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Is Greener Whiter Yet? The Sustainable Slopes Program after Five Years

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This study focuses on two basic questions: Are voluntary programs effective in promoting higher environmental performance by participant firms? If so, which distinct areas of environmental performance are more likely to be improved by firms joining a voluntary environmental program? We address these questions by assessing the environmental effectiveness of the ski industry's Sustainable Slopes Program in the western United States between 2001 and 2005. We found no evidence in our five-year analysis to conclude that ski areas adopting the SSP displayed superior performance levels than nonparticipants for the following areas of environmental protection: overall environmental performance, expansion management, pollution management, and wildlife and habitat management. SSP participants only appear to show a statistically significant correlation with higher natural resource conservation performance rates. For policymakers, these results suggest that caution is needed before a priori assuming that strictly voluntary programs can be effective in promoting comprehensive superior environmental performance.

KEY WORDS: voluntary environmental programs, opportunism, ski industry, environmental policy

Introduction

For some time now, public policy and management scholars have been interested in identifying mechanisms that encourage environmental protection by businesses. Public policies, in terms of environmental regulations, monitoring, penalties, institutional norms, and economic incentives, have historically been identified as positively related to regulatory compliance. Recently, these factors have also been identified with an increased likelihood of participation in voluntary environmental programs (VEPs) that seek to promote proactive corporate environmental protection in more flexible and cost-efficient ways (Carmin, Darnall, & Homens, 2003; Delmas & Toffel, 2004; Khanna, 2001; King & Lenox, 2000; Rivera, 2004). Indeed, much of the current federal government's environmental policies are predicated upon VEP-type programs. Yet, empirical evidence is still scant and contradictory about whether voluntary initiatives are effective alternative environmental policy instruments (Darnall, 2003a; Khanna, 2001; King & Lenox, 2000; Potoski & Prakash, 2005; Rivera & Delmas, 2004; Welch, Mazur, & Bretschneider, 2000).

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In August 2004, the *Policy Studies Journal* published Professors Rivera and de Leon's review of the Sustainable Slopes Program (SSP), which examined the initial effectiveness of this voluntary program as articulated by the National Ski Areas Association (NSAA). Their empirical findings indicated that institutional pressures often seemed to be motivating ski areas' participation in the SSP; however, "despite these institutional pressures, participant ski areas seem[ed] to be correlated with lower third-party environmental performance ratings" (Rivera & de Leon, 2004, p. 417); that is, the SSP appeared in the beginning to be attracting the "dirtier" ski areas. They suggested that this behavior was at least partially indicating, in an Olsonian (Olson, 1965) way, "free rider" behavior, or using a VEP to garner, if not necessarily deliver, environmental laurels. Much to the surprise of its authors, the article generated immediate and intense media coverage, with articles being published in multiple media outlets including *the Denver Post* (two front-page Business section stories and a supportive editorial based on the research), *the Rocky Mountains News, the Los Angeles Times, the Seattle Post, the Boston Globe, the Salt Lake City Tribune, CBS News, MSNBC News, the Aspen Daily News, Vail Trail News* and, some weeks later, the *New York Times*.

Most of the stories were supportive, a few were more "balanced"; others, especially those from the ski areas' and their trade association's publications were slightly more critical, and a few were outright hostile. The crux of the criticism centered around two major points. First, that the 2001 data represented a single "snapshot" in time focused on the first year of the SSP program. Thus, even if the analysis itself was correct (a judgment to which SSP proponents do not necessarily subscribe), it reflected the initial dilemmas of any "startup program," that is, the analysis did not accurately represent the "results" of an established program, and, besides, surely the subsequent n-year data would reflect favorably on the SSP. Second, the NSAA strongly derided the use of materials collected by the Ski Area Citizens' Coalition (SACC), claiming that they were unreliable and strongly biased against ski areas' justifiable profit concern (e.g., in terms of area expansion) (Dorsey, 2004; Link, 2005). In short, while the article was clearly "academic," it had, in the best traditions of the literature in public affairs, touched a much broader set of interests.

This current study seeks to contribute to both the immediate discussion as to the "success" of the SSP program by specifically taking the criticisms into analytic account and, just as important, by using a more longitudinal (i.e., five-year) data set. In addition, we will begin an initial discussion on the general viability of the VEP concept using the SSP as a representative case by evaluating the link between participation in VEPs and different areas of corporate environmental performance.

Following this introduction, we first outline the theoretic underpinnings of the analysis. The next section describes the major contextual elements of the western ski industry and the SSP. Then, we provide details about our methodological approach and articulate how we have changed the analysis to address the complaints over the initial assessment of the SSP. The following sections present the analytic findings and their discussion as well as our conclusions.

Conceptual Framework

Motivations for Participation in VEPs

The literature on VEPs shows a growing consensus consistent with neo-institutional theory that gives external pressures a significant role in determining the adoption of these initiatives (Arora & Cason, 1996; Darnall, 2002; Delmas, 2002; Khanna & Damon, 1999; Potoski & Prakash, 2005; Welch, Mazur, & Bretschneider, 2000). The neoinstitutional theory proposes that the choices of rationally bounded managers are restricted and shaped by a taken-for-granted social and cultural environment that provides a sense of social legitimacy to organizations (Meyer & Rowan, 1977; Powell & DiMaggio, 1991; Scott, 2001). The most important elements of this social and cultural context include institutions such as shared beliefs, norms, formal rules, symbols, and ceremonial traditions that define legitimate behavior (Meyer & Rowan, 1977; Powell & DiMaggio, 1991).

Neo-institutional scholars (Suchman, 1995) challenge the notion that businesses are exclusively profit seeking and emphasize the importance of achieving social legitimacy for long-term business survival and competitiveness. Legitimate businesses are those whose actions are seen or presumed to be "desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p. 574). Institutions that determine social legitimacy exert coercive, normative, and mimetic pressures that have an isomorphic effect, leading businesses that operate in the same organization field to adopt similar structures and strategies (Powell & DiMaggio, 1991).

Accordingly, recent empirical studies have found a statistically significant association between higher participation in VEPs and institutional pressures such as higher regulatory and monitoring requirements and greater community and environmentalist demands (Arora & Cason, 1996; Darnall, 2002; Delmas, 2002; Khanna & Damon, 1999; Potoski & Prakash, 2005; Welch et al., 2000). Additionally, these studies indicate the higher adoption of these initiatives by publicly traded and larger firms that are more visible and thus, attract stronger institutional pressures to show superior environmental management (Arora & Cason, 1996; Darnall, 2002; Delmas, 2002; Khanna & Damon, 1999; King & Lenox, 2000; Rivera, 2004; Winter & May, 2001). In the case of the U.S. western ski industry, Rivera and de Leon's (2004) initial assessment of the SSP also found similar institutional pressures and firm characteristics significantly related to the adoption of this program.[1]

Effectiveness of VEPs

Despite the emerging consensus about the factors and firm characteristics significantly associated with participation in VEPs, research still shows contradictory perspectives and problematic evidence regarding a fundamental question for those interested in exploring the use of VEPs as alternative instruments of environmental policy (Andrews, 1998; Carmin, Darnell, & Homens, 2003; Khanna, 2001; Potoski & Prakash, 2005): Are voluntary programs effective in promoting higher environ-

mental performance among their participants? Let us therefore elaborate on the two basic alternative perspectives regarding the environmental effectiveness of voluntary programs.

The first theme proposes that voluntary programs serve as effective policy tools to promote enhanced environmental protection. Supporters of voluntary initiatives hypothesize that these programs provide specific incentives in the form of increased environmental management flexibility, technical assistance, and enhanced "green reputation" that directly encourage participants to adopt superior environmental protection practices (Delmas & Terlaak, 2001; Khanna, 2001). VEPs' flexibility and technical assistance protocols can allow firms to adopt an expanded variety of environmental management practices and technologies that are more cost-efficient than those required by command-and-control regulations (Delmas & Terlaak, 2001; Moon, 2005). The sharing of "best practices" and environmental management systems approaches, typical of voluntary programs, may also facilitate environmental innovation and organizational learning at different levels of the firm, thus permitting it to adopt environmental protection practices found to be more cost efficient and effective (King & Lenox, 2000). Because of their expected superior environmental practices, VEP participants may credibly improve their "green" reputation and use it to gain higher sales and/or price premiums from environmentally aware consumers (Reinhardt, 1998). For instance, hotel facilities participants in the Costa Rican Certification for Sustainable Tourism appear to gain statistically significant premium prices (Rivera, 2002). In addition, a firm's credible "green" reputation may help participants to enhance their environmental legitimacy and thus, develop better relations with regulators and environmentalists that can preempt more stringent oversight and regulations (Darnall, 2003b; Lyon & Maxwell, 2001).

Additionally, even for those VEPs that lack independent monitoring, sanctions, and/or rewards, neo-institutional scholars have posited that voluntary programs may trigger a socialization process involving external peer and industry-wide pressures that compel members to self-regulate in order to gain or maintain a collective "green" reputation as well as trust from its corporate peers, regulators, stakeholders, and, ultimately, consumers (Granovetter, 1985; Hoffman, 1999; King & Lenox, 2000). VEPs' institutional socialization tactics may involve technical-assistance visits and meetings, the use of formal symbols—such as environmentally friendly, that is, "green" labels—to identify participants, periodic public reports highlighting best- and worst-practices participants, peer pressures, endorsement by important industry players and regulatory agencies, and environmental groups (DiMaggio & Powell, 1983; Hoffman, 1999; King & Lenox, 2000). To be sure, a few studies have suggested that voluntary initiatives that include some of these institutional socialization mechanisms, such as the U.S. Environmental Protection Agency (EPA)'s 33/50 program and ISO-14001, may have respectively been associated with lower toxic release inventory (TRI) emissions and environmental compliance by their participants (Dasgupta, 2000; Khanna & Damon, 1999; Potoski & Prakash, 2005).

On the other hand, some scholars have depicted VEPs as relatively ineffective environmental policy instruments. For years they have posited that in general, firms

seldom engage in collective action efforts beyond their narrow self-interest unless socially constrained by strong institutional pressures in the form of monitoring and sanctions for lack of cooperation (Hardin, 1968; Olson, 1965; Ostrom, 1990; Williamson, 1975). *Absent these strong institutional pressures, we propose that purely VEPs are unlikely to promote superior environmental performance because of their lack of coercive mechanisms to prevent opportunistic participants from free-riding on program benefits* such as having a "green" reputation, technical assistance, etc. (King & Lenox, 2000; Rivera & de Leon, 2004; Toffel, 2005). In this case, opportunism[2] is distinguished from the usual self-interest seeking as a behavior in which voluntary program participants deliberately evade and/or misrepresent performing agreed-on environmental practices aimed at promoting higher environmental performance (Wathne & Heide, 2000; Williamson, 1975, 1985).[3]

The opportunistic challenges faced by voluntary programs, with no monitoring and sanctions, arise from the nonexcludable public good nature of some of the benefits they provide to participants (Darnall, 2002; King & Lenox, 2000; Potoski & Prakash, 2005). For instance, once created by the program, credible "green" reputations are enjoyed by all adopting firms, including those opportunistically free-riding with low environmental performance because they are not differentiated from the truly environmentally proactive firms (Darnall, 2003a; King & Lenox, 2000). To be sure, empirical evidence from recent evaluations of VEPs has generated doubts about the environmental effectiveness of these initiatives (Carmin et al., 2003; Khanna, 2001; Moon, 2005). These studies suggest that voluntary initiatives such as the chemical industry's Responsible Care, ISO-14001, and the U.S. Department of Energy's Global Climate Challenge may attract firms with questionable environmental performance. Once enrolled, these firms do not appear to improve significantly their environmental performance (King & Lenox, 2000; Toffel, 2005; Welch et al., 2000). In the case of the ski industry's SSP, initial evidence also suggests that its participants are more likely to have lower environmental performance (Rivera & de Leon, 2004).

Lastly, we need to appreciate that there are distinctions among different areas of environmental performance and voluntary programs' effectiveness. The arguments about the role of institutional pressures in preventing opportunistic behavior can shed light on another important and related issue that has scarcely been addressed by scholarly research: Which distinct areas of environmental performance are more likely to be improved by firms joining a voluntary environmental program? Most studies examining the environmental effectiveness of voluntary environmental initiatives have used the amount of toxic releases as a proxy for environmental performance because of the general lack of data about other areas of corporate environmental performance (Khanna, 2001; Toffel & Marshall, 2004). Yet, of course, environmental performance is a multidimensional concept that includes not only pollution emissions, but also other areas of environmental protection, such as wildlife and habitat management, resource conservation, and footprint reduction (Starik & Rands, 1995). Indeed, the SSP and other voluntary initiatives include a comprehensive list of environmental practices and standards that incorporate these and other recognized dimensions of environmental protection. Thus, it can be

expected that VEP participants that do not face strong institutional pressures in the form of monitoring and sanctions for noncompliance would selectively adopt different environmental management practices depending on their cost, technical difficulty, visibility for stakeholders, and benefits.

Accordingly, *we propose that participant firms would be less likely to adopt those areas of environmental protection that are more costly and have uncertain long-term benefits with little short-term payoffs for firms.* For instance, practices such as wildlife protection and "footprint" reduction, despite their significant importance for environmental protection, offer no immediate financial benefits to ski areas (Porter & van der Linde, 1995; Walley & Whitehead, 1994). However, resource conservation practices that seek to reduce the use of energy, water, and other materials are known to offer shorter term payoffs, making them more likely to be adopted by participants (Walley & Whitehead, 1994).

The Context of Western Skiing: Principal Actors and Programs

Skiing has proven to be a very popular recreational activity in the United States and particularly in the western half of the country, constituting an important part of the area's tourism and recreation economy (Hudson, 2000). Despite rapid growth in the 1960s and 1970s, during the 1980s and 1990s, the ski industry experienced relatively consistent (i.e., a low-growth rate) demand in terms of the number of skier visits (Hudson, 2000; NSAA, 2004b).[4] More recently, even though the ski industry has faced a number of challenges (e.g., economic uncertainty in the United States and increased travel-related security concerns), ski resorts nationwide experienced an increased number of skier visits over the last four ski seasons, particularly in the Rocky Mountains and western United States (NSAA, 2004a, 2005b). The 2000 through 2004 ski seasons resulted in an average of 56 million skier visits per year, compared to an average of 52 million skier visits per year between 1982 and 1999; the three best years in terms of skier visits occurred within the last four years (NSAA, 2004a, 2004b). In addition, snowboarding continues to grow in popularity, albeit at a modest rate. The increase in skier visits has been accompanied by a consolidation and stabilization in the number of ski resorts operating within the United States. Since 2000, there have been approximately 490 ski resorts in operation each season compared to the 727 resorts in operation during the 1984–85 season (NSAA, 2004c).

Given the favorable climate and terrain for skiing, resorts located in the western United States are particularly popular skiing destinations. Western ski resorts, while fewer in absolute numbers, tend to attract more skiers than resorts in other parts of the country. Skier visits to resorts in the Rocky Mountains and Pacific West accounted for 54 percent of all skier visits during the 2003–04 season while states in these regions contain only 34 percent of the ski resorts operating in the United States in 2004 (NSAA, 2004b, 2004c). Resorts in the Rocky Mountain region also commanded higher average lift ticket prices ($61.08) compared to the overall average ($53.95) (NSAA, 2004a). Resorts in the western United States are also more likely to operate on federal lands. Unlike resorts in the eastern United States, over 90 percent

of resorts in the West are operated on property leased from the U.S. Forest Service (USFS) under a special permitting process (SACC, 2005).

A number of special interest groups have criticized the relationship between the ski industry and the USFS for the low rents charged to ski resorts for the use of public lands. Additionally, the USFS and the NSAA have created a number of partnership arrangements under which the parties work together to promote ski sports (Briggs, 2000; Clifford, 2002; Wharton, 1997b). In a 1997 speech to the ski industry, Mike Dombeck, the then head of the USFS, reflected on this relationship when he stated that outdoor recreation had surpassed timber logging as the most important activity in national forests and that there were over 31 million skier visits to national forest lands in 1996 (Wharton, 1997a).

Ski resorts operating on USFS-controlled land must obtain special operating permits, abide by various environmental regulations, and pay permit fees based on the fair market value of the use of the land using a formula that considers the revenue ski resorts generate from the use of USFS lands (e.g., revenue from lift tickets, ski schools, and facilities on forest lands). USFS fees range from 1.5 percent to 4.0 percent of a ski resort's adjusted gross revenue from activities on national forest land (Ski area permit rental charge, at 16 U.S.S §497 c. 2005). Despite the requirement that fees be based on fair market value, a number of GAO (General Accountability Office) reports have found that the USFS has not been collecting appropriate fees from ski resorts (GAO, 1996; Rogers, 2002, 2003).

The USFS's increased focus on recreation has coincided with a decrease in federal appropriations for the USFS and increased pressures on the agency to generate revenues from the management of forest lands (Clifford, 2002). There are also concerns that fees generated from economic activity on USFS lands are used in part to fund special accounts and trust funds that are exempt from Congress' annual appropriation process but are used to finance local community projects and partially pay for overhead expenses such as equipment purchases and/or employee salaries (Gorte, 2000; Gorte & Corn, 1995). Some have argued that the use of this receipt-sharing process may create perverse incentives for local USFS offices faced with reduced federal appropriations (Gorte, 2000).

The SSP

Environmentalists have long been critical of the U.S. ski industry and the USFS's seemingly lax oversight of ski areas on federal lands (Briggs, 2000; Clifford, 2002; Glick, 2001). In the late 1990s, the NSAA's decision to create the SSP followed years of criticism by environmental groups concerned with the environmental impact resorts have on sprawl, air quality, water quality, and wildlife (Briggs, 2000). The 1998 arson attack on a Vail ski lodge, purportedly the work of a radical environmental group concerned about an expansion project undertaken by Vail, received widespread media attention, seemingly united environmentalists, and subjected the ski industry to significant scrutiny (Glick, 2001; Sachs, 2002).

In the aftermath of the arson attack, the NSAA met and worked with various stakeholders—including ski resorts, governmental organizations, and environmen-

tal groups—to develop an environmental charter for the ski industry (NSAA, 2000; Sachs, 2002). Following this collaborative process, in June 2000 the NSAA launched the SSP and issued *Sustainable Slopes: The Environmental Charter for Ski Areas* (NSAA, 2000). In addition to articulating an environmental vision-and-mission statement for the industry, the environmental charter's goal has been to demonstrate the ski industry's "commitment to good environmental stewardship" and "provide a framework for resorts across the country to implement best practices, assess environmental performance, and set goals for improvement in the future" (NSAA, 2000, p. 2).

A number of governmental and nonprofit organizations partnered with the NSAA in the creation of the SSP, including the U.S. EPA, USFS, Colorado Department of Public Health & Environment, U.S. Department of Energy, Conservation Law Foundation, Leave No Trace, Inc., and The Mountain Institute (NSAA, 2000).

According to the NSAA (2005a): "The number one reason for supporting Sustainable Slopes, expressed either directly or indirectly by all Partnering Organizations, is that it leads to improved environmental performance." A few of these partnering organizations have also provided significant funding for the SSP. For example, the USFS contributed $30,000 to finance the creation of the SSP and later funded data collection efforts used by the NSAA in the creation of the SSP annual reports (Clifford, 2002; NSAA, 2005a). The SSP annual reports have also been funded by the National Fish and Wildlife Foundation (NSAA, 2001). However, a number of prominent environmental organizations (e.g., The Sierra Club, The Nature Conservancy) that were involved in the SSP creation program chose not to become official partners in the SSP program (NSAA, 2000).

The SSP charter (NSAA, 2000) involves 21 general categories of environmental protection for ski area planning, operations, and outreach (see Table 1). Since the creation of the SSP in 2000, the NSAA has issued *Sustainable Slopes*, annual reports highlighting environmental activities of endorsing resorts and reporting on the progress of resorts in incorporating the environmental principles into their operations. Over the years, the number of resorts endorsing the SSP has increased from 160 in 2000 (33 percent of U.S. ski areas) to 178 in 2005 (36 percent of U.S. ski areas) (NSAA, 2000, 2005a). However, it is important to underscore that the number of resorts completing the SSP's annual self-assessment tool, a key part of the program, fell from a high of 90 (52 percent) resorts in 2002 to 54 (30 percent) resorts in 2005 (NSAA, 2002, 2005a). The 22-percent decline in submission of self-assessment reports has been experienced despite the prominent role given to responding ski areas in the SSP annual reports and despite the partial funding provided by the USFS to collect these self-assessment data.

For all its efforts, the SSP has not reduced tensions between the ski industry and certain environmental groups and the media that have criticized the SSP for its lack of performance standards and independent oversight and for ignoring many important areas of environmental protection (see e.g., Hartman & Zalaznick, 2003; Langeland, 2002). As the U.S. EPA liaison to the SSP noted in a *Vermont Law Review* article: "The challenge for Sustainable Slopes lies in its implementation. It is a voluntary program, so ski resorts opt-in with nonbinding obligations. If resorts do not

Table 1. Basic Dimensions of Ski Areas' Environmental Performance[a]

Basic Dimension	SSP General Environmental Protection Categories	SACC Environmental Protection Criteria
1. Expansion management	1. Planning, design, and construction	1. Maintaining ski terrain within the existing footprint 2. Preserving undisturbed lands from development 3. Preserving environmentally sensitive areas
2. Natural resources conservation	2. Water use for snowmaking 3. Water use for facilities 4. Water use for landscaping and summer activities 5. Energy use for facilities 6. Energy use for snowmaking 7. Energy use for lifts 8. Energy use for vehicle fleets 9. Waste reduction 10. Product re-use 11. Recycling	4. Promoting and implementing recycling, and water, land, and energy conservation strategies 5. Conserving water and energy by avoiding new snowmaking
3. Pollution management	12. Water quality management 13. Wastewater management 14. Potentially hazardous wastes 15. Air quality 16. Visual quality 17. Transportation	6. Minimizing traffic, emissions, and pollution. 7. Protecting water quality
4. Wildlife and habitat management	18. Fish and wildlife management 19. Forest and vegetative management 20. Wetlands and riparian areas 21. Education and outreach	8. Protection of threatened or endangered species 9. Wildlife habitat protection

Source: SACC (2005) and NSAA (2000).
[a]A detailed list of the underlying variables used for assessing each environmental protection criterion is available online at the SACC's web site (http://www.skiareacitizens.com/criteria.html).
SSP, Sustainable Slopes Program; SACC, Ski Area Citizens' Coalition.

employ suggested actions or do not report annually, there are no consequences. Independent of fulfilling the twenty-one principles, resorts remain able to use the program logo for marketing and advertising" (Sachs, 2002).

Methodology

Statistical Analysis

Because a ski area's environmental performance is not exogenous to its decision to adopt the SSP, we employed a recursive two-stage approach proposed by Heckman (1978, 1979) that corrects for self-selection bias in the estimation of the effects of voluntary programs. The specific application of this recursive methodology to assess the benefits of VEPs is outlined by Khanna and Damon (1999, pp. 4–5, 13) and applied by the growing number of studies that have assessed the benefits

of VEPs (Khanna & Damon, 1999; Maddala 1986; Potoski & Prakash, 2005; Rivera, 2002; Rivera & de Leon, 2004; Welch et al., 2000). Also, to avoid endogeneity, control variables that vary over time were lagged one year in both stages. To elaborate:

Stage One. In this step, we model ski resorts' participation in the SSP by using a probit regression specification with panel data. Subsequently, we use this probit model to calculate each ski resort's probability of participation in the SSP. The control variables included in these probit models seek to account for federal and stakeholder institutional pressures known to affect participation in the SSP and other VEPs (Khanna, 2001; Rivera & de Leon, 2004).

$$D_{it} = \delta_i + a_1 X_{1it} + \varepsilon_{1it}; \quad (1)$$

Where:
i = ith ski area
t = observation year
D_{it} = Decision to participate in the SSP
δ_i = Regression constant term
X_{1it} = Vector of independent variables (federal government oversight, stock exchange trading, size, state location)
a_1 = Regression coefficients for vector of independent variables
ε_{1it} = Equation 1's random error term

Stage Two. In this stage of the analysis, we model the different dimensions of ski resorts' environmental performance using a random effects specification[5] estimated with a mixed generalized linear regression technique (MGLR) deemed appropriate for unbalanced panel data (Greene, 2000; Little, 1995).[6] The estimated probability of participation in the SPP calculated in the initial step is used here as an independent variable to assess the effect of SSP participation on environmental performance (Greene, 2000; Khanna & Damon, 1999; Maddala, 1986). The second-stage regression model also includes control variables previously found to be associated with corporate environmental performance (Darnall, 2002; Delmas, 2002; Khanna, 2001; King & Lenox, 2000; Potoski & Prakash, 2005; Rivera & de Leon, 2004). Our second-step model specification is represented by the following equation:

$$Y_{it} = \alpha_i + b_2 X_{2it} + \varepsilon_{2it}; \quad (2)$$

Where:
Y_{it} = ith ski area's environmental performance at year t
α_i = Regression constant term
X_{2it} = Vector of independent variables (federal government oversight, stock exchange trading, size, and index of state environmentalism)
P_{it} = Probability of participation in the SSP
ε_{2it} = Equation 2's random error term

The use of Heckman's two-stage recursive methodology for estimating self-selection models has been criticized by some because the first and second stage models usually share all or almost all identifier variables (Puhani, 2000). If a linear probability model is used in stage one for determining the inverse Mill's ratio (probability of participation variable introduced on the second stage), collinearity problems between this ratio and other independent variables arise in the second stage (Maddala, 1986, pp. 267–71; Olsen, 1980, pp. 1818–19). Thus, it has been suggested that the application of the Heckman methodology requires the use of identifying variables associated with the dependent variable in stage one but not associated with the dependent variable in stage two.

This methodological issue was initially addressed by Olsen (1980) in an article published in *Econometrica* and more recently by other authors (Greene, 2000, pp. 926–46; Maddala, 1986, pp. 267–71). They show that the Heckman techniques that use a probit model for stage one and a linear model for the second stage do not suffer problems of identification even when a similar set of independent exogenous variables is used for both stages. This is because the probit model involves a nonlinear function of its independent variables and thus the Mill's ratio calculated from it "is a nonlinear function of the exogenous variables in the model" (Olsen, 1980, p. 1818).

Data and Measures

Building upon Rivera and de Leon's (2004) initial cross-sectional assessment of the SSP, we collected panel data on SSP adoption, environmental performance, and independent control variables (e.g., ski resort location, ownership, size, etc.) for five years between 2001 and 2005. Information about SSP adoption was obtained from the program's official annual reports and web site. Environmental performance dimensions data were obtained from the disaggregated SACC annual scorecard rankings. Data for the independent variables were gathered from individual ski areas' internet home pages, Travelocity.com, the NSAA, the USFS, and the stock markets in New York and Toronto.

Our final sample consisted of 110 U.S. western ski areas, which equates to approximately 62 percent of the 178 facilities operating in the western United States in 2005.[7] Included in this sample were 76 ski areas that as of the summer of 2005 had received third-party environmental performance ratings and 34 ski areas randomly drawn from the western ski resort population. The use of this sample to estimate the first and second step regression models is described in the following.

Probit Regression Pooled Data. Because once enrolled in the SSP ski areas are not excluded from the program, their adoption decision does not have to be made every year. Thus, as suggested by Khanna and Damon (1999), once a ski area has adopted the SSP, it is dropped from the data set. Conversely, nonadopters could choose to participate in any following year. For instance, ski areas that joined the program in 2001 are included two times in the probit regression pooled data, once as nonmembers in 2000, and then as SSP members in 2001 (Khanna & Damon, 1999). The resulting pooled data used for the probit analysis includes 233 observations.

Environmental Performance Dimensions Models. In the case of the second step regression models, all ski area observations for which environmental performance data were available between 2001 and 2005 were used, resulting in an unbalanced panel data set of 350 observations.

In the following paragraphs, we describe the measures of the variables included in our analysis beginning with the different dimensions of environmental performance, participation in the SSP, and then following with the independent variables.

Measure of Environmental Performance Dimensions. Following the approach used by Rivera and de Leon (2004), publicly available data obtained from the SACC annual scorecard listing were used to estimate the ski areas' environmental performance. The SACC is a partnership of nonprofit environmental organizations located in the western United States. Since 2000, the SACC has conducted assessments of the environmental performance of western ski resorts and annually publishes the results online as Environmental Scorecard Grades (http://www.skiareacitizens.com). Ski areas are assigned letter grades from A (best) to F (worst) based on their percentage compliance with multiple environmental performance criteria. The environmental criteria's underlying variables and the grading methodology are available online at the SACC web site (http://www.skiareacitizens.com/criteria.html). The information used to estimate scorecard grades is obtained from government documents collected through Freedom of Information Act requests.[8] Additional information is gathered from on-site visits, an annual ski area survey, individual ski resorts' web sites, corporate reports, and external sources such as media articles published by trade magazines, business press, and the general media (Dorsey, 2004; SACC, 2005).

Since their initial publication, the SACC's scorecard grades have received increasing recognition as a measure of ski areas' environmental performance not only by specialized ski publications and web sites but also by mainstream media in the United States and abroad including: *the New York Times, the Denver Post, the Rocky Mountains News, the Los Angeles Times, the Seattle Post, CNN*, and *ESPN*.[9] Nevertheless, it is important to underscore that the NSAA has vehemently criticized the use of Environmental Scorecard Grades as "an unaudited, inherently flawed, and biased measure of resort environmental performance" (Dorsey, 2004). The NSAA also strongly portrays the SACC as an alliance of radical environmental groups whose goal is to obstruct the expansion of the industry (Dorsey, 2004; Link, 2005). In particular, NSAA representatives criticize the scorecard for placing undue emphasis on penalizing ski areas involved in expansion-related activities, such as real estate development, and those refusing to respond to SACC annual surveys (Baird, 2004; Blevins, 2004; Dorsey, 2004; Janofsky, 2000).

To be sure, the controversial perspectives surrounding the use of environmental performance data are not unique to the SACC's scorecard grades. They are inherent in other widely used sources of environmental performance information such as, for example, self-reported TRI data gathered by the U.S. EPA (King & Lenox, 2000; Toffel & Marshall, 2004). It is not surprising that "hard" environmental performance data are seldom available given that in the United States less that 1 percent of large regulated facilities received inspection of their air, water, and land pollu-

tion between 1996 and 1998 (Potoski & Prakash, 2005). Thus, SACC scorecard grades and other measures of environmental performance widely used in the literature are clearly imperfect measures based on the judgment and interpretation of qualitative and quantitative data that inherently involve human error and biases (Waddock, 2003). In this sense, the human judgments used to develop the SACC scorecard ratings "are in many respects no different from the interpretations that underlie financial and accounting statements, which also rely on the (sometimes erroneous and sometimes felonious as witnessed in the first year of the millennium) judgments of auditors, accountants, and financial analysts to determine materiality" (Waddock, 2003).

In light of the putative problems presented by the SACC scorecard, we chose to extend the approach taken in the initial evaluation of the SSP (Rivera & de Leon, 2004). First, we tried to obtain alternative data that could verify or challenge the findings of the SACC environmental scorecard. An obvious alternative was the SSP members' annual self-reported environmental performance assessments collected by the NSAA, gathered in part through funding from the USFS (NSAA, 2005a). On different occasions, we contacted the NSAA's Director of Public Policy, seeking to gain access to these data. Unfortunately, the NSAA chose to maintain the proprietary nature of these self-reported assessments and, therefore, we were denied access to these data.

The only additional publicly available indication of ski resorts' environmental performance available was the Golden Eagle Award given annually to ski resorts in recognition of their environmental excellence. This award is currently being administered by the NSAA and was previously run by Mountains Sport Media, the publisher of *Ski Magazine* (NSAA, 2005a). It is noteworthy that in the 2000 to 2004 period, Golden Eagle awardees also received the SACC's highest environmental scorecard grades in four out of five cases, suggesting a high correlation between these two independent proxies of superior environmental performance.

Second, we followed an alternative approach aimed at addressing concerns related to the SACC scorecard's "overemphasis" on penalizing expansion-related activities. Instead of using the SACC's overall Environmental Scorecard Grades, we used the disaggregated data to estimate percentage compliance ratios for four basic dimensions of ski areas' environmental performance: (i) expansion management; (ii) natural resources conservation; (iii) pollution management; and (iv) wildlife and habitat management. Table 1 also lists the SACC scorecard criteria that we selected to be included under each dimension. It is important to note that we excluded SACC criteria that did not fit these categories or that were not used consistently over the period of 2001 to 2005.[10] Finally, we also estimated *overall environmental performance* for each ski area as the nonweighted average of the four basic environmental performance dimensions' percentage compliance ratios.

Measure of Other Variables. Adoption of the SSP is measured using a discrete variable that takes a value of one for enrolled facilities and zero for nonparticipants. Low, medium, and high levels of *federal government environmental oversight* are measured respectively by identifying the type of private, mixed, and public land ownership

occupied by ski area facilities. As suggested by previous authors (Briggs, 2000; Clifford, 2002; Rivera and de Leon, 2004), facilities located on public land owned by the federal government faced significantly higher levels of environmental oversight. *Ski area size* is calculated as the total amount of skiable acres possessed by each ski area. *Ownership by a publicly traded firm* is measured by a dummy variable equal to one for ski areas belonging to corporations traded on a stock exchange and zero otherwise. *Probability of participation in the SSP* is measured on a zero-to-one continuous scale and its values were estimated using the probit model calculated in the first stage of the statistical analysis (Hartman, 1988; Khanna & Damon, 1999). Lastly, the level of *state environmental pressures* is measured with two alternative proxies: state location or Mazur and Welch's (1999) index of state environmentalism used by other researchers (Potoski & Prakash, 2005; Toffel, 2005). This index is estimated using four standardized indicators: (i) state membership in the largest U.S. environmental organizations; (ii) level of proenvironmental public opinion as measured by National Opinion Research Center; (iii) congressional delegation's League of Conservations Voters proenvironmental ranking; and (iv) state's environmental policy implementation strength ranking (Mazur & Welch, 1999).

Results and Discussion

Tables 2 and 3 show the descriptive statistics for SSP participation and performance rates for the different areas of environmental protection. Descriptive statistics for the independent variables for 2005 are presented in Table 3. These descriptive figures suggest that, as has been the case for the overall population of U.S. ski resorts, the level of SSP participation for our sample of western ski resorts has increased less than 3 percent over the 2001 to 2005 period (see Table 2). Regarding overall environmental performance, the descriptive results indicate that the proportion of ski areas (SPP members and nonmembers) receiving the lowest rates (F grades) has decreased from about 28 percent in 2001 to 12 percent in 2005, with the mid-rate environmental performance ranking (C grades) increasing the most from approximately 21 percent in 2001 to about 51 percent in 2005 (see Table 2). It is also interesting to note that in terms of individual dimensions of environmental protection, Expansion Management is the dimension where the largest proportion of sampled ski resorts (45.45 percent) received the highest grade (A grade). Indeed, no ski resorts received an A grade for pollution management and wildlife protection and only 3.95 percent scored an "A" for natural resource conservation (see Table 3).

Adoption of the Sustainable Slopes Program

Findings for two probit regression specifications that model ski areas' participation decisions are presented in Table 4. Each model uses a different proxy for state environmental pressures: Model 1 relies on state location whereas Model 2 uses Mazur and Welch's (1999) index of state environmentalism. Given that the two models are statistically significant ($p < 0.01$) and offer similar results, we only discuss the results of Model 2.[11,12] In accordance with previous research on VEPs, the probit

Table 2. Descriptive Statistics for Program Participation and Overall Environmental Performance

Variable/Year	2001		2002		2003		2004		2005		Full Period (2001–05)	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Sustainable slopes adoption												
Yes	79	71.82%	81	73.64%	82	74.55%	81	73.64%	82	74.55%	405	73.64%
No	31	28.18%	29	26.36%	28	25.45%	29	26.36%	28	25.45%	145	26.36%
Total	110		110		110		110		110		550	
Overall environmental performance (percentage score for SSP members and nonmembers)												
77 to 100 (A)	4	7.02%	4	5.71%	4	5.71%	4	5.26%	3	3.90%	19	5.43%
60 to <77 (B)	7	12.28%	7	10.00%	7	10.00%	13	17.11%	5	6.49%	39	11.14%
45 to <60 (C)	12	21.05%	21	30.00%	28	40.00%	33	43.42%	39	50.65%	133	38.00%
35 to <45 (D)	18	31.58%	24	34.29%	15	21.43%	16	21.05%	21	27.27%	94	26.86%
<35 (F)	16	28.07%	14	20.00%	16	22.86%	10	13.16%	9	11.69%	65	18.57%
Total	57		70		70		76		76		350	
Average performance	44.86 (16.23)		45.66 (14.52)		47.65 (15.44)		50.66 (15.44)		48.00 (12.48)		47.53 (14.82)	

SSP, Sustainable Slopes Program.

Table 3. Descriptive Statistics for the Year 2005

Variable	N	Percent	Variable	N	Percent
Expansion management (percentage score)			Federal government oversight		
77 to 100 (A)	35	45.45%	Lower	19	17.27%
60 to <77 (B)	12	15.58%	Medium	15	13.64%
45 to <60 (C)	11	14.29%	Higher	76	69.09%
35 to <45 (D)	7	9.09%	Total	110	
<35 (F)	12	15.58%			
Total	77				
Mean score	67.30 (26.31)				
Natural resource conservation			Ownership by a publicly traded firm		
77 to 100 (A)	3	3.95%	Yes	10	9.09%
60 to <77 (B)	3	3.95%	No	100	90.91%
45 to <60 (C)	6	7.89%	Total	110	
35 to <45 (D)	11	14.47%			
<35 (F)	53	69.74%			
Total	76				
Mean score	31.37 (18.04)				
Pollution Management			Size (thousand acres)		
77 to 100 (A)	0	0.00%	0–1	57	51.82%
60 to <77 (B)	12	15.58%	1 > –2	28	25.45%
45 to <60 (C)	54	70.13%	2 > –3	17	15.45%
35 to <45 (D)	0	0.00%	3 > –4	6	5.45%
<35 (F)	11	14.29%	4 > –5	2	1.82%
Total	77		Total	110	
Mean score	50.54 (11.19)		Mean score	1.3 (1.04)[a]	
Wildlife and habitat management			State location		
77 to 100 (A)	0	0.00%	Alaska	2	1.82%
60 to <77 (B)	0	0.00%	Arizona	2	1.82%
45 to <60 (C)	36	46.75%	California	20	18.18%
35 to <45 (D)	6	7.79%	Colorado	25	22.73%
<35 (F)	35	45.45%	Idaho	8	7.27%
Total	77		Montana	8	7.27%
Mean score	32.17 (19.97)		New Mexico	8	7.27%
			Nevada	4	3.64%
			Oregon	8	7.27%
			Utah	13	11.82%
			Washington	9	8.18%
			Wyoming	3	2.73%
			Total	110	

[a]Standard deviations are in parentheses.

Table 4. Results from Probit Regression Models[b]

	Model 1	Model 2
Constant	–1.68 (0.42)[a]***	–2.50 (0.36)***
Federal government environmental oversight		
High (public land)	1.29 (0.32)***	1.17 (0.28)***
Medium (public-private land)	1.81 (0.42)***	1.69 (0.34)***
Ownership by publicly trade firm	0.99 (0.84)	1.45 (0.78)*
Size (thousand of acres units)	0.73 (0.17)***	0.66 (0.14)***
State environmental pressures		
Index of state environmentalism		1.21 (0.51)**
State location		
Alaska	–1.13 (0.70)	
Arizona	–0.12 (0.72)	
California	0.51 (0.34)	
Idaho	–1.34 (0.46)***	
Montana	–0.59 (0.47)	
New Mexico	–1.03 (0.43)**	
Nevada	–0.81 (0.44)*	
Oregon	0.72 (0.55)	
Utah	–0.24 (0.41)	
Washington	–0.32 (0.42)	
Wyoming	–1.19 (0.61)**	
N	233	233
–2 Log L	216.45	236.57
χ^2 for covariates	91.46***	71.34***
Percent correctly classified	83.8	80.2

Note: Dependent variable: Participation in the Sustainable Slopes Program.
[a]Standard errors are in parentheses.
[b]Model 1 is used to predict ski areas' probability of participation given that it has a higher percentage of correctly classified adoption decisions.
Prob: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

findings indicate that ski areas are significantly more likely to participate in the SSP when facing higher levels of federal government oversight ($p < 0.05$) (Darnall, 2003a; Henriques & Sadorsky, 1996; Khanna & Damon, 1999; Rivera, 2004). Also, consistent with previous studies of VEP participation, the results suggest that larger ski area size ($p < 0.01$), and greater levels of state environmental pressures ($p < 0.05$) are significantly correlated with adoption of the SSP (Darnall, 2002; Khanna, 2001; King & Lenox, 2000; Toffel, 2005).[13] The effect of ownership by a publicly traded firm is less conclusive as only Model 2 suggests a positive relationship with SSP participation at 90 percent confidence. Given that participation in the SSP has changed little over the 2001–05 period, it is not surprising that our findings are congruent with Rivera and de Leon's (2004) assessment of the first year participation in the SSP.

Overall, this evidence is consistent with neo-institutional theory concepts suggesting that coercive pressures in the form of regulatory demands, arising at either the federal or state level, are a key incentive for promoting corporate "green" signaling in the form of adoption of self-regulatory initiatives, such as the SSP (Darnall, 2003a; Delmas & Terlaak, 2001). Similarly, larger ski areas and those traded in the

stock market are more visible to a wider array of stakeholders (i.e., the media, environmentalists, consumers, the industry association) that exert stronger normative institutional pressures on these facilities to show greater proactive environmental behavior (Darnall, 2003a; King & Lenox, 2000). Thus, we suggest that independent of their actual environmental practices, these resorts use SSP adoption as a relatively low-cost and conspicuous "green legitimacy" building mechanism that may help to preempt additional environmental regulatory demands (Darnall, 2003b; Lyon & Maxwell, 2001). Larger or publicly traded facilities may also find the adoption of SSP practices easier because they tend to have more resources and greater access to innovative environmental management technologies as compared to smaller or privately owned ski areas (Hoffman, 1999; King & Lenox, 2000).

Environmental Effectiveness of the SSP

More important than identifying factors associated with participation is determining whether the adoption of voluntary programs, such as the SSP, actually promotes higher environmental performance by participants (Andrews, 1998; Potoski & Prakash, 2005). Seeking to address this question, we estimated five different regression models that analyze the outcome of the SSP in different areas of environmental protection: Overall environmental management, expansion management, natural resource conservation, pollution management, and wildlife and habitat management (see Table 5) For all models, the chi-square statistic indicates a significant fit for the independent variables included in the models ($p < 0.01$) (alternative model specifications are displayed on endnote 14).[14]

Model 3 in Table 5 presents the results for overall environmental performance. We find that the coefficient on probability of participation is not statistically significant, even at 90 percent confidence. This finding indicates that ski areas' adoption of the SSP is not significantly correlated with higher overall environmental performance for the 2001–05 period. Similarly, the results suggest that during this period, enrollment in the SSP does not have a statistically significant correlation with higher performance in the following individual dimensions of environmental protection: expansion management (see Model 4), pollution management (Model 6), and wildlife and habitat management (Model 7). In these three cases, the coefficients on the probability of participation variable are statistically insignificant ($p < 0.1$). Compared to nonadopting ski resorts, SSP participants only appear to show a statistically significant correlation with higher Natural Resource Conservation performance rates ($p < 0.05$; see Model 5).

These results indicate lack of statistical evidence to conclude that between 2001 and 2005, ski areas adopting the SSP displayed superior performance levels than nonparticipants for most areas of environmental protection. SSP adoption only seems to be associated with higher performance in natural resources conservation practices. These nonsignificant findings are consistent with the neoinstitutional theory arguments positing that purely voluntary initiatives are bound to suffer free-riding behavior because of their lack of robust coercive and normative mechanisms

Table 5. MGL Regression Results

	Overall Environmental Performance (Model 3)	Expansion Management (Model 4)	Natural Resources Conservation (Model 5)	Pollution Management (Model 6)	Wildlife and Habitat Management (Model 7)
Constant	55.96 (5.29)[a]***	85.12 (8.81)***	31.87 (7.94)***	57.53 (5.38)***	62.16 (7.56)***
Federal government oversight					
High (Public land)	–7.00 (3.86)*	–4.68 (5.94)	–13.32 (6.21)**	–0.52 (4.23)	–10.38 (6.38)
Medium (public-private land)	–10.81 (4.61)**	–8.54 (7.01)	–18.97 (7.53)**	1.20 (5.13)	–17.45 (7.92)**
Ownership by publicly traded firm	–2.06 (4.18)	–15.97 (6.65)**	–2.28 (6.51)	–2.15 (4.42)	–3.81 (6.40)
Probability of participation	8.75 (8.32)	–11.90 (14.00)	32.70 (12.43)**	12.59 (8.41)	–4.27 (11.85)
Size (thousand of acres units)	–4.47 (2.1)**	–7.0 (3.5)**	–7.0 (3.1)**	2.0 (2.1)	–0.45 (2.9)
State environmental pressures	–0.19 (7.57)	9.60 (12.61)	16.66 (11.31)	–14.71 (7.65)*	–7.76 (10.65)
N	348	348	348	348	348
–2 Log L	–590.6	–321.1	–223.7	–481.9	–117.9
χ^2 for covariates	272.27***	330.34***	191.37***	175.92***	88.79***

Note: Dependent variable: environmental performance.
[a]Standard errors are in parentheses.
Prob: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

that can differentiate between proactive and opportunistic participants (Hardin, 1968; King & Lenox, 2000; Olson, 1965; Ostrom, 1990; Williamson, 1975).

As highlighted by Rivera and de Leon (2004) in their initial selection effect assessment of the SSP: A significant number of poor environmental performing facilities appear to self-select into the program because the program's charter did not establish performance-based standards, did not require independent third-party monitoring of its members' environmental practices, and lacked sanctions or rewards for respectively poor or superior environmental performance (Dorsey, 2004; Rivera & de Leon, 2004; Sachs, 2002). Our five-year treatment effect evaluation contributes to the initial SSP assessment by showing lack of statistical evidence suggesting that once enrolled and over time, enough participants improve their practices in agreed-upon SSP dimensions of environmental protection, such as expansion management, pollution management, and wildlife and habitat management. Facing the SSP's weak institutional mechanisms for preventing opportunistic behavior, it appears that once enrolled, program participants may predominantly adopt those environmental management practices that are highly visible, such as recycling, or those that offer immediate short-term benefits with relatively small investments, such as energy and water conservation (Porter & van der Linde, 1995; Walley & Whitehead, 1994).

To be sure, our findings suggest that compared to nonadopting ski areas, the only dimension of environmental protection for which SSP members seem to show a statistically significant improvement is natural resources conservation. This

dimension includes recycling, energy, and water conservation practices (see Table 1) that profit-driven firms are more likely to adopt without an institutional socialization process spurred by strong coercive and normative pressures (Delmas, 2002; Hoffman, 1999; King & Lenox, 2000; Scott, 2001). On the other hand, the other three major dimensions of environmental protection involve practices that may not have evident short-term financial benefits, or as in the case of relatively more profitable pollution-prevention measures, require larger financial investments that run against ski areas' capital budget constraints (Walley & Whitehead, 1994).

Regarding the control variables included in the environmental performance specifications, we found that ski areas' location on federal land or mixed land appears to have a statistically significant correlation with lower overall environmental performance (Model 3) and natural resource conservation performance (Model 5). In addition, location in mixed land also shows a significant correlation with lower wildlife and habitat management performance (Model 6). The coefficient on ownership by a publicly traded firm (Model 4) also indicates a statistically significant association with lower performance for expansion management. Finally, larger ski areas appear to have a statistically significant correlation with lower overall environmental performance ($p < 0.05$). Similarly, larger ski areas are significantly related to lower performance rates for expansion management (Model 4) and natural resource conservation (Model 5).

These findings for ski areas located on federal or mixed land were unexpected (Henriques & Sadorsky, 1996; Khanna, 2001). After all, ski areas occupying federal land administered by the USFS are periodically subjected to greater coercive institutional pressures in the form of enhanced government oversight through a Special Use Permit process. These Special Use Permits call for ski areas' operations and development plans to be consistent with USFS resource management plans and fee structures (Briggs, 2000; Clifford, 2002; Rivera & de Leon, 2004). Holding Special Use Permits also involves obtaining the approval of Environmental Impact Statements for any new development.

Yet, the lower performance of ski areas occupying national forest lands may reflect weak institutional pressures that result from at least three contradictory mandates and conflict of interest conditions experienced by the USFS. For instance, as suggested by Rivera and de Leon (2004), the USFS has opposing mandates that require it to regulate ski areas' environmental impacts and concurrently promote ski-industry growth. Second, promoting increasing economic activities on national forest land directly increases the hundreds of millions of dollars annually allocated to the off-budget trust funds sometimes used by the USFS to partially finance overhead expenses such as employee salaries (Dombeck, 2000; Gorte & Corn, 1995).[15] Third, the USFS is required by law to share 25 percent of its gross commercial revenue from national forests with local counties for roads and school financing (Gorte, 2000; Rey, 2005).[16] Accordingly, local western congressional representatives and county officials with national forest lands in their districts tend to actively advocate for increasing economic activities in national forests against the demands from environmentalists for reduced economic activity (Dombeck, 2000; Gorte, 2000; Rey, 2005). In addition, it can also be argued that the lack of exclusive private property

rights intrinsic to ski areas located on federal land preempts any incentives that ski firms may have to engage in environmental protection practices that involve uncertain long-term benefits (Hardin, 1968; Olson, 1965; Ostrom, 1990).[17]

Despite the higher visibility of ski areas owned by publicly traded corporations, the lack of evidence linking them to higher scores for overall environmental performance, natural resources conservation, pollution management, and wildlife habitat management was not surprising. The same can be said of their significant association with lower expansion management performance. Wall Street does not exert normative environmental pressures on firms and instead focuses on demanding consistent double-digit increases in financial performance which, in the case of ski resorts, is accomplished by focusing on aggressive real estate development and expansion activities that inherently have a negative impact on the environmental footprint of ski resorts (Hudson, 2000; Palmeri, 2003). The emphasis on quarterly profits also reduces the appeal of investments in other areas of environmental protection that involve uncertain long-term payoffs (Walley & Whitehead, 1994). We suggest that a similar underlying logic applies to the overall lower environmental performance shown by larger ski areas that are known for their aggressive focus on real estate development around skiable terrain (Palmeri, 2003).

Conclusions

This study contributes to answering a basic issue regarding the use of VEPs as alternative environmental protection policy tools: Are voluntary programs effective in promoting higher environmental performance by participant firm facilities? We also contribute to the literature by highlighting the importance of analyzing an additional issue related to the environmental policy effectiveness of voluntary environmental initiatives: Which distinct areas of environmental performance are more likely to be improved by firms joining a voluntary environmental program? We addressed these two questions by assessing the implementation in the western United States of the SSP, a voluntary initiative established by the NSAA.

Consistent with neo-institutional theory, our findings indicate that participation in the SSP is related to coercive and normative pressures in the form of enhanced federal oversight and higher state environmental demands exerted by state agencies, local environmental groups, and public opinion (Darnall, 2003a; Khanna, 2001; King & Lenox, 2000; Rivera, 2004). Additionally, our five-year study found no statistical evidence to conclude that compared to nonparticipants, SSP ski areas have higher overall environmental performance or higher scores in the following individual dimensions of environmental protection: expansion management, pollution management, and wildlife and habitat management. SSP participants only appear to show a statistically significant correlation with higher natural resource conservation performance rates.

These findings are also consistent with the neo-institutional perspective argument that purely voluntary initiatives that lack specific performance-based standards, third-party oversight, rewards for exceptional behavior, and/or sanctions for poor performance are bound to suffer free-riding behavior because of their lack of

robust institutional mechanisms that can differentiate between proactive and opportunistic participants (Hardin, 1968; King & Lenox, 2000; Olson, 1965; Ostrom, 1990; Rivera & de Leon, 2004; Scott, 2001; Williamson, 1975).

Facing SSP's weak institutional mechanisms for preventing opportunistic behavior, it appears that once enrolled, ski areas may predominantly adopt natural resources conservation practices that are known to be easier and more visible for their customers (such as recycling) or those that offer immediate short-term benefits with relatively small investment such as energy and water conservation (Porter & van der Linde, 1995; Walley & Whitehead, 1994). Unfortunately, without an effective institutional socialization process spurred by strong coercive and normative pressures, we found no evidence of similar adoption of practices affecting other major dimensions of environmental protection, such as expansion management and wildlife habitat management. These other dimensions may not have evident short-term financial benefits or customer visibility, or as in the case of relatively more profitable pollution prevention measures, require larger financial investments that run against firms' capital budget constraints (Delmas, 2002; Hoffman, 1999; King & Lenox, 2000; Scott, 2001; Walley & Whitehead, 1994).

For policymakers, the findings of this study suggest reservations about *a priori* assuming that purely voluntary programs can be effective in promoting comprehensive superior environmental protection. Of course, given the limited nature of this particular inquiry, we cannot judge VEPs in general. However, we do present the distinct possibility that purely voluntary environmental initiatives are much more problematic than their proponents would generalize. Most importantly, this research suggests caution for federal agencies about officially endorsing industry-sponsored voluntary environmental initiatives—such as the ski industry's SSP—that lack independent monitoring, performance standards, and any type of sanctions/rewards for poor/superior environmental performance. Finally, it is important to stress an important limitation of our study. Although the SACC's Environmental Scorecard is the best available measure of ski areas' environmental performance, its validity has been strongly challenged by the NSAA. We repeatedly requested access to alternative environmental performance data collected by the SSP but NSAA officials denied us access to the data. In future studies in this area we hope researchers may be able to access these proprietary environmental performance data collected by the SSP or are able to use other alternative environmental-performance measures.

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Notes

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1. Rivera and de Leon's (2004) manuscript provides a detailed outline of a neo-institutional theory model of participation in voluntary programs that interested readers should examine. Khanna and Damon (1999) also develop and alternate model of voluntary participation in the initiatives.
2. Williamson (1975, p. 6) originally defined opportunism as "self-interest seeking with guile." He later characterized guile as "lying, stealing, cheating, and calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse" (Williamson, 1985, p. 47).
3. Free riding is understood as avoiding cooperating in the provision of a collectively produced good while expecting to derive individual benefit from it (Delmas & Keller, 2005; Olson, 1965).
4. The term "skier visit" refers to one skier or snowboarder visiting a resort for any portion of one day (NSAA, 2005b).
5. A fixed-effects model is inappropriate because of the time-invariant nature of some of the independent variables (Hsiao, 1986). A Housman test is normally used to select between fixed and random effects models for specification without time-invariant independent variables (Greene, 2000).
6. The MGLR technique is better suited to handle unbalanced panel data than the traditional generalized least-squares techniques (Little, 1995; Rubin, 1976). This mixed linear regression methodology employs a maximum likelihood estimation approach and allows the unknown random error vector to exhibit both correlation and heterogeneous variances (Little, 1995).
7. We classified western ski areas as those located in the Rocky Mountains and Pacific West regions of the United States.
8. These government documents—available online at the SACC's website—include, among others: USFS environmental impact statements, master development plans, expansion proposals, and forest management plan revisions, as well as formal biologic opinions prepared by the U.S. Fish and Wildlife Service (SACC, 2005).
9. A quick Google search of the term "ski area environmental scorecard grades" generates links to over 200 stories and articles on the scorecard rankings and more than 500 hits.
10. Criteria left out involve for instance: Opposing/supporting environmentally sound policy positions and those that in the early 2000s penalized ski areas for not responding to SACC's annual survey.
11. Model 1 yields a slightly higher percentage of correctly classified participation decisions and it is used to estimate the values of ski area's probability of participation in the SSP—one of the independent variables included in the second stage of the regression analysis. Calculating the probability of participation with Model 1 also reduces the chance of overidentification as this model does not include all the same independent variables used in the second stage of the analysis (see note #6).
12. To assess heteroskedasticity problems in the probit models, we used the David and Mackinnon test: It did not indicate problems ($p < 0.05$).
13. State location, the alternate measure of state environmental pressures used in Model 1, similarly suggest that domicile in states with lower environmental pressures, such as Idaho ($p < 0.01$), New Mexico ($p < 0.05$), Nevada ($p < 0.01$), and Wyoming ($p < 0.05$), is significantly related to lower participation in the SSP.
14. We thank one of the anonymous reviewers for requesting that we explore alternate model specifications that may have revealed the presence of identification problems in the second stage of analysis (see the description of these possible problems in the discussion of the statistical analysis under the "Methodology" section of this article). To do so, we recalculated all the second-stage MGL regression models excluding the following independent variables: (i) ski area size, and (ii) ownership by publicly traded firm. These two variables showed the highest collinearity with the probability of participation variable (inverse Mill's ratio) calculated in stage one and thus, could have led to identification problems. See Table 6 for findings of alternate model specifications.

Table 6. New MGL Regression Results:[a] Excluding Size and Ownership by Publicly Traded Firm as Control Variables

	Overall Environmental Performance (Model 3)	Expansion Management (Model 4)	Natural Resources Conservation (Model 5)	Pollution Management (Model 6)	Wildlife and Habitat Management (Model 7)
Constant	0.53	0.89	0.091	0.56	0.62
	(0.051)[b]	(0.074)	(0.10)	(0.05)	(0.069)
Probability of participation	–0.053	–0.039	0.29	0.050	–0.082
	(0.056)	(0.083)***	(0.10)**	(0.053)	(0.073)
N	348	348	348	348	348
–2 Log L	–609.8	–459.4	–74.8	–504.7	–140.2
χ^2	282.89***	362***	182.62***	174.31***	87.86***

Note: Dependent variable: environmental performance dimensions.
[a]Additional independent variables included in the models (federal government oversight and state environmental pressures) not shown.
[b]Standard errors are in parentheses.
Prob: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

With the exception of the Expansion Management regression (Model 4), all other models produced similar results for the probability of participation variable (our key independent variable of interest in the analysis). In the case of the Expansion Management regression the new coefficient for the probability of participation variable shows a negative and significant association with the dependent variable (expansion management percentage score). This specific new finding actually suggests that in expansion-related practices, SSP participants have lower performance than nonparticipants.

15. Forest Service trust fund allocations are independent of the U.S. Congress annual appropriation process (Dombeck, 2000; Gorte & Corn, 1995).
16. Since 1908, the 25 Percent Fund Act (16 U.S.C. sec. 500) has required these payments in lieu of property taxes.
17. We thank Nicole Darnall for pointing out this alternate explanation.

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