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Voluntary environmental programs (VEPs) have been created to encourage companies to engage in behaviors that mitigate environmental impacts (e.g., recycling, emissions reduction). Many ski areas participate in the Sustainable Slopes Program, an initiative that promotes VEPs in the ski area industry. Past research has addressed the performance of VEPs in mitigating environmental impacts in this industry, but little is known about skier and snowboarder knowledge of VEPs, their motivations and future behaviors in response to these programs, and how other cognitions such as their environmental value orientations, activity specialization, and attachment to ski areas influence these motivations and behaviors related to VEPs. To address these knowledge gaps, data were obtained from surveys administered onsite to 429 skiers and snowboarders at the Mt. Bachelor ski area in central Oregon (United States) from January to March, 2010 (response rate = 89.7%). This ski area employs several managerial and operational VEPs to support environmental conservation and reduce emissions (e.g., recycling, renewable energy, bio-fuel transportation). Results showed, however, that few skiers and snowboarders were knowledgeable of these VEPs and motivated to visit this ski area

because of these programs. Many respondents, however, intended to visit more often in the future if this ski area promotes and increases the number of VEPs. Respondents who were more knowledgeable of these VEPs and motivated to visit currently and in the future because of these programs were more likely to have a: (a) high amount of place attachment to this ski area, (b) stronger biocentric or environmental value orientations, and (c) high degree of specialization in skiing or snowboarding. Managers and operators can use these findings to inform communication and marketing of their environmental programs and performance to various clientele subgroups.

Voluntary Environmental Programs at an Alpine Ski Area: Influence of Recreationists' Knowledge, Motivations, Attachment, Value Orientations, and Specialization

by
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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

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Christopher M. Little, Author

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CONTRIBUTION OF AUTHORS

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CHAPTER 1 – INTRODUCTION

Downhill skiing was highlighted at the 1932 Olympic Winter Games in Lake Placid, New York, helping to propel the sport to the forefront of winter recreation activities in the United States (U.S.) (Hudson, 2004). It was not until after the Second World War, however, that large ski areas and mass winter recreation and tourism emerged, a trend fueled largely by soldiers returning from war who were eager to apply skills acquired in skiing during combat to recreation settings back in the U.S. (Hudson, 2004). With the introduction of newer technologies such as snowmaking, metal skis, and plastic boots, downhill skiing experienced enormous growth in popularity in the 1960s and 1970s, only to be followed by decades of consolidation and product management.

Influenced by changing demographics, a saturated ski market, and intensive marketing campaigns, the ski area industry in the 1980s was characterized by a business approach to management and a more tourism based approach to development (Kottke, 1990). Larger ski areas grew larger and smaller ski areas struggled to remain financially viable. Between 1980 and 1990, the number of ski areas in the U.S. dropped by 18% and now there are 481 ski areas in this country (Hudson, 2004). To remain competitive, many ski areas have diversified operations to accommodate a variety of winter activities (e.g., snowboarding, snowmobiling) and new trends (e.g., terrain parks, gladded ski runs), and have also expanded operations to the summer season to accommodate activities such as mountain biking and hiking (Needham, Wood, & Rollins, 2004).

As ski areas grew in size, so did their perceived negative impacts on the environment. Ski areas use resources including water for snowmaking, energy for chairlifts, and forests and wildlife habitat for suitable recreation terrain. Negative environmental impacts include air pollution from maintenance equipment, as well as erosion, habitat fragmentation, exotic species introduction, and clear-cutting on ski slopes (Puntieri, 1991; Tsuyuzaki, 1994; Watson, 1985). To mitigate these impacts and address criticism from external interest groups (e.g., environmental organizations, government agencies, public), the ski area industry has attempted to embrace the environmental movement and adopt alternative management strategies. Recently, some ski areas have adopted voluntary environmental programs (VEPs) to address environmental impacts.

These VEPs are not specific to the ski area industry; they are programs, codes, agreements, and commitments that encourage firms to voluntarily reduce their environmental impacts beyond requirements established by mandatory environmental rules and regulations (Carmin, Darnall, & Mil-Homens, 2003). In the late 1980s, VEPs were created in response to the traditional command-and-control regulation process that became a core element of the federal government's environmental policy agenda, and gave firms some flexibility outside of the regulatory system to achieve environmental goals (Dietz & Stern, 2002). These programs addressed a number of environmental concerns raised by the public and other interest groups, and helped firms avoid complex and costly conflicts that are often associated with regulatory reform (Baggott, 2007).

Adoption and implementation of VEPs started an ongoing debate involving the environmental effectiveness of these programs and reasons why firms participate (Dietz

& Stern, 2002; Khanna, 2001; O'Rourke, 2003; Rivera & de Leon, 2004). Research has investigated motivations of corporate participation in VEPs in the U.S., but findings have been mixed and uncertainty remains about the environmental effectiveness of these programs (Arora & Cason, 1996; Khanna & Damon, 1999; King & Lenox, 2000).

The U.S. ski area industry has made substantial efforts to incorporate VEPs into management and operations. In 2000, the National Ski Areas Association (NSAA) created the Sustainable Slopes Charter in partnership with the U.S. Environmental Protection Agency, U.S. Forest Service, and other agencies. This charter is a voluntary environmental initiative that was created to encourage more environmental stewardship in the ski industry and is a management framework for ski areas that includes a number of VEPs aimed at reducing environmental impacts (Rivera & de Leon, 2004). Examples of VEPs in this program target energy and water conservation, waste management, wildlife habitat protection, and vegetation management (NSAA, 2009). As of 2008, 187 ski areas (75% of ski areas in the U.S.) had endorsed this charter by adopting VEPs outlined in its framework.

Similar to other voluntary environmental initiatives, the Sustainable Slopes Charter is not without criticism. Participants in this charter are expected to implement annual self-assessments of their environmental performance. As a result, environmental organizations have criticized this charter as a "green-washing" scheme (i.e., erroneously proclaiming to engage in conservation behaviors) because of the lack of environmental performance standards and third party oversight for participant compliance (Rivera & de Leon, 2004; Rivera, De Leon, & Koerber, 2006; SACC, 2009).

Research has addressed various topics at ski areas including climate change (Elsasser & Burki, 2002; Scott & McBoyle, 2007; Scott, McBoyle, & Mills, 2003; Scott, McBoyle, & Minogue, 2007); environmental impacts (Clifford, 2002; Todd & Williams, 1996); management (Holden, 1998; Ormiston, Gilbert, & Manning, 1998); conflict among activity groups (Vaske, Carothers, Donnelly, & Baird, 2000); visitor motivations (Alexandris, Kouthouris, & Girgolas, 2007; Fredman & Heberlein, 2005; Holden, 1999; Klenosky, Gengler, & Mulvey, 1993); and trends in summer (Needham et al., 2004) and winter visitation (Hudson & Miller, 2005; Klenosky et al., 1993; Richards, 1996).

Although there have been studies examining VEPs and sustainability (Bruce, 2000; Carmin et al., 2003; Christmann & Taylor, 2002; Darnall & Sides, 2008; Steelman & Rivera, 2006), comparatively less research has examined these topics specifically at ski areas (Blust, 2004; Donohoe, 2004; George, 2003; Rivera & de Leon, 2004; Rivera, De Leon, & Koerber, 2006). Research on VEPs in the ski area industry has addressed environmental performance (Donohoe, 2004; George, 2003; Rivera & de Leon, 2004; Rivera et al., 2006), stakeholder interests served (Steelman & Rivera, 2006), and managerial perspectives (Blust, 2004; Todd & Williams, 1996). Donohoe (2004), for example, evaluated this industry's adoption of the Sustainable Slopes Charter and found that ski areas were making progress implementing charter principles and environmental ethics played an important role in distinguishing resorts that are demonstrating environmental leadership with a higher implementation rate. From a managerial perspective, Blust (2004) examined ski area manager perceptions of sustainability in the industry. Respondents were not interested in developing a widely accepted definition of

sustainability, but instead were more concerned with efforts to promote sustainable development at their ski area. Money was a deciding factor in sustainable development because reducing costs was an incentive to being more sustainable.

Little research, however, has examined the influence of VEPs on winter recreationists' behavior (e.g., skiers, snowboarders). This research will address this knowledge gap by examining the extent that: (a) recreationists are aware of VEPs at ski areas and their knowledge of VEPs, (b) the presence of VEPs influences their motivations to visit ski areas on their current and future trips, and (c) other characteristics and cognitions such as specialization, attachment, and value orientations influence the importance of VEPs in motivating people to visit ski areas. It is important to understand visitor knowledge of VEPs and the influence of these programs on motivations and behavior because social trends to protect the environment have increased and competition among ski areas is high, so any attributes that improve a destination's image may enhance visitation and business growth (Dietz & Stern, 2002; Hudson, 2004).

Thesis Purpose and Organization

The primary objective of this thesis is to understand skier and snowboarder knowledge of VEPs at an alpine ski area, and the extent that these programs influence motivations to visit the area on current and future trips. This thesis contains two separate standalone articles that address this objective using data from onsite surveys of skiers and snowboarders at the Mt. Bachelor ski area in central Oregon.

The first article in this thesis (chapter two) is exploratory in nature and describes skier and snowboarder knowledge of VEPs at this ski area, motivations to visit because

of these programs, and intentions to visit more often in the future if the number of VEPs at this ski area increased. This article addresses four questions. First, how much do skiers and snowboarders know about VEPs at this ski area? Second, to what extent do these VEPs influence their motivations to visit on the current trip? Third, where do VEPs rank in importance compared to other skier and snowboarder motivations for visiting (e.g., proximity, terrain, snow conditions)? Fourth, to what extent would skiers and snowboarders visit more often in the future if there were more VEPs at this ski area?

The second article (chapter three) builds on this first article by investigating the influence of other skier and snowboarder cognitions such as place attachment, recreation specialization, and environmental value orientations on visitor knowledge, motivations, and behaviors associated with VEPs at this ski area. This article tests several hypotheses partially supported by earlier research (e.g., Bang, Ellinger, Hadjimarcou, & Traichal, 2000; Bricker & Kerstetter, 2000; Fluker & Turner, 2000; Fredman & Heberlein, 2005; Hvenegaard, 2002; McFarlane, 1994; Vaske & Donnelly, 1999). The first hypothesis predicts that individuals who are likely to visit this ski area more often in the future because of its VEPs will be more knowledgeable of these programs and more motivated to visit on their current trip because of these VEPs, will have stronger environmental value orientations, will be more specialized in their activity, and will be more attached to this ski area. The second hypothesis predicts that skiers and snowboarders who are motivated to visit on their current trip because of the ski area's VEPs will have stronger biocentric environmental value orientations, will be more specialized in their activity, and will be more attached to this ski area. The final hypothesis predicts that individuals who

are more knowledgeable of VEPs at this ski area will have stronger environmental value orientations, will be more attached to this ski area, and will have a higher degree of specialization in their activity. This article is followed by a brief integrative summary and discussion of implications of the two main articles presented in this thesis (chapter four).

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CHAPTER 2 – WINTER RECREATIONISTS' MOTIVATIONS AND KNOWLEDGE RELATED TO VOLUNTARY ENVIRONMENTAL PROGRAMS AT AN ALPINE SKI AREA

Introduction

Following the Second World War, the downhill ski industry was characterized by rapid growth in equipment technology, destination resorts, and mountain access (Hudson, 2004). Mass marketing, product expansion, and the invention of snowmaking also expanded this industry's capabilities (Hudson, 2004). Given recent financial difficulties, changing public demographics, and inconsistent demand, however, this industry has started to consolidate and change. Large ski destinations catering to tourists more than residents have become ubiquitous, and the number of ski areas operating in North America declined 18% between 1980 and 1990 (Hudson, 2004). As ski destinations continued to grow in size and shrink in number, new activities such as snowboarding, snowmobiling, and heliskiing emerged. Ski areas have diversified to accommodate these winter activities and have also expanded operations into the summer season for activities such as mountain biking and hiking (Needham, Wood, & Rollins, 2004).

The environmental movement has also influenced the ski industry. Ski areas use resources such as water for snowmaking, energy for chairlifts, and forests and wildlife habitat for suitable recreation terrain. Impacts include air pollution from maintenance equipment, as well as erosion, habitat fragmentation, exotic species introduction, and clear-cutting on ski slopes (Puntieri, 1991; Tsuyuzaki, 1994; Watson, 1985). Several environmental interest groups have pressured ski area operators to address these and

other environmental issues (Needham & Rollins, 2005) and some ski areas have recently adopted voluntary environmental programs (VEPs) to help reduce their environmental impacts. VEPs include "programs, codes, agreements, and commitments that encourage organizations to voluntarily reduce their environmental impacts beyond the requirements established by the environmental regulatory system" (Carmin, Darnall, & Mil-Homens, 2003 p. 528). In 2000, the National Ski Areas Association (NSAA) created the Sustainable Slopes Charter in partnership with the U.S. Environmental Protection Agency, U.S. Forest Service, and other agencies. This charter is a voluntary initiative that creates a management framework for ski areas to include a number of VEPs aimed at encouraging greater environmental stewardship in the industry (Rivera & de Leon, 2004). Examples of VEPs in this program include water and energy conservation methods, waste management, wildlife habitat protection, and vegetation management (NSAA, 2009b). As of 2008, 187 ski areas (75% of ski areas in the United States) had endorsed the Sustainable Slopes Charter by adopting VEPs outlined in its framework.

Research on VEPs has focused on environmental performance (Darnall & Sides, 2008; Donohoe, 2004; George, 2003; Rivera & de Leon, 2004; Rivera, De Leon, & Koerber, 2006), corporate sustainability and motivations for involvement (Bruce, 2000; Carmin et al., 2003; Christmann & Taylor, 2002; Deleon & Rivera, 2007), interests served (Steelman & Rivera, 2006), and managerial perspectives (Blust, 2004; Todd & Williams, 1996). Little research, however, has examined what visitors such as skiers and snowboarders know about VEPs at ski areas and how these VEPs may influence their motivations to visit these areas presently and in the future. This article addresses these

knowledge gaps. It is important to understand visitor knowledge of VEPs and the influence of these programs on motivations and behavior because social trends to protect the environment have increased and competition among ski areas is high (Olsen, Lodwick, & Dunlap, 1992; Rivera & de Leon, 2004), so any attributes that improve a destination's image may enhance visitation and business growth.

Conceptual Foundation

This article examines the extent that visitors know about VEPs at an alpine ski area and if these programs influence their motivations to visit this area. Simply stated, a motivation is an internal or external factor that arouses and directs human behavior (Iso-Ahola, 1999). A leisure or recreation motivation is a reason for visiting an area or participating in an activity at a given time and / or location (Manfredo, Driver, & Tarrant, 1996). Motivations to visit an area *in the future* are related to the concept of behavioral intentions. Past research has shown that an individual's future behavior can be predicted, in part, directly from his or her intention to perform that behavior (Fishbein & Ajzen, 1981; Fishbein & Manfredo, 1992). This study examined intentions to visit a ski area in the future by asking skiers and snowboarders how often they would visit in the future (i.e., behavioral intention) if this area increased its number of VEPs.

Motivations to visit an area *on the present trip* have received more empirical attention in the recreation literature. Iso-Ahola (1999) identified two dimensions of these types of motivations. The first dimension, "seeking," involves motivations associated with searching for personal and interpersonal rewards from participation (e.g., challenge, sense of competence, exploration). The second dimension is "escaping," or the desire to

escape from other life experiences (e.g., escape pressures, leave daily routines behind). Recreation motivations for participating in an activity or escaping to or from a destination include cultural, sociological, and psychological components (Robinson & Gammon, 2004). Crompton (1979), for example, identified seven social-psychological motivations associated with participation (escape, self-exploration, relaxation, prestige, regression, enhancement of kinship relations, social interaction) and two cultural motives (novelty, education). Similarly, the recreation experience preference (REP) scales include over 300 motivations that cluster into a few broader domains (e.g., exploration, nature, exercise, exhilaration, escape, introspection, be with similar people; Manfredo et al., 1996).

Most of these motivations are social-psychological or internal forces that "push" people to visit an area or engage in an activity. There are, however, external motivations that "pull" or attract people to an area or activity (Crompton, 1979; Dann, 1981). In the context of ski areas, for example, pull factors may include destination attributes such as ski lifts, terrain, and lodging. This push-pull framework is one approach for explaining current motivations of recreationists (Dann, 1977). Push factors (e.g., escape, relaxation, adventure) are forces in our lives that influence current decisions and behaviors, whereas pull factors (e.g., beaches, facilities, sunshine) are forces that attract an individual to a particular activity or destination. There are many push and pull factors that influence decisions for participating in recreation activities at particular settings, and collectively they encompass a multiple motivations approach (Swarbrooke & Horner, 1999).

There are many reasons why skiers and snowboarders may be motivated to visit an alpine ski area on their trip. Studies have found that push motivations for visiting these

areas in the winter include excitement and thrill seeking, exercise, demonstrating skill and ability, relaxation, and achievement (Holden, 1999; Klenosky, Gengler, & Mulvey, 1993; Williams, Dossa, & Fulton, 1994). Research has also documented attributes that pull winter visitors to these areas including terrain, snow conditions, number of runs, lift ticket prices, proximity, lodging, and resort services (Alexandris, Kouthouris, & Girgolas, 2007; Hudson & Shephard, 1998; Klenosky et al., 1993; Mills, Couturier, & Snepenger, 1986; Richards, 1996; Williams et al., 1994). VEPs may be additional attributes that pull recreationists to a ski area, so this study examined the extent that VEPs influenced people to visit a ski area and where these programs ranked in importance compared to other reasons for visiting. This information is important because skiers and snowboarders have a broad diversity of motives for participating, and understanding this wide range of needs will allow ski area managers to accommodate their clientele. In addition, it will allow managers to understand the importance of VEPs in relation to other motivations for visiting, and perhaps prioritize attributes that still accommodate the most important needs of visitors while using VEPs to help mitigate environmental impacts (Holden, 1998).

Although visitors may be motivated to visit a ski area because of its participation in VEPs, this does not mean that visitors are knowledgeable of all VEPs at the area. Knowledge is a central component of information processing and decision making (Johnson & Russo, 1984; Raju, Lonial, & Mangold, 1995; Vaske, Needham, Stafford, Green, & Petchenik, 2006). Past research has examined recreationists' awareness and knowledge of environmental issues such as wildlife disease (Vaske et al., 2006), fossil fuel exploration (Teel, Bright, Manfredo, & Brooks, 2006), and conservation behaviors

such as catch-and-release angling (Hvenegaard, 2002; Sutton & Ditton, 2001). Most studies have found that many recreationists are not highly knowledgeable of some of these types of environmental issues. Vaske et al. (2006), for example, found that the largest proportion of hunters answered only five or fewer questions out of nine questions about environmental issues associated with chronic wasting disease in wildlife.

Little is known, however, about skier and snowboarder knowledge of VEPs and other ski area attributes, which may influence decisions to visit on current or future trips. Individuals may already know about VEPs at a particular area, which subsequently influences their motivations to visit because of these programs. Alternatively, others may be motivated to visit places because of VEPs, so they seek information to learn about and become knowledgeable of specific programs at a particular area. Although research has identified ski area attributes that are important to visitors, this does not mean that visitors are always aware of every attribute at a given area (e.g., Carmichael, 1996; Godfrey, 1999; Richards, 1996). Unlike well known attributes such as terrain and chairlifts, VEPs are a relatively new phenomenon at ski areas, so this article examines the extent that visitors are knowledgeable of these programs. Understanding how much recreationists know about VEPs provides important information that will allow managers to assess the effectiveness of their marketing of environmental programs and performance that are partially designed evoke a "green" image and attract visitors.

Given that little research has examined recreationists' perceptions of VEPs, this article is exploratory in nature and addresses four research questions related to the extent that VEPs influence skier and snowboarder knowledge, motivations to visit, and future

intentions to visit an alpine ski area. First, how much do skiers and snowboarders know about VEPs at a ski area? Second, to what extent do these VEPs influence skier and snowboarder motivations to visit on their current trip? Third, where do VEPs rank in importance compared to other skier and snowboarder motivations for visiting (e.g., proximity, terrain, snow conditions)? Fourth, to what extent would skiers and snowboarders visit more often in the future if there were more VEPs at a ski area?

Methods

Study Site and Context

Data were collected at the Mt. Bachelor (MTB) ski area in central Oregon, U.S. for two reasons. First, Mt. Bachelor is located only 22 miles from the city of Bend and its population of over 80,000 residents. It is also one of the largest ski areas in the U.S., accumulates over 350 inches of snow every winter, and its summit of 9,065 feet is the highest of all ski areas in the Pacific Northwest creating a vertical drop of over 3,000 feet. Mt. Bachelor's seven express chairlifts provide access to over 3,500 acres of terrain and 71 ski runs and trails. Due to its size, location, and terrain, Mt. Bachelor receives over 700,000 visitors every winter and accommodates a diverse range of activities and users.

Second, Mt. Bachelor employs a number of managerial and operational VEPs to support environmental conservation and reduce emissions (NSAA, 2009c). This ski area, for example, purchases all power from renewable energy sources, employs extensive recycling and waste reduction programs, and operates bio-fuel powered shuttles to transport guests and employees to and from the mountain (MTB, 2009). According to the environmental watchdog group, Ski Area Citizens' Coalition (SACC), Mt. Bachelor

ranks ninth among all ski areas in the U.S. for environmental stewardship based on results of The 2008-2009 Ski Area Environmental Scorecard (SACC, 2010). This ski area has also won numerous awards for its environmental performance. In 1994, for example, Mt. Bachelor was the first to win the Golden Eagle Award for environmental excellence presented by the National Ski Areas Association (NSAA, 2009a). The Mt. Bachelor ski area continues to introduce and support new VEPs to protect natural resources and reduce environmental degradation (MTB, 2009).

Data Collection

Data were obtained with methods similar to those used in other studies of visitors at ski areas (e.g., Klenosky et al., 1993; Ormiston, Gilbert, & Manning, 1998; Thapa & Graefe, 2003; Vaske, Carothers, Donnelly, & Baird, 2000; Vaske, Dyar, & Timmons, 2004). Surveys were administered onsite to skiers and snowboarders at the Mt. Bachelor ski area; employees and people under the age of 18 were not surveyed. Data were collected from the middle of January to the end of March, 2010 during which sampling days were randomly selected with the number of sampling days averaging five per week. Consistent with past research at ski areas (Holden, 1998; Vaske et al., 2004), sampling occurred during lunch hours (11:30 a.m. to 3:00 p.m.) in restaurant facilities on the mountain and at its base to reduce interfering with visitors' recreation experiences. On each sampling day, one of the three dining facilities (Pine Martin Lodge, Sunrise Lodge, West Village Lodge) was randomly selected for sampling and potential respondents were approached at these facilities using a systematic random sampling technique where every fifth table was systematically selected after starting the selection by randomly selecting a

table (Leedy & Ormrod, 2005). At each table, the individual in each household with the most recent birthday was asked to complete a survey. If all individuals were from different households, they were each asked to complete the survey. If the selected individual refused to participate, was under 18 years of age or an employee, or had already completed a survey, an individual at the next table was selected.

Surveys took approximately 10 to 15 minutes to complete and after an onsite pilot test of the instrument, the final sample size was $n = 429$ ($n = 303$ skiers, $n = 126$ snowboarders) with a response rate of 89.7%. Given the small number of telemark skiers surveyed ($n = 13$), they were grouped with alpine skiers for analyses. This sample size allows generalizations about the population of adult visitors at Mt. Bachelor at a 95% confidence level with a margin of error of ± 4.7% (i.e., more than 19 times out of 20; Salant & Dillman, 1994; Vaske, 2008).

Analysis Variables

Surveys contained questions measuring skier and snowboarder knowledge of VEPs, motivations for visiting, and future intentions to visit if there were more VEPs at this ski area. First, similar to approaches used by Vaske et al. (2006), knowledge was measured using a true / false format with 12 statements identifying VEPs that were occurring (e.g., "Mt. Bachelor has a recycling program") and were not occurring at Mt. Bachelor (e.g., "Mt Bachelor has reintroduced native wildlife animals on the mountain"). Responses were measured on 5-point scales of 1 “very certain this is false” to 5 “very certain this is true.” For analysis purposes, responses were recoded to 0 "did not answer correctly" and 1 "answered correctly" with "unsure" considered an incorrect answer.

Second, 37 survey variables were used to measure visitors' pull motivations for going to Mt. Bachelor on their current trip. These variables were largely informed by items used in past research (e.g., Alexandris et al., 2007; Carmichael, 1996; Godfrey, 1999; Klenosky et al., 1993; Williams et al., 1994), but included several additional items related to VEPs. Respondents reported the extent that they disagreed or agreed that each issue motivated them to visit Mt. Bachelor on their current trip. Respondents were asked, for example, to reply to statements such as “I visited Mt. Bachelor today because I wanted to experience a unique high alpine area.” Responses were measured on 5-point scales of 1 "strongly disagree” to 5 “strongly agree.”

Third, skiers and snowboarders were asked 14 questions about the extent that they would intend to visit in the future if the number of VEPs was increased at Mt. Bachelor. Respondents were asked, for example, “How would you change how often you visit if Mt. Bachelor was more committed to environmental conservation?” Responses were coded on 5-point scales of 1 “visit much less often,” 2 “visit slightly less often,” 3 “visit about the same,” 4 “visit slightly more often,” and 5 “visit much more often.” For analyses, responses were recoded to 0 "visit same or less often" or 1 "visit more often."

Results

Activity Group Profiles

In total, 56% of respondents were male and 44% were female. Approximately 60% of snowboarders were male and 57% of skiers were male, but this difference was not statistically significant, $\chi^2 = 0.17$, $p = .677$. In addition, the phi effect size was $\phi = .02$ and guidelines from Cohen (1988) and Vaske (2008) suggest that the strength of this

difference can be characterized as "small" or "minimal," respectively. The average age of respondents was 39.8 years, but skiers were significantly older (M = 43.4 years) than snowboarders (M = 30.5 years), t = 11.43, $p < .001$. The point-biserial correlation effect size of r_{pb} = .42 suggests a "large" (Cohen, 1988) or "substantial" (Vaske, 2008) relationship between age and activity participation. Over 87% of respondents had visited Mt. Bachelor previously, whereas 13% were first time visitors on the day that they were surveyed. There were no significant differences in repeat visitation between skiers (88% had previously visited) and snowboarders (82% had visited), χ^2 = 2.33, p = .127, ϕ = .08.

Knowledge of VEPs

The first research question focuses on how much skiers and snowboarders knew about VEPs at Mt. Bachelor. Visitors were most knowledgeable about recycling programs at this ski area, as 70% of skiers and 66% of snowboarders knew that Mt. Bachelor had a recycling program (Table 2.1). Less than half of respondents, however, answered the other questions about VEPs correctly. Only 27% of visitors, for example, were aware that Mt. Bachelor uses energy efficient lighting and only 24% knew that this ski area uses bio-diesel to fuel some of its vehicles. The fewest respondents (9%) knew that Mt. Bachelor had won awards for environmental conservation. There were no significant differences between skiers and snowboarders in their answers to 11 of the 12 questions, $\chi^2 \leq 2.61$, p = .106 to .999. Snowboarders (15%) were significantly more aware than skiers (7%) that Mt. Bachelor allows visitors to purchase a "green tag" to help offset car emissions, χ^2 = 7.11, p = .008. The effect size of ϕ = .14, however, suggests that the strength of this difference was “minimal” (Vaske, 2008) or “small” (Cohen, 1988).

Table 2.1. Skier and snowboarder knowledge of VEPs at Mt. Bachelor ski area.

Statements [1]	Correct response	Percent answered correctly (%)			χ^2	*p*-value	ϕ
		Skiers	Snowboarders	Total			
Has recycling programs	True	70	66	68	0.67	.411	.04
Conserves water by never using snowmaking equipment	False	42	41	42	0.04	.848	.01
Uses energy efficient lighting in facilities	True	28	23	27	1.13	.289	.05
Provides incentives to visitors who carpool to this ski area	False	24	26	25	0.18	.673	.02
Uses bio-diesel to fuel some of its vehicles	True	24	24	24	0.00	.999	.00
Purchases all food related products from local suppliers	False	21	25	22	0.93	.335	.05
Has reintroduced wildlife animals on the mountain	False	20	16	20	1.10	.294	.05
Promotes a "no idling" program in parking / drop off areas	True	10	15	12	2.61	.106	.08
Purchases 100% of power from renewable energy sources	True	11	11	11	0.02	.901	.01
Donates 5% of ticket revenue to local environmental orgs	False	10	14	11	1.43	.232	.06
Allows visitors to buy a “green tag” to offset car emissions	True	7	15	9	7.11	.008	.14
Won awards for environmental conservation	True	8	12	9	1.96	.161	.07

[1] Responses were coded on 5-point scales of 1 = very certain this is false to 5 = very certain this is true. Responses of 1 = very certain this is false and 2 = somewhat certain this is false were recoded as a “False” response, and 4 = somewhat certain this is true and 5 = very certain this is true were recoded as a “True” response. A response of 3 = unsure was coded as an incorrect response.

Respondents' overall knowledge of VEPs at this ski area was calculated by summing the number of correctly answered questions. The final knowledge score could range from a minimum of 0 (i.e., no questions answered correctly) to 12 (i.e., all questions answered correctly). The highest score achieved, however, was 9 correct answers (i.e., 75% of questions correctly answered) and only 1% of respondents answered this many questions correctly (Table 2.2). On average, respondents answered only 2.76 of the 12 questions correctly (i.e., 23% of questions answered correctly) with the highest proportions of respondents answering no questions correctly (18%) or just two questions correctly (18%). There was no significant difference in mean knowledge scores between skiers (M = 2.71 questions correctly answered) and snowboarders (M = 2.86 correctly answered), $t = 0.64$, $p = .522$, $r_{pb} = .03$. Taken together, these results show that skiers and snowboarders were not highly knowledgeable of VEPs at Mt. Bachelor.

Table 2.2. Responses to true / false statements about VEPs.

Correct responses / Total statements	Skiers (%)	Snowboarders (%)	Total (%)
0/12	18	19	18
1/12	16	15	16
2/12	18	16	18
3/12	14	11	13
4/12	15	14	15
5/12	5	11	7
6/12	8	6	8
7/12	3	7	5
8/18	1	2	1
9/12	1	0	1
10/12	0	0	0
11/12	0	0	0
12/12	0	0	0
Mean [1]	2.71	2.86	2.76

[1] Differences between skiers and snowboarders, $t = 0.64$, $p = .522$, $r_{pb} = .03$.

Current Trip Motivations Related to VEPs

The second question addresses the extent that VEPs influenced motivations to visit Mt. Bachelor on the current trip. A principal components exploratory factor analysis with varimax rotation reduced the 37 motivation variables to eight factors explaining 72.30% of the variance in respondent motivations for visiting, and all factor loadings exceeded .51 (Table 2.3). Membership of variables in a factor is based on factor loadings of each variable and these loadings should generally be greater than or equal to .40 and eigenvalues should be over 1.0 (Tabachnick & Fidell, 1996). The first factor contained eight items related to VEPs and environmental performance (e.g., "I visited because Mt. Bachelor is committed to environmental conservation"), and the Cronbach alpha reliability coefficient of this factor was .97 (Table 2.4). Measurement reliability refers to the consistency of responses across a set of variables that are designed and intended to measure a given unobserved concept or factor (Vaske, 2008). An alpha greater than or equal to approximately .60 indicates that variables are measuring the same factor and justifies combining them into a scale or index (Nunnally & Bernstein, 1994).

The second factor included eight items related to food and service (e.g., "I visited because of the dining facilities offering food / beverages;" reliability = .91), and the third factor contained six items related to chairlifts and ski runs or trails (e.g., "I visited because of the variety of different runs / trails;" reliability = .88). Four items loaded on the fourth factor, which were related to scenery and nature (e.g., "I visited to view the natural scenery"), yielding a reliability of .86. The fifth factor contained three items associated with mountain access (e.g., "I visited because of ease of access to the base;"

reliability = .85) and the sixth factor contained four items related to facilities tailored primarily for youth (e.g., "I visited because of the terrain park / half pipe;" reliability = .72). Finally, the seventh factor consisted of two items about snow conditions (e.g., "I visited because of the amount of snow;" reliability = .87) and the eighth factor contained two items about lift lines and ticket prices (e.g., "I visited because of the lift ticket / pass prices;" reliability = .58). Deletion of any variables from its respective factor did not improve reliability, and factor solutions and reliabilities did not substantially differ between skiers and snowboarders.

In total, 21% of respondents agreed that they were motivated to visit Mt. Bachelor on their current trip because of VEPs at this ski area (Table 2.5). Nineteen percent of respondents, for example, agreed that they visited Mt. Bachelor because it participates in recycling and 12% to 13% visited because of the mountain's use of renewable energy and methods to reduce emissions. Only 10% or fewer respondents visited because of this ski area's use of energy efficient facilities, commitment to environmental conservation, concern about effects of ski areas on climate change, environmental leadership in the ski industry, and receipt of awards for environmental conservation. These results show that VEPs generally influenced fewer than 20% of skiers and snowboarders to visit this area.

The highest proportion of visitors agreed that they visited Mt. Bachelor on their current trip because of the variety of different ski runs / trails (82%), terrain (82%), fresh air (82%), number of ski runs / trails (78%), scenic views (77%), and quality of snow (73%). Conversely, few people visited because of childcare services (6%), retail shops (8%), advertising they saw about this ski area (8%), and equipment rental facilities (9%).

Importance of these issues in motivating individuals to visit Mt. Bachelor on their current trip only differed significantly between skiers and snowboarders for four of the 37 items, χ^2 = 4.23 to 6.84, p = .040 to .009. Effect sizes for these four items, however, ranged from only ϕ = .10 to .13, suggesting that the strength of these differences was "minimal" (Vaske, 2008) or "small" (Cohen, 1988).

The third research question focuses on where VEPs rank in importance compared to other skier and snowboarder motivations for visiting the Mt. Bachelor ski area (e.g., proximity, terrain, snow conditions). On average, the scenery / nature factor was most important to respondents (M = 3.82), followed closely by snow conditions (M = 3.81) and lifts / trails (M = 3.75; Table 2.6). VEPs were the sixth most important motivating factor (M = 2.80), ranking higher than only food / service (M = 2.55) and facilities primarily for youth (M = 2.40). Rankings did not statistically differ between skiers and snowboarders, t = 0.04 to 1.78, p = .076 to .966, r_{pb} = .00 to .09. To summarize, VEPs were not nearly as important as most other reasons for visiting, but they were more important than food and service facilities, and amenities that are provided mainly for youth.

Table 2.3. Exploratory factor analysis of skier and snowboarder motivations for visiting Mt. Bachelor ski area in winter.

	Factor loadings [1]							
Motivation items	F1 VEPs / Environment	F2 Food / Service	F3 Lifts / trails	F 4 Scenery / nature	F5 Mountain access	F6 Facilities for Youth	F7 Snow conditions	F8 Lift lines / prices
Because MTB's use of efficient facilities	.91							
Because MTB's reduction of emissions	.90							
Because MTB's use of renewable energy	.89							
Because MTB won awards in conservation	.88							
Because MTB's environmental leadership	.87							
Because MTB's conservation commitment	.85							
Because MTB's participation in recycling	.85							
Because MTB's concern for climate change	.84							
Because of dining facilities		.78						
Because of food and beverage		.77						
Because of retail shops		.76						
Because of ski patrol / safety		.72						
Because of staff / service		.70						
Because of equipment rentals		.69						
Because of childcare services		.67						
Because of ski school / lessons		.66						
Because of variety of trails			.89					
Because of number of trails			.87					
Because of terrain			.84					
Because of number of lifts			.64					
Because of quality of lifts			.57					
Because of trail grooming			.51					
To view natural scenery				.85				
To be close to nature				.83				
To enjoy the fresh air				.82				
To experience a high alpine area				.71				

[1] Principle components factor analysis with Varimax rotation. Only factors with eigenvalues greater than 1 and items with factor loadings greater than .40 were retained in the final factor structure. Items coded on 5-point scales of 1 = strongly disagree to 5 = strongly agree.

Table 2.3. Exploratory factor analysis of skier and snowboarder motivations for visiting Mt. Bachelor ski area in winter (*continued*).

	Factor loadings [1]							
Motivation items	F1 VEPs / Environment	F2 Food / Service	F3 Lifts / trails	F 4 Scenery / nature	F5 Mountain access	F6 Facilities for Youth	F7 Snow conditions	F8 Lift lines / prices
Because of ease of access to base					.84			
Because of lift service to alpine area					.78			
Because of availability of parking					.69			
Because of terrain park / half pipe						.66		
Because of special events						.62		
Because of public transportation to MTB						.60		
Because of advertisements						.58		
Because amount of snow							.90	
Because quality of snow							.86	
Because of ticket price								.68
Because of lift line length								.67
Eigenvalue	6.89	4.88	3.77	2.84	2.62	2.30	1.76	1.62
Percent (%) of total variance explained [2]	18.63	13.18	10.18	7.67	7.07	6.41	4.75	4.37

[1] Principle components factor analysis with Varimax rotation. Only factors with eigenvalues greater than 1 and items with factor loadings greater than .40 were retained in the final factor structure. Items coded on 5-point scales of 1 = strongly disagree to 5 = strongly agree.

[2] Cumulative variance explained = 72.30%.

Table 2.4. Reliability analysis for skier and snowboarder responses to motivation items and factors. [1]

Motivation factors and items	Item total correlation	Alpha if deleted	Cronbach's alpha
Factor 1: VEPs / environment			.97
Because MTB's use of efficient facilities	.93	.97	
Because MTB's reduction of emissions	.91	.97	
Because MTB's use of renewable energy	.88	.97	
Because MTB won awards in conservation	.91	.97	
Because MTB's environmental leadership	.90	.97	
Because MTB's conservation commitment	.89	.97	
Because MTB's participation in recycling	.84	.97	
Because MTB's concern for climate change	.85	.97	
Factor 2: Food / service			.91
Because of dining facilities	.74	.89	
Because of food and beverage	.73	.89	
Because of retail shops	.80	.89	
Because of ski patrol / safety	.69	.90	
Because of staff / service	.68	.90	
Because of equipment rentals	.71	.90	
Because of childcare services	.66	.90	
Because of ski school / lessons	.63	.90	
Factor 3: Lifts / trails			.88
Because of variety of trails	.74	.84	
Because of number of trails	.76	.83	
Because of terrain	.68	.84	
Because of number of lifts	.71	.84	
Because of quality of lifts	.65	.85	
Because of trail grooming	.52	.88	
Factor 4: Scenery / nature			.86
To view natural scenery	.75	.80	
To be close to nature	.75	.79	
To enjoy the fresh air	.68	.83	
To experience a high alpine area	.63	.85	
Factor 5: Mountain access			.85
Because of ease of access to base	.78	.73	
Because of lift service to alpine area	.70	.80	
Because of availability of parking	.67	.83	
Factor 6: Facilities for youth			.72
Because of terrain park/half pipe	.44	.70	
Because of special events	.52	.65	
Because of public transportation to MTB	.51	.65	
Because of advertisements	.55	.63	
Factor 7: Snow conditions			.87
Because amount of snow	.78	-	
Because quality of snow	.78	-	
Factor 8: Lift lines / prices			.58
Because of ticket price	.41	-	
Because of lift line length	.41	-	

[1] Items coded on 5-point scales of 1 = strongly disagree to 5 = strongly agree.

Table 2.5. Skier and snowboarder agreement with motivation items.

Motivation factors and items	Percent agree (%)			χ^2	*p*-value	ϕ
	Skiers	Snowboarders	Total			
Factor 1: VEPs / environment						
Because MTB's participation in recycling	15	27	19	6.84	.009	.13
Because MTB's use of renewable energy	10	19	13	6.78	.009	.13
Because MTB's reduction of emissions	10	15	12	1.39	.238	.06
Because MTB's use of efficient facilities	8	15	10	4.23	.040	.10
Because MTB's conservation commitment	8	15	10	3.39	.066	.09
Because MTB's concern for climate change	9	11	10	0.62	.431	.04
Because MTB's environmental leadership	7	13	9	3.52	.061	.09
Because MTB won awards in conservation	5	10	7	2.46	.117	.08
Factor total	20	25	21	1.38	.240	.06
Factor 2: Food / service						
Because of dining facilities	17	24	19	2.47	.116	.08
Because of ski patrol / safety	19	19	19	0.00	.982	.00
Because of staff/service	17	24	19	2.74	.098	.08
Because of food and beverage	16	21	17	1.89	.169	.07
Because of ski school/lessons	13	15	13	0.66	.418	.04
Because of equipment rentals	8	10	9	0.18	.673	.02
Because of retail shops	8	7	8	0.02	.887	.01
Because of childcare services	6	5	6	0.24	.622	.02
Factor total	20	24	21	1.03	.310	.05
Factor 3: Lifts / trails						
Because of variety of trails	82	82	82	0.02	.903	.01
Because of terrain	82	82	82	0.04	.851	.01
Because of number of trails	79	76	78	0.28	.597	.03
Because of number of lifts	60	57	59	0.25	.620	.02
Because of quality of lifts	57	53	56	0.62	.430	.04
Because of trail grooming	52	48	51	0.55	.458	.04
Factor total	83	85	84	0.13	.721	.02

Table 2.5. Skier and snowboarder agreement with motivation items (*continued*).

Motivation factors and items	Percent agree (%)			χ^2	*p*-value	ϕ
	Skiers	Snowboarders	Total			
Factor 4: Scenery / nature						
To enjoy the fresh air	83	77	82	1.90	.168	.07
To view natural scenery	78	73	77	1.50	.220	.06
To be close to nature	62	61	62	0.09	.759	.02
To experience a high alpine area	63	61	62	0.28	.599	.03
Factor total	85	82	84	0.80	.370	.04
Factor 5: Mountain access						
Because of ease of access to base	61	61	61	0.02	.896	.01
Because of lift service to alpine area	64	56	61	2.26	.133	.07
Because of availability of parking	49	43	47	1.08	.300	.05
Factor total	69	67	68	0.18	.675	.02
Factor 6: Facilities for youth						
Because of terrain park / half pipe	13	24	16	6.48	.011	.13
Because of public transportation to MTB	11	15	12	1.14	.285	.05
Because of special events	12	10	11	0.30	.587	.03
Because of advertisements	8	7	8	0.02	.880	.01
Factor total	14	17	15	0.50	.479	.04
Factor 7: Snow conditions						
Because quality of snow	73	73	73	0.02	.885	.01
Because amount of snow	69	69	69	0.01	.944	.00
Factor total	75	77	75	0.20	.659	.02
Factor 8: Lift lines / prices						
Because of lift line length	60	59	60	0.08	.781	.01
Because of ticket price	29	29	29	0.00	.956	.00
Factor total	48	46	47	0.16	.689	.02

Motivations to Visit in the Future Related to VEPs

The fourth research question examines the extent that skiers and snowboarders would visit more often in the future if there were more VEPs at Mt. Bachelor. In total, 25% to 38% of skiers and 23% to 38% of snowboarders intended to visit Mt. Bachelor more often if there were more VEPs at this ski area (Table 2.7). The largest proportion of respondents may visit more often in the future if Mt. Bachelor offered incentives to people who carpool to this ski area (e.g., parking closer to chairlifts, 38%), used as many products as possible from local suppliers (38%), and did more to inform visitors of what the ski area is doing in terms of environmental conservation (37%). The fewest number of respondents intended to visit more in the future if Mt. Bachelor won more awards for environmental conservation (24%) and increased their recycling program (27%). There were no statistically significant differences between skiers and snowboarders, $\chi^2 = 0.01$ to 1.74, $p = .187$ to .967, $\phi = .00$ to .06. These findings show that up to one-third of visitors intend to likely visit more often in the future if Mt. Bachelor participates in more VEPs.

Table 2.6. Mean rank order of motivation factors for skiers and snowboarders.

	Mean [1]					
Motivation factors	Skiers	Snowboarders	Total	*t*-value	*p*-value	r_{pb}
Scenery / nature	3.82	3.83	3.82	0.04	.966	.00
Snow conditions	3.80	3.83	3.81	0.29	.772	.02
Lifts / trails	3.77	3.71	3.75	0.83	.409	.04
Mountain access	3.57	3.43	3.53	1.74	.082	.09
Lift lines / prices	3.32	3.17	3.27	1.66	.098	.08
VEPs / environment	2.76	2.89	2.80	1.78	.076	.09
Food / service	2.57	2.50	2.55	0.71	.476	.04
Facilities for youth	2.36	2.48	2.40	1.43	.154	.07

[1] Factors identified using principal component factor analysis with Varimax rotation from motivation items coded on 5- point scales of 1 = strongly disagree to 5 = strongly agree.

Table 2.7. Percent of skiers and snowboarders intending to visit more often if there were more VEPs.

	Percent (%) visit more often					
Future visitation items	Skiers	Snowboarders	Total	χ^2	*p*-value	ϕ
Offered incentives to people who carpool	38	38	38	0.01	.967	.00
Used as many products as possible from local suppliers	38	36	38	0.18	.674	.02
Did more to inform visitors about VEPs	39	32	37	1.52	.218	.06
Offered food supplies that are more sustainable	36	30	34	1.44	.230	.06
Donated a portion of revenue to environmental organizations	34	30	33	0.57	.449	.04
Encouraged more people to use public transportation	33	34	33	0.11	.745	.02
Used more energy efficient facilities	33	28	32	0.93	.336	.05
A top rank ski area in environmental conservation	32	31	31	0.06	.811	.01
Used as many recycled products as possible	31	26	30	1.36	.244	.06
Did more to reduce their emissions	31	25	29	1.21	.272	.05
Donated a portion of revenue to offset vehicle emissions	30	26	29	0.43	.512	.03
More committed to environmental conservation	29	23	28	1.74	.187	.06
Increased their recycling program	28	25	27	0.55	.460	.04
Won more awards for environmental conservation	25	23	24	0.14	.714	.02

Discussion

This article explored skier and snowboarder knowledge of VEPs at alpine ski areas and the influence of these programs on their motivations and behavioral intentions to visit these areas. Results showed that few skiers and snowboarders at the Mt. Bachelor ski area in Oregon were knowledgeable of VEPs at this area. In addition, less than 20% of skiers and snowboarders were motivated to visit Mt. Bachelor on their present trip because of VEPs at this ski area. Other attributes such as scenery, snow conditions, and access were significantly more important in influencing visitor motivations. Up to one-third of skiers and snowboarders, however, intended to visit more often in the future if Mt. Bachelor participated in more VEPs. These results have implications for management and research.

Implications for Management

From a management perspective, several factors may have contributed to skiers and snowboarders not being knowledgeable of VEPs. These programs are relatively new attributes at alpine ski areas and visitors may not be aware of environmental issues at these areas. Although Mt. Bachelor employs a substantial number of VEPs and provides information about these on its internet website and other materials (e.g., a few on-mountain interpretive signs), this information is not as conspicuous as information about other attributes such as scenery, snow conditions, and the number of chairlifts and other amenities. The obscurity of information about VEPs may have prevented many visitors from learning about these programs. Managers should consider increasing interpretive information about VEPs to inform visitors about what is being done to reduce impacts. Managers could, for example, increase visibility of information about environmental

performance on their internet website, at ticket purchasing booths and on chairlifts, on interpretive signs at dining facilities, and in promotional advertising. These actions may improve marketing of environmental performance at Mt. Bachelor, which may subsequently increase visitor knowledge of VEPs and attract more visitors to the ski area.

In addition to a lack of knowledge about VEPs, few skiers and snowboarders were pulled to visit this ski area because of its environmental programs, perhaps because most of these visitors were not knowledgeable of VEPs and this may have hindered them from being motivated by these programs. Some skiers and snowboarders may also have been influenced more by internal motivations that pushed them to the ski area (e.g., to get exercise, relieve stress, escape home) instead of pull motivations such as VEPs. Awareness of these factors that motivate individuals to recreate at ski areas can assist managers in providing opportunities that cater to visitors and ensure that satisfaction of guests and condition of resources do not deteriorate.

Although most skiers and snowboarders were not knowledgeable of VEPs at Mt. Bachelor or motivated to visit this area on their current trip because of these VEPs, a large number stated that they would visit more often in the future if there were more of these environmental programs at this ski area. One-third of respondents also said that they would visit more often if this ski area did more to inform visitors of what the area is currently doing in terms of environmental conservation, suggesting that Mt. Bachelor is in a position to increase visitation simply by doing more to promote VEPs that are already underway. By expanding the number of VEPs (e.g., incentives for people who

carpool, biodegradable supplies, local products), managers may also be able to increase frequency of visitation and enhance their share of the competitive ski area market.

These VEPs may also reduce operational costs and increase profits (Carmin et al., 2003). Mt. Bachelor, for example, recently expanded its VEPs by renovating the West Village Lodge to incorporate a sun room and air lock that reduce loss of heat energy and associated costs. Although direct economic returns of VEPs motivate managers to implement these environmental programs, indirect economic benefits from increased revenue associated with higher visitation due to VEPs are often overlooked. In other words, upgrades to facilities such as this sun room and air lock may not only directly reduce heating costs, but may also indirectly motivate a visitor to spend money at a ski area that uses energy efficient facilities instead of areas that do not take these actions.

Results of this study may also assist Mt. Bachelor's efforts to continue as an environmental leader in the ski area industry. Many ski areas in the western states are located on land that is leased from a federal agency, which allows managers to use the land for business operations without direct ownership. In total, 90% of ski areas in the western states are located on federally owned land (Rivera & de Leon, 2004). Located in the Deschutes National Forest, Mt. Bachelor operates on public lands under agreement with the U.S. Forest Service, which should make environmental stewardship a priority. By implementing VEPs that are beyond federal environmental regulations, Mt. Bachelor sets an example in the industry by showing their respect for public lands and concern for natural resources. Mt. Bachelor may be able to maintain and enhance their progressive and competitive status by implementing more VEPs such as minimizing snowmaking to

conserve water, increasing public transportation to reduce emissions, developing onsite renewable energy infrastructure to reduce grid dependence, and providing more extensive recycling and composting. These efforts may allow Mt. Bachelor to remain competitive with other environmental leaders in the industry such as Squaw Valley and Sugar Bowl in California, Aspen in Colorado, and Park City and Sundance in Utah (SACC, 2010).

Findings from this study may also be useful to recreation managers outside the ski area industry. Freeride mountain bike parks, fishing lodges, and whitewater parks, for example, may benefit from this research because like the ski area industry, they are managed by private companies, rely on natural resources, and often operate on public lands. Given that mangers are challenged to conserve resources while continuing to provide high quality opportunities, adopting and promoting VEPs may allow managers to balance resource management goals while continuing to attract recreation enthusiasts.

Implications for Research

From a research perspective, trends in outdoor recreation may be influenced by environmental impacts, climate change, and conservation efforts. Many studies have examined biophysical impacts of recreation behavior (Cole, 2004; Leung & Marion, 2000). Substantial research, for example, has investigated impacts on vegetation, soil, water, and wildlife at alpine ski areas (Clifford, 2002; Puntieri, 1991; Tsuyuzaki, 1994; Watson, 1985). On a broader scale, research has also investigated how climate change may affect visitation and other characteristics at ski areas (Elsasser & Burki, 2002; Moen & Fredman, 2007; Scott, 2006; Scott, McBoyle, & Mills, 2003; Scott, McBoyle, & Minogue, 2007). Comparatively little research, however, has empirically examined the

influence of environmental impacts, climate change, and conservation efforts and programs on recreationists. This study helps to address this knowledge gap by examining the influence of conservation efforts (i.e., VEPs) on skier and snowboarder knowledge, motivations, and behavior. Researchers are encouraged to continue investigating these emerging trends that are influenced by changing environments on local and global scales.

This research also contributes to understanding skier and snowboarder motivations and intentions. Most previous studies of these recreation groups have focused on internal factors that push people to visit places such as ski areas (e.g., Alexandris et al., 2007; Driver & Tocher, 1970; Fluker & Turner, 2000; Manfredo et al., 1996) partially because, as Dann (1981) suggested, an individual's decision to visit a destination is a result of a prior need for travel and push factors are logical and often antecedent to pull factors (Fluker & Turner, 2000). This article, however, showed that there are many factors that also pull visitors to ski areas and it built on Carmichael's (1996) work by expanding traditional ski area attributes to encompass newly emerging attributes such as those related to environmental conservation and related programs (i.e., VEPs). In tourism research, environmental programs have been identified as attributes influencing motivations. Chan and Baum (2007), for example, found that attributes related to conservation, culture, and natural resources influenced factors that pulled visitors to a destination (Chan & Baum, 2007). More research is needed examine the extent that environmental attributes in general and VEPs in particular influence visitor motivations in other contexts.

Results of this study showed that most skiers and snowboarders were not highly knowledgeable of VEPs at the Mt. Bachelor ski area, but would visit more often in the future if there were more of these programs at this area. This low knowledge of VEPs supports research showing that many recreationists are not highly knowledgeable of some environmental issues and conservation programs (e.g., Vaske et al., 2006). Intentions to visit more often in the future because of VEPs may have been influenced by the questions used to measure this knowledge, as the survey questions may have acted as a vehicle to inform and educate respondents about VEPs at Mt. Bachelor. In addition, visitors may have reacted to statements because of social pressures to conform to a desired social condition. This social desirability bias (Fisher, 1993) may have caused some skiers and snowboarders to say that they would visit more often if there were more VEPs simply to avoid any possible embarrassment and project a favorable image. Future research is needed to determine the extent that these types of bias exist when measuring behavioral intentions related to environmental conservation programs.

This research also contributes to the benefits based management approach in recreation, which suggests that benefits from recreation may be personal (e.g., enhance self-esteem of the individual recreationist), societal (e.g., lower crime rate), economic (e.g., lower health care costs), and environmental (e.g., increased public commitment to conservation; Manning, 1999). Driver et al. (1991) defined a recreation benefit as the attainment of a desired condition, an improved condition, or prevention of an unwanted condition. In the context of this study, VEPs may be conceptualized as an environmental benefit because visitors at Mt. Bachelor are supporting a business engaging in

environmental conservation efforts, which subsequently benefit the environment. Using a benefits based approach, managers can identify benefits that visitors pursue, design facilities and services to accommodate these benefits, and then measure the extent that these benefits are realized (Manning, 1999). The Mt. Bachelor ski area manages for environmental benefits by adopting and implementing VEPs, but little is known about whether visitors realize these benefits. This study provides a first step in addressing this issue by examining skier and snowboarder knowledge of VEPs and how these programs influence motivations and visitation, but research is needed to examine whether visitors realize the benefits of VEPs to apply a benefits based approach to ski area management.

Finally, this study should be viewed as exploratory and a starting point for examining skier and snowboarder knowledge and motivations related to VEPs at alpine ski areas. Findings presented here are limited to one ski area and may not generalize to all areas participating in VEPs. Applicability of findings to other activity groups, ski areas, and commercial recreation settings remains a topic for further empirical investigation.

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CHAPTER 3 – INFLUENCE OF WINTER RECREATIONISTS' SPECIALIZATION, ATTACHMENT, AND VALUE ORIENTATIONS ON MOTIVATIONS AND KNOWLEDGE OF VOLUNTARY ENVIRONMENTAL PROGRAMS AT SKI AREAS

Introduction

There are 481 alpine ski areas operating in the United States (U.S.; NSAA, 2009d). To remain competitive and financially viable, many of these areas have diversified operations by expanding from single season businesses managed for winter activities such as skiing and snowboarding to four season resort destinations accommodating many other activities such as mountain biking, hiking, and golf (Hudson, 2004; Hudson & Cross, 2005; Needham, Wood, & Rollins, 2004). In addition to recreation diversification, ski areas have taken steps to reduce their environmental impacts by adopting programs and management strategies that help protect natural resources. These initiatives are known as voluntary environmental programs (VEPs) and many ski areas have adopted these programs and incorporated them into their operations (NSAA, 2009b).

Ski areas use resources such as water for snowmaking, energy for chairlifts, and forests and wildlife habitat for suitable recreation terrain. Impacts include air pollution from maintenance equipment, as well as erosion, habitat fragmentation, exotic species introduction, and clear-cutting on ski slopes (Puntieri, 1991; Tsuyuzaki, 1994; Watson, 1985). To help mitigate these negative impacts, ski areas have adopted these VEPs or "programs, codes, agreements, and commitments that encourage organizations to voluntarily reduce their environmental impacts beyond the requirements established by the environmental regulatory system" (Carmin, Darnall, & Mil-Homens, 2003, p. 528). In

2000, the National Ski Areas Association (NSAA) created the Sustainable Slopes Charter, an environmental initiative developed with the U.S. Environmental Protection Agency, U.S. Forest Service, and other agencies to promote VEPs in the ski industry (Rivera & de Leon, 2004). This charter encourages, but does not mandate, ski areas to adopt VEPs to mitigate negative impacts. Examples of VEPs in this charter include water and energy conservation, wildlife habitat protection, and waste and vegetation management. As of 2008, 187 ski areas had endorsed this charter (NSAA, 2009b).

Research has examined VEPs in the ski area industry to address environmental performance (Donohoe, 2004; George, 2003; Rivera & de Leon, 2004; Rivera, De Leon, & Koerber, 2006), stakeholder interests (Steelman & Rivera, 2006), and managerial perspectives (Blust, 2004; Todd & Williams, 1996). Donohoe (2004), for example, evaluated the ski industry's adoption of the Sustainable Slopes Charter and found that although ski areas were making progress implementing charter principles, environmental ethics were important in distinguishing resorts that are demonstrating environmental leadership with a higher implementation rate. Blust (2004) examined perceptions of ski area managers regarding sustainability in the industry and found that these managers were not interested in developing a widely accepted definition of sustainability, but were more concerned with efforts to promote sustainable development at their own ski area. In addition, financial costs were a decisive factor associated with sustainability because reducing costs was an important incentive to becoming more sustainable (Blust, 2004).

This body of research, however, has not focused much empirical attention on the importance of VEPs to winter recreationists such as skiers and snowboarders, especially

what these groups know about VEPs at ski areas and how these programs may influence motivations to visit these areas presently and in the future. This article addresses these knowledge gaps by examining winter recreationists' motivations and knowledge of VEPs and how other cognitions such as specialization, place attachment, and value orientations influence their motivations and knowledge. It is possible that skiers and snowboarders who are knowledgeable about VEPs and motivated to visit a ski area currently and in the future because of these programs are highly skilled and committed to their activity, strongly attached to the ski area, and have biocentric or environmentally centered value orientations. Understanding relationships among specialization, value orientations, place attachment, and knowledge and motivations related to VEPs may be useful because it can help managers understand subgroups of users attracted to an area because of its VEPs and can assist in targeting advertising and promotional efforts to these groups.

Conceptual Foundation

Current Trip Motivations and Future Intentions Related to VEPs

This article examines how much skiers and snowboarders know about VEPs at ski areas, if these programs influence motivations and intentions to visit this area on their current and future trips, and how other cognitions such as attachment, specialization, and value orientations influence these motivations and knowledge related to VEPs. A motivation is an internal or external factor that arouses and directs human behavior (Iso-Ahola, 1999). A leisure or recreation motivation is a reason for participating in an activity or visiting an area at a given time and / or location (Manfredo, Driver, & Tarrant, 1996). Motivations to visit an area *in the future* are directly related to the concept of behavioral intentions and

research has shown that an individual's future behavior can be predicted, in part, directly from his or her intention to perform that behavior (Fishbein & Ajzen, 1975; Fishbein & Manfredo, 1992). This article examines intentions to visit an alpine ski area in the future by asking skiers and snowboarders how often they would visit in the future (i.e., behavioral intention) if this area increased its number of environmental programs.

Motivations to visit an area *on the present trip* have received more empirical attention in the recreation literature. Iso-Ahola (1999) identified two dimensions of these types of motivations. The first dimension is "seeking," which involves motivations related to searching for personal and interpersonal rewards from participation (e.g., sense of competence, exploration, challenge). The second dimension is "escaping," or the desire to escape from other life experiences (e.g., escape pressures, daily routines). Motivations for participating in an activity or escaping to or from a destination include cultural, sociological, and psychological components (Robinson & Gammon, 2004). Crompton (1979), for example, identified seven social-psychological motivations associated with participation (escape, self-exploration, relaxation, prestige, regression, enhancement of kinship relations, social interaction) and two cultural motives (novelty, education). Similarly, the recreation experience preference (REP) scales contain more than 300 motivations that can be grouped into a few broad domains (e.g., exploration, nature, exercise, exhilaration, escape, introspection, similar people; Manfredo et al., 1996).

These motivations tend to be social-psychological or internal forces that "push" people to visit an area or engage in an activity. There are, however, external motivations that also "pull" or attract people to an area or activity (Crompton, 1979; Dann, 1981). In

other words, push factors (e.g., escape, relaxation, novelty) are internal forces influencing decisions and behaviors, whereas pull factors (e.g., beaches, facilities) are external forces attracting an individual to an activity or destination. Pull factors associated with ski areas, for example, may include destination attributes such as ski lifts, terrain, and lodging. This push-pull framework is one approach for explaining current motivations of recreationists and there are many push and pull factors influencing decisions associated with participating in recreation activities at particular settings that collectively combine to form a multiple motivations approach (Dann, 1977; Swarbrooke & Horner, 1999).

Skiers and snowboarders often have multiple reasons or motivations for visiting a ski area on their trip. Research has found that push motivations for visiting ski areas in the winter include excitement and thrill seeking, exercise, demonstrating skills and ability, relaxation, and achievement (e.g., Holden, 1999; Klenosky, Gengler, & Mulvey, 1993; Williams, Dossa, & Fulton, 1994). Several studies have also found attributes that pull winter visitors to these areas including terrain, snow conditions, number of runs, lift ticket prices, proximity, lodging, and resort services (Alexandris, Kouthouris, & Girgolas, 2007; Hudson & Shephard, 1998; Klenosky et al., 1993; Mills, Couturier, & Snepenger, 1986; Richards, 1996; Williams et al., 1994). VEPs may be additional attributes that pull skiers and snowboarders to an alpine ski area, so this article examines how much VEPs influenced people to visit a ski area on their current trip and whether people would visit more often in the future if the number of VEPs at an area was increased.

Research has shown that motivations pulling visitors to an area on their current trip can influence behavioral intentions such as motivations to visit more often in the

future. Phillips and Jang (2007), for example, found that motivations moderate intentions to visit in the future; those who previously visited a site or were currently visiting the area were more likely to return in the future. It is plausible, therefore, that skiers and snowboarders who are motivated to visit ski areas because of their current environmental commitment and VEPs may be likely to visit more often in the future if these areas increased their number of these environmental programs. This article tests relationships between current trip motivations and future visits related to VEPs at an alpine ski area.

Knowledge of VEPs

Although visitors may be motivated to visit a ski area because of its participation in VEPs, this does not mean that visitors are knowledgeable of all VEPs at the area. Knowledge is a central component of information processing and decision making (Johnson & Russo, 1984; Raju, Lonial, & Mangold, 1995; Vaske, Needham, Stafford, Green, & Petchenik, 2006). Past research has examined recreationists' awareness and knowledge of environmental issues such as wildlife disease (Vaske et al., 2006), fossil fuel exploration (Teel, Bright, Manfredo, & Brooks, 2006), and conservation behaviors such as catch-and-release angling (Hvenegaard, 2002; Sutton & Ditton, 2001). Most studies have found that many recreationists are not highly knowledgeable of some of these types of environmental issues. Vaske et al. (2006), for example, found that the largest proportion of hunters answered only five or fewer questions out of nine questions about environmental issues associated with chronic wasting disease in wildlife.

Little is known, however, about skier and snowboarder knowledge of VEPs, which may influence decisions to visit on current or future trips. Studies on other topics

have found relationships between knowledge, intentions, and motivations. Raju et al. (1995), for example, investigated behavioral intentions and knowledge in the context of electronic shopping, and found that awareness and knowledge influenced decision making behaviors. In the context of ski areas, therefore, it is conceivable that individuals who are already knowledgeable about VEPs at a particular area decide to visit currently and in the future because of these programs. Alternatively, others may be motivated to visit places because of VEPs, so they might seek information to learn about and become knowledgeable of specific programs at a particular area. Although research has identified ski area attributes that are important to visitors, this does not mean that visitors are always aware of every attribute at a given area (e.g., Carmichael, 1996; Godfrey, 1999; Richards, 1996). Unlike well known attributes such as terrain and chairlifts, VEPs are a relatively new phenomenon at ski areas, so this article examines the extent that visitors are knowledgeable of these environmental programs and how this knowledge may influence motivations and visitation related to VEPs. Understanding how much recreationists know about VEPs provides important information that will allow managers to assess the effectiveness of their marketing of environmental programs and performance that are partially designed evoke a conservation image and attract visitors.

Place Attachment

Although skiers and snowboarders who are knowledgeable of VEPs at a ski area may be more motivated to visit because of these programs, it is possible that those who feel attached to the area are also more likely to visit because of these VEPs. Place attachment indentifies bonds between people and places (Giuliani & Feldman, 1993) and

Tuan (1974) suggested that physical space becomes “place” when individuals attach meaning over time to a particular location. Therefore, “what begins as undifferentiated space becomes place as we get to know it better and endow it with value” (Tuan, 1977, p. 6). Attachment to places provides people with a sense of belonging and purpose that gives meaning to their lives (Tuan, 1980). Through emotional and functional associations to particular settings, individuals engender a deep connection to locations and resources.

Place attachment generally consists of at least two dimensions – place dependence and place identity (Proshansky, Fabian, & Kaminoff, 1983). Place dependence refers to the functionality associated with a specific location (Stokols & Shumaker, 1981) and is represented by a setting's physical characteristics (e.g., deep snow, challenging terrain). Place identity refers to the emotional ties to a location (Proshansky et al., 1983), can develop over time, and is related to symbolic meanings of a place. Some researchers have suggested that repeat visitation may create place identity (Moore & Graefe, 1994), but others have argued that place identity is not always the result of frequency of visitation and experience with a place (Proshansky et al., 1983).

Place attachment has received considerable attention in the literature and has been applied to many recreation activities and settings (e.g., Kyle, Bricker, Graefe, & Wickham, 2004; Kyle, Graefe, Manning, & Bacon, 2003; Stedman, 2002, 2003; White, Virden, & van Riper, 2008; Williams & Vaske, 2003). Studies have examined the concept relative to other characteristics such as knowledge, motivations, and intentions. Stedman (2002), for example, found that individuals who felt attached to a given place were more willing to engage in behaviors that maintained or enhanced valued attributes

of the setting. Similarly, studies of skier and snowboarder attachment to winter recreation areas have shown that these recreationists who are more attached to a particular place are more sensitive to impacts and have different motivations than those who are less attached (e.g., Fredman & Heberlein, 2005; Gibbons & Ruddell, 1995) This article builds on this research by examining relationships between place attachment and the importance of VEPs in motivating skiers and snowboarders to visit an alpine ski area. It is possible that visitors who are attached to a particular ski area may be more knowledgeable of VEPs at the area and consider these programs to be important for protecting the resource and a reason for why they visited on their current trip and intend to visit again in the future.

Value Orientations

Research has shown that participants in recreation activities differ and are heterogeneous, for example, in the extent that they feel attached to a setting. Some visitors may feel strongly connected to a site, whereas others may have little feeling of attachment. As a result, recreationists are often grouped into smaller more homogeneous subgroups based on characteristics and cognitions such as place attachment. A number of studies have also grouped visitors by other concepts such as their value orientations toward general objects or natural resources (Bright, Manfredo, & Fulton, 2000; Vaske & Needham, 2007). Value orientations (Kluckhohn, 1951) refer to general classes of objects (e.g., wildlife, forests, environment) and are revealed through the pattern, direction, and intensity of basic beliefs (Fulton, Manfredo, & Lipscomb, 1996; Vaske & Donnelly, 1999). Patterns in these beliefs have consistently factored into bipolar value orientation continuums such as the protection-use continuum (Bright et al., 2000; Fulton et al., 1996;

Vaske & Needham, 2007) and biocentric-anthropocentric continuum (Steel, List, & Shindler, 1994; Vaske & Donnelly, 1999). A biocentric or protectionist orientation is largely nature-centered and supports the value of ecosystems and species, whereas an anthropocentric or use orientation represents a more human-centered view by considering humans as more important than the environment. Individuals in a population often differ in their orientations along these continuums.

Studies have examined value orientations toward forests (Steel et al., 1994; Vaske & Donnelly, 1999), wildlife (Deruiter & Donnelly, 2002; Kellert & Berry, 1987; Manfredo, Pierce, Fulton, Pate, & Gill, 1999; Vaske & Needham, 2007; Zinn, Manfredo, & Barro, 2002), and more general environmental issues (Bright, Barro, & Burtz, 2002; Dunlap & Van Liere, 2008; Kellert, 1993). Some of these studies have examined relationships between value orientations and motivations and intentions. Manfredo, Teel, and Bright (2003), for example, found that biocentric or environmentally oriented individuals were less motivated to hunt wildlife. Similarly, Vaske and Donnelly (1999) reported that people with a protectionist orientation toward wilderness and forests were more likely to vote in favor of preserving and protecting these natural resources.

Little research has examined environmental value orientations of winter recreationists at ski areas, but this may be important for explaining behaviors in relation to VEPs at these areas. Skiers and snowboarders with strong biocentric or protectionist orientations toward the environment, for example, may be more knowledgeable of VEPs and motivated to visit ski areas that participate in these environmental programs. This

article, therefore, examines the possible influence of environmental value orientations on recreationists' knowledge, motivations, and visitation related to VEPs at a ski area.

Recreation Specialization

Similar to value orientations, the concept of specialization has also been used extensively in the literature to understand subgroups of recreationists. Recreation specialization is conceptualized as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences" (Bryan, 1977, p. 175). At one end of the continuum are generalists or novices who have little experience or involvement in a particular recreation activity. At the other end are more specialized individuals who are highly committed, skilled, and experienced in the activity. Recreationists are thought to progress to higher stages along this continuum, reflected by increasing participation, skill, and commitment (see Bryan, 1977; Needham, Vaske, Donnelly, & Manfredo, 2007; Scott & Shafer, 2001 for reviews).

Researchers generally agree that specialization is multidimensional, consisting of behavioral, cognitive, and affective components (McFarlane, 2004; Scott & Shafer, 2001). Indicators of the behavioral dimension include equipment investment and previous participation experience (e.g., Ditton, Loomis, & Choi, 1992). Cognitive indicators include self-reported skill level and knowledge about the activity (e.g., Needham, Rollins, & Vaske, 2005). Indicators of affective attachment and commitment include centrality to lifestyle and enduring involvement (e.g., McIntyre & Pigram, 1992). Recent studies have suggested that affective indicators such as centrality may be the most important measures

of specialization, followed by cognitive characteristics such as skill level and behavioral indicators such as equipment and past experience (Needham et al., 2007).

The concept of specialization has been studied relative to a number of different concepts in recreation, including perceptions of management, environmental behaviors, motivations, and place attachment (see Manning, 1999; Scott & Shafer, 2001). Bricker and Kerstetter (2000), for example, found that among whitewater recreationists, place identity was positively correlated with activity involvement and past experience. Similarly, Hammitt, Backlund, and Bixler (2004) reported that more experienced anglers felt a stronger bond to particular fishing areas. Kyle et al. (2003) found that hikers who were more involved in this activity reported a higher level of place identity with a particular hiking trail than those who were less involved in the activity.

Studies have also examined specialization and skill of recreationists at alpine ski areas, which have shown that more specialized users tend to be more sensitive to social and resource conditions (Needham et al., 2005; Ormiston, Gilbert, & Manning, 1998; Thapa & Graefe, 2003; Vaske, Dyar, & Timmons, 2004; Won, Bang, & Shonk, 2008). Research on other activities has also shown that specialists tend to be more likely than less specialized users to support environmental practices and conservation (e.g., volunteer or donate to environmental causes, leave no trace, catch-and-release; Dyck, Schneider, Thompson, & Virden, 2003; Hvenegaard, 2002; McFarlane & Boxall, 1996; Sutton & Ditton, 2001). Oh and Ditton (2008), for example, found that recreationists' concerns for the environment and conservation increased as degree of specialization increased. It is conceivable, therefore, that more specialized skiers and snowboarders may be more

concerned and knowledgeable about environmental programs at ski areas and more motivated to visit areas that mitigate environmental impacts by supporting VEPs.

Based on this literature and these plausible effects of specialization, value orientations, and place attachment on recreationists' knowledge, motivations, and intentions related to VEPs, the following hypotheses are explored for skiers and snowboarders at an alpine ski area (Figure 3.1):

H_1: Recreationists who are more biocentric, specialized, attached to the ski area, knowledgeable of VEPs, and motivated to visit on their current trip because of these programs will intend to visit more in the future if there are more VEPs at this area.

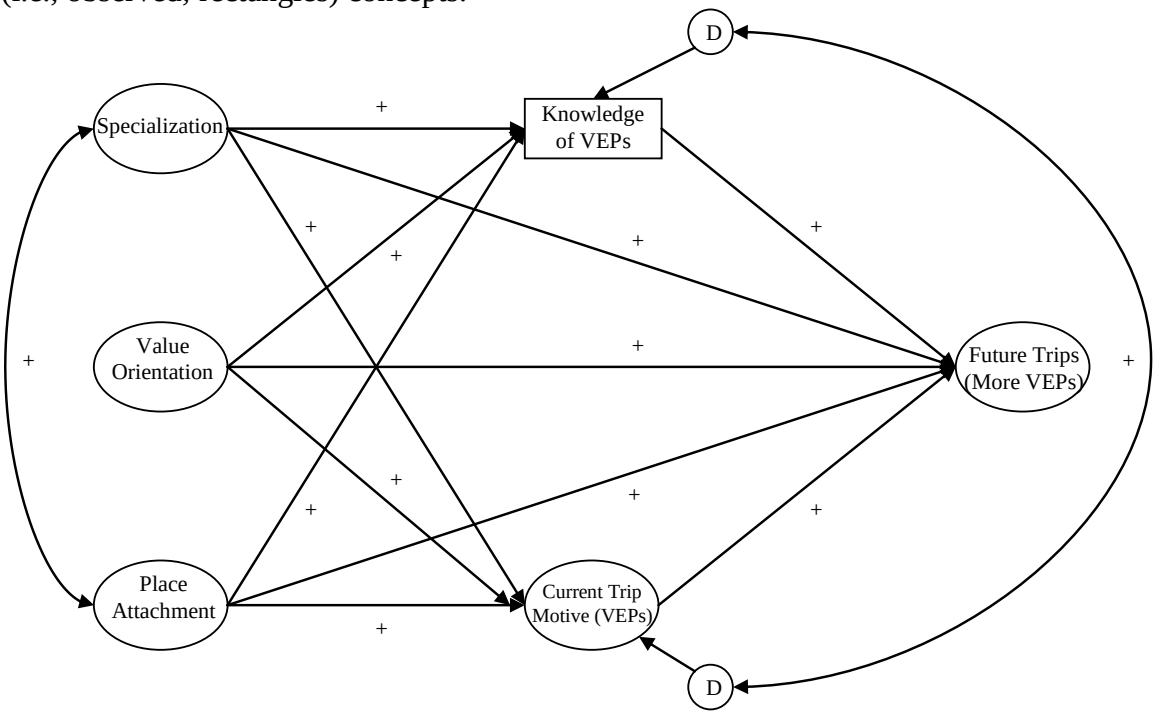
H_2: Recreationists who are more biocentric, specialized, attached to the ski area, and motivated to visit this area on their current trip because of VEPs will be more knowledgeable of these programs at this area.

H_3: Recreationists who are more biocentric, specialized, attached to the ski area, and knowledgeable of VEPs will be more motivated to visit this area on their current trip because of these programs.

H_4: Recreationists who are more specialized in skiing or snowboarding will be more attached to this area that caters to these two activity groups.

This article also examines if any of these effects of specialization, value orientations, and attachment on knowledge, motivations, and intentions related to VEPs differ between skiers and snowboarders at this alpine ski area (i.e., moderation, interaction effect).

Figure 3.1. Hypothesized model for skier and snowboarder knowledge, motivations, and future visitation related to voluntary environmental practices. The "+" symbols refer to positive hypothesized relationships between latent (i.e., unobserved; ovals) and manifest (i.e., observed; rectangles) concepts.



Methods

Study Site and Context

Data were collected at the Mt. Bachelor (MTB) ski area in central Oregon (U.S.) for two main reasons. First, Mt. Bachelor is located only 22 miles from the city of Bend and its population of over 80,000 residents. It is also one of the largest ski areas in the U.S., accumulates over 350 inches of snow every winter, and its summit of 9,065 feet is the highest of all ski areas in the Pacific Northwest creating a vertical drop of over 3,000 feet. Mt. Bachelor's seven express chairlifts provide access to over 3,500 acres of terrain and 71 ski runs and trails. Due to its size, location, and terrain, Mt. Bachelor receives over 700,000 visitors every winter and accommodates a range of activities and users.

Second, Mt. Bachelor employs a number of managerial and operational VEPs to support environmental conservation and reduce emissions (NSAA, 2009c). This ski area, for example, purchases all power from renewable energy sources, employs extensive recycling and waste reduction programs, and operates bio-fuel powered shuttles to transport guests and employees to and from the mountain (Mt. Bachelor, 2009). According to the environmental watchdog group, Ski Area Citizens Coalition (SACC), Mt. Bachelor ranked ninth among all ski areas in the U.S. for environmental stewardship based on results of the 2008-2009 Ski Area Environmental Scorecard (SACC, 2009). This ski area has also received numerous awards for its environmental performance. In 1994, for example, Mt. Bachelor was the first to win the prestigious Golden Eagle Award for environmental excellence presented by the National Ski Areas Association (NSAA, 2009a). The Mt. Bachelor ski area continues to introduce and support new VEPs to protect natural resources and reduce environmental impacts (Mt. Bachelor, 2009).

Data Collection

Data were obtained with methods similar to those used in other studies of visitors at ski areas (e.g., Klenosky et al., 1993; Ormiston et al., 1998; Thapa & Graefe, 2003; Vaske et al., 2004). Surveys were administered onsite to adult skiers and snowboarders at the Mt. Bachelor ski area; employees and people under the age of 18 were not surveyed. Data were collected from the middle of January to the end of March, 2010 during which sampling days were randomly selected with the number of sampling days averaging five per week. Consistent with past research at ski areas (Holden, 1998; Vaske et al., 2004), sampling occurred during lunch hours (11:30 a.m. to 3:00 p.m.) in restaurant facilities on

the mountain and at its base to reduce interfering with visitor recreation experiences. On each sampling day, one of the three dining facilities (Pine Martin Lodge, Sunrise Lodge, West Village Lodge) was randomly selected for sampling and potential respondents were approached at these facilities using a systematic random sampling technique where every fifth table was systematically selected after starting the selection by randomly selecting a table (Leedy & Ormrod, 2005). At each table, the individual in each household with the most recent birthday was asked to complete a survey. If all individuals were from different households, they were each asked to complete the survey. If an individual refused to participate, was under 18 years of age or an employee, or had completed a survey, an individual at the next table was selected.

Surveys took approximately 10 to 15 minutes to complete and after an onsite pilot test of the instrument, the final sample size was $n = 429$ ($n = 303$ skiers, $n = 126$ snowboarders) with a response rate of 89.7%. Given the small number of telemark skiers surveyed ($n = 13$), they were grouped with alpine skiers for data analyses. This sample size allows generalizations about the population of adult visitors at the Mt. Bachelor ski area at the 95% confidence level with a margin of error of ± 4.7% (i.e., more than 19 times out of 20; Salant & Dillman, 1994; Vaske, 2008).

Model Variables

Future Trip Intentions Related to VEPs. These skiers and snowboarders were asked 14 questions about the extent that they would visit in the future if the number of VEPs was increased at Mt. Bachelor. Respondents were asked, for example, "how would you change how often you visit if Mt. Bachelor was more committed to environmental

conservation" and "how would you change how often you visit if Mt. Bachelor donated a portion of revenue to offset vehicle emissions?" Responses were measured on 5-point scales of 1 "visit much less often," 2 "visit slightly less often," 3 "visit about the same," 4 "visit slightly more often," and 5 "visit much more often."

Current Trip Motivations Related to VEPs. Eight survey variables were used to measure pull motivations for visiting Mt. Bachelor that were related to existing VEPs at this ski area. These motivation items were based on information from managers at Mt. Bachelor and this ski area's internet webpage (Mt. Bachelor, 2009). Respondents reported the extent that they disagreed or agreed that each issue motivated them to visit this ski area on their current trip. Respondents were asked, for example, to reply to statements such as "I visited Mt. Bachelor today because this ski area has won awards for environmental conservation" and "I visited Mt. Bachelor today because this ski area participates in recycling." Responses were measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree."

Knowledge of VEPs. Similar to Vaske et al. (2006), knowledge was measured using a true / false format with 12 statements identifying VEPs that were occurring (e.g., "Mt. Bachelor has a recycling program") and were not occurring at Mt. Bachelor (e.g., "Mt. Bachelor has reintroduced native wildlife animals on the mountain"). Responses were measured on 5-point scales of 1 "very certain this is false" to 5 "very certain this is true." For analysis purposes, responses were recoded to 0 "did not answer correctly" and 1 "answered correctly" with "unsure" considered an incorrect response. Respondents' overall knowledge of VEPs at this ski area was calculated by summing the number of

correctly answered questions, which could range from a minimum of 0 (i.e., no questions answered correctly) to 12 (i.e., all questions answered correctly).

Place Attachment. Scales for measuring place attachment were identical to those used in past research (e.g., Williams & Vaske, 2003). Six variables measured the place dependence and place identity dimensions of attachment. Respondents reported the extent that they disagreed or agreed with statements such as "Mt. Bachelor is very special to me" and "Mt. Bachelor is one of the best places for doing what I like to do." Responses were measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree."

Value Orientations. Recreationists' environmental value orientations were measured using Dunlap, Van Liere, Mertig, & Jones' (2000) revised New Ecological Paradigm (NEP) scale. Agreement with four anthropocentric statements (e.g., "humans have the right to modify the natural environment to suit their needs") and six biocentric statements (e.g., "plants and animals have as much right as humans to exist") was measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree." The four anthropocentric variables were reverse coded to classify respondents along a continuum.

Recreation Specialization. Consistent with previous research (e.g., McFarlane, 2004; McIntyre & Pigram, 1992; Needham et al., 2007; Scott, Ditton, Stoll, & Eubanks, 2005; Scott & Shafer, 2001; Scott & Thigpen, 2003), degree of specialization in skiing or snowboarding was measured in terms of affective, cognitive, and behavioral dimensions.

Five variables were used for measuring the affective dimension of centrality to lifestyle. Respondents reported the extent that they disagreed or agreed with statements such as "I would rather participate in this activity than do most anything else" and

"participating in this activity is a large part of my life." Responses were measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree."

Five variables were also used for measuring the cognitive dimension of self-reported skill level. For four of these variables, respondents reported the extent that they disagreed or agreed with statements such as "testing my skills in this activity is very important to me" and "I am becoming more skilled in this activity each year." Responses were measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree." For the remaining variable, respondents were asked to rate their skill level in the activity on a 5-point scale of 0 "beginner," 1 "novice," 2 "intermediate," 3 "advanced," and 4 "expert."

Four variables were used for measuring the behavioral dimension of equipment in skiing or snowboarding. For these variables, users reported the extent that they disagreed or agreed with statements such as "I have invested a lot of money on equipment for this activity" and "I am obtaining more equipment for this activity each year." Responses were measured on 5-point scales of 1 "strongly disagree" to 5 "strongly agree."

Finally, the behavioral dimension of past experience was measured with a single computed variable. Respondents were asked how many years in total they have spent skiing or snowboarding in their life. To control for age, experience was expressed as a percentage and calculated with the following equation:

Number of years spent skiing or snowboarding in life / age * 100

= proportion of life spent skiing or snowboarding

These 15 variables for measuring the various dimensions of specialization are consistent with those used in Barro and Manfredo (1996) and Needham et al. (2007). All variables used for measuring the six concepts in this article are described in Tables 3.1 through 3.6.

Data Analysis

Measurement reliability of the multiple-item indices measuring specialization, value orientations, place attachment, current trip motivations, and future trip intentions was examined with Cronbach alpha reliability coefficients. Measurement reliability is defined as the internal consistency among variables and it indicates that multiple items measure the same latent or unobserved concept (i.e., variables intercorrelate with each other; Vaske, 2008). An alpha reliability coefficient of $\geq .60$ and item total correlations of $\geq .40$ suggest that variables are reliably measuring the same concept, which justifies combining them in further analyses (Nunnally & Bernstein, 1994). Item total correlations represent correlations between the response to a given variable and sum of the other variables associated with the concept (Vaske, 2008). Knowledge about VEPs was an observed (i.e., manifest) variable created by summing scores on the true / false questions.

Confirmatory factor analysis (CFA) was then used to examine whether variables measuring these concepts provided a good fit and demonstrated construct validity. Construct validity refers to the way that variables and concepts relate to each other within a system of theoretical relationships, and is demonstrated if specific survey variables are explained by latent concepts (Vaske, 2008). Construct validity of variables measuring the specialization dimensions (centrality, skill, equipment, experience) was assessed using second-order CFA to test whether the variables measuring these first-order factors had

acceptable factor loadings and provided a good fit, and if these first-order factors were explained by a higher second-order factor (i.e., specialization in skiing or snowboarding).

Structural equation modeling (SEM) was then applied to test the hypotheses and examine predictive validity of the six factor model (Figure 3.1). Multigroup structural equation models were also conducted to determine if tests of these hypotheses differed between skiers and snowboarders. One model examined factor loadings and path coefficients among the concepts for skiers, and a second model for snowboarders. The first step in this type of moderation analysis involves testing for measurement invariance to reveal any differences in factor loadings between these two groups. The second step is to run the structural model after imposing constraints so that the path coefficients among the concepts are constrained to equality across groups. The final step involves running the model without these constraints, testing for differences in effects between groups, and comparing models (i.e., constraints, no constraints) using the chi-square difference test ($\Delta\chi^2$). An insignificant test suggests that moderation is not present and there is no interaction between groups (Byrne, 2006; Chou & Bentler, 1995).

EQS 6.1 software and Satorra-Bentler robust estimation to correct for multivariate non-normality were used because data skewness and kurtosis indicated violations of the normal distribution assumption needed for this type of structural path analysis (Byrne, 2006; Chou & Bentler, 1995). Model evaluation was based on the Satorra-Bentler scaled chi-square (S-B χ^2), but large sample sizes and complex models inflate this statistic, so model fit was also assessed with robust corrected comparative fit index (CF1*), non-normed fit index (NNFI*), incremental fit index (IFI*), root mean square error of

approximation (RMSEA*), and normed χ^2/df (* denotes robust corrected estimations). CFI*, NNFI*, and IFI* values ≥ .90, RMSEA* values ≤ .08, and a normed χ^2/df ratio of 2:1 to 5:1 suggest acceptable model fit (Browne & Cudeck, 1993). CFA also generates factor loadings for variables, which should be ≥ .40 to be retained. Robust standard errors were used for test statistics and errors were not permitted to correlate (Byrne, 2006).

Results

Descriptive Findings

Skier and snowboarder responses to the 12 true / false knowledge questions about VEPs at Mt. Bachelor showed that visitors were most knowledgeable about recycling programs at this ski area, as 70% of skiers and 66% of snowboarders knew that Mt. Bachelor had a recycling program (Table 3.1). Less than half of respondents, however, answered the other questions about VEPs correctly. Only 27% of visitors, for example, were aware that Mt. Bachelor uses energy efficient lighting and 24% knew that this ski area uses bio-diesel to fuel some of its vehicles. The fewest respondents (9%) knew that Mt. Bachelor had received awards for environmental conservation efforts. There were no significant differences between skiers and snowboarders in their answers to 11 of the 12 questions, $\chi^2 \leq 2.61$, $p = .106$ to .999. Snowboarders (15%) were significantly more aware than skiers (7%) that Mt. Bachelor allows visitors to purchase a "green tag" to help offset car emissions, $\chi^2 = 7.11$, $p = .008$. The effect size of $\phi = .14$, however, suggests that the strength of this difference was “minimal” (Vaske, 2008) or “small” (Cohen, 1988).

Table 3.1. Skier and snowboarder knowledge of VEPs at Mt. Bachelor ski area.

VEP Statements [2]	Correct response	Percent correct (%) [1] Skiers	Snowboarders	Total	χ^2	*p*-value	ϕ
Has a recycling program	True	70	66	68	0.67	.411	.04
Conserves water by never using snowmaking equipment	False	42	41	42	0.04	.848	.01
Uses energy efficient lighting in facilities	True	28	23	27	1.13	.289	.05
Provides incentives to visitors who carpool to this ski area	False	24	26	25	0.18	.673	.02
Uses bio-diesel to fuel some of its vehicles	True	24	24	24	0.00	.999	.00
Purchases all food related products from local suppliers	False	21	25	22	0.93	.335	.05
Has reintroduced native wildlife animals on the mountain	False	20	16	20	1.10	.294	.05
Promotes a "no vehicle idling" program in parking/drop off areas	True	10	15	12	2.61	.106	.08
Purchases 100% of its power from renewable energy sources	True	11	11	11	0.02	.901	.01
Donates 5% of ticket revenue to local environmental organizations	False	10	14	11	1.43	.232	.06
Allows visitors to buy a “green tag” to help offset vehicle emissions	True	7	15	9	7.11	.008	.14
Won awards for environmental conservation	True	8	12	9	1.96	.161	.07

[1] Responses were originally coded on 5-point scales of 1 = very certain this is false, 2 = somewhat certain this is false, 3 = unsure, 4 = somewhat certain this is true, 5 = very certain this is true. Responses of 1 = very certain this is false and 2 = somewhat certain this is false were recoded as a “False” response, and 4 = somewhat certain this is true and 5 = very certain this is true were recoded as a “True” response. A response of 3 = unsure was coded as an incorrect response.

[2] Correct responses/total responses (total percentage of respondents): 0/12 (18%), 1/12 (16%), 2/12 (18%), 3/12 (13%), 4/14 (15%), 5/12 (7%), 6/12 (8%), 7/12 (5%), 8/12 (1%), 9/12 (1%), 10/12 (0%), 11/12 (0%), 12/12 (0%). Mean = 2.71/12 (skiers), 2.86/12 (snowboarders), 2.76/12 (total). There were no differences in mean knowledge scores between skiers and snowboarders, $t = 0.64$, $p = 0.522$, $r_{pb} = 0.03$.

Although the total knowledge score could range from a minimum of 0 (i.e., no questions answered correctly) to 12 (i.e., all questions answered correctly), the highest score achieved was 9 correct answers (i.e., 75% of questions correctly answered) and only 1% of respondents answered this many questions correctly. On average, visitors answered only 2.76 of the 12 questions correctly (i.e., 23% of questions correct) with the highest proportions of respondents answering no questions correctly (18%) or just two questions correctly (18%). There was no significant difference in average knowledge scores between skiers (M = 2.71 questions correctly answered) and snowboarders (M = 2.86 correct), $t = 0.64$, $p = .522$, $r_{pb} = .03$. Taken together, these results show that skiers and snowboarders were not highly knowledgeable of VEPs at Mt. Bachelor.

Similarly, relatively few recreationists were motivated to visit Mt. Bachelor on their current trip because of the VEPs at this ski area (Table 3.2). Nineteen percent of respondents, for example, agreed that they visited Mt. Bachelor because it participates in recycling and 12% to 13% visited because of the mountain's renewable energy use and emission reductions. Only 10% or fewer people visited because of this ski area's use of energy efficient facilities, commitment to conservation, concern about effects of ski areas on climate, leadership in the industry, and receipt of environmental conservation awards. There were some minor differences between activity groups with snowboarders being slightly more motivated to visit because this ski area participates in recycling and uses renewable energy and efficient facilities, but effect sizes showed that these differences were “minimal” (Vaske, 2008) or “small” (Cohen, 1988), $\chi^2 \leq 6.84$, $p \leq .040$, $\phi = .13$.

Table 3.2. Reliability analysis of variables measuring current trip motivations influenced by VEPs.

VEP motivations – I visited Mt. Bachelor today because it:	Item code	Percent agree (%) [1]			Item total correlation	Alpha if item deleted [3]
		Skiers	Snowboarders	Total		
Is committed to conservation	V_2	8	15	10	.89	.97
Is concerned about effects of ski areas on climate change	V_3	9	11	10	.85	.97
Is an environmental leader in the ski industry	V_4	7	13	9	.90	.97
Has won awards for environmental conservation	V_5	5	10	7	.91	.97
Participates in recycling [2]	V_6	15	27	19	.84	.97
Uses renewable energy (wind, solar) [2]	V_7	10	19	13	.88	.97
Uses energy efficient facilities [2]	V_8	8	15	10	.93	.97
Tries to reduce their emissions	V_9	10	15	12	.91	.97

[1] Variables originally coded on 5-point scales of 1 = strongly disagree, 2 = disagree, 3 = neither, 4 = agree, 5 = strongly agree. Percents calculated by combining 4 = agree and 5 = strongly agree.

[2] Variables were significantly different between skiers and snowboarders for percent agree ($\chi^2 \leq 6.84$, $p \leq .040$, $\phi \leq .13$).

[3] Overall Cronbach alpha reliability = .97.

Although most visitors were not influenced by Mt. Bachelor's VEPs on their current trip to this area, 25% to 39% of skiers and 23% to 38% of snowboarders intended to visit Mt. Bachelor more often in the future if there were more VEPs at this ski area (Table 3.3). The largest proportion of respondents may visit more often in the future if Mt. Bachelor offered incentives to people who carpool to this ski area (e.g., parking closer to chairlifts, 38%), used as many products as possible from local suppliers (38%), and did more to inform visitors of what the ski area is doing in terms of environmental conservation (37%). The fewest respondents would visit more often if Mt. Bachelor won more environmental awards (24%) and recycled more (27%). There were no differences between skiers and snowboarders ($p > .05$). These findings show that up to one-third of visitors intend to visit more often in the future if Mt. Bachelor participates in more VEPs.

Agreement with the place attachment statements ranged from 13% (i.e., "I would not substitute any other area for doing what I do at Mt. Bachelor") to 72% (i.e., "Mt. Bachelor is one of the best places for doing what I like to do;" Table 3.4). Many visitors enjoyed Mt. Bachelor as one of the best places for recreating, believed that this area was special to them, and felt some degree of attachment to this mountain. Most visitors also believed, however, that there are other comparable places that could serve as substitutes. Skiers were slightly more likely to agree that Mt. Bachelor was special to them and snowboarders were more likely to agree that no other places compare to this ski area, but these significant differences were "minimal," $\chi^2 \leq 6.43$, $p \leq .015$, $\phi = .12$ (Vaske, 2008).

The majority of skiers and snowboarders agreed with the biocentric NEP statements measuring environmental value orientations and disagreed with the

anthropocentric NEP items (Table 3.5). For example, respondents were most likely to agree that "humans are severely abusing the environment" (70%) and disagree that "the balance of nature is strong enough to cope with impacts of modern industrial nations" (12% agree, 88% disagree). There were no statistically significant differences between skier and snowboarder responses to these value orientation statements ($p > .05$).

Across all four dimensions of specialization (centrality, skill, equipment, experience), the majority of skiers and snowboarders agreed with most of the 15 variables measuring these dimensions (Table 3.6). A total of 73% of respondents, for example, agreed with the centrality item that if they stopped skiing or snowboarding, an important part of their life would be missing. For the skill dimension, 69% agreed that they were becoming more skilled in skiing or snowboarding each year and 59% rated their skill in the activity as advanced or expert. Similarly, two-thirds of respondents (66%) had accumulated a substantial amount of equipment and invested money on skiing or snowboarding equipment. Responses to nine of these 15 variables did not differ between skiers and snowboarders ($p > .05$). However, skiers were more likely than snowboarders to have participated in the activity for a larger part of their life and feel slightly more skilled, whereas snowboarders were more likely to feel that they were becoming more skilled in the activity each year and that this activity was becoming important to them and more important than most other activities, χ^2 or $t \leq 10.21$, $p \leq .045$. Effect sizes, however, indicated that most of these differences were “minimal" (e.g., $\phi \leq .18$, Vaske, 2008).

Table 3.3. Reliability analysis of variables measuring intention to visit more often in the future if there were more VEPs.

VEP future visit – How would change how often you visit if it:	Item code	Percent visit more often (%) [1]			Item total correlation	Alpha if item deleted [2]
		Skiers	Snowboarders	Total		
Was more committed to environmental conservation	V_{10}	29	23	28	.87	.97
Was a top ranked ski area in environmental conservation	V_{11}	32	31	31	.85	.97
Won more awards for environmental conservation	V_{12}	25	23	24	.85	.97
Increased their recycling program	V_{13}	28	25	27	.87	.97
Used as many recycled products as possible	V_{14}	31	26	30	.90	.97
Used more energy efficient facilities	V_{15}	33	28	32	.91	.97
Did more to reduce their emissions	V_{16}	31	25	29	.90	.97
Offered incentives to people who carpool (e.g., park closer to chairlifts)	V_{17}	38	38	38	.78	.97
Encouraged more people to use public transportation	V_{18}	33	34	33	.71	.97
Donate a portion of revenue to offset vehicle emissions	V_{19}	30	26	29	.81	.97
Donate a portion of revenue to environmental organizations	V_{20}	34	30	33	.83	.97
Offered food supplies that are more sustainable / biodegradable	V_{21}	36	30	34	.87	.97
Used as many products as possible from local suppliers	V_{22}	38	36	38	.87	.97
Did more to inform visitors of its environmental conservation programs	V_{23}	39	32	37	.84	.97

[1] Variables coded on 5-points scales of 1 = visit much less often, 2 = visit slightly less often, 3 = visit about the same, 4 = visit slightly more often, 5 = visit much more often. Percents calculated by combining 4 = visit slightly more often and 5 = visit much more often.

[2] Overall Cronbach alpha reliability = .97.

Table 3.4. Reliability analysis of variables measuring place attachment.

Place attachment variables	Item code	Percent agree (%) [1]			Item total correlation	Alpha if item deleted [3]
		Skiers	Snowboarders	Total		
Mt. Bachelor is very special to me [2]	V_{24}	63	50	59	.71	.86
Mt. Bachelor is one of the best places for doing what I like to do	V_{25}	74	68	72	.64	.87
I am very attached to Mt. Bachelor	V_{26}	42	37	41	.78	.85
I would not substitute any other area for doing what I do at Mt. Bachelor	V_{27}	13	15	13	.67	.87
I identify strongly with Mt. Bachelor	V_{28}	35	27	33	.82	.84
No other place compares to Mt. Bachelor [2]	V_{29}	19	30	22	.56	.88

[1] Variables coded on 5-point scales of 1 = strongly disagree, 2 = disagree, 3 = neither, 4 = agree, 5 = strongly agree.
Percents calculated by combining 4 = agree and 5 = strongly agree.
[2] Variables were significantly different between skiers and snowboarders for percent agree ($\chi^2 \leq 6.43$, $p \leq .015$, $\phi = .12$).
[3] Overall Cronbach alpha reliability = .88.

Table 3.5. Reliability analysis of NEP variables measuring environmental value orientations.

NEP Statements	Item code	Percent agree (%) [1]			Item total correlation	Alpha if item deleted [3]
		Skiers	Snowboarders	Total		
Humans have the right to modify the natural environment to suit their needs [2]	V_{30}	28	29	28	.55	.90
Humans were meant to rule over the rest of nature [2]	V_{31}	14	17	15	.69	.89
The so-called ecological crisis facing humankind has been greatly exaggerated [2]	V_{32}	18	17	17	.66	.89
The balance of nature is strong enough to cope with impacts of modern industrial nations [2]	V_{33}	12	13	12	.61	.89
If things continue on present course, we will soon experience a major ecological catastrophe	V_{34}	59	57	58	.70	.89
We are approaching the limit of the number of people the earth can support	V_{35}	52	50	51	.62	.89
The balance of nature is very delicate and easily upset	V_{36}	59	55	58	.64	.89
When humans interfere with nature, it often produces disastrous consequences	V_{37}	58	60	58	.69	.89
Plants and animals have as much right as humans to exist	V_{38}	67	73	69	.61	.89
Humans are severely abusing the environment	V_{39}	70	71	70	.75	.88

[1] Variables coded on 5-point scales of 1 = strongly disagree, 2 = disagree, 3 = neither, 4 = agree, 5 = strongly agree.
Percents calculated by combining 4 = agree and 5 = strongly agree.
[2] Variables were reverse coded for reliability analysis.
[3] Overall Cronbach alpha reliability = .90.

Table 3.6. Reliability analysis of variables measuring specialization.

Specialization dimensions and variables	Item code	Percent agree (%) [4] Skiers	Snowboarders	Total	Item total correlation	Alpha if item deleted	Cronbach alpha [6]
Centrality [1]							.85
If I stopped participating, an important part of my life would be missing	V_{40}	75	70	73	.70	.81	
I would rather participate in this activity than do most anything else [5]	V_{41}	39	50	43	.77	.78	
Participation in this activity is a large part of my life	V_{42}	54	54	54	.77	.79	
Most recreation activities do not interest me as much as this activity	V_{43}	38	44	40	.55	.84	
This activity is becoming a more important part of my life each year [5]	V_{44}	39	58	45	.55	.85	
Skill							.78
Self-reported skill level [2,5]	V_{45}	63	49	59	.56	.73	
Given skills I have developed, it is important that I continue to participate[1]	V_{46}	76	75	76	.52	.75	
I feel that I am more skilled in this activity than most other people [1,5]	V_{47}	52	33	46	.63	.71	
Testing my skills in this activity is very important to me [1]	V_{48}	56	62	58	.65	.70	
I am becoming more skilled in this activity each year [1,5]	V_{49}	64	78	69	.41	.78	
Equipment [1]							.87
I have accumulated a lot of equipment for this activity	V_{50}	65	68	66	.76	.82	
I have invested a lot of money on equipment for this activity	V_{51}	68	60	66	.74	.83	
I spend a lot of time learning about the newest equipment for this activity	V_{52}	22	22	22	.73	.83	
I am obtaining more equipment for this activity each year	V_{53}	35	43	38	.67	.86	
Experience [3,5]		58	32	50	--	--	--

[1] Variables coded on 5-point scales of 1 = strongly disagree, 2 = disagree, 3 = neither, 4 = agree, 5 = strongly agree.
[2] Variable coded as 1 = beginner, 2 = novice, 3 = intermediate, 4 = advanced, 5 = expert. Cell entries are % advanced or expert.
[3] Item calculated by (number of years in life participating in activity / age *100) = proportion of life skied or snowboarded. Cell entries mean proportions (%).
[4] Calculated by combining 4 = agree and 5 = strongly agree unless specified otherwise (e.g., self-reported skill level, experience).
[5] Variables were significantly different between skiers and snowboarders ($\chi^2 \leq 14.01$, $p \leq .045$, $\phi = .18$, $t = 10.21$, $p < .001$, $r_{pb} = .37$).
[6] Overall specialization index Cronbach alpha reliability = .91.

Measurement Models

The CFA demonstrated that the data provided a strong measurement model fit for the latent concepts (i.e. future trip intention, current trip motivation, attachment, value orientations, specialization) and observed variable (i.e., knowledge). Figure 3.2 shows the standardized factor loadings associated with each concept. All factor loadings were acceptable (i.e., ≥ .40), as they ranged from .68 to .94 for future visitation related to VEPs, .83 to .94 for current trip motivations related to VEPs, .50 to .91 for attachment, and .56 to .80 for value orientations. For the second-order CFA of specialization, first-order factors ranged from .50 to .87 for centrality, .41 to .83 for skill, and .70 to .82 for equipment. The centrality dimension most strongly represented overall degree of specialization in skiing or snowboarding (second-order factor loading = .90), followed by skill (loading = .81), equipment (loading = .79), and past experience (loading = .45). All of the factor loadings were statistically significant at $p < .05$ and the S-B χ^2 was also significant at $p < .001$, but this is a function of sample size and model complexity. The other fit indices demonstrated extremely strong construct validity and measurement model fit (CFI* = .98, NNFI* = .97, IFI* = .98, RMSEA* = .05, $\chi^2/df = 2.45$).

Reliability coefficients indicated extremely high internal consistency for each latent concept, suggesting that variables reliability measured their respective concept (i.e., ≥ .60; Tables 3.1 to 3.6). Cronbach alpha reliability coefficients were .97 for both current trip motivations and future intentions related to VEPs, .88 for place attachment, and .90 for value orientations. For specialization, alpha coefficients were .85 for centrality, .78 for skill, and .87 for equipment. Reliability of the overall specialization index was high at

.91. Item total correlations for all variables measuring each concept exceeded .40 and deletion of any variable from its respective concept did not improve reliability.

Structural Models

The first hypothesis predicted that recreationists who are more biocentric, specialized, attached to Mt. Bachelor, knowledgeable of VEPs, and motivated to visit on their current trip because of these programs will intend to visit more often if there are more VEPs at this ski area. Significant positive relationships were observed between intention to visit more often in the future because of VEPs and current trip motivations related to VEPs, knowledge of these programs, and environmental value orientations (Figure 3.3). Significant relationships were not, however, observed between future visit intentions and both place attachment and specialization. Value orientations had a stronger influence on future visit (β = .38) than motivations (β = .11) and knowledge (β = .06) related to VEPs. Value orientations and knowledge and current trip motivations related to VEPs explained 18% of the variance in intention to visit more often in the future if there were more VEPs at this ski area. Respondents who would be likely to visit more often in the future if there were more VEPs at this area had stronger biocentric orientations, were more motivated to visit because of VEPs, and knew more about these programs.

According to the second hypothesis, visitors who are more biocentric, specialized, attached to Mt. Bachelor, and motivated to visit this area on their current trip because of VEPs will be more knowledgeable of these programs at this area. Attachment, value orientations, and specialization all significantly influenced knowledge of VEPs and explained 48% of the variance in this knowledge (Figure 3.3). There was no correlation,

Figure 3.2. Confirmatory factor analysis (CFA) of six-dimension measurement model including second-order CFA of specialization dimensions. All factor loadings are standardized and were significant at $p < .05$. Based on Satorra-Bentler Robust estimation for multivariate non-normality, measurement model fit indices: S-B $\chi^2 = 3337.07$, $p < .001$, CFI* = .98, NNFI* = .97, IFI* = .98, χ^2 /df = 2.45, RMSEA* = .05. See Tables 3.2 through 3.6 for variables corresponding to codes (e.g., V_2).

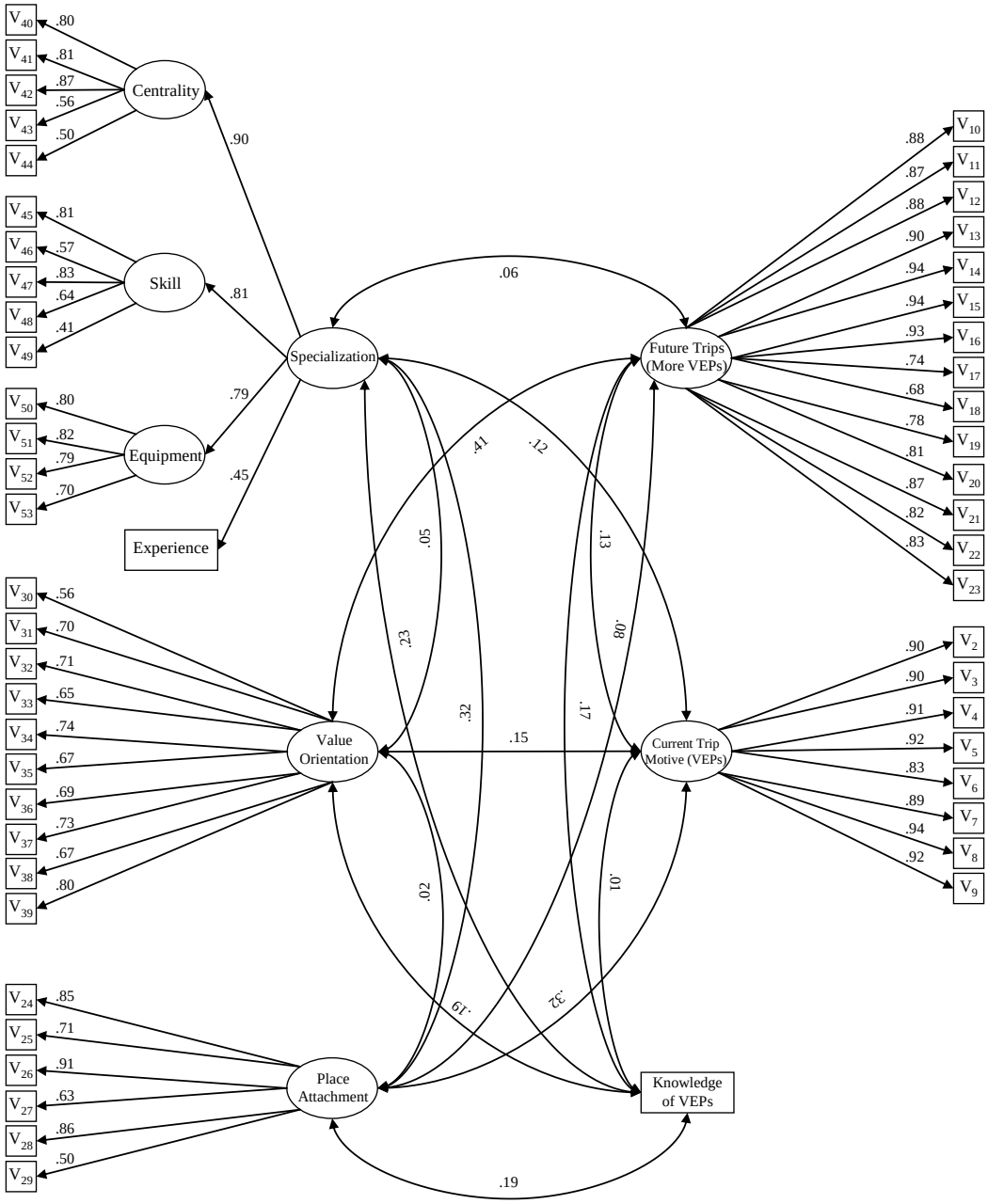
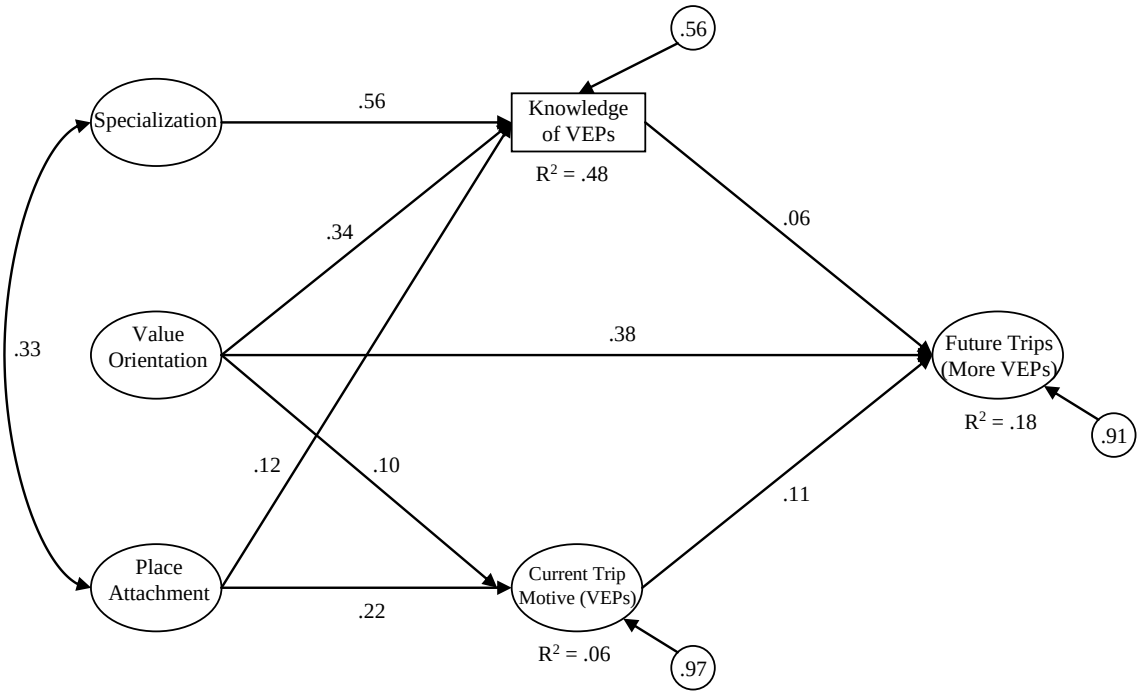


Figure 3.3. Structural equation model (SEM) of relationships among concepts related to voluntary environmental practices. All factor loadings and path coefficients shown are standardized and were significant at $p < .05$. Non-significant ($p > .05$) paths are not shown. Based on Satorra-Bentler Robust estimation for multivariate non-normality, structural model fit indices: S-B $\chi^2 = 3535.47$, $p < .001$, CFI* = .98, NNFI* = .98, IFI* = .98, χ^2 /df = 2.58, RMSEA* = .07. A multigroup model tested for differences in paths between skiers and snowboarders (i.e., moderation / interaction effect). Tests for invariance of factor loadings and structural model paths were not statistically significant. The chi-square difference test indicated that the paths did not significantly differ between skiers and snowboarders, $\Delta\chi^2 = 6.77$, df = 3, $p = .079$.



however, between current trip motivations related to VEPs and knowledge of these programs. Specialization (β = .56) had a stronger influence on knowledge than value orientations (β =.34) and place attachment (β =.12). Respondents who were more knowledgeable about VEPs at Mt. Bachelor were highly specialized in skiing or snowboarding, felt attached to this ski area, and had stronger biocentric orientations.

The third hypothesis predicted that recreationists who are more biocentric, specialized, attached to Mt. Bachelor, and knowledgeable of VEPs at this ski area will be more motivated to visit on their current trip because of these programs. Significant positive relationships were observed between current trip motivations related to VEPs and both place attachment and environmental value orientations, but not specialization or knowledge (Figure 3.3). Attachment had a stronger effect (β = .22) than value orientations (β = .10) on motivations related to VEPs. Value orientations and attachment, however, collectively explained only 6% of the variance in trip motivations related to VEPs. Visitors who were more likely to be motivated to visit this ski area because of its VEPs were highly attached to Mt. Bachelor and had stronger biocentric orientations.

Consistent with previous research (e.g., Bricker & Kerstetter, 2000; Hammitt et al., 2004; Kyle et al., 2003), the fourth hypothesis predicted that individuals who are more specialized in skiing or snowboarding will be more attached to this ski area that caters to these two activity groups. A positive correlation (.33) between specialization and attachment was found, suggesting that respondents who are more specialized in skiing or snowboarding are also more attached to Mt. Bachelor. Final structural model fit

was acceptable and strong (S-B χ^2 = 3535.47, $p < .001$; CFI* = 0.98, NNFI* = 0.98, IFI* = 0.98, RMSEA* = 0.07, χ^2/df = 2.58).

The final step in the analysis was to conduct multigroup structural equation models to determine if relationships among these concepts differed between people who were skiing or snowboarding on the day that they were surveyed (i.e., moderation or interaction effect). All tests for invariance of factor loadings and structural model paths were not statistically significant. The chi-square difference test indicated that the paths did not significantly differ between skiers and snowboarders, $\Delta\chi^2 = 6.77$, df = 3, $p = .079$. Moderation was not present because factor loadings and structural path coefficients did not differ significantly between skiers and snowboarders.

Discussion

This article focused on skier and snowboarder perceptions of VEPs at the Mt. Bachelor ski area by examining what these groups knew about these VEPs, how these programs influenced motivations to visit this area presently and in the future, and how cognitions such as specialization, attachment, and value orientations influenced motivations and knowledge related to VEPs. Few skiers and snowboarders were knowledgeable of VEPs or motivated to visit the ski area because of these programs. Many respondents may, however, visit more often in the future if this area promoted and increased its number of VEPs. Visitors who may be likely to visit in the future if there were more VEPs at this area were more biocentric and had stronger motivations and knowledge related to these programs. Those who were motivated to visit on their current trip because of these programs had a more biocentric orientation and felt highly attached to this ski area.

Finally, visitors who were more knowledgeable of VEPs at this ski area had a more biocentric orientation, were more attached to this area, and were more specialized in their activity. These results have implications for management, theory, and future research.

Implications for Management

From a management perspective, most respondents were not knowledgeable about VEPs at this ski area and were not motivated by these programs on their current trip, but may visit more often if there were more VEPs and more was done to inform visitors of these programs. VEPs are relatively new at alpine ski areas and visitors may not be aware of environmental issues at these areas. Although Mt. Bachelor employs a substantial number of VEPs and provides information about these on its internet website and other materials (e.g., on-mountain signs), this information is not as prominent as information about other attributes such as scenery, snow conditions, number of chairlifts, and other amenities. Obscurity of information about VEPs may have prevented many visitors from learning about these programs. However, given that almost 40% of respondents would visit more often if this ski area did more to inform visitors of what it is currently doing in terms of environmental conservation, managers may be in a position to increase visitation simply by doing more to promote VEPs that are already operational. Therefore, managers should consider increasing interpretive information about VEPs to inform visitors about what is being done to reduce impacts. Managers could, for example, increase visibility of information about environmental performance on their internet website, at ticket purchasing booths and on chairlifts, on interpretive signs at dining facilities, and in promotional advertising. By also expanding the number of VEPs (e.g., incentives for

people who carpool, biodegradable supplies, local products), managers may increase visitor knowledge of VEPs and attract more visitors to the ski area, which would improve Mt. Bachelor's share of the competitive ski area market.

Skier and snowboarder environmental value orientations, as well as knowledge about VEPs and the extent that they were motivated by these programs on their current trip predicted 18% of the variance in how often they may return in the future if there were more VEPs. In addition, almost 40% of visitors could return more often if there were more of these programs. This is a significant finding for such a competitive recreation industry. A strong predictor of current and future visitation related to VEPs, however, was environmental value orientation. This suggests that marketing efforts targeted toward environmental topics may be effective in attracting visitors. States in the Pacific Northwest such as Oregon have large proportions of residents with strong biocentric value orientations toward forests and other natural resources (e.g., Steel et al., 1994), so managers at Mt. Bachelor could increase marketing campaigns that disseminate information about this ski area's VEPs to target these populations. Similarly, visitors who felt highly attached to this ski area were also more knowledgeable of VEPs and motivated to visit on their current trip because of these programs. Local people who live in nearby communities such as Bend and Redmond may be more attached to this ski area, so managers should consider targeting these populations with marketing aimed at increasing knowledge about VEPs and future visitation related to these programs.

Results showed that responses from visitors who are more specialized, biocentric, and attached to Mt. Bachelor predicted 48% of the variance in their knowledge of VEPs

at this ski area. Specialization was the strongest predictor of this knowledge, suggesting that highly specialized skiers and snowboarders are more likely to seek and respond to information about VEPs. Managers, therefore, could target activity proficiency programs such as ski schools, camps, and competitions to increase visitor knowledge of VEPs. Managers could also focus on attracting more highly specialized recreationists to the area if their goal is to increase visitor knowledge of VEPs. This can be done by providing more attributes such as terrain parks, difficult and less accessible terrain, and discounted quality equipment that are typically desired by more specialized guests. Consistent with past research (e.g., Bricker & Kersetter, 2000), there was also a significant relationship between attachment and this specialization. If managers want guests to feel more attached to the place, they could implement strategies to increase the specialization level of guests including increasing ski school programs, promoting quality equipment sales, extending operating seasons, reducing season pass prices, and promoting progressive technologies.

Implications for Research

From theoretical and research perspectives, there has been substantial research on skiing and snowboarding such as studies of user conflict and motivations, and resource impacts of these activities (e.g., Alexandris et al., 2007; Hudson, 2004; Needham et al., 2004; Puntieri, 1991). There has also been research on VEPs at ski areas such as studies of the Sustainable Slopes Charter (e.g., Donohoe, 2004; George, 2003). There has been little attention, however, given to the importance of VEPs to skiers and snowboarders, especially what these groups know about VEPs at ski areas and how these programs influence motivations to visit these areas presently and in the future. This article should

be considered exploratory and an initial attempt at addressing these knowledge gaps, so future research is needed to build on this study and examine these issues in more detail.

In particular, little research has measured recreationists' knowledge, current trip motivations, and future trip intentions related to VEPs in general and at ski areas in particular. This study, therefore, developed scales for measuring these three concepts and the high factor loadings and reliabilities suggested that the scales appear to be appropriate for measuring these concepts. It is important to recognize, however, that some variables measuring these concepts were specific to Mt. Bachelor and environmental programs at this area, so they may not be applicable to other locations or activity groups. Empirical studies are needed to examine whether these scales are transferable to other contexts and if reliability and validity of these scales remain as strong as what was found here.

Responses to these scales showed that most skiers and snowboarders were not highly knowledgeable of VEPs at Mt. Bachelor, but would visit more often in the future if there were more of these programs at this ski area. This low knowledge of VEPs supports research showing that many recreationists are not highly knowledgeable of some environmental issues and conservation programs (e.g., Vaske et al., 2006). Intentions to visit in the future because of VEPs may have been influenced by questions measuring this knowledge, as the survey may have acted as a vehicle to inform and educate respondents about VEPs at this ski area. In addition, visitors may have reacted to statements because of pressure to conform to a desired social condition. This social desirability bias (Fisher, 1993) may have caused some skiers and snowboarders to say that they would visit more often if there were more VEPs simply to avoid any possible embarrassment and project a

favorable image. Research is needed to determine the extent that these types of bias exist when measuring recreationists' responses to these environmental conservation programs.

Skier and snowboarder knowledge of VEPs, however, was strongly influenced by degree of specialization in these activities. Knowledge and information gathering have received limited attention in the recreation literature (Manning, 1999), but results showed that commonly studied concepts such as specialization can influence recreationists' knowledge of specific issues. Identical to recent research, specialization was treated in this study as a multidimensional concept consisting of affective, cognitive, and behavioral components (e.g., McFarlane, 2004; Needham et al., 2007). Identical to Needham et al.'s (2007) study of hunters and Lee and Scott's (2004) study of birders, factor loadings from the second-order CFA showed that affective (i.e., centrality) and cognitive (i.e., skill) dimensions represented skier and snowboarder specialization better than behavioral dimensions (i.e., equipment, experience). It is becoming apparent that irrespective of activity, specialization is multidimensional and may be best understood in terms of activity skill and centrality, whereas experience and equipment are less useful but still important dimensions of the concept. More research is needed, however, to investigate recreationists' knowledge of VEPs and related programs, and examine relationships between this specialization and knowledge to determine the extent that findings in other contexts are similar to those reported here.

This research improves understanding of skier and snowboarder motivations and intentions. The majority of previous studies of these recreation groups have focused on internal factors that push people to visit ski areas (e.g., Alexandris et al., 2007; Klenosky

et al., 1993). This study, however, showed that there are motivating factors that also pull visitors to alpine ski areas including newly emerging attributes such as those related to environmental conservation and related programs (i.e., VEPs). Consistent with previous research in other contexts, current and future trip motivations related to environmental programs were related to knowledge about these programs (e.g., Phillips & Jang, 2007; Raju et al., 1995), feelings of attachment to an area (e.g., Fredman & Heberlein, 2005; Gibbons & Ruddell, 1995), activity specialization (e.g., Hvenegaard, 2002; Oh & Ditton, 2008), and environmental value orientations (e.g., Manfredo et al., 2003; Vaske & Donnelly, 1999). However, only 6% of current trip motivations related to VEPs, 18% of future visitation, and 48% of knowledge about these environmental programs were explained by these other cognitions, suggesting that a substantial amount of variance in visitor knowledge, motivations, and intentions related to VEPs remains unexplained and is influenced by other characteristics and cognitions. Research is needed to confirm these findings and empirically examine other concepts that influence knowledge, motivations, and intentions associated with VEPs at ski areas and other recreation settings.

Finally, this study should be viewed as exploratory and a starting point for examining skier and snowboarder knowledge and motivations related to VEPs at alpine ski areas, and the extent that other cognitions such as specialization, value orientations, and place attachment influence motivations and knowledge. Findings in this article are limited to the Mt. Bachelor alpine ski area and may not generalize to all recreation settings that are participating in environmental programs. Research is needed, therefore,

to examine the applicability of these findings to other activity groups and other commercial recreation settings in general and alpine ski areas in particular.

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CHAPTER 4 – CONCLUSION

The preceding chapters advanced the field of recreation management by exploring: (a) winter recreationists' knowledge, current trip motivations, and future trip intentions related to voluntary environmental programs (VEPs) at an alpine ski area; and (b) the influence of their specialization, attachment, and value orientations on these motivations, knowledge, and intentions related to VEPs. This chapter briefly summarizes the major findings of this thesis, and their implications for management and research.

Summary of Findings

Substantial research has examined skiers and snowboarders at alpine ski areas, particularly in the context of user conflict and motivations. Extensive research has also investigated environmental issues and conservation strategies at ski areas, focusing largely on negative environmental impacts, climate change, and the Sustainable Slopes Charter. Little research, however, has investigated the influence of VEPs on skiers and snowboarders, especially knowledge about VEPs, how these programs influence present and future motivations to visit, and how different subgroups respond to the presence of VEPs. This thesis contained exploratory and descriptive (chapter two), and theoretical (chapter three) research that addressed these knowledge gaps.

The second chapter explored skier and snowboarder knowledge of VEPs at the Mt. Bachelor ski area, and the influence of these programs on motivations and behavioral intentions to visit this area. Results showed that: (a) few skiers and snowboarders were knowledgeable of VEPs; (b) fewer than 20% of skiers and snowboarders were presently

motivated to visit because of these programs; (c) other attributes such as scenery, snow conditions, and access were more important than VEPs in influencing visitor motivations; and (d) up to 40% of skiers and snowboarders intended to visit more often in the future if Mt. Bachelor participated in more VEPs.

The third chapter built on chapter two by examining how cognitions such as recreation specialization, place attachment, and environmental value orientations influenced motivations and knowledge related to VEPs. Visitors who were more likely to visit in the future if there were more VEPs at this ski area had stronger biocentric value orientations and were more motivated and knowledgeable of these programs. Those who were motivated to visit on their current trip because of these programs had a stronger biocentric orientation and felt highly attached to this ski area. Visitors who were more knowledgeable of VEPs at this ski area had a stronger biocentric orientation, were more attached to this area, and were more specialized in skiing or snowboarding. Results from chapters two and three have implications for management, theory, and future research.

Managerial Implications

Few respondents were knowledgeable about VEPs and motivated to visit by these programs on their current trip, but may visit more often if the number of VEPs was increased and visitors were more informed of these programs. Several factors may have contributed to skiers and snowboarders not being knowledgeable of VEPs and motivated by VEPs. These programs are relatively new at alpine ski areas and not many visitors may be aware of environmental issues at these areas. Although Mt. Bachelor employs a number of managerial and operational VEPs, information on these VEPs is not visibly

conspicuous on the mountain or on their website. Difficulty of finding information about VEPs may have prevented many visitors from learning about these programs, which may have precluded them from being motivated by VEPs on their current trip. However, given that almost 40% of respondents would visit more often if this ski area did more to inform visitors of what it is currently doing in terms of environmental conservation, managers may be in a position to increase visitation simply by doing more to promote VEPs that are already in operation. Managers should consider increasing interpretive information about VEPs to inform visitors about what is currently being done to reduce impacts. Managers could, for example, increase visibility of information about environmental performance on their internet website, at ticket purchasing booths and on chairlifts, on interpretive signs at dining facilities, and in promotional advertising. These actions may improve marketing of environmental performance at Mt. Bachelor, which may increase visitor knowledge of VEPs and attract more visitors to this ski area.

These VEPs may also reduce operational costs and increase profits. Although direct economic returns of VEPs (e.g., reduced heating and other energy costs) motivate some managers to implement these types of environmental programs, indirect economic benefits from increased revenue associated with higher visitation due to VEPs are possibly being overlooked. Increasing VEPs may not only directly reduce operational costs through increased efficiencies, but they may indirectly motivate visitors to spend money at ski areas that employ VEPs instead of those areas that are less progressive.

Results of this study may also assist Mt. Bachelor's efforts to continue as an environmental leader, as it is frequently ranked among the most environmentally

conscious companies in the ski area industry. Located in the Deschutes National Forest, this ski area operates on public lands under agreement with the U.S. Forest Service. By implementing VEPs that are beyond federal environmental regulations, Mt. Bachelor may be setting an example in the industry by showing respect for public lands and concern for natural resources. In addition, this ski area may be able to maintain and enhance its progressive and competitive status by implementing more VEPs to contribute to their "eco-friendly" image and ranking. In the competitive ski area market, any attributes that set an area apart from others may improve reputation and increase visitation.

Mangers may also be able to target specific groups to increase visitation. Results showed that skier and snowboarder environmental value orientations, as well as their knowledge of VEPs and extent that they were motivated by these programs on their current trip predicted future intentions to visit if VEPs were increased. Importantly, environmental value orientation was the strongest predictor of future visits related to VEPs. In addition, almost 40% of visitors may return more often if there were more of these programs. This is a significant finding for such a competitive recreation industry and suggests that marketing efforts targeting environmental topics may be effective in attracting visitors, especially in the Pacific Northwest where a large proportion of residents have biocentric value orientations. Similarly, visitors who felt highly attached to this ski area were also more knowledgeable of VEPs and motivated to visit on their current trip because of these programs. Local people who live in nearby communities such as Bend, Redmond, and Prineville may be more attached to this ski area, so

managers should consider targeting these areas with marketing campaigns informing recreationists about ski area VEPs.

Responses from visitors who are more specialized, biocentric, and attached to Mt. Bachelor predicted 48% of the variance in their knowledge of VEPs at this ski area. Specialization was the strongest predictor of knowledge about these programs, which suggests that highly specialized skiers and snowboarders are more likely to seek and respond to information about VEPs at this ski area. Managers, therefore, could target activity proficiency programs (e.g., ski schools, camps, competitions) to increase visitor knowledge of VEPs. Managers could also focus on attracting more highly specialized recreationists by providing more attributes desired by this group (e.g., terrain parks, difficult and less accessible terrain, discounted quality equipment). There was also a relationship between attachment and specialization, suggesting that managers could increase attachment to Mt. Bachelor by doing more to enhance guest specialization.

Research Implications

Few studies have empirically examined theoretical concepts in the field of recreation in the context of skiers and snowboarders, alpine ski areas, and VEPs. Chapter two used the concepts of knowledge, motivations, and behavioral intentions to explore skier and snowboarder responses to VEPs. Chapter three built on chapter two by testing conceptual relationships among knowledge, motivations, intentions, place attachment, value orientations, and recreation specialization. Results from these two chapters have implications for theory and future research.

Chapter two showed that there may be both traditional and newly emerging motivational factors that pull visitors to ski areas. These findings expanded traditional ski area attributes to incorporate newly emerging attributes such as those related to VEPs. In tourism research, environmental programs have been identified as attributes influencing motivations, and more research is needed to examine the extent that conservation attributes in general and VEPs in particular influence visitor motivations in other recreation contexts.

This research also contributes to research on the benefits based management approach in recreation, which suggests that recreationists acquire personal (e.g., enhance self-esteem of the individual recreationist), societal (e.g., lower crime rate), economic (e.g., lower health care costs), and environmental (e.g., increased public commitment to conservation) benefits from participating in a recreation activity at a specific setting. In the context of this study, VEPs may be conceptualized as an environmental benefit because visitors at Mt. Bachelor are supporting a business engaging in environmental conservation efforts, which may subsequently benefit the environment. By adopting a benefits based approach, managers can identify benefits that visitors pursue, design facilities and services to accommodate these benefits, and then measure the extent that these benefits are realized. Mt. Bachelor ski area manages for environmental benefits by adopting and implementing VEPs, but little is known about whether visitors realize these benefits. This study provides a first step in addressing this issue by examining skier and snowboarder knowledge of VEPs and how these programs influence motivations and

visitation, but research is needed to examine whether visitors realize benefits of VEPs to apply a benefits based approach to ski area management.

Chapter three built on chapter two by developing scales for measuring three concepts related to VEPs (i.e., knowledge, motivations, future intentions to visit), and the high factor loadings and reliabilities suggested that the scales appear to be appropriate for measuring these concepts. Empirical studies are needed to examine whether these scales are site-specific or transferable to other contexts, and if reliability and validity of these scales remain as strong as what was found here. Responses to these scales showed that few skiers and snowboarders were knowledgeable of VEPs at Mt. Bachelor, but intended to visit more often in the future if there were more of these programs at this ski area. Intentions to visit in the future because of VEPs may have been influenced by questions measuring this knowledge, as the survey may have informed and educated respondents about VEPs at this ski area. In addition, visitors may have reacted to statements because of pressure to conform to a desired social condition. Social desirability bias, for example, may have caused some skiers and snowboarders to say that they would visit more often if there were more VEPs simply to avoid any possible embarrassment and project a favorable image. Research is needed to determine the extent that these types of bias exist when measuring recreationists' responses to these environmental conservation programs.

Although skiers and snowboarders were not highly knowledgeable of VEPs at the Mt. Bachelor ski area, this finding was consistent with previous research showing that recreationists are not often highly knowledgeable of environmental programs. Their knowledge of VEPs, however, was strongly influenced by degree of specialization in

these activities. Knowledge and information gathering have received limited attention in the recreation literature, but results showed that commonly studied concepts such as specialization can influence recreationists' knowledge of specific issues. In the context of specialization, results of this study are consistent with past research suggesting that it is becoming apparent that regardless of the activity, specialization is multidimensional and may be best understood in terms of activity skill and centrality, whereas experience and equipment are less useful but still important dimensions of the concept. More research is needed, however, to investigate recreationists' knowledge of VEPs and related programs, and examine relationships between this specialization and knowledge to determine the extent that findings in other contexts are similar to those reported in this thesis.

Although this research improves understanding of skier and snowboarder motivations and intentions, only 6% of current trip motivations related to VEPs, 18% of future visit intentions, and 48% of knowledge about these environmental programs were explained by cognitions such as place attachment, specialization, and value orientations. This finding suggests that a substantial amount of variance in visitor knowledge, motivations, and intentions related to VEPs remains unexplained and is influenced by other characteristics and cognitions not examined in this study. Therefore, it remains a question for future research to confirm these findings and empirically examine other concepts that influence knowledge, motivations, and intentions associated with VEPs at alpine ski areas and other recreation settings.

Finally, this thesis explored innovative research questions and hypotheses in the context of skier and snowboarder knowledge, motivations, and intentions related to VEPs

at an alpine ski area, and how other cognitions such as specialization, value orientations, and place attachment influence these motivations and knowledge. Findings in this thesis, however, may be limited to the Mt. Bachelor ski area and may not generalize to all settings that are participating in similar environmental programs. Research is needed, therefore, to examine the applicability of these findings to other activity groups and other commercial recreation settings in general and to other alpine ski areas in particular.

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APPENDIX

Appendix A. Mt. Bachelor Survey

Skier and Snowboarder Perceptions of Environmental Programs at Mt. Bachelor

Please Complete this Survey and Return it to the Researcher

Participation is Voluntary and Responses are Anonymous

Thank You for Your Participation

A Study Conducted Cooperatively by:

OSU Oregon State University

Mt Bachelor

We are conducting this survey to learn about your experiences at Mt. Bachelor and perceptions of environmental programs at this area. Your input is important and will assist managers. ***Once you have completed this survey, return it to the researcher.***

1. ***Before today***, had you ever been to Mt. Bachelor before? **(check *ONE*)** ☐ No ☐ Yes

2. What type of ticket or pass are you visiting with ***today***? **(check *ONE*)**
   ☐ Daily lift ticket (full or half day) ☐ Season pass (full or mid week) ☐ Group ticket / group rate
   ☐ Multiday lift ticket (2 to 7 days) ☐ Club card ☐ Other (write response) _____
   ☐ 12 day pass ☐ Gift card _____

3. Overall, how dissatisfied or satisfied are you with your experience at Mt. Bachelor ***today***? **(check *ONE*)**
   ☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither ☐ Satisfied ☐ Very Satisfied

4. What ***ONE main activity*** are you participating in at Mt. Bachelor ***today***? **(check *ONE*)**
   ☐ Alpine skiing ☐ Telemark skiing ☐ Snow tubing
   ☐ Snowboarding ☐ Cross-country skiing ☐ None of these activities → skip to question 9 on next page

5. How would you rate your skill level in this one main activity? **(check *ONE*)**
   ☐ Beginner ☐ Novice ☐ Intermediate ☐ Advanced ☐ Expert

6. About how many ***years in your life*** have you been participating in this activity? **(write number)** _____ year(s)

7. About how many ***days per year*** do you typically participate in this activity? **(write number)** _____ day(s)

8. To what extent do you disagree or agree with each of the following statements related to your involvement in this activity? **(circle one number for *EACH* statement)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
If I stopped participating in this activity, an important part of my life would be missing.	1	2	3	4	5
I would rather participate in this activity than do most anything else.	1	2	3	4	5
Participation in this activity is a large part of my life.	1	2	3	4	5
Most recreation activities do not interest me as much as this activity.	1	2	3	4	5
This activity is becoming a more important part of my life each year.	1	2	3	4	5
Given the skills I have developed in this activity, it is important that I continue to participate.	1	2	3	4	5
I feel that I am more skilled in this activity than most other people.	1	2	3	4	5
Testing my skills in this activity is very important to me.	1	2	3	4	5
I am becoming more skilled in this activity each year.	1	2	3	4	5
I have accumulated a lot of equipment for this activity.	1	2	3	4	5
I have invested a lot of money on equipment for this activity.	1	2	3	4	5
I spend a lot of time learning about the newest equipment for this activity.	1	2	3	4	5
In general, I am obtaining more equipment for this activity each year.	1	2	3	4	5
I try to participate in this activity as often as possible.	1	2	3	4	5
I am spending more time participating in this activity each year.	1	2	3	4	5

9. Overall, how dissatisfied or satisfied are you with Mt. Bachelor's commitment to environmental conservation? (**check *ONE***)

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither ☐ Satisfied ☐ Very Satisfied

10. To what extent are you certain that each of the following statements about Mt. Bachelor is true or false? (**circle one number for *EACH***)

Mt. Bachelor ...	Very Certain this is False	Somewhat Certain this is False	Unsure	Somewhat Certain this is True	Very Certain this is True
... has a recycling program.	1	2	3	4	5
... purchases 100% of its power from renewable energy sources (wind, solar).	1	2	3	4	5
... uses energy efficient lighting in facilities.	1	2	3	4	5
... conserves water by never using snowmaking equipment.	1	2	3	4	5
... has reintroduced native wildlife animals on the mountain.	1	2	3	4	5
... uses bio-diesel to fuel some of its vehicles.	1	2	3	4	5
... provides incentives to visitors who carpool to this ski area.	1	2	3	4	5
... promotes a "no vehicle idling" program in parking / drop off areas.	1	2	3	4	5
... allows visitors to buy a "green tag" to help offset personal vehicle emissions.	1	2	3	4	5
... donates 5% of ticket revenue to local environmental conservation organizations.	1	2	3	4	5
... purchases all food related products from local suppliers.	1	2	3	4	5
... won awards for environmental conservation.	1	2	3	4	5

11. To what extent do you disagree or agree that each of the following ***on-mountain characteristics*** influenced your decision to visit Mt. Bachelor today? (**circle one number for *EACH***)

I visited Mt. Bachelor today because the ...	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
... mountain's terrain.	1	2	3	4	5
... variety of different runs / trails.	1	2	3	4	5
... number of runs / trails.	1	2	3	4	5
... terrain park / halfpipe.	1	2	3	4	5
... trail grooming.	1	2	3	4	5
... weather.	1	2	3	4	5
... amount of snow.	1	2	3	4	5
... quality of snow.	1	2	3	4	5
... number of chairlifts.	1	2	3	4	5
... quality of chairlifts.	1	2	3	4	5
... lift line length.	1	2	3	4	5
... lift ticket / pass prices.	1	2	3	4	5
... recreation activities (for example: skiing, snowboarding).	1	2	3	4	5
... special events (for example: races, concerts, competitions).	1	2	3	4	5

12. To what extent do you disagree or agree that each of the following ***experiential issues*** influenced your decision to visit Mt. Bachelor today? **(circle one number for *EACH*)**

I visited Mt. Bachelor today because I wanted to …	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
… experience a unique high alpine area.	1	2	3	4	5
… enjoy the fresh air.	1	2	3	4	5
… be close to nature.	1	2	3	4	5
… view the natural scenery.	1	2	3	4	5

13. To what extent do you disagree or agree that each of the following ***facilities and services*** influenced your decision to visit Mt. Bachelor today? **(circle one number for *EACH*)**

I visited Mt. Bachelor today because the …	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
… staff / service.	1	2	3	4	5
… ski school / lessons.	1	2	3	4	5
… ski patrol / safety.	1	2	3	4	5
… dining facilities offering food / beverages.	1	2	3	4	5
… food / beverage.	1	2	3	4	5
… retail shops.	1	2	3	4	5
… equipment rental.	1	2	3	4	5
… childcare services.	1	2	3	4	5

14. To what extent do you disagree or agree that each of the following ***access issues*** influenced your decision to visit Mt. Bachelor today? **(circle one number for *EACH*)**

I visited Mt. Bachelor today because the …	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
… ease of chairlift access to a high alpine area.	1	2	3	4	5
… ease of access to the base of this ski area.	1	2	3	4	5
… availability of parking.	1	2	3	4	5
… availability of public transportation to this ski area (bus).	1	2	3	4	5
… close proximity to where I live.	1	2	3	4	5
… ski area's reputation.	1	2	3	4	5
… advertising I saw about the ski area (brochure, TV, internet).	1	2	3	4	5

15. To what extent do you disagree or agree that each of the following ***environmental issues*** influenced your decision to visit Mt. Bachelor today? **(circle one number for *EACH*)**

I visited Mt. Bachelor today because this ski area …	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
… is committed to environmental conservation.	1	2	3	4	5
… is concerned about effects of ski areas on climate change.	1	2	3	4	5
… is an environmental leader in the ski industry.	1	2	3	4	5
… has won awards for environmental conservation.	1	2	3	4	5
… participates in recycling.	1	2	3	4	5
… uses renewable energy (wind, solar).	1	2	3	4	5
… uses energy efficient facilities.	1	2	3	4	5
… tries to reduce their emissions.	1	2	3	4	5

16. If Mt. Bachelor took each of the following actions in the future, to what extent would it change how often you visit this ski area? **(circle one number for *EACH*)**

How would you change how often you visit if Mt. Bachelor ...	Visit Much Less Often	Visit Slightly Less Often	Visit About The Same	Visit Slightly More Often	Visit Much More Often
... was more committed to environmental conservation.	1	2	3	4	5
.... was a top ranked ski area in environmental conservation	1	2	3	4	5
... won more awards for environmental conservation.	1	2	3	4	5
... increased their recycling program.	1	2	3	4	5
... used as many recycled products as possible.	1	2	3	4	5
... used more energy efficient facilities.	1	2	3	4	5
... did more to reduce their emissions.	1	2	3	4	5
... offered incentives to people who carpool such as designated parking closer to chairlifts.	1	2	3	4	5
... encouraged more people to use public transportation between Bend and this ski area (bus, "Super Shuttle").	1	2	3	4	5
... donated a portion of revenue to offset vehicle emissions.	1	2	3	4	5
... donated a portion of revenue to environmental conservation organizations.	1	2	3	4	5
... offered food supplies (cups, plates, utensils) that are more sustainable / biodegradable.	1	2	3	4	5
... used as many products as possible from local suppliers.	1	2	3	4	5
... did more to inform visitors of what this ski area is doing in terms of environmental conservation.	1	2	3	4	5

17. To what extent do you oppose or support giving incentives to people who carpool to the ski area, such as designated parking closer to chairlifts? **(check *ONE*)**

☐ Strongly Oppose ☐ Oppose ☐ Neither ☐ Support ☐ Strongly Support

18. Food supplies such as cups, plates, and utensils that are more environmentally sustainable / biodegradable are more expensive to purchase. To what extent do you oppose or support a small increase in food prices (2% to 5%) to cover costs of these supplies?

☐ Strongly Oppose ☐ Oppose ☐ Neither ☐ Support ☐ Strongly Support

19. Mt. Bachelor currently offers a "Super Shuttle" bus from Bend to the ski area for a fee ($7 one way, $10 round trip). Have you ever used this service? **(check *ONE*)**

☐ No ☐ Yes ☐ Unsure

20. To what extent would you oppose or support a small increase in ticket prices (2% to 5%) to offer this "Super Shuttle" bus from Bend to this ski area free of charge? **(check *ONE*)**

☐ Strongly Oppose ☐ Oppose ☐ Neither ☐ Support ☐ Strongly Support

21. How did you get to Mt. Bachelor *today*? **(check *ONE*)**

☐ My own personal vehicle → how many total people were in the vehicle? _____person(s)
☐ Somebody else's personal vehicle → how many total people were in the vehicle? _____person(s)
☐ Mt. Bachelor "Super Shuttle" bus from Bend
☐ Other bus transportation
☐ Other (write response) _____

22. To what extent do you disagree or agree with each of the following statements? **(circle one number for *EACH*)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Mt. Bachelor is very special to me.	1	2	3	4	5
Mt. Bachelor is one of the best places for doing what I like to do.	1	2	3	4	5
I am very attached to Mt. Bachelor.	1	2	3	4	5
I would not substitute any other area for doing what I do at Mt. Bachelor.	1	2	3	4	5
I identify strongly with Mt. Bachelor.	1	2	3	4	5
No other place compares to Mt. Bachelor.	1	2	3	4	5

23. To what extent do you disagree or agree with each of the following statements? **(circle one number for *EACH*)**

Whenever possible, I always ...	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
... visit ski areas that are committed to environmental conservation.	1	2	3	4	5
... try to learn about environmental conservation programs at ski areas.	1	2	3	4	5
... stay at hotels / lodging committed to environmental conservation.	1	2	3	4	5
... use public transportation, walk, or bicycle.	1	2	3	4	5
... participate in recycling.	1	2	3	4	5
... donate or volunteer for environmental conservation organizations.	1	2	3	4	5

24. Listed below are statements about relationships between humans and the environment.
To what extent do you disagree or agree with each of the following statements? **(circle one number for *EACH*)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Humans have the right to modify the natural environment to suit their needs.	1	2	3	4	5
Humans were meant to rule over the rest of nature.	1	2	3	4	5
The so-called ecological crisis facing humankind has been greatly exaggerated.	1	2	3	4	5
The balance of nature is strong enough to cope with impacts of modern industrial nations.	1	2	3	4	5
If things continue on their present course, we will soon experience a major ecological catastrophe.	1	2	3	4	5
We are approaching the limit of the number of people the earth can support.	1	2	3	4	5
The balance of nature is very delicate and easily upset.	1	2	3	4	5
When humans interfere with nature, it often produces disastrous consequences.	1	2	3	4	5
Plants and animals have as much right as humans to exist.	1	2	3	4	5
Humans are severely abusing the environment.	1	2	3	4	5

25. Are you: **(check *ONE*)** ☐ Male ☐ Female

26. What is your age? **(write age)** _____ years old

27. Where do you live? **(write responses)** City / town _____ State / Province _____ Country _____

Thank you, your input is important! ***Please return this survey to the researcher.***

RESEARCHER COMPLETES THIS SECTION:

Day: _____ Date: _____ Time: _____ Location: _____