PERCEPTIONS OF SUSTAINABILITY:

THE OREGON SKI INDUSTRY

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TERMINAL PROJECT

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ABSTRACT

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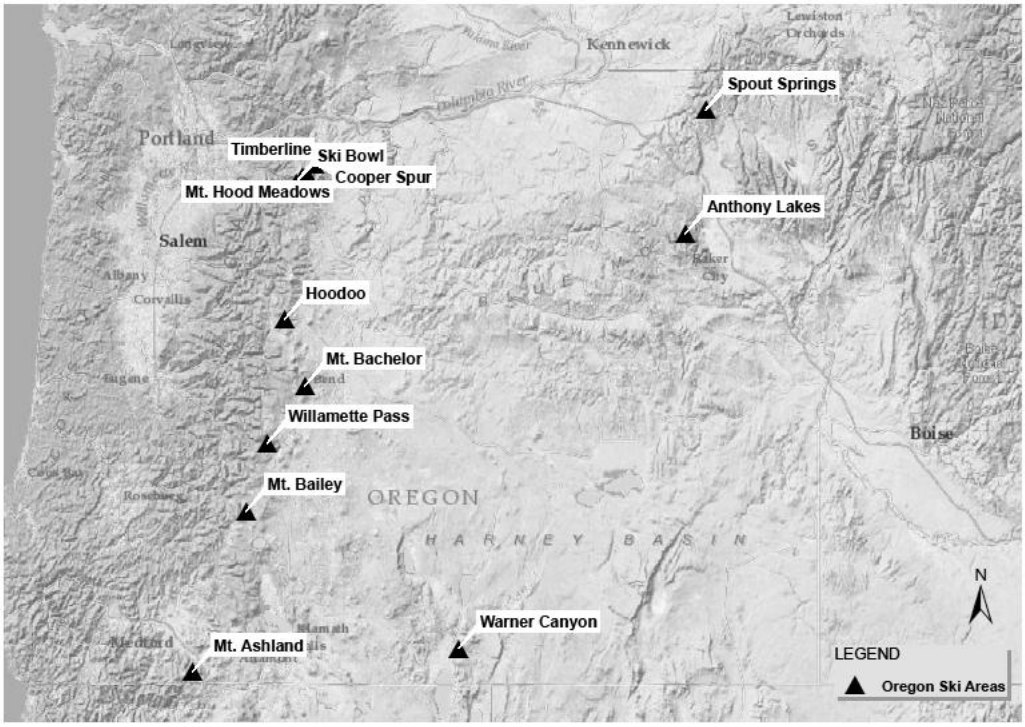
Skiing has been part of Oregon's history since the early 1930's, inspiring many generations of Oregon Skiers and Riders and supporting the economy of many of Oregon's rural communities. National-level Special Use Permit legislation has recently allowed ski areas to lease their land and operate year-round – a shift that has many environmentalists concerned with the increased impact ski area activities have on their surrounding environment. The National Ski Area Association has encouraged ski areas to become more environmentally-conscious and sustainable for over a decade through its Sustainable Slopes program, however its reach and the level of awareness skiers and riders have of the program has been less than comprehensive. Based on a survey conducted of Oregon skiers and riders during the 2011-12 ski season, this study examines the perceptions Oregon skiers and riders have regarding the role of ski areas to provide environmental stewardship, complement recreational activities within the National Forest, manage public land, and drive the Oregon economy. Though further research will be needed, this study seeks to begin the conversation regarding sustainable ski area operations on public land and help ski areas in Oregon better-understand how they are perceived by their guests.

OVERVIEW

The State of Oregon has a long-standing tradition of both Nordic and Downhill skiing dating back to the late Nineteenth Century (Arthur, Atkeson, & Ackroyd, 1998). With unique geographic landforms, most notably the dramatic contours of the Southern Cascade Range, wildlands of Oregon have hosted skiers of all disciplines on its volcanically-formed landscape for over a century. Historic areas within what would become National Forest Lands can trace the roots of skiing in Oregon back as far as 1926 (Grauer, 1975). With such a rich tradition of skiing, Oregon currently hosts twelve active ski areas, 11 of which are located on National Forest Service land and are permitted by the National Forest Service.

Figure 1. OREGON SKI AREAS



Oregon's forest base covers approximately 27.5 million acres, making up about 44% of the state. Based on data provided by the Oregon Department of Forestry, nearly 57% of that is held by Federal entities such as National Forest System and the Bureau of Land Management (**See Appendix I**).

In 1995, ski areas occupied "less than one-twentieth of one percent of National Forest System lands nationwide" however it was recognized by congress that these permitted areas "form the backbone of the local economy" for many rural areas in proximity (HB 1527, 1995). Four hundred and eighty-six ski areas currently operate in the United States, participating in an industry that generated upwards of $3.3 billion during the 2010-11 season (SIA, 2011). Oregon ski areas supported 1,964,683 skier visits during the 2010-11 season (NSAA & Group, 2011) on nearly 17,048 acres under Special Use Permits from the National Forest Service. Across 12 ski resorts 54 chairlifts run, which serve 414 trails (SkiOregon, 2012).

Oregon's ski areas have an average of 24% Beginner terrain, 38% of Intermediate terrain, and 38% of Expert terrain (Ski Oregon, 2012).

Though popular among a unique segment of Oregon's population, skiing in Oregon requires significant commitment of time, energy, and resources. Skiers typically have to drive to their desired ski area, as many of the population centers of Oregon lie anywhere from 20 to 70 miles away from mountainous regions. With the exception of Timberline, few on-mountain lodging or "base village" development exists due to a unique policy of minimizing land swaps needed to privatize land for base are operations (Nazzaro, 2009). Along with the costs associated with driving to recreational opportunities (Knetsch, 1963; Knetsch & Cesario, 1976), cost to the environment may impact decision-making. As outdoor enthusiasts, skiers have to deal with the inherent impacts their sport has on the environment. Although a strong economic sector in Oregon with a strong representation of recreational visitors to Oregon's National Forests and other public land, skiing has, in the last ten years, been confronted with the challenge of becoming more sustainable.

PUBLIC LAND USE IN OREGON

Skiers represent a significant portion of National Forest Recreational visitors to public land in Oregon.[1] National Level data from 2009 reports just over 15% of National Forest visits were for the purpose of Downhill Skiing, with an additional 4% for cross country skiing (National Visitors Use Monitoring data, 2009). Recreational visits accounted for about 75% of the total annual visits to the Willamette National Forest alone, whereas they account for about 86% of visits nationally (Fiscal Year 2009). Not all National Forests have the same visitation patterns as the Willamette National Forest, though it can be assumed that visitation rates of snow sports participants at the state level represent between 8-15% of visits to National Forests.

Ski resorts operate on about 17,048 acres (approximately 1.1%) of the approximately 15.7 million acres of public land in Oregon (**Appendix I**). This concentration of ski and snowboard recreational activities on such a small acreage allows significant revenue generation per acre. Without accounting for indirect and induced economic impacts of snow sports, preliminary estimates indicate ski areas' on-mountain economic impact alone generates an approximately $126 million annually (Community Planning Workshop, 2012).[2]

Oregon's land-use pattern regarding outdoor recreation opportunities is unique compared to practices of public land entities in other states. Aside from operational requirements put forth by National Special Use Permitting, eleven out of Oregon's twelve ski areas operate on ski area specific special use permits. Timberline Lodge at the base of Mt. Hood, is the one exception; Being an historic landmark built by the Works Progress Administration, Timberline operates on a Granger-Thye permit[3] (U.S. Congress, 1950).

[1] Of the 1,657,000 visits to the Willamette National Forest, nearly 8% of those visits (132,560 visits) were downhill skier/boarder visits. (Forson Correspondence, May 2012)

[2] A comparative relationship could be made to statewide timber sales generating $378.6 million operating on 9.4 million acres (approximately 60%) of Oregon public land (Foresters, February 1, 2007). Ski areas generate $7,412 per acre in on-mountain direct economic impacts as compared to timber generating $32 per acre in Oregon.

[3] The Granger-Thye Permit is used for Timberline particularly because it is a Government-owned and constructed building.

Leadership of the United States Department of Agriculture's U.S. Forest Service Region 6 has not engaged in land exchanges for parcels located at the base of ski areas.

Without land exchanges that enable ski areas to build and develop on privately held "fee simple" land, which is often swapped to provides space for development of a resort base area, Oregon ski areas remain wholly public and are not granted the ability to externalize ski-related lodging, retail or entertainment activities on private land. This has contributed to minimal base area development at Oregon ski areas, unlike development often found at the base of large ski resorts in other states such as Utah or Colorado. As a result of this alternative pattern toward ski area land use, ski areas in Oregon often spur corridor development according to day use travel patterns. Communities such as Oakridge, Bend, Sandy, La Grande, and others provide "gateways" to ski areas, influencing a diffusion of skier dollars to businesses either in these population centers or on routes to the ski area.

SKI AREA PERMITS

Under the Special Use Permit issued to ski areas across the country, ski area operations are required to fulfill the stipulations of the National Environmental Protection Act, the Clean Water Act, and the Clean Air Act, among other environmentally-oriented laws. Much of the National Legislation is just now catching up with common practice in Oregon, according Willamette National Forest Service Representative Stacey Forson. Ski areas and the Forest Service alike are constantly looking for opportunities to lower costs of operations through coordinated efforts to best-use available resources. Many informal agreements, usually in the form of Memos of Understanding, are brokered to preserve existing ecosystem services, while achieving goals relevant to efficient ski area operations. These environmentally-oriented terms of operation are not unusual, but are rarely incorporated into permit requirements.

As one of the most prevalent Special Use permits issued nationally, the United States Congress has favored ski areas as economic drivers of many rural communities through policy at the national level. The most recent iteration of ski area permits passed on the November 7, 2011 as the "Ski Area Recreational Opportunity Enhancement Act of 2011." Revisions of previous legislation included in this document focused on the expansion of summer recreational activities that may be undertaken on public lands already permitted to ski areas, such as zip lines, mountain bike terrain parks and trails, and Frisbee golf courses, among others (U.S. Congress, 2011). Moving away from extractive economic activities on public land may present opportunities for Oregon ski areas, providing economic uses for land that would otherwise be used for harvesting timber. Though many have been capitalizing and/or relying on summer visits for years, opportunities exist for economic development of special use permitted land that has a smaller "footprint" than resource extraction activities (Forson, 26 April 2012).

By allowing ski areas to operate as recreational facilities year-round, many opportunities and concerns arise. In operating year-round, greater impacts are exerted on permitted areas by recreational activities. In the past, ski areas have been stymied by environmentalists who view expansion of ski area activities as a threat to ecosystem services, unless managed appropriately (Grêt-Regamey, Bebi, Bishop, & Schmid, 2008; Lackey, 1997; Prato, 2011; Rasker, 2006). Environmental groups will likely take a similar approach to this recent expansion into summer activities (Coalition, 2012). The Ski Area Recreational Opportunity Enhancement Act requires that, to be considered, activities must "encourage outdoor recreation and enjoyment of nature" as well as "harmonize with the natural environment of the

National Forest System land on which the activity or facility is located"(U. S. Congress, 2011), referring back to guidance of the National Forest Service's mission.

ENVIRONMENTAL CONCERNS

This question of "harmony" with the environment has plagued skiers and riders: As outdoor recreation enthusiasts, skiers and riders depend greatly on weather in order to participate in snow sports (Sustainable Slopes, 2005).[4] The activity, however, as it has existed for the last half-century requires fuel to spin chairlifts, travel to and from the mountain, and in some states produce snow, among other requirements. Similarly, since the passage in 1960 of the Multiple Use Sustained Yield Act (MUSY) to better-guide the National Forest Service in the management of public lands (U. S. Congress, June 12, 1960), the issue of sustainability has been a constant source of contention (Kessler, Salwasser, Cartwright, & Caplan, 1992) . Though MUSY has been challenged by scholarship since its passage regarding everything from the integration of recreation opportunities (McKinzie, 1992-1993), to the argument of "mixing uses" versus segmenting land for different uses (Behan, 1967), it can be argued that "harmonious use… without impairment of land productivity" remains its primary intention (MUSYA, 1960).

Scholarship has attempted to predict the relationship between outdoor activity participation and environmental attitudes (Tarrant & Green, 1999), with promising qualitative results but high variability in prediction. Prior studies have looked at populations such as cross-country skiing and hiking which show a supportable positive relationship between these "conserver" groups and "specific aspects of the environment necessary for pursuing such activities" (Jackson, 1986). Though studies have also shown that such values do not necessarily translate to "mediation" of behavior (Thapa, 2010), there remains a significance to the association between outdoor pursuits and environmental consciousness. This could be explained as an inherent cognitive dissonance in value judgments and behavioral actions (Festinger, 1957).

Understanding these studies and considering their limitations, ski area marketing, public entities, and ski area operations have been trying to make the ski industry more sustainable. Of the 486 ski areas operating in 2010-11, 180 or 37% of ski areas nationally currently subscribe to the "Sustainable Slopes" Environmental Charter enacted in 2000. "Membership" by National Ski Area Association members and financial supporters of the initiative from within and beyond the ski industry have publicly committed to improving upon current operational practices in the interest of, as their slogan suggests, "keeping winter cool"(NSAA, December 2005).

Eight of Oregon's twelve ski resorts signed up as charter members of Sustainable Slopes in 2000, promising to address the issues surrounding sustainability, climate change, and the impact their operations had on the future of snow sports. Sustainable Slopes remains committed to improvement, encouraging all ski areas to strive for better environmental policies. Rather than calling for regulatory actions, Sustainable Slopes has remained a voluntary initiative since its inception (NSAA). Participation in environmental policies around ski area operations continues to provide additional guidance above and

[4] "Ski areas operate within, and are dependent on, natural systems including ecological, climatic and hydrological systems. These dynamic systems can affect our operations, just as we affect them. We are committed to working with stakeholders to help understand and sustain the diversity of functions and processes these systems support" (p.5)

beyond national-level environmental legislation. Since 2000, many ski areas have applied the recommended 21 principles of sustainability (**See Appendix II**) into their operation strategy, however it is unclear whether this move has made a significant impact on the industry (Todd & Williams, 1996).

Given the complex nature of public land uses, particularly as it relates to the permitting and operation of ski areas, this study explores how the Oregon skier population perceives the ski industry, the role ski areas play in the management of public land, and the importance of sustainability to Oregon snow sports participants. A survey of Oregon snow sports participants' perceptions of the role of the ski industry in their state provides the basis for understanding how sustainability factors into skiers' and riders' decision-making. Ultimately, the results of this study may be incorporated into future research around opportunities to promote ski area operations as a sustainable economic asset in Oregon.

METHODOLOGY

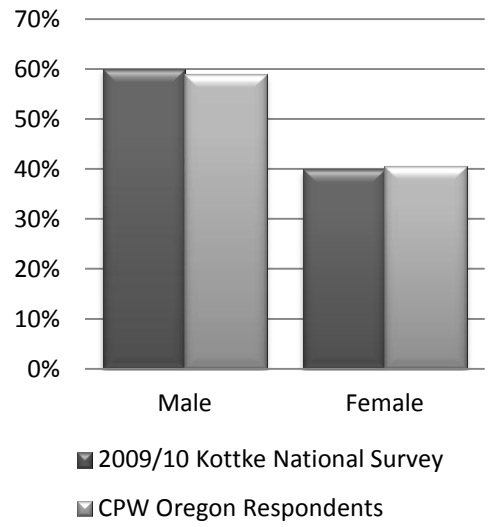
In order to understand the viewpoints of Oregon snow sports participants as it relates to sustainability, this study relied on literature, cultural knowledge, and snow sports industry experience to develop a series of questions that would gauge participants' understanding of the role of ski areas in Oregon. This study hypothesized that greater commitment to snow sports would result in greater agreement with many of the perceived roles of ski areas in Oregon. Frequency of participation, ability level, years of experience, transportation patterns, and demographics were explored to understand how perception and environmental-consciousness might influence perceptions of sustainability. A sample of Oregon skiers and riders provided responses to this set of questions, upon which this study draws its findings and discussion of perceived roles ski areas in Oregon perform.

SAMPLING

The Community Planning Workshop at the University of Oregon (CPW) conducted an online survey centered on economic impact of the Oregon Ski Industry during the 2011-12 season. The sampling goal was obtain a random sample that was representative the population of Oregon Skiers and Riders for the 2010-11 ski season. Inherently sampling of snow sports participants poses significant challenges due to the nature of skiing and snowboarding. In the interest of weighing quality and randomness of responses, convenience of completion (so as to not interrupt skiers and riders during their activities), ease of distribution, weather conditions, human resources, and ease of collecting information, the survey sample gathered provided the basis for understanding and answering the research questions presented in this study. CPW was able to collect surveys from approximately 980 respondents, though only about 745 of these responses were complete. As a result, the findings presented in this study are based on the 745 complete survey responses.

The sample collected for analysis proved representative of Oregon snow sports participants compared to national of similar nature. Comparison with other studies showed that snow sports participants in Oregon fit a similar demographic to both the 2009-10 Kottke End of Year study, as well as the 2009 National Visitor Use Monitoring report. As shown in **Figure 2**, skiing and snowboarding attracts more men than women, alpine ski participants maintaining a 60% male, 40% female split. Snowboarding attracts closer to a 66% male 34% female split.

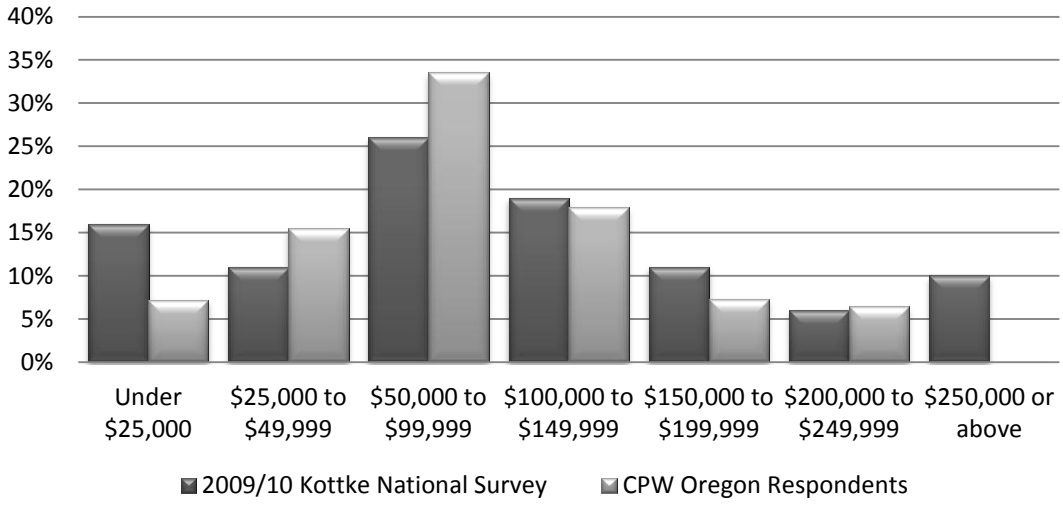
Figure 2. OREGON RESPONDENTS' GENDER AS COMPARED TO 2009/10 KOTTKE NATIONAL RESPONDENTS' GENDER



Source: 2009/10 NSAA National Demographic Report, Community Planning Workshop

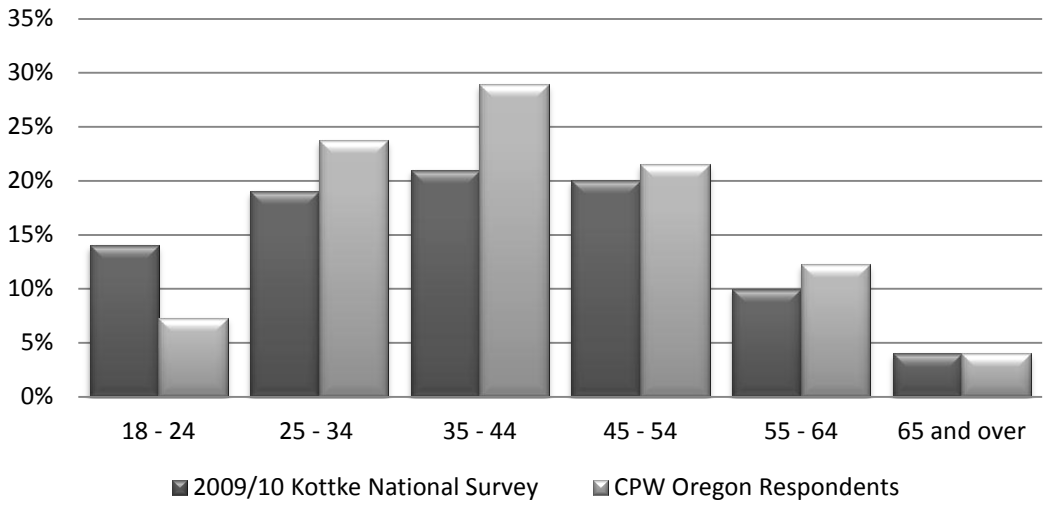
Both of these statistics agree with National Forest and Wildland visitation gender ratios (Forest ServiceFiscal Year 2009) and data collected for this study (**Figure 2**). Participants tend to be fairly well-off, as 62% skiers have a household income that exceeds $75,000 (SIA Intelligence Report, 2011). It was observed in 2010 that about 10% of skiers are Latino, about 12% are Pacific Islander, with individuals of African American descent representing another 5% (SIA, p.32). Snow sports participants are well-educated: 56% of skiers have received a Bachelor's Degree or higher. Similar characteristics were found in our study, as noted in **Figures 3 and 4** in household income and age distributions of the CPW Oregon Respondent sample.

Figure 3. RESPONDENT REPORTED HOUSEHOLD INCOME AS COMPARED TO KOTTKE NATIONAL HOUSEHOLD INCOME



Source: 2009/10 NSAA National Demographic Report, Community Planning Workshop

Figure 4. OREGON RESPONDENTS' AGES AS COMPARED TO 2009/10 KOTTKE NATIONAL RESPONDENTS' AGES



Source: 2009/10 NSAA National Demographic Report, Community Planning Workshop

Characteristics of the sample taken for this study can be generalized to understand the typical Oregon Skier/Rider's visitation patterns and participation characteristics. The average sampled respondent visits the mountains 20 days each year, 18 days of which they spend skiing or riding. Oregon skiers report approximately half of their ski days occur on weekends, followed by about 30% weekdays. Surprisingly, holidays and holiday weekends account for just fewer than 10% of the average skier's season. Respondents reported an average of 21 years of ski/board experience, most living in households where 2 people ski, one of which is typically under 18. Oregon skiers/riders sampled typically travel with one to two companions by car in the environs of 80 miles to ski.

SURVEY DESIGN

A section of the Ski Oregon Economic Impact Study focused specifically on perceptions skiers and riders have of ski areas, specifically as it relates to sustainability. Entitled "Ski Industry Perceptions," respondents were asked to share their perception of ski areas, as it relates specifically to their role to:

- Provide environmental stewardship
- Complement other recreational uses in the National Forest
- Manage public land in the public interest
- Fulfill the National Forest Service mission
- Contribute money to the Oregon economy

The roles described are intended to provide a generalized discussion regarding sustainability within the context of outdoor winter recreation in Oregon. Elements of environmental, public interests related to state and federal land, and economic concerns were included to address major tenants of sustainability as they relate to ski areas. Each question's Likert scale of 5 points provided respondents with the ability to discern the extent to which their perception extended.

By asking these questions, this study sought to better-understand how Oregon ski areas are viewed by their guests in regards to tenants of sustainability. Respondents were then asked specifically about the importance of sustainability to them, and whether the level of sustainability demonstrated by ski areas is a determining factor in their patronage of a ski area. Correlations that can be drawn between the primacy of sustainability and participation patterns may shed light on sustainability's value in economic or behavioral decision-making to the Oregon Skier/Rider.

In recognizing that there are a multitude of influences on skier/rider behavior, only a segment of respondent characteristics are examined in this study, chosen predominately to identify which segment of Oregon skiers values sustainability and what (if any) influence these views have on participants' behavior. To better isolate determinants from the large swath of behavioral characteristics of this sample, characteristics that might provide a level of commitment to outdoor recreation, indicators of sustainable lifestyles, and demographics were considered in this analysis.

ANALYSIS

To discover any relationships that may exist within the sample of respondents' perceptions of sustainability of ski areas, a series of analytical steps were taken. From the questions asked regarding respondents' perceptions of Oregon Ski Areas, cross-tabulation analysis took a more comprehensive look at a set of potential characteristics and behaviors to better understand who, of the respondent sample, holds these beliefs.

To approach the data set in a systematic way and achieve the greatest range of options, a Pearson's Chi Square analysis was performed on characteristics of interest vis-à-vis perception responses. The statistical significance (p-value) of these relationships is represented by the Pearson's Chi-Square statistics intended to better contextualize to what extent these characteristics are correlated. From the results of these cross-tabulations, statistically significant relationships were identified within a 95% Confidence Interval. With higher significance, behaviors of snow sports participants could then be identified as either predictors or results of environmentally-conscious attitudes. It is from these relationships that a narrative around Oregon snow sports participants' perceptions of ski areas as it relates to sustainability can be constructed.

INTERVIEWS

To assure that sustainable strategies will benefit operators, further research regarding practices within the Oregon snow sports industry will be necessary to provide more depth to this study. To draw general knowledge for this study, Interviews were conducted of the following ski area personnel for the purpose of this study:

- Jon Tullis, Director of Public Affairs for Timberline Mountain Resort
- Scott Kaden, President of the Pacific Northwest Ski Areas Association
- Stacey Forson, Recreation Lands, Heritage, and Mineral Staff Officer of Willamette National Forest

The focus of these interviews was to ascertain how sustainability has been integrated and/or considered by the ski industry from the viewpoint of those involved with ski area operations and/or industry research.

LIMITATIONS

Uncooperative weather during the 2011-12 ski season provided a series of challenges owing to some limitations to the study presented. With little snow throughout the West during the early months of the season, many resorts struggled to open or stay open during the month of December. Normally this is a significant sales month in all sectors, but most importantly for ski areas, this period is popular for destination skiers/riders and occasional participants who may not have visited later in the season. With a sample drawn from between 745 complete surveys out of a pool of 980 responses (235 incomplete surveys), state-level generalizations can be made.

As a result of these delayed openings and/or intermittent closings, this study was able to garner representative samples from 6 out of the 12 resorts in Oregon, those resorts representing approximately 75% of annual skier visits in the state. The results presented in this study, therefore, can be generalized to all Oregon skiers and riders, but may not be representative of specific Oregon ski resorts. This study can, however, speak to the perceptions these participants hold related to the sustainability questions asked.

Furthermore, the overriding intent of the survey was to gather economic impact data. Built into the Community Planning Workshop's Ski Oregon Economic Impact Survey that was predominately economic in nature, respondents were asked about their perceptions of Oregon Ski Areas at a surface-level; these responses were not explored in detail with thorough follow-up questions. The data presented in this study offers generalized perceptions that may merit research to truly understand the nature of responses collected.

With a slow start, this study relied heavily on existing contact lists from subscribers to email notifications, season pass holders, with a minority of participants having completed postcards. Exactly half of the respondents are season pass holders at one Oregon ski area. Consequently, though the randomness of those receiving the online survey could be assured, it was nearly impossible to control for non-response issues.

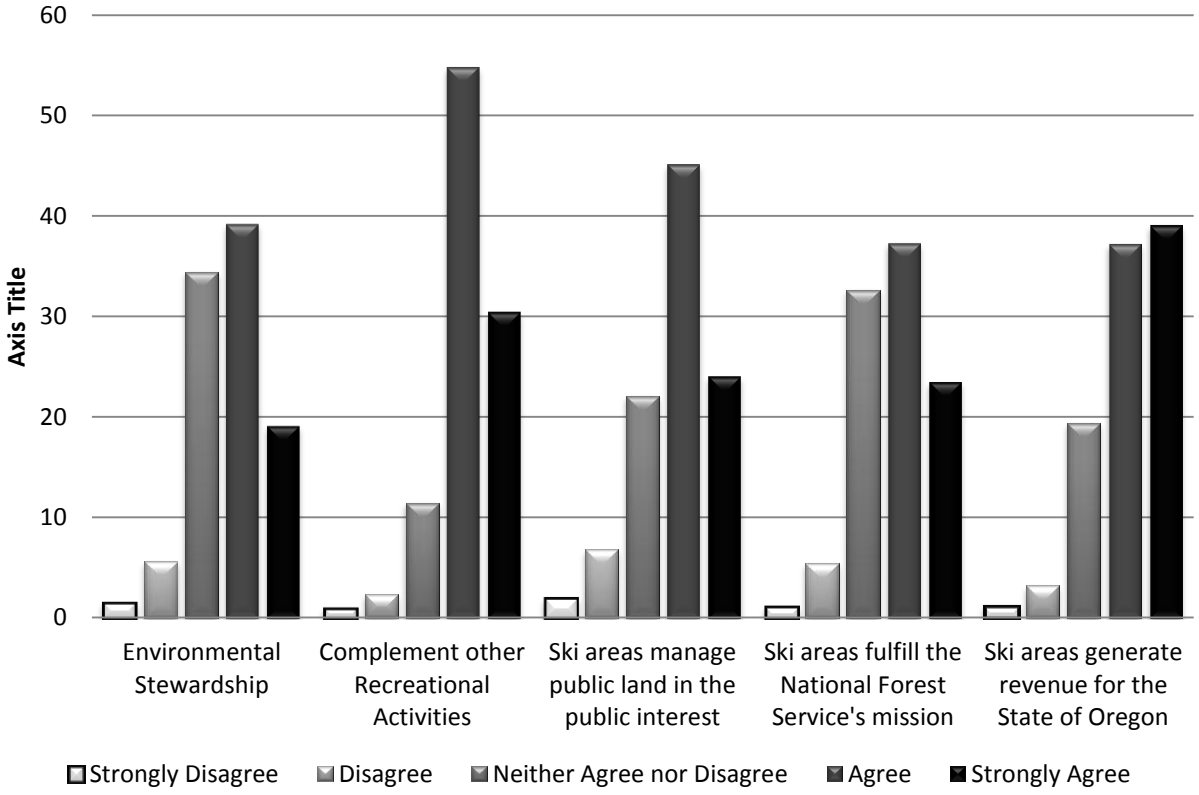
FINDINGS

Responses indicate that Oregon snow sport participants believe sustainability and environmental consciousness are important, with a focus on the relationship ski areas have with the environment around them. Responses presented in this section demonstrate the extent to which participants agreed of disagreed with specific perceptions of ski areas and their relationship to sustainability. Observations can be made about these questions in aggregate, to provide a basis for understanding perceptions of sustainability of the Oregon Ski Industry.

PERCEPTIONS

Oregon skiers were asked a series of questions regarding their perception of Oregon Ski Areas, requesting their level of agreement or disagreement with the statement provided. The set of questions represented a spectrum of sustainability roles ski areas may be perceived to satisfy. **Figure 5** provides an overview of the percent of responses answered in each category of the 726 completed responses.

Figure 5. Perceived Role of Ski Areas in Oregon



Source: CPW "Oregon Skier Survey," 2012.

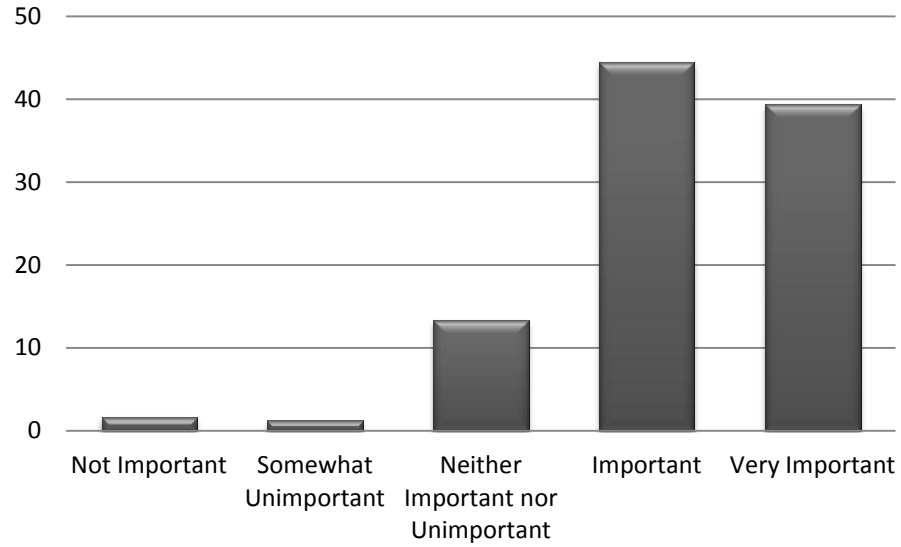
Fifty-eight percent or more Oregon snow sports participants agreed with the statements provided, though just over 32% of respondents remained neutral regarding ski areas' role to provide environmental stewardship and ski areas fulfilling the National Forest Service mission. Nearly 40% of respondents strongly agreed that ski areas in Oregon add to the state's economic base, second in overwhelming support only to ski areas as complementary recreation opportunities in the National

Forest. Respondents were hesitant to disagree with any of the perceived roles attributed to Oregon ski areas, representing no more than 9% of any response. From this overview, the individual questions can now be understood in context and significant relationships can be investigated.

IMPORTANCE OF SUSTAINABILITY

Looking specifically at skier/rider characteristics related to sustainability (as mentioned above) to the perceived role of ski areas in Oregon, the same set of characteristics was compared to the respondent's self-association with sustainability. With eighty-four percent of respondents answering that sustainability is important to them personally, sustainability can be identified as a core tenant of Oregon skiers and riders (See **Figure 6**).

Figure 6. IMPORTANCE OF SUSTAINABILITY TO RESPONDENTS



Based on the awareness of snow sports culture in this region, it is no surprise that many respondent characteristics exhibit strong statistical relationships with these affirmative responses. **Table 1** displays characteristics with significance towards the importance of sustainability.

Table 1. CHARACTERISTICS RELATED TO THE IMPORTANCE OF SUSTAINABILITY

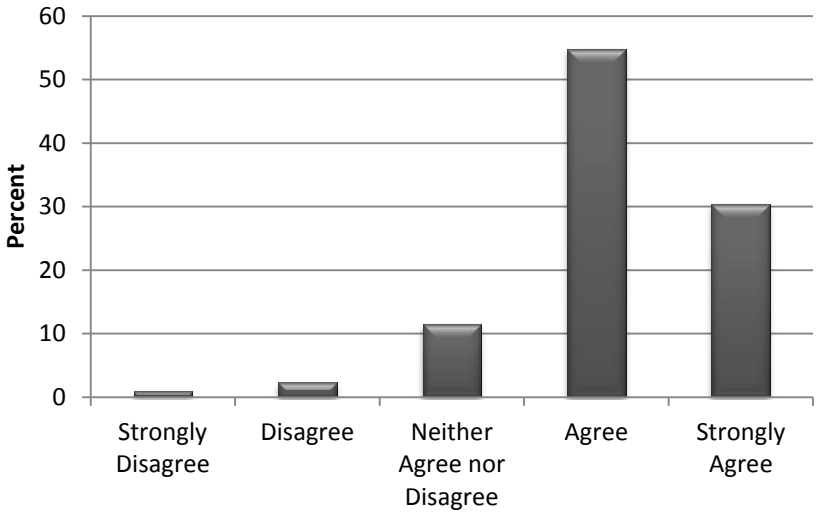
Characteristic	Pearson Chi-Square
How Many Activities Participated: 2010-11 Season	0.000
Ability: Snowboarding	0.000
Cross Country Ski: 2010-11	0.000
Ability: Cross Country Ski	0.001
Total Per Person - Fuel/transportation	0.007
Snowshoe: 2010-11	0.008
Miles traveled to Skiing	0.023
Ability: Downhill Skiing	0.024
Hours spent skiing	0.035

Participation characteristics that support the previously stated hypothesis seem to influence the primacy of sustainability for Oregon Skiers/Riders. Ability levels, particularly the ends of the spectrum (i.e. beginners and experts), and participation patterns such as 4 to 5 hours spent skiing provide stronger chi-square relationships. Supporting this study's original hypothesis, sustainability is correlated predominately with transportation and visitation patterns, commitment to snow sports in the form of ability levels, as well as participation in particular disciplines.

RECREATION IN THE NATIONAL FOREST

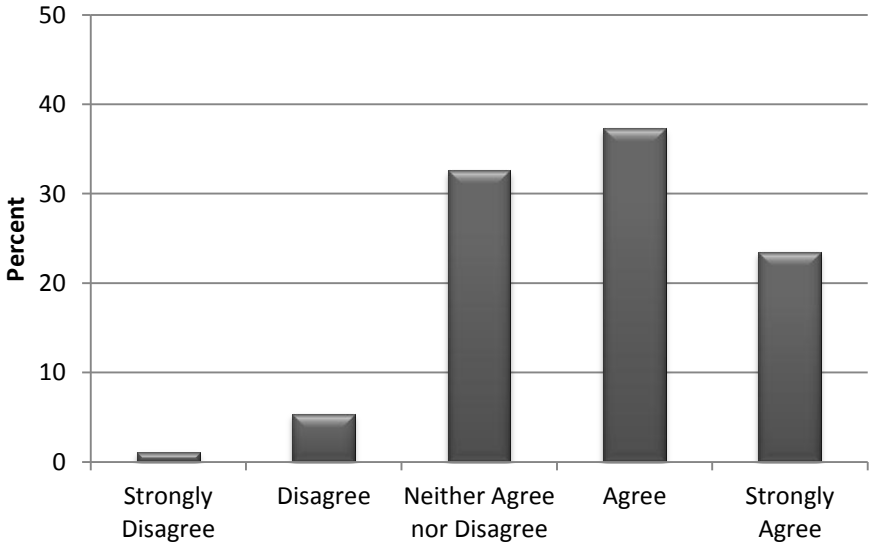
Ski areas round out opportunities to enjoy the outdoors in Oregon's National Forests, according to respondents. Operating under Special Use Permits on public land, permitted ski areas are guided to maintain all "renewable surface resources" while providing an output "in perpetuity" (U. S. Congress, June 12, 1960). Complementing other activities in the National Forest allows ski areas to provide a winter recreation opportunities on natural landforms, in a renewable manner (i.e. snow surfaces are not finite resources). As displayed in **Figure 7**, 85% of respondents believe ski areas provide a complementary activity to other outdoor recreation opportunities on National Forest land, 30% of which strongly agree. Notably, very few respondents remained neutral, suggesting a strong affirmation of snow sports as a staple of Oregon's winter culture.

Figure 7. SKI AREAS COMPLEMENT OTHER RECREATIONAL ACTIVITIES IN THE NATIONAL FOREST



In keeping with the complementary nature of snow sports, respondents agreed that ski areas help fulfill the National Forest Service mission. **Figure 8** presents data collected regarding another question involving the National Forest Service, though elicited a slightly different distribution of responses. Though nearly 61% of respondents agreed that ski areas fulfill the mission of the National Forest Service, nearly 33% of respondents neither agreed nor disagreed with this statement.

Figure 8. SKI AREAS FULFILL THE NATIONAL FOREST SERVICE MISSION



As previously mentioned, there are very few people who disagreed about Oregon Ski Areas' relationship to the mission of the National Forest Service, with only about 7% of respondents in disagreement. These responses may be more indicative of snow sports participants' understanding of the National Forest Service mission, than their agreement or disagreement about its place.

Given the responses depicted in Figures 5 and 6, a number of characteristics and behaviors were cross tabulated with the likelihood of agreement with the aforementioned statements. Without more questions related to these responses, a set of independently collected behaviors or characteristics provide more information. **Tables 2 and 3** provide a selection of the most statistically significant relationships that may contribute to the affirmation of ski areas' roles. These correlations allow selected characteristics of respondents to provide more insight into individuals' perceptions.

Table 2. AGREEMENT THAT SKI AREAS COMPLEMENT OTHER RECREATIONAL ACTIVITIES IN THE NATIONAL FOREST SYSTEM

Characteristic	Pearson Chi-Square
Participation in October Pre-season ski/snowboard sales	0.014
2010-11 Downhill Skiing	0.016
Participation in September Pre-season ski/snowboard Sales	0.021
Total Spent Per Person: Fuel/transportation	0.028
How Many Activities Participated during 2010-11	0.033
2010-11 Snowshoeing	0.035
Ability: Telemark Skiing	0.040

Also strongly related to the complementary nature of ski areas to other recreational opportunities in the National Forest was participating in pre-season sales. This may indicate respondents' greater desire to participate over time in a multitude of outdoor recreational activities. By using public land in a number of different ways, recreational activities often overlap, producing diverse communities of participants who may be able to try new sports over time. Subsequently, by allowing for diversified use of land, ski areas fulfill the Forest Service's multiple-use mandate.

Table 3. AGREEMENT OF FULFILLING THE NATIONAL FOREST SERVICE MISSION

Characteristic	Pearson Chi-Square
Sex	0.000
Participation in September Pre-Season Sales	0.038
Under 18	0.042
Household Income	0.052
Household Size	0.091

Demographic information proved highly significant in influencing agreement with the National Forest Service mission. Based on significance of Chi-squares listed in **Table 2**, Men were more divided on their agreement with closer to a 65/35 split agree to disagree, whereas Women tended to be split 50/50. Single person households, and those with four members, tended to agree more strongly that ski areas fulfill the Forest Service mission. Owing to household of four being more strongly supportive, it follows that having one to two skiers/riders under 18 increased likelihood of agreement.

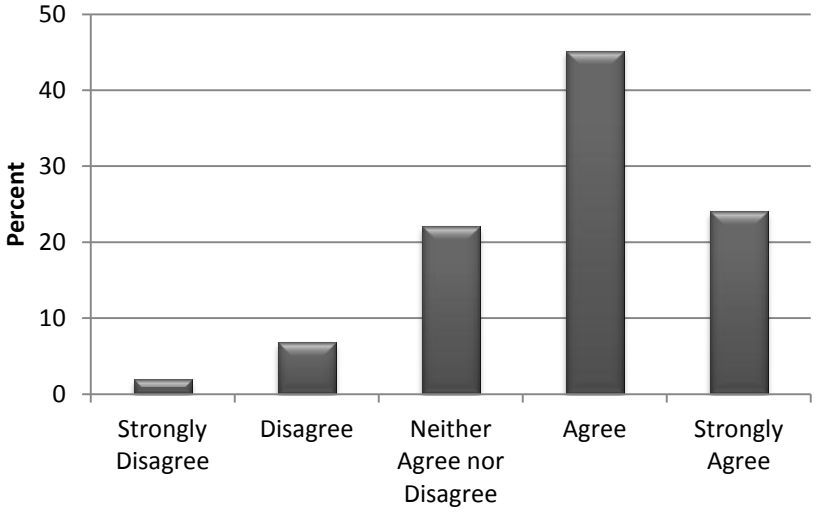
Recent visits and one's participation in particular snow sports proved notable in understanding the significant proportion of neutral responses. In isolating respondents who neither agreed nor disagreed with ski areas fulfilling the National Forest Service mission, those who had visited the resorts at Mt. Hood during the 2010-11 season were more likely to remain neutral. Similarly, respondents who had never tried telemark skiing or snowboarding were likely neither to agree nor disagree. The less people living in a respondent's household, especially the fewer individuals under eighteen influenced neutral responses as well.

Notable relationships can be traced between the number of different disciplines each respondent participated in during the 2010-11 season. When participating in multiple snow sports, it may also follow that participation in pre-season sales would enable purchasing gear for these various activities.

MANAGING PUBLIC LAND IN THE PUBLIC INTEREST

With nearly all of Oregon's ski areas operating on public land, land management that appropriately balances public interest with ecosystem health and economic pressures becomes pertinent to ski area operations. Results represented by **Figure 9** explain that ski areas' role providing management of public land is well agreed upon. With nearly 70% of respondents agreeing, participants reinforce the relationship of National Forest Service Special Permitted uses with land management and mitigation best practices.

Figure 9. SKI AREAS MANAGE PUBLIC LAND IN THE PUBLIC INTEREST



To understand what characteristics are indicative of supporting ski areas in this role, statistics calculated in **Table 4** point to a strong relationship between participation in multiple snow sports activities and

agreement with ski areas managing public land in the public interest. Disciplines such as Backcountry skiing and Cross Country Skiing show a strong correlation, due, perhaps, to their nature; Requiring more land area though lower in environmental impact, the preservation of public land may be a core value of these participants.

Table 4. AGREEMENT WITH SKI AREAS MANAGING PUBLIC LAND IN THE PUBLIC INTEREST

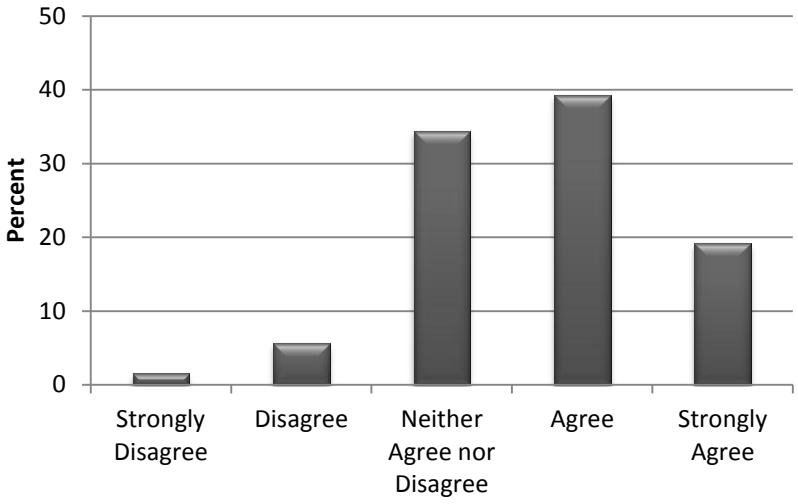
Characteristic	Pearson Chi-Square
How Many Activities Participated during 2010-11	0.005
Cross country skiing: 2010-11	0.016
Backcountry skiing: 2010-11	0.025
Most Recent Ski Area Visit	0.018
Home Ski Area	0.027

Table 4 also indicates that snow sports participant's home ski area and most recent ski area visit may influence perceptions of public land management. With statistical significance of where one most recently skied and his/her home ski area influencing agreement with ski area management of public land, so too did this influence neutrality. Respondents who had visited Mt. Hood Skibowl were more likely to remain neutral. Conversely, those respondents who had not visited Willamette Pass were less likely to respond "neither agree nor disagree." Neutral respondents to this question were likewise less likely to have gone cross-country skiing, and based on results in **Table 4**, more likely to agree that ski areas in Oregon manage public land in the public interest. Though public interest is not static and is subject to change over time, managing public land is one example of how ski areas contribute to the preservation of ecosystem services, a key tenant of sustainable operations.

ENVIRONMENTAL STEWARDSHIP, ENVIRONMENTALLY-CONSCIOUS OPERATIONS

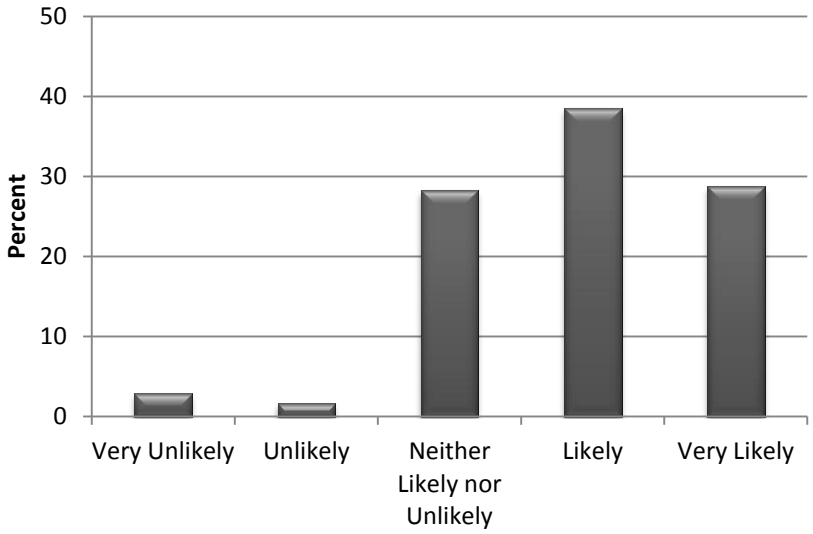
At the heart of instilling sustainability principles in the ski industry is the incorporation of environmental measures into ski area operations. To provide environmental stewardship of permitted public land for ski area operations, ski areas must consider the implications of their operations. Decision-making structures and standard operating procedures are bound by environmental legislation, but have the ability to steward operational choices that protect ecosystem services. Though just over 34% of Oregon skiers and riders do not feel strongly either way, overall agreement of just over 58% of participants believe that it is the ski areas' role to provide environmental stewardship (see **Figure 10**).

Figure 10. SKI AREAS PROVIDE ENVIRONMENTAL STEWARDSHIP



Survey respondents, in addition to being asked about the role of ski areas in providing environmental stewardship were also asked how the consideration of the environment might affect their decision-making when participating in winter recreational activities. In search of a valued ski/ride experience and satisfaction of individual needs, patrons of a ski resort may wish to feel aligned with a ski area's management norms. To understand how common it is for environmental norms to affect Oregon skiers'/riders' behavior, this study explored the influence operational norms have on decision-making. By specifically looking at the likelihood of frequenting a particular ski area based on its operations policies, **Figure 11** provides data collected about the importance of environmentally-aware operations in Oregon skier/rider decision-making.

Figure 11. LIKELIHOOD OF PATRONIZING A SKI AREA BASED ON ENVIRONMENTALLY-CONSCIOUS OPERATIONS



Just over 28% of respondents were neither likely nor unlikely to consider environmental consciousness in choosing which ski area to visit. Based on statistical analysis, neutral respondents were less likely to have tried cross country skiing, visited the backcountry during the 2010-11 season, and more likely to identify themselves as intermediate skiers/riders. Environmental or sustainable considerations for snow sports participants who remained neutral may simply have less influence in decision-making than travel distance or ski area services.

Table 5 identifies statistically significant influences of participation patterns and respondent characteristics that drive environmentally conscious decisions made by Oregon skiers/riders. By comparing the significant relationships between those qualities affecting the perceived role of ski areas proving environmental stewardship and decision-making based on environmentally-conscious ski area operations, there are some notable similarities and differences as seen in **Tables 5 and 6**.

Table 5. AGREEMENT WITH SKI AREAS PROVIDING ENVIRONMENTAL STEWARDSHIP

Characteristic	Pearson Chi-Square
Most Recent Ski Area Visit	0.000
Home Ski Area	0.004
Favorite Ski Area	0.004
How Many Activities Participated during 2010-11	0.030
Cross country skiing: 2010-11	0.046

Geography related to respondents' most recent visit, home ski areas, and favorite ski area all are significantly correlated to ski areas as complementary to National Forest recreation opportunities. With environmental stewardship becoming increasingly more important as ski areas gain year-round operation permit opportunities, the attributes present in the above **Table 5** provide some insight into how well patrons associate particular ski areas with environmental norms. Recognizing that the same ski area may be the answer to all three responses to these visits, these three categories may be cross-correlated. By embracing the role of environmental steward, ski areas create associations between their role in providing recreational opportunity and maintaining the natural resources that make their ski area more environmentally-friendly.

Table 6. DECISION AFFECTED BY A SKI AREA'S ENVIRONMENTALLY-CONSCIOUS OPERATIONS

Characteristic	Pearson Chi-Square
2010-11 Cross Country Skiing	0.001
How Many Activities Participated: 2010-11 Season	0.002
Percent of ski days: Weekends	0.011
Ability: Cross Country Ski	0.017
Most Recent Ski Area Visit	0.030
Usually Ski/Ride: Alone	0.044
Ability: Snowboarding	0.064
Number of People You Travel With	0.070

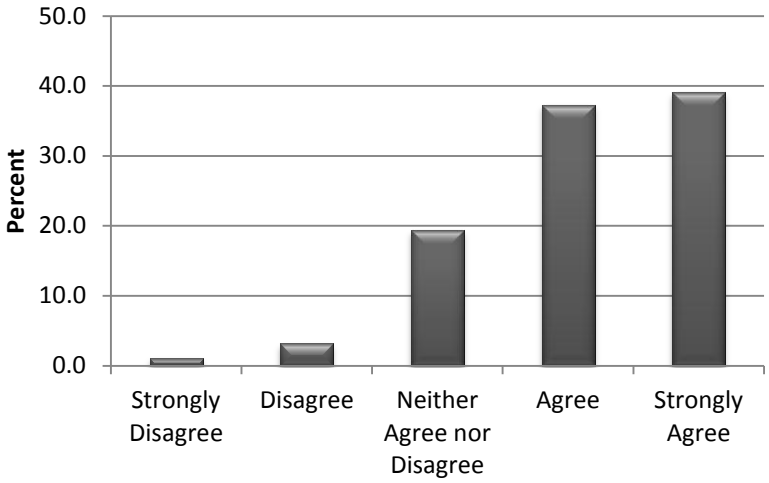
Respondents who Cross country ski and those who participate in a variety of snow sports activities correlate strongest, as noted in **Table 6**, with decisions involving environmentally-conscious operations. It seems fitting to group compare and contrast these two questions, as some similar characteristics affect both one's perceptions regarding environmental stewardship within the purview of a ski area and one's decision to patronize an area based on their environmental-consciousness. Most noteworthy between responses to these two questions is the addition of a significant relationship with skiers/riders that spend more of their ski days on weekends. Because weekend skiers make just over half of skier visits in Oregon, the likelihood of agreement with questions related to environmental concerns becomes more relevant to discussion about ski industry sustainability.

Ability levels of participants in both cross-country skiing and snowboarding proved influential to environmentally-conscious decision making. Being at one end of the spectrum or the other (i.e. a beginner or an expert) at these sports increased response likelihood of incorporating the nature of a ski area's operations in decision-making. This relationship is notable, as self-identified Beginners and Experts participated more frequently during the 2010-11 season, and represent 66% of the skier population.

ECONOMIC ROLE OF SKI AREAS

Many Oregonians sampled responded that they believe ski areas in Oregon play a role in generating revenue for the State of Oregon. With less than 5% of respondents disagreeing with ski areas as economic engines and less than 20% remaining neutral as shown in **Figure 12**, it seems that of the perceived roles of Oregon ski areas, revenue generation is the most commonly accepted function of ski areas.

Figure 12. Ski areas generate revenue for the State of Oregon



It seems that characteristics that affect one's opinion of ski areas' economic role are quite diverse. Because values may factor into agreement regarding the economic link ski areas provide may diverge as much as those interested in local economic role to those interested in the role ski areas play in providing an outlet for the retail and manufacturing industries, the relationships identified by cross-tabulation analysis in **Table 7** are not as strongly statistically significant as characteristics associated with other perceived roles of ski areas.

Table 7. AGREEMENT THAT SKI AREAS GENERATE REVENUE FOR THE STATE OF OREGON

Characteristics	Pearson Chi-Square
Percent of ski days: Weekdays	0.038
Number of Days: 2010-11 Season	0.027
How Many Activities Participated: 2010-11 Season	0.032
Total Amount Spent Per Person: Fuel/transportation	0.035

Skiers/riders who visit the ski hill more days during the season and spend more than 25% of their ski days during the week are more likely to agree with the economic role of Oregon ski resorts. With the strongest statistical significance, the volume at which an individual participates often influences their opinion of ski areas. Individuals who participate on weekdays and generally spend more time at the ski hill may live closer to the ski area or be integrated into the local economy of a ski area, lending some indication that ski areas are vital economic engines for economies of their surrounding areas.

SUSTAINABLE SLOPES

The National Ski Area Association's Sustainable Slopes Program has a presence in Oregon, despite nearly 83% of Oregon skiers and riders' unfamiliarity with the initiative. The eight charter member ski areas of the Sustainable Slopes Program in Oregon are:

- Anthony Lakes
- Mt. Ashland
- Mt. Bachelor
- Hoodoo
- Mt. Hood Meadows
- Mt. Hood Skibowl
- Timberline, and
- Willamette Pass

Many respondents reported one of these eight ski areas as the ski area they visited most often. With these home ski areas in mind, responses from these patrons were segmented from the aggregate responses to identify what, if any, affect one's home ski area participating in Sustainable Slopes had on a patron's responses. Though no significant differences were noted in comparing responses from Sustainable Slopes patrons, awareness of sustainable slopes did show statistical significance with previously mentioned questions regarding environmental stewardship, public land managed in the public interest, and fulfillment with the National Forest Service mission. Furthermore, respondents who were more likely to consider environmentally conscious operations in their decision-making were three times less likely to be familiar with the Sustainable Slopes Program. Similarly, respondents who indicated sustainability is important to them personally were over three times less likely to be familiar with the Sustainable Slopes Program.

DISCUSSION

Themes emerge from significant relationships identified by the findings of this study that may provide a better understanding of Oregon skiers and riders and the relationship they have with ski areas in Oregon. This section will discuss characteristics of respondents that are relevant to their perception of sustainable concepts related to ski area roles. Relevant snow sports participation characteristics include time investment and commitment characteristics, travel patterns, and demographics. By identifying elements that are most strongly related to perceived sustainability principles of ski areas, this discussion may provide a greater understanding of the data collected as a whole.

Looking at the Pearson's Chi-Square comparisons, many traits are related to multiple roles ski areas carry out. Some cross correlation may have occurred in the data as, for example, a respondent's favorite ski area may also be one's home ski area. Though this may be the case, qualities that repeatedly constituted statistically significant relationships provided indication that these qualities may be more strongly associated with sustainable ski area functions noted in this study.

CHARACTERISTICS FOUND TO BE SIGNIFICANT

The relationship between ability level and perceived sustainability of ski areas in Oregon seemed to be tied to enthusiasm for snow sports. Increases in agreement did not correlate incrementally to ability levels, but rather the distribution of sustainability-conscious skiers/riders rested with beginners and experts. Since ability can be tied to invested time and effort in a particular discipline, respondents' self-identified ability as a beginner or expert may indicate (though not directly statistically significant) a stronger commitment to snow sports. Abilities of these two committed groups proved influential to perceived roles of ski areas in Oregon.

Diversification of snow sports participation influenced respondents' perceptions of ski areas. The number of different disciplines each respondent participated in significantly influenced agreement with the roles of ski areas in Oregon explored in this study. Participants who responded to participating in 2-4 snow sports typically agreed with sustainability tenants presented. This group of individuals may exhibit similar traits to those referenced in the previous paragraph, as commitment to and investment in snow sports proved important when agreeing with roles of Oregon ski areas.

Geography related to ski area patronage is significant. Both "home ski area" and "most recent ski area visit" provided significance to perceptions of ski areas and sustainable value responses. With such a rich variety of ski areas in Oregon, each engenders a particular environmental, social, and cultural ethos. Each is well-attuned to their skier/rider population and provides stewardship of their resort accordingly. This reciprocity between ski area and skier/rider provides the basis for choosing the ski area he or she frequents most. Where one skis in Oregon, according to the results of this study, influences the roles one perceives ski areas to fill. Since these perceptions are tied to agreement with sustainable values, certain ski areas most frequently visited by guests invoke greater or lesser perceived sustainable values. Refinement, however, is needed to explore the intricacies of sustainable values in this context, to better capture actual scale and scope of these perceptions.

Solo skiers/riders tend to have strong affinity towards sustainable values. Though it was not the most influential factor for agreement with the roles of ski areas, it presented a significant relationship in to 4

out of the 6 questions. Perhaps being more flexible in their allegiance and/or more capable of making independent decisions, skiers who recreate alone exhibited strong affiliation to sustainability tenants.

Transportation costs also influenced responses to perceptions of ski area roles and the importance of sustainable operations. The amount spent per person on fuel and transportation had an influence on three questions asked, and can be pointed to as a common litmus test for sustainability. Transportation is typically cited as the most unsustainable aspect of snow sports, given the conservative average of 80 miles Oregon skiers and riders travel to the hill. Considering the rise of fuel costs over the last 5 years, the more one spends on transportation may factor into decision-making for snow sports participants.

CHARACTERISTICS NOT FOUND TO BE SIGNIFICANT

Based on literature reviewed for this study and initial hypotheses, some characteristics previously thought to be associated with sustainability and environmental consciousness behavioral patterns did not produce statistically significant relationships to agreement with roles fulfilled by Oregon ski areas. Whether or not a participant is a season pass holder and how many years a participant has been skiing/riding are both characteristics that were not found to be significant in this study. Similarly, frequency of participation was not as relevant as previously assumed for Oregon skiers/riders in relation to sustainability and perceived roles of ski areas. Given the influence of ability level and diversification of snow sports respondents reported, this may be a topic for future research.

Demographics did not present strong enough statistical significance to be considered influential to sustainability values. Though important in reference to fulfillment of the National Forest Service mission, demographic characteristics were more often correlated with neutral outcomes, especially respondents' marital status, education achieved, and number of individuals who ski in a household. The findings of this study suggest that sustainability and environmental-consciousness are not tied directly to any one traditionally-assumed demographic group of snow sports participants, but rather the importance of sustainability cross-cuts demographic, social, and participation characteristics measured.

SO WHAT?

The results of this study present some noteworthy ideas regarding the perceived roles of Oregon Ski Areas. Though Oregon skiers and riders fit the profile of snow sports participants at the National level, there are unique qualities that set these regional participants apart. Environmental-consciousness and sustainability have been long-talked about topics in Oregon, given its predominance of forest land and history of extractive economic activity. In looking at snow sports as an opportunity for Oregonians to engage with these National Forests and wildlands, it becomes important to connect participants with a greater understanding of their surroundings.

Noting the sizable number of neutral responses within the perception questions asked by this study related to the National Forest Service mission and environmental stewardship, there are opportunities to remind skiers and riders that in visiting their favorite ski area they are engaging with the National Forests; ski areas and skiers alike have interest in protecting them so they might continue to use them for snow sport activities. With overwhelming support of ideas related to sustainability, the opportunity for value-added snow sports experiences for skiers as well as operational efficiencies for operators has the potential to better-recognize the unique nature of the Oregon snow sports market.

Oregon has in the past branded themselves via professional marketing strategies to focus on sustainable business practices (Curtis, 2001), however has not tapped into the iconic and unique nature of the Oregon snow sports industry in this way. This study has further shown that many Oregon skiers and riders consider sustainability values in their economic decision-making and formulate perceptions of Oregon Ski Areas based on many of these same values. Though findings related in this study provide a snapshot of aggregated role perceptions of Oregon skiers/riders, value propositions for both Oregon ski area operators as well as Oregon skiers/riders can be distilled. To embed these value-added opportunities into the Oregon snow sports market, further research will be required.

SKI AREA OPERATORS

The findings presented by this study suggest that Oregon skiers and riders consider many aspects of sustainability in their choices, many of which may pertain directly to ski area operations. Knowing this, there may be opportunities for ski areas to capitalize on sustainable concepts as a means of adding value to their operation without requiring more inputs. Though these ideas have been addressed as specific environmental concerns, there is reason to believe that many of the suggested strategies will have positive economic outcomes in addition to environmental benefits.

Sustainable ski areas may be able to establish greater competitive advantage and out-compete resorts of comparable size and proximity to gateway communities throughout Oregon. By finding ways primarily to recycle or reuse waste products on site, not only can cost incurred in disposal be saved, but these resources can go farther to produce better experiences (Siomkos, Vasiliadis, & Lathiras, 2006). An example might include ski areas using vegetable fry oil to run diesel powered machines, such as grooming equipment or coach busses that bring participants to the ski hill. In approaching many of these waste-reduction opportunities, the evidence presented in this study suggests that skiers and riders in Oregon will positively respond to these operational changes. Not only could regionally-competitive ski areas (ski areas in proximity to the same gateway community) use these sustainability tactics to gain market share against their competitor, but may also be able to establish greater participant loyalty. Any increase in perceived value of a ski/ride experience could manifest itself in season pass sales, or better-established relationships with less frequent participants. Based on the initial findings of this study, sustainability efforts could provide both operational savings and increased share of skier visits.

Oregon ski resorts could, with the increased visibility of sustainable operational practices, create opportunities for destination resort enhancement. There is evidence, based on the findings presented, that there is a growing desire for a more “pure” ski/ride experience in Oregon (Ski Oregon, 2012); an experience that omits the “faux European village” development style in favor of better quality terrain (Rogers, 2012). Destination resort enhancements may not have to stretch far past transportation options to be effective. In providing consistent, reliable transportation from Oregon’s snow sport gateway communities, destination visitors staying in Bend, Portland, or Eugene could gain easier access to base areas that are often a drive away from “town.” Not only could this transportation network provide ease for out-of-town visitors, but could also add a low-impact way to get up to the ski hill for locals alike. The outcomes of this type of sustainably-oriented investment could, in light of Oregon snow sports participants’ likelihood of considering environmental operations, influence a sustainable ski area’s market share.

SKIERS & RIDERS

Evaluation and analysis of skiers and riders' perceptions can provide guidance to shape the roles ski areas fulfill in Oregon going forward. With further research that asks participants' willingness to make sacrifices in the interest of furthering the sustainability of their ski resorts, there is a good chance that Oregon snow sports participants may be able to resolve some of their cognitive dissonance.

With a passion for both snow sports and environmental resources, the results of this study show that Oregon participants want to know that their ski area is "doing its part" in protecting environmental resources. As a market, skiers and riders may be able to influence the operational practices ski areas make in this state through patronage of environmentally-conscious resorts. Though this may not weigh heavily in a decision between a large and small resort or between two resorts of varying distance from one's house (i.e. visiting Willamette Pass versus Mt. Bachelor), it may very well result in acknowledgement by participants of one operational practice over another in the form of skier visits.

Indicators beyond the State of Oregon point to a growing market demand for greater connection to the roots of snow sports. Expansion of side-country and backcountry gear, along with an indicated prevalence of downhill skiers/riders diversifying into cross country and snowshoe sports (SIA Intelligence Report, 2011) echo the results of this study. Increased interest in sustainable operations and the desire for a more "authentic" ski/ride experience coincide with the roles respondents perceived ski areas to play in Oregon. Similarly, a sustainable ski area might provide better awareness and connection to the National Forest land it operates on, thus tapping into these desires.

Desiring a more positive experience, skiers and riders are seeking superior value in their ski area's operations, in keeping with their preferences also to conserve environmental resources. Findings reported in this study suggest that skiers and riders are eager for more environmental consciousness on the part of Oregon ski area operations. As respondents indicated, ski areas provide complementary recreational opportunities to other uses of the National Forest in Oregon; skiers and riders are looking for ways to maintain the availability of these opportunities without damaging the future opportunities of generations to come. Not only do Oregon skiers and riders have a desire to preserve environmental resources, but they may also seek to assure the continuation of Oregon's rich ski tradition.

FURTHER RESEARCH

This study seeks to start the conversation about sustainability within the Oregon Snow Sports Industry. At the very least, the results of this analysis have concluded that Oregon skiers and riders consider sustainability important and perceive ski areas to fill roles to maintain and further snow sports on public lands. Research going forward will be most successful if focused on creating awareness of existing conditions (i.e. relationships to land, resources, and existing measures taken to assure their preservation), determining how receptive the Oregon snow sports market is to changes in operations, and identifying implementation strategies to best achieve area-specific sustainability practices. For sustainability of ski area management and operations, in the context of both economic and environmental concerns, will determine whether the tradition of winter recreational opportunities in Oregon continues.

Use of public land, through the National Forest Service's Mission and Multiple-use policy, has both an environmental and economic value. This poses a unique challenge to the Oregon ski industry to weigh both in determining the course their operations may take to mitigate impacts to public lands. Determining the awareness levels of snow sports participants regarding their use of public land may prove extremely valuable for both operators and participants alike. Knowing that ski areas in Oregon are nearly all on National Forest land may change perspectives of participants to consider environmental values in their snow sport visitation habits.

An opportunity exists for the Oregon Snow Sports Industry to define sustainability more clearly. An approach that speaks to sustainability as a culture, entrenched in Oregon ski tradition may provide a path for Oregon ski areas to reinforce their community investment, according to Jon Tullis, Director of Public Affairs for Timberline Mountain Resort. The sustainability concept that is espoused by Timberline fits the definition used often in mountain-based tourism in Europe, "focus[ing] on components that least compromise its ecosystem and cultural heritage, yet contribute to economic welfare" (LAG Moss, et al. "Tourism in Bioregional Context" published in Godde et al., 2000). Oregon's unique winter sports market may lend itself to more intercept survey efforts to understand patrons' motivations and willingness to accept changes to their ski area experience. Research focused on consumer choice and common operational practices in Oregon driven by ski area operator surveys and focus groups could help shape and embed an Oregon snow-sport-specific definition of sustainability. This definition may follow the pioneering efforts of Travel Oregon Forever (TravelOregon), but may focus more on operational practices and value propositions posed by this study.

Intercept data have historically driven marketing-focused initiatives regarding sustainability. It would be valuable to speak directly to ski area operation managers to determine area-specific strategies to incorporate sustainable practices into their standard operational procedures. In addition to fielding information regarding successes and failures they each have experienced, directors of ski areas could identify opportunities to embed economic- and environmentally-sustainable practices into the Oregon ski industry.

Though sustainability is important to Oregon snow sports participants, the visibility and familiarity of NSAA's Sustainable Slopes is minimal. Finding in this study that only 16% of respondents are familiar with the Sustainable Slopes program, those ski areas committed to and participating in the program as charter members may look for ways to demonstrate the sustainable operations they currently practice. Knowing that 67% of Oregon patrons consider the environmental-consciousness of a ski area they visit, it could prove valuable to consider a more visible approach to sustainable operations.

The voluntary nature of minimizing environmental impacts through Sustainable Slopes is a very strong aspect of its existence; however Sustainable Slopes practices have not been demonstrated by the industry in enough of a comprehensive way to connect with the values of Oregon's skiers and riders. Voluntary participation in environmentally-related sustainability requirements is well-supported by scholarship, insisting that measures above and beyond legal mandate are better applied through voluntary compliance (Arora & Cason, 1996; Khanna, 2001; Lenox & Nash, 2003), and has been looked at specifically in North American ski resorts and hotels (Smerecnik & Andersen, 2011). The applicability of many of its tenants are economically infeasible to many ski area operators in Oregon due to small-scale operations, and consequently smaller operational budgets and margins. As noted by scholarship, stakeholder-driven initiatives of environmental performance produce long-term economic viability of businesses(Simpson, 2001). This may prove an important value proposition for Oregon ski areas.

At the root of further discussion must be context. A conversation continued at the National level about the steps a ski area should take to become sustainable does not reach far enough to touch core values of Oregon skiers and riders. Oregon ski areas vary so greatly in acreage, skier visits, amenities, distance from their primary "bed-base," and experience provided. In order to appropriately connect with Oregon Skiers, enhancing a large-scale campaign for ski areas that recycle, for example, may not produce holistic operational sustainability outcomes. Rather, an approach from within Oregon will encourage a discussion amongst geographically- and economically-interconnected ski areas to determine what sustainable ski areas will look like in Oregon going forward.

APPENDIX I: OREGON LAND BASE

FOREST OWNERSHIP

Total Land Base in Oregon = 62,068,000 Acres
Forestland Base = 27,541,000 Acres

	# of Acres	% of Total
National Forest	13,122,000	47.7%
BLM & Federal	2,538,000	9.2%
Federal Total	**15,660,000**	**56.9%**
State Forest	786,000	2.8%
Other Public	245,000	.9%
Tribal	474,000	1.7%
State & Other Total	**1,505,000**	**5.4%**
Forest Industry	5,870,000	21.3%
Other Private	4,506,000	16.4%
Private Total	**10,376,000**	**37.7%**
Total Forestland	**27,541,000**	**100%**

(Source: Oregon Dept. of Forestry)

APPENDIX II: NATIONAL-LEVEL SKI AREA LEGISLATION SUMMARY

Permitting of ski areas in the United States can be traced back to original legislation in 1915 that stemmed out of National Forest creation, national-level land use reform, and can be considered a direct result of the "Organic Act" among other articles of legislation (U.S. Congress, 1915). Through the tradition of Forestry in the United States and the creation of the National Parks System in 1917, public lands were set aside for public use. Despite challenges within the Department of the Interior to organize the National Parks Service to balance the increased demand for access to newly-designated National Parks and the traditional role of the department to provide Forest management services, the National Parks System has become one of America's greatest achievements (Bowes, 1989). Part of the increased demand for recreational access to National Forest land and wilderness areas was due to the increased interest in downhill skiing in North America beginning in the mid-1920's (Grauer, 1975). With the Wilderness Presevation Act of 1964, protection of publicly-held wilderness lands expanded exponentially.

With the increased interest in downhill skiing as a recreational activity, ski area development boomed. As one of the fastest-growing outdoor recreational activities throughout the 1950s to 1970s, changes in permitting ski areas advanced significantly faster than could be legislated. Downhill skiing was seen as a compatible use, according to National Forest Service "Multiple-Use, Sustained Yield" policy, and aligned with many desires to integrate land and resource planning efforts. At the core of this permitting process were economic development opportunities of winter recreational activities, with an explicit nod at sustaining this activity on public land over many decades.

Modern legislation took the form of a Congressional action, 16 USC 497b, passed by Congress in their 94th session on October 22, 1986 entitled "National Forest Ski Area Permitting Act of 1986." The bill delineates it intent by recognizing the following:

> *A ski area permit—*
>
> *(1) may be issued for a term not to exceed 40 years;*
>
> *(2) shall ordinarily be issued for a term of 40 years (unless the Secretary determines that the facilities or operations are of a scale or nature as are not likely to require long-term financing or operation), or that there are public policy reasons specific to a particular permit for a shorter term;*
>
> *(3) shall encompass such acreage as the Secretary determines sufficient and appropriate to accommodate the permittee's needs for ski operations and appropriate ancillary facilities;*
>
> *(4) may be renewed at the discretion of the Secretary;*
>
> *(5) may be cancelled by the Secretary in whole or in part for any violation of the permit terms or conditions, for nonpayment of permit fees, or upon the determination by the Secretary in his planning for the uses of the national forests that the permitted area is needed for higher public purposes;*

> *(6) may be modified from time to time by the Secretary to accommodate changes in plans or operations in accordance with the provisions of applicable law;*
>
> *(7) shall be subject to such reasonable terms and conditions as the Secretary deems appropriate; and*
>
> *(8) shall be subject to a permit fee based on fair market value in accordance with applicable law.* (U.S. Congress, 1986)

Subsection (d) of this document cites a close relationship between this piece of legislation and the stipulations of the National Environmental Protection Act (NEPA) and the Forest Rangelands Renewable Resources Act which includes the Secretary of Agriculture's "duties to involve the public in his decision-making and planning for national forests." These tenants have provided guidance for permitting of National Forest Land for the development of winter ski recreation facilities, with slight modifications (1996), until the most recent legislation was passed in 2011.

APPENDIX III: SUSTAINABLE SLOPE'S MEASURES OF SUSTAINABILITY

- Habitat Protection (104 Points)
    - Maintaining Ski Terrain Within the Existing Footprint (30 points)
    - Preserving Undisturbed Lands from Development (31 points)
    - Protecting or Maintaining Threatened, Endangered, Sensitive, or Candidate Species and Their Habitat (22 points)
    - Preserving Environmentally Sensitive Areas (21 points)
- Protecting Watersheds (35 Points)
    - Protecting/Preserving Wetlands (9 points)
    - Protecting Water Quality (12 points)
    - Water Conservation (14 points)
- Addressing Global Climate Change (50 Points)
    - Conserving energy by avoiding new snowmaking. (10pts)
    - Renewable Energy (17 points)
    - Energy Efficiency (14 points)
    - Transportation (9 points)
- Environmental policies and practices (41 points)
    - Environmental Policy Positions and Advocacy (17 points)
    - Waste Stream Management (9 points)
    - Purchasing (8 points)
    - Environmental Reporting and Accountability (5 points)
    - Community Sustainability (2 points)

APPENDIX IV: REGRESSION ANALYSIS

Regression analysis performed on the data collected produced results that may provide greater context for the relationships that exist between perception, environmental-consciousness, and sustainability within the ski industry in Oregon. Upon considering the way perception related to the greater questions of sustainability, the determining factor that may pose the most important question to ski areas in Oregon is patronage. If Oregon skiers and riders will weigh environmental considerations of ski area operations in their decision of which ski area to visit, the Oregon ski market may be implicated by its ability to appease patrons' value dissonance. If an Oregon snow sport participant feels as if their choice of ski area has resolved their conflicting values (the environmental impacts of skiing versus the enjoyment of skiing), they may be more likely to participate more often.

Table 1 shows the results of a linear regression model constructed to understand what independent sustainability variables influence the decision to support a stronger likelihood that an Oregon skier/rider will patronize a particular ski area based on that ski area's attention to environmentally-conscious operations.

Table 1.

Independent Variables	**Standardized Coefficients**		
Model R square = .255	**Significance (1-tailed)**	**Beta**	**t**
Ski areas provide environmental stewardship	.000	.095	2.186
Ski areas complement other recreational opportunities in National Forests	.011	.015	.335
Ski areas manage public land in the public interest	.177	-.095	-1.786
Ski areas fulfill the National Forest Service's mission	.037	.048	.898
Ski areas generate revenue for the State of Oregon	.004	.066	1.715
How familiar are you with the Sustainable Slopes program?	.148	.000	.007
How important is sustainability to you, personally?	.000	-.478*	-14.281*

*Negative values are the result of the construction of this question: Lower values indicate stronger importance of sustainability to respondents.

The strongest relationships exhibited by this model are the agreement that ski areas fill the role of environmental stewardship and that sustainability is important to the respondent, personally. Least likely to influence the decision are familiarity with the Sustainable Slopes program or agreement that ski areas fill the role of managing public land in the public interest. Notably, one of the highest influences of a patron's likelihood to make decisions based on environmental consciousness of operations is the agreement that ski areas fill the role of generating revenue for the State of Oregon. This information may indicate a strong relationship between the tenants of environmentalism and minimizing impacts to areas around ski areas and the economic output produced by ski areas annually. In supporting the use of public land for outdoor recreation, there seems to be a necessary component that the development of public land for skiing and riding produce some economic value for the state's economy.

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