Emotional and Sensory Questions into SOP Mapping

Upon reflection, integrating emotion questions into sense of place mapping draws participants away from answering questions based on the activities they engage in at those locations, to a deeper exploration of why and how they value those places. There may be no way to fully understand peoples' emotional and sensory experiences of place, yet their rich stories of reliving memories and experiences with those places helps to provide a better understanding of why they are important. Telling your story to someone of how and why places are important to you, prompted emotional responses as participants relived their emotions through memories and immersed themselves in the senses experienced. As a researcher, I felt their expressed emotions through the interviews, and related my own similar experiences of feelings to theirs at certain places. The interviews in this research provided crucial information for forming conclusions to apply to future research, which may not have been possible without provoking feelings captured during the interviews. Although this particular approach to data collection is not feasible for most projects, integrating some

aspects of emotional and sensory types of questions into large scale projects is certainly possible and could be quite useful.

The online mapping survey proved to be successful in obtaining recalled memories of emotional and sensory related information from participants. The interviews further informed the mapping survey responses to better understand participants' experienced emotions and senses. Overall, the findings in both the mapping survey and the interview led to conclusions of what types of questions could be integrated into a larger mapping survey and which questions were best left for interviews.

Although this study was not focused on the social psychological component of emotions, further work in understanding emotion structures related to landscapes could benefit future SOP mapping assessments. One limitation in this research was relying on the participants' ability to recall details of experienced emotions and triggers of those emotions from past visits to the forest. As each individual differs in how they perceive an experience, these perceptions may vary if a survey was conducted in the field rather than in a recall survey format, such as this one. Additionally, performing intercept surveys to gather data on emotions experienced during a visit, may lead to responses with greater details regarding emotions experienced, landscape triggers, or sensory stimuli, since those experiences would be fresh in the participant's mind. On the other hand, intercept surveys are time-intensive and respondents may not be willing to devote enough time for thoughtful responses.

After evaluating the words participants listed as emotions experienced in the online mapping survey, it was clear that experienced emotions at each location may be better suited as a choice from a picklist if using an online survey for data collection. During the interview following up on emotions experienced, it was often noted that emotion words were difficult

to produce for some participants. Participants would be describing their stories and take a moment to search for emotion words that better explained how they felt at that location. Often times answers to emotion questions were not emotions, rather thoughts about a place. From a psychotherapist's perspective, it is common for people to use thinking words to describe their feelings rather than emotion words (Personal Communication – Judith Swanson LCSW, 2021).

For future sense of place mapping studies, adding emotions experienced questions using a pre-determined set of emotions, like the secondary or tertiary set of emotions, is recommended. Questions like "*what emotions do you experience at this location*" would be easy to incorporate in an online web mapping survey and best answered using a predetermined set of responses, along with an option for adding free form information. Providing a list of emotions participants could choose from would be beneficial for clearly defining their emotions, as well as the researcher's ability to more clearly interpret those emotions during analysis. The set of secondary or tertiary emotions developed in this research could easily be adopted in an online or paper map survey. Of course, this picklist would need to be evaluated in different studies, just as landscape values have been evaluated.

The questions pertaining to "*what is it about this place that triggers these emotions"* may be best left open-ended and interpreted similar to interview responses. I found that some questions in the online survey such as, "*why do you feel attached to this place*", provoked similar responses in the follow up interview when asked "*what about this place triggers your emotions*". These similarities in responses led me to believe that open-ended questions on a survey could be a useful alternative for when interviews are not possible. However, research containing a larger number of participants would ultimately lead to longer times to analyze

the data. Providing a list of emotional triggers such as the ones aggregated in this research (landscape features, experience, or memories) could be a valuable option for understanding the relationship between emotions and triggers in larger surveys. The disadvantage of providing a list of emotional triggers is the loss of detailed descriptors of each trigger, such as the details captured during the interviews about emotional triggers.

Other questions that could easily be asked in an online or paper map survey using a pre-determined list of responses would be "*what basic senses do you experience at this location*" and "*what is your strongest sense experienced*". The follow up question *"why is that the strongest sense experienced"* could lead to complex responses when using an open-ended question form, leaving room for interpretation and analysis. However, one way to mitigate the interpretation of that open-ended question is to use a categorized list of sensory triggers that could help identify features that trigger the senses, such as in Table 9. Realistically, understanding why a strongest sense was experienced would be best asked in an interview. The reason I recommend this approach is because there would be no way to provide an extensive list of reasons why a sense was the strongest experienced.

Recommendations for Future Sense of Place Mapping

Through this research it was shown there are great possibilities for integrating perceived emotional and sensory experiences into sense of place mapping efforts. Not only does it allow for a better understanding of how people connect to landscapes through their primary senses and feelings, it provides a space for collaboration and participation from many diverse perspectives. Furthermore, engaging the public in planning decisions strengthens communication and builds trust in developing relationships and partnerships to

care for the lands so many of us have connections with. The structure and development of sense of place mapping studies require participation from many stakeholders including land managers, planners, citizens, special interest groups, stewardship groups, and indigenous communities, if possible. The diversity of perspectives and local knowledge should influence the types of questions asked in a survey framed specifically for the study area.

Integrating emotional and sensory types of questions into traditional values mapping depends on a few factors including, expected level of detail and number of participants. The in-depth rich stories gained from interviews are not possible to include in larger studies. However, integrating selected emotion and sensory based questions with pre-determined lists of answer choices is feasible, as was shown in this research. The questions "*what basic senses do you experience at this location*", "*what is your strongest sense experienced*", and "*what emotions do you experience at this location*", would be the most adaptable questions to include in larger mapping surveys.

The values participants associate with certain places are important for understanding peoples' experiences in landscapes and how they are connected to a place. There are many useful associations and comparisons that can be made between values, landscape types, emotions and senses experienced. As you start to combine the various analysis methods, it becomes apparent there are more to values than reporting the frequency, densities, or spatial statistics to understand one's sense of place in the forest.

Structure and development of landscape values questions should be a collaborative process that involves land managers, researchers, and those knowledgeable of the study area to create the best set of values specific to that place. Choosing terminology for some values can be rather challenging to find an appropriate word that will be commonly understood,

which is why it is important to evaluate many values mapping studies. A continuous evaluation of values and descriptions ensures all perspectives of place are being recognized, as well as awareness of individualistic values pertaining to a certain place. In any values mapping study, definitions and terminology of values are key components of collecting meaningful data. Planning how the various values will be used in analysis can help eliminate the possibility of not having beneficial values for comparisons.

In conclusion, there are great benefits to exploring how emotional and sensory experiences affect sense of place. Incorporating these questions as part of values mapping may provide land managers with an increased awareness of not only what values people associate with certain locations, but why they have those values. Understanding the reasons why people value a place allow for better informed planning decisions.

Endnote on Influences of Emotional Experiences on Research

At the beginning of the COVID-19 pandemic, I was incredibly nervous about how I was going to collect data, which were planned to be in-person interviews. I soon came to realize that maybe this was actually a blessing in disguise. Having the ability to use Zoom tools for interviews that were recorded and transcribed (somewhat accurately) was a great advantage over in-person interviews because it lessened the commitment each participant had to make for contributing to my research. Participants no longer needed to commit commute time to meet in person, giving me the advantage of reaching out to participants that may otherwise not have been able to participate. Additionally, using social media hashtags related to my study area provided the added benefit of reaching a broader community of participants. I gained half of my participants using social media searches.

On another note, I do believe the pandemic heightened the emotional responses related to important places in the forest. The pandemic seemed to have influenced the intensity in emotional attachments many participants have to these places of importance. During the beginning of the pandemic, most outdoors recreation locations were closed to the public. This instilled a threatened feeling that many had never experienced before of being told, "No you can't go play outside". As children, many of us can remember being told "go play outside and make sure you are back for dinner". Trailheads were blocked, roads were closed, forests were closed, and most places were made very inaccessible. It was like we were grounded from the playground. For those who lived further from the forest, they expressed a heightened appreciation and value for these places we often take for granted. Others who lived near the forest or in forested areas tended to appreciate these areas the

same as before the pandemic, but understood how valuable they are for overall well-being, as well as being thankful for having that connection to nature.

Furthermore, during the summer of 2020 in Oregon we experienced one of the worst years for wildfires and lost so many forested areas and communities. Not long after the forest reopened, it was once again closed to protect people from the rapidly spreading forest fires. The grief of losing so much land and many special places pulled at the emotions people felt about these places. With the influence of wildfires and the pandemic, these places in the forest and outdoors in general, have been noted as being even more important to all of the participants.

Another factor that may have contributed to the distribution of the points placed in the forest around the vicinity of Mt. Hood, is the closure of the Columbia River Gorge thanks to the impacts of the massive fire Eagle Creek fire. Over the last few years, I've heard about more crowds on trails concentrated around Mt. Hood since many of the Gorge trail closures forced people to find new places to hike and engage in activities. It was observed that people who placed points in the Gorge area were primarily working with stewardship groups or trail keepers helping to restore many of the destroyed trails.

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Spatial Data References

Figure 1: Map of Mount Hood National Forest Study Area

National Forest Wilderness Areas, *National Forests and Grasslands Boundary*: USDA Forest Service, National Datasets, https://data.fs.usda.gov/geodata/edw/datasets.php

Interactive Web Map Survey Basemap

Developed by Alicia Milligan and Spencer Keller

National Forest Wilderness Areas, *National Forests and Grasslands Boundary, Recreation Area Activities, National Forest System Trails, RecFacility Points, National Forest Systems Roads*: USDA Forest Service, National Datasets, https://data.fs.usda.gov/geodata/edw/datasets.php, accessed 2018.

River Put In/Take Out points, Biking Trails, Climbing Areas: Outdoor Alliance GIS Lab, Levi Rose, accessed 2018.

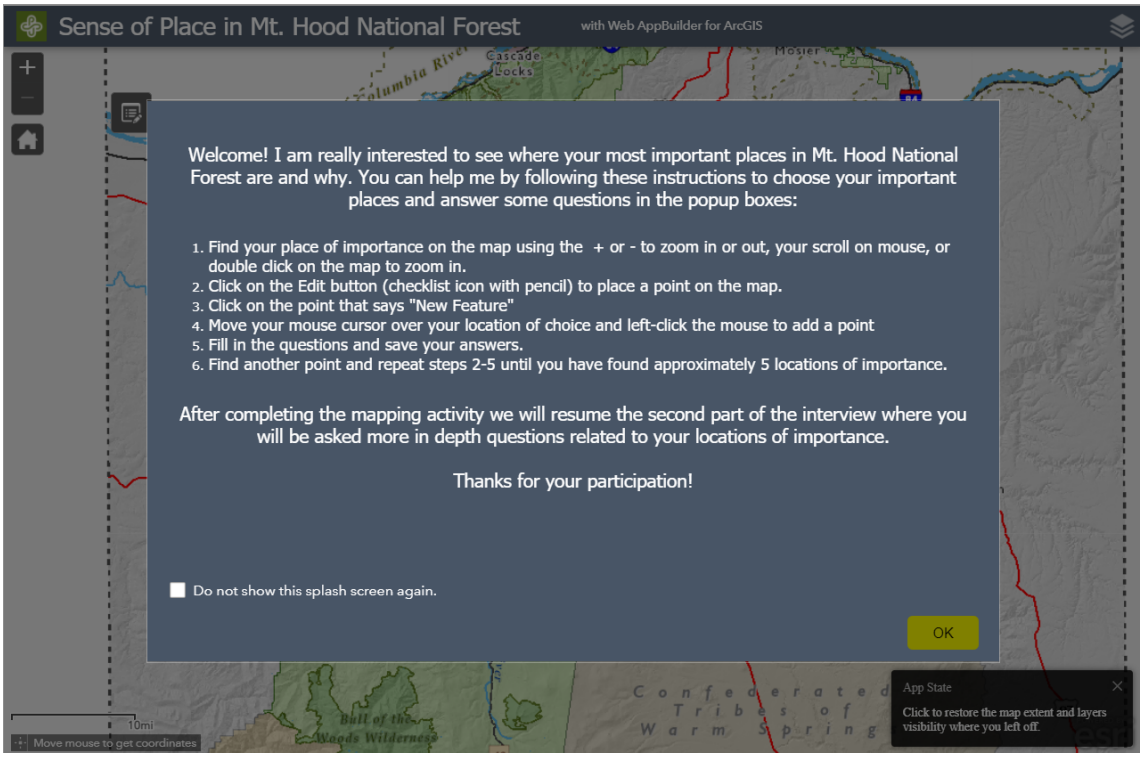
Vegetation Analysis

Existing Vegetation Type: LANDFIRE, https://www.landfire.gov/evt.php, accessed 2021.

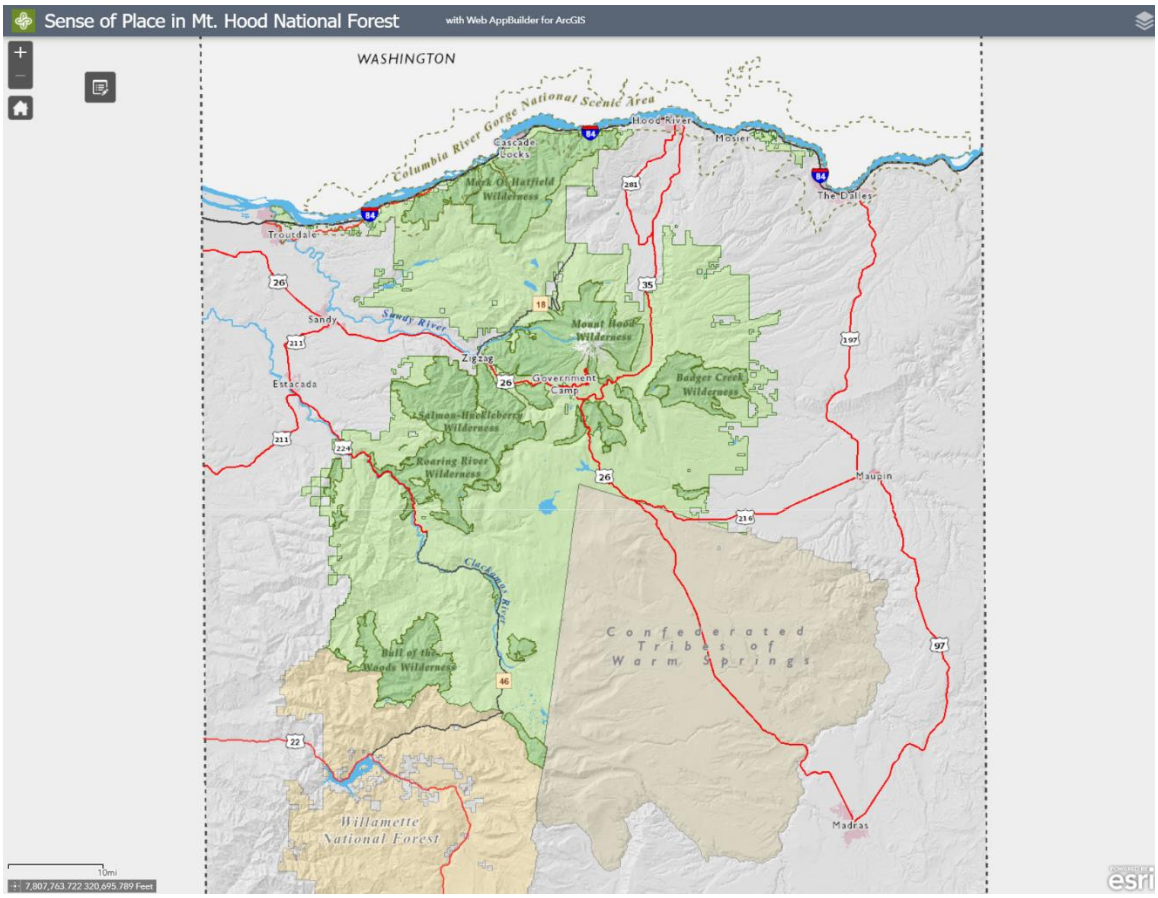
Appendices

Appendix A: Interactive Web Map Survey Images of Scale at Three Levels

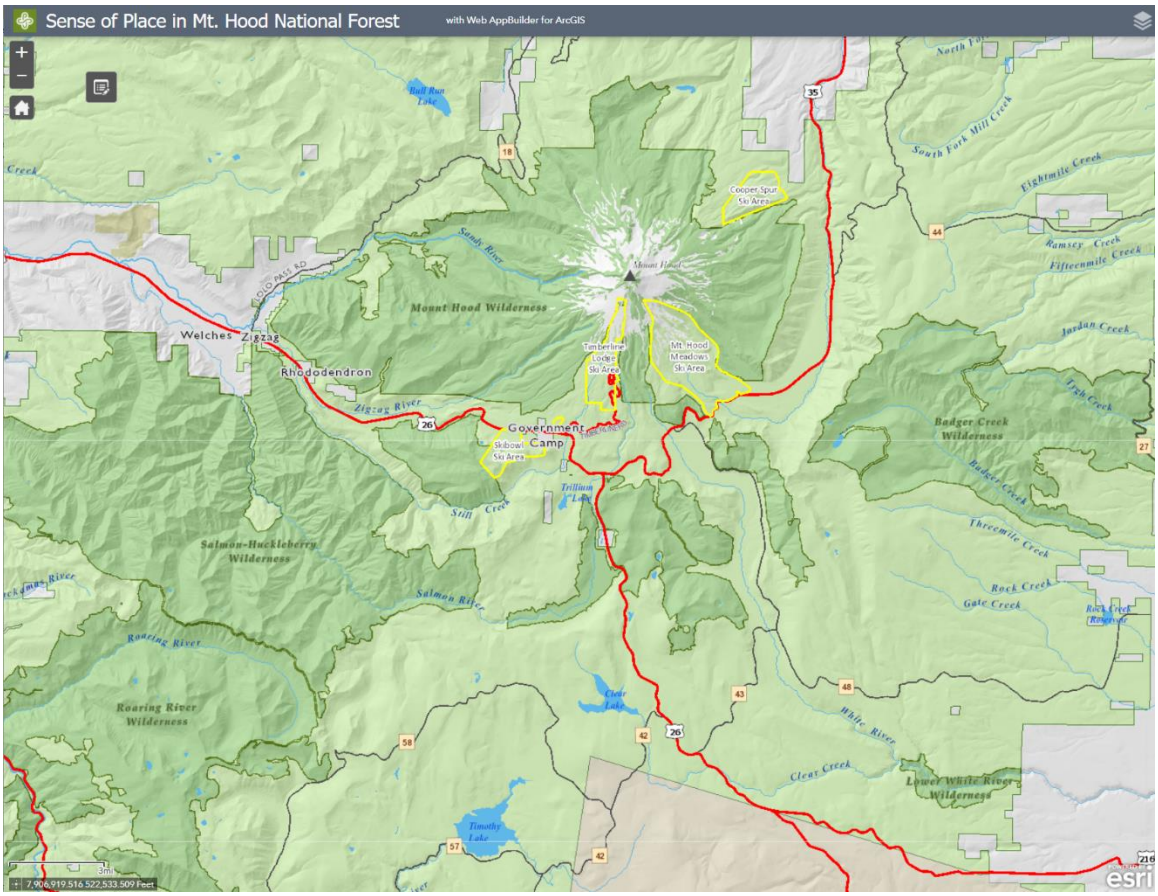
Splash Screen on Interactive Web Map



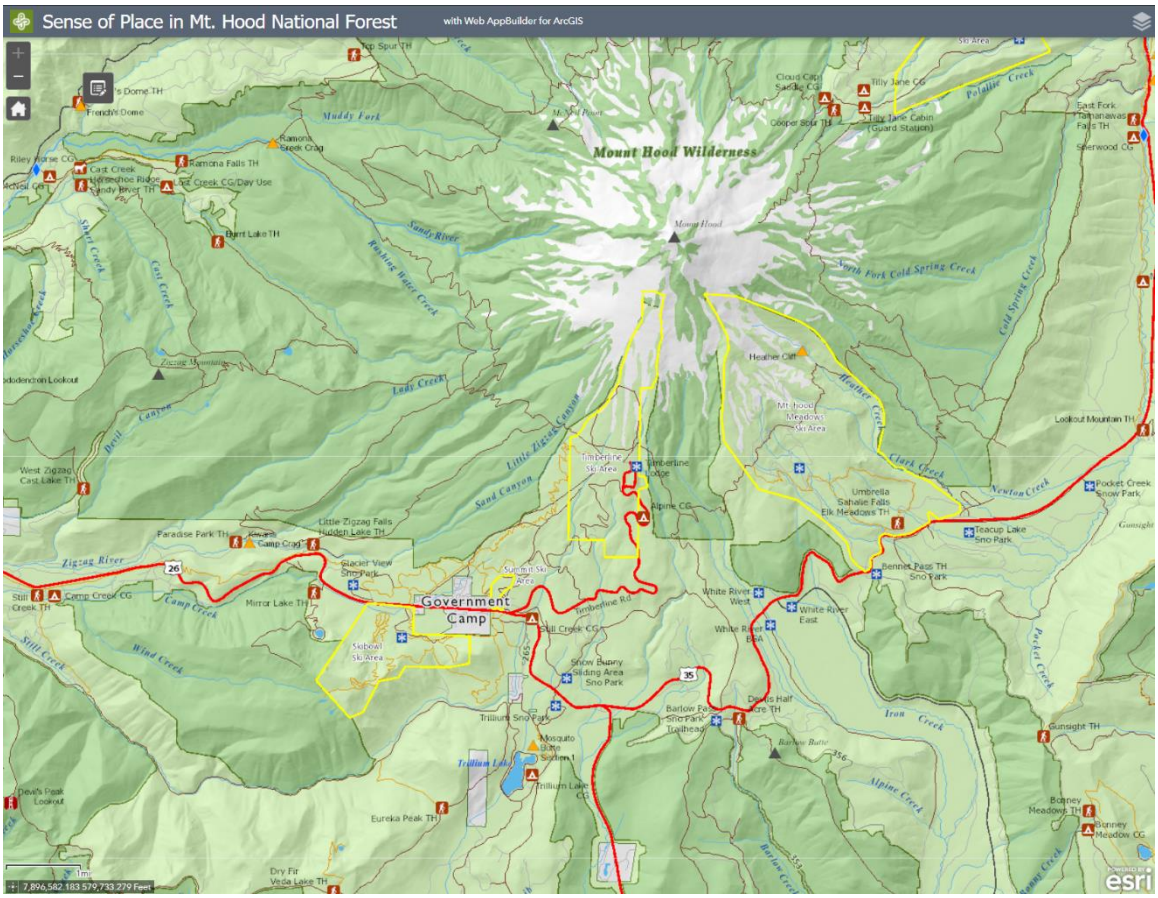
Interactive Web Map Survey Level 1



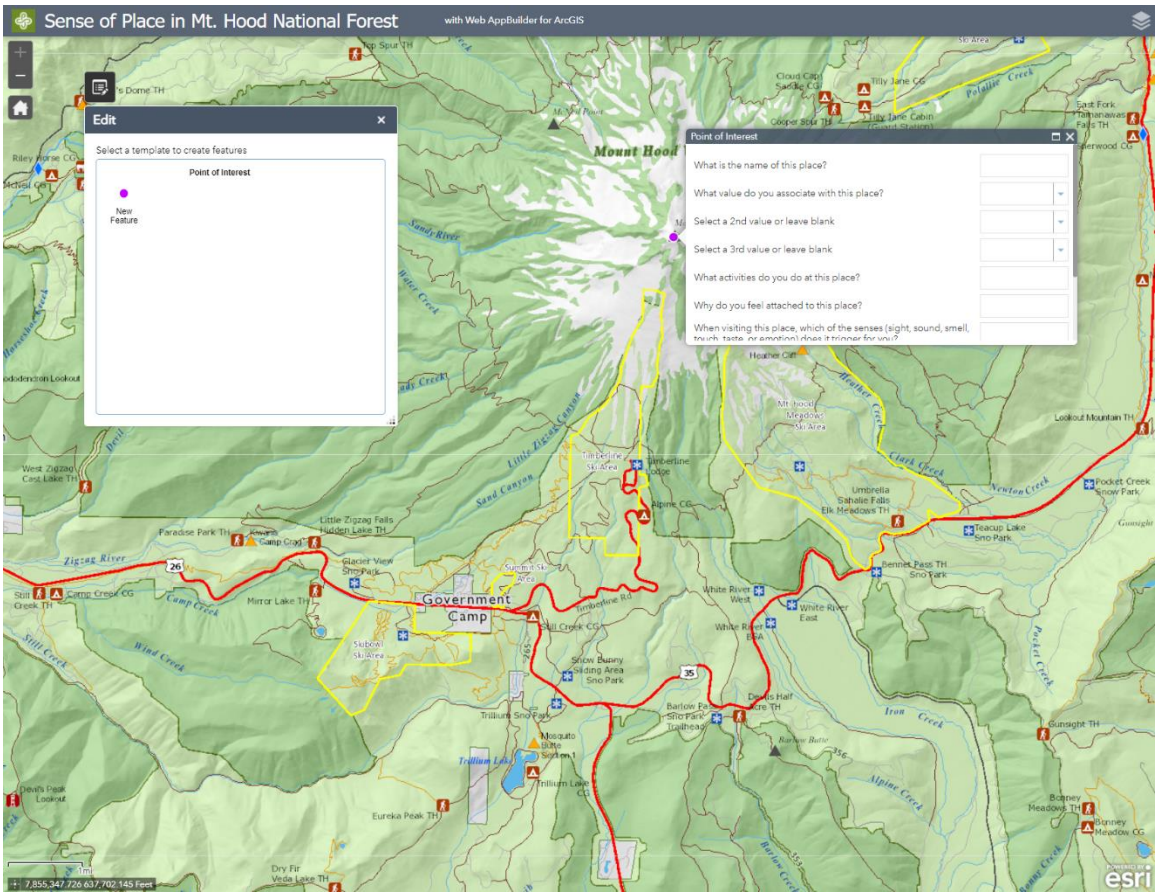
Interactive Web Map Survey Level 2



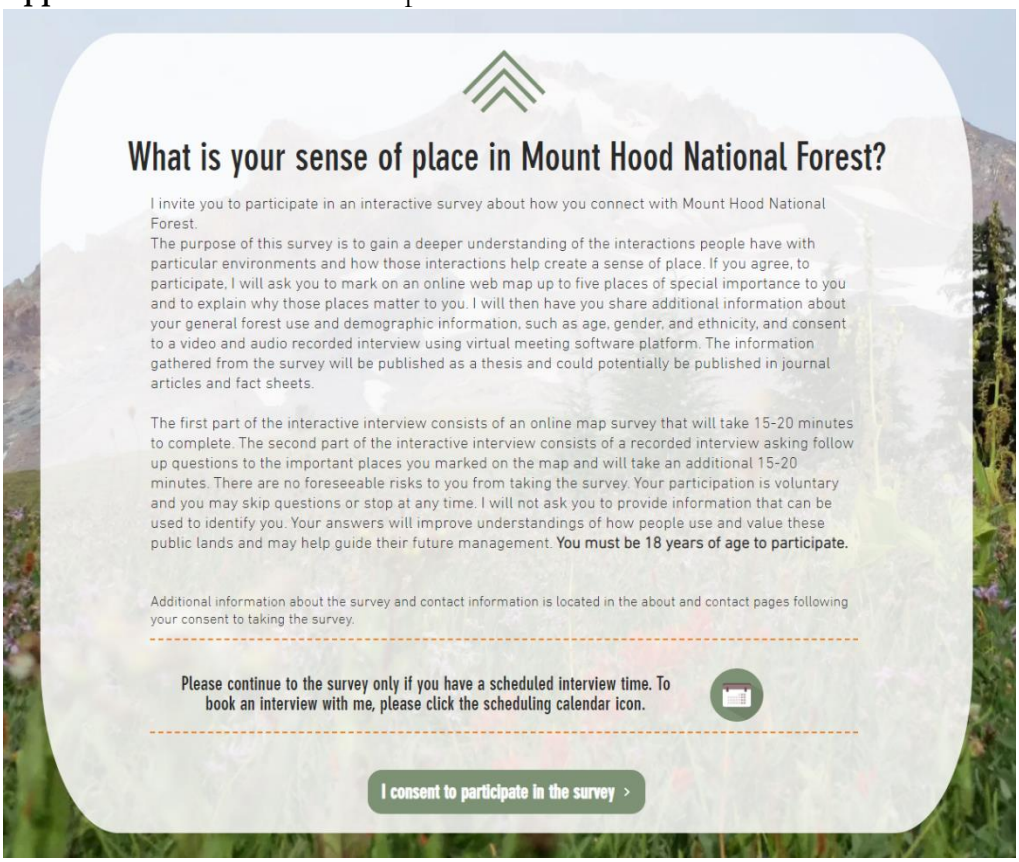
Interactive Web Map Survey Level 3



Example of point placed and survey pop-up box



Appendix B: Consent to Participate



Appendix C: Parrott's primary, secondary, and tertiary emotional structure

Primary emotion	Secondary emotion	Tertiary emotion
Love	Affection	Adoration · Fondness · Liking · Attraction · Caring · Tenderness · Compassion · Sentimentality
	Lust/Sexual desire	Desire · Passion · Infatuation
	Longing	Longing
Joy	Cheerfulness	Amusement · Bliss · Gaiety · Glee · Jolliness · Joviality · Joy · Delight · Enjoyment · Gladness · Happiness · Jubilation · Elation · Satisfaction · Ecstasy · Euphoria
	Zest	Enthusiasm · Zeal · Excitement · Thrill · Exhilaration
	Contentment	Pleasure
	Pride	Triumph
	Optimism	Eagerness · Hope
	Enthrallment	Enthrallment · Rapture
	Relief	Relief
Surprise	Surprise	Amazement · Astonishment
Anger	Irritability	Aggravation · Agitation · Annoyance · Grouchy · Grumpy · Crosspatch
	Exasperation	Frustration
	Rage	Anger · Outrage · Fury · Wrath · Hostility · Ferocity · Bitterness · Hatred · Scorn · Spite · Vengefulness · Dislike · Resentment
	Disgust	Revulsion · Contempt · Loathing
	Envy	Jealousy
	Torment	Torment
Sadness	Suffering	Agony · Anguish · Hurt
	Sadness	Depression · Despair · Gloom · Glumness · Unhappiness · Grief · Sorrow · Woe · Misery · Melancholy
	Disappointment	Dismay · Displeasure
	Shame	Guilt · Regret · Remorse
	Neglect	Alienation · Defeatism · Dejection · Embarrassment · Homesickness · Humiliation · Insecurity · Insult · Isolation · Loneliness · Rejection
	Sympathy	Pity · Mono no aware · Sympathy
Fear	Horror	Alarm · Shock · Fear · Fright · Horror · Terror · Panic · Hysteria · Mortification
	Nervousness	Anxiety · Suspense · Uneasiness · Apprehension (fear) · Worry · Distress · Dread