

**Teton-West Yellowstone Region  
Backcountry Winter Recreation  
Economic Impact Analysis**

Photo: Tom Turiano

## **Full Report**



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November, 2013

## **Abstract**

This report presents the results of a study that analyzed the annual economic contribution of winter backcountry recreation in Grand Teton National Park, parts of the Bridger-Teton and Caribou-Targhee National Forests, and areas around West Yellowstone in Gallatin National Forest and Yellowstone National Park. The economic activity impacts communities in Teton County, Wyoming; Teton, Bonneville, Fremont and Madison Counties, Idaho; and West Yellowstone, Montana. We define backcountry recreation to include backcountry skiing and snowboarding (aka AT); cross-country and nordic track skiing; snowshoeing; walking/jogging on groomed backcountry trails; and over-snow biking. The population includes residents of the communities in the region who participated in one or more of those activities as well as nonresidents who participated in one or more of those activities during the course of their visit. We gathered data via surveys administered to a random sample of residents and nonresidents over the course of the 2012/2013 winter season. We estimated the population by aggregating Federal Lands Recreation Enhancement data, National Visitor Use Monitoring Data, Grand Teton National Park trail counts and concessionaire use data. We find the total annual direct economic contribution of these activities in the region to be \$22,564,461. We estimate the annual direct economic impact by nonresidents who participate in these activities while visiting the region to be \$12,073,815. We estimate the annual economic contribution of residents to be \$6,473,919. We estimate that this economic activity annually generates \$2,974,004 in wages to employees who work in jobs directly stemming from these forms of winter backcountry recreation. And we estimate that this activity annually contributes \$1,042,723 in tax revenues to state and local government.

**Mark Newcomb** contracted with **Winter Wildlands Alliance** to undertake this study. Winter Wildlands Alliance (WWA), is a national non-profit organization dedicated to promoting and preserving winter wildlands and quality human-powered snowsports experiences on public lands. WWA has a collective membership of over 25,000 and 35 grassroots member groups in 11 states. Mark Newcomb is an economist with experience in environmental economics, energy infrastructure, urban and rural planning, GIS and spatial analysis. He has an MS in Economics and Finance from the University of Wyoming and twenty-five years experience backcountry skiing and working as a backcountry ski guide and avalanche course instructor.

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# 1 Introduction

This paper presents the results of a regional economic analysis of winter backcountry recreation, largely of the non-motorized nature (backcountry skiing and snowboarding (aka AT); cross-country skiing both on and off of groomed trails; snowshoeing; walking/jogging on groomed backcountry trails; and over-snow biking) that occurs in a region encompassing Grand Teton National Park, parts of the Bridger-Teton National Forest and Caribou-Targhee National Forest, and Rendezvous Ski Trails in West Yellowstone (located on the Gallatin National Forest). The population of interest includes residents of Teton County, Wyoming; Teton, Bonneville, Fremont and Madison Counties, Idaho; and West Yellowstone, Montana; as well as nonresidents of that region who participated in winter backcountry recreation during the course of their visit. Over the course of the 2012/2013 winter season we surveyed a random sample of resident and nonresident backcountry visitors who walked or jogged, cross-country skied, snowshoed, backcountry skied (aka AT) or fat-tire biked at least once during the season. The survey asked for data about annual expenditures on goods and services related to these forms of backcountry recreation, as well as the location and frequency of backcountry visits. It also contained questions meant to assess satisfaction levels with various elements of the winter backcountry recreation experience. We applied estimates based on this data to populations of resident and nonresident backcountry visitors estimated via a combination of data sources, including Federal Lands Recreation Enhancement (FLREA) data, USDA Forest Service National Visitor Use Monitoring (NVUM) data, trail counts and authorized concessionaire use data from both Grand Teton National Park and the Forest Service.

Nationwide participation in winter backcountry recreation is on the rise. Between 2008 and 2011, the percentage of the U.S. population aged 16 and above participating in snow and ice sports increased by about 4.2 million people Cordell, H. Ken, Project Leader (2012). And non-motorized snow sports other than downhill skiing are some of the fastest growing outdoor sports as measured by total participation rates for the US population

ages 6+ SGMA (2012). Snowshoeing, for example, has seen a two-year increase of 24.9%, and Alpine Touring (AT) (aka backcountry skiing and snowboarding) has increased 34.4% SGMA (2012). In contrast, snowmobiling has experienced an increase of 11.7% at the casual level (those who participate 1 - 7 times annually) and an 11.7% *decrease* at the frequent level (those who participate 15+ times annually) SGMA (2012). Another study done by the Snowsports Industry Association (SIA) in partnership with the Physical Activity Council (PAC) found that approximately 4.3M people cross-country ski, 4.1M people snowshoe and 2.1M people backcountry ski and/or snowboard (listed as ‘Telemarking’) PAC (2013), SIA (2013). While the economic contribution related to these activities is measurable at a national level, locally, its impacts are not well understood.

Within the Teton-Yellowstone region, anecdotal evidence suggests that winter backcountry use is increasing, bolstered by developments in gear technology and a growing body of publicity about the quality of the recreational experience.<sup>1</sup> The amount, quality and ease of access to public lands managed by the USDA Forest Service and National Park Service in the region is certainly an important, if not the most important, factor behind this rise in popularity. Partnerships with local trails and pathways organizations support grooming of trails for cross-country skiing, snowshoeing, walking and fat-tire biking that further enhances the quality of the experience.

Economic impact analyses are commonly used to quantify the dollars spent, within a defined region, as a result of a certain activity or group of activities. In its most basic form an economic impact analysis measures the direct effect, or immediate changes in production, of an activity resulting from a change in policy, regulation or consumer taste/preference Stynes (2000). As in White and Stynes (2010), we note the distinction between impact and contribution—the former is spending in the region from forest visitors outside the region while the latter is spending by forest visitors from within the region. In general, spending by backcountry users within the region is considered a valid contribution to the local economy if it would not occur without access to the backcountry.<sup>2</sup> While we label the overall economic activity as a contribution rather than impact, wherever we can we distinguish

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<sup>1</sup>See, for example, Schnitzpahn (2012) and Rendezvous Ski Trails (2012). Indeed winter recreation visitation is so intense in some areas that it is leading to congestion Pearlman (2008).

<sup>2</sup>On one hand, the type of person who recreates in the backcountry (relatively active and physically fit) would substitute some other form of active recreation in place of backcountry recreation (i.e., they would spend money on recreation with or without access to public lands. On the other hand, many would have never moved to the region without such access.

between economic impact and economic contribution.

We find the total annual direct economic contribution of these activities in the region to be \$22,564,461. We estimate the annual direct economic impact by nonresidents who participate in these activities while visiting the region to be \$12,473,919. We estimate the annual economic contribution of residents to be \$6,473,919. We estimate that this economic activity annually generates \$2,974,004 in wages to employees who work in jobs directly stemming from these forms of winter backcountry recreation. And we estimate that this activity annually contributes \$1,042,723 in tax revenues to state and local government. We conservatively estimate that 7,419 residents of the region participate in winter backcountry recreation in the region and that 41,336 nonresidents participated in winter backcountry recreation during the course of their visit to the region. We estimate that the 7,419 residents participating in winter backcountry recreation spend an average of \$803 annually in region and an additional \$255 out-of-region on goods and services for backcountry winter recreation. Our per-person spending estimate for the 41,336 nonresidents is \$273 per person per visit on backcountry winter recreation goods and services during their visit. For perspective, the annual direct economic impact of all forms of tourism in Teton County, Wyoming is estimated to be \$677.0 million Dean Runyan Associates (2012).

Finally, we note that this study measures only the direct economic contribution of backcountry recreation. It does not estimate the indirect and induced effects of these forms of winter backcountry recreation on the region.

## **1.1. Other Studies**

Aggregated data on the economic impacts for all forms of outdoor recreation combined has been compiled by the Outdoor Industry Association (OIA). According to this study, outdoor recreation in Wyoming generated \$4.5 billion in consumer spending, 50,000 jobs, \$1.4 billion in wages and \$300 million in state and local tax revenue over the course of 2012 Outdoor Industry Association (2013).

Aggregated data is also available from other sources. For example, according to sia (2013), between August, 2012 through January 2013 consumers nationwide spent \$2.6B on snow sports apparel, accessories and equipment, including \$550M in January alone. Over the course of the 2011-2012 winter season, there were an estimated 690,811 visits to ski re-

sorts and 382,428 days spent snowmobiling in Wyoming. Combined, the two industries accounted for an estimated \$92.6 million in labor income and \$161.1 million in indirect and induced additional economic activity Nagler et al. (2012).

By far the most comprehensive visitation data for National Forests comes from the National Visitor Use Monitor Program (NVUM).<sup>3</sup> The NVUM program entails forest-wide, on-site surveys and visitor counts to estimate volumes of recreation visitation to National Forests and Grasslands as well as descriptive characteristics about that visitation English et al. (2002). The study is conducted on a subset of national forests in each region every year so that every administrative forest region is sampled once every five years. The program costs about \$500,000 for one forest district survey kur. About a third of those surveyed are also given an economic survey that generates data about spending profiles for various types of visitors. A summary of NVUM economic survey results for the three winter-use categories are given in Appendix C.

The NVUM has strengths and weaknesses. Its design by a team of statisticians and Forest Service employees ensures that NVUM data is statistically valid at the level of use for which it is designed English et al. (2002). It is not designed, however, to address more specific geographic or governmental regions (i.e. town and counties surrounded by Forest Service lands), and it's list of activities lacks specificity in regards to winter activities (i.e., it lists only three choices for winter related activity under the primary purpose of visit question: downhill skiing, cross-country skiing and snowmobiling) NVUM Handbook (2007). Nor do NVUM studies include data on commercial use of Forest Service lands and related visitor expenditures on outfitters and outdoor education providers White and Stynes (2010). Incidentally, Stynes and White (2006) finds that while average spending per visitor varies little across forest regions, there is wide variability among recreation sites within regions related to the proximity of a site to commercial development. Thus the need for more localized studies such as Kaliszewski (2012).<sup>4</sup>

The best data on *localized* economic impacts of outdoor recreation comes from industries such as fishing, hunting and snowmobiling that require permits, licenses or similar forms of registration. This information can be used to build data bases with addresses and numbers of participants which can then be used to generate contact lists for mail, phone

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<sup>3</sup>See NVUM for a comprehensive description of the program and related research reports and publications.

<sup>4</sup>As a side note, in 2012 there were 160 million total visitors to all National Forest lands that resulted in \$11 billion in tourist spending.

and email surveys. Examples of economic impact studies that use such databases include U.S. Fish and Wildlife Service (2006), Trout Unlimited (2005) and Loomis (2005) for fishing; Munn et al. (2010) for fishing and hunting; and Nagler et al. (2012) and Otto (2011) for snowmobiling in Wyoming and Iowa respectively.

A study similar in nature to this one, but focused on the summer season use of trails and pathways for biking, is Kaliszewski (2012). An economic impact and travel cost study focused on a local ice climbing area is Anderson (2010). Results from these studies are listed for comparison to ours in Section 5.4.

## **1.2. Organization of This Report**

The remainder of this report proceeds as follows. First we describe some assumptions and terms used throughout the report. Then we describe the study region and how we estimated its population of winter backcountry users, the survey design, and the sample design. After that we provide some of the general results and provide sample data. Then we estimate the economic contribution of backcountry recreation based on our population estimates. Finally we list the results of that portion of the study focused on the opinions of various backcountry users. The appendices contain more detailed descriptions of the sample data.

## 2 Study Design

### 2.1. Terms

Following is a list of several terms, definitions and acronyms are used extensively throughout this report.

**winter backcountry recreation** For the purposes of this analysis, this term includes the five activities listed below, plus winter mountaineering (a tiny percentage of all winter backcountry visits). It does not include snowmobiling for snowmobiling sake. But it does include snowmobiling when used to access backcountry in order to undertake one or more of the following activities. When we reference ‘winter backcountry visitation,’ we also mean visitation that occurs for the purpose of undertaking one of the following activities.

**Backcountry skiing (aka AT)** AT is an acronym for alpine touring, whether on skis or snowboard. We use this term to describe any visitor to the backcountry who travels up hill under their own power for the specific purpose of glissading back down via skis or snowboard. They might use a snowmobile to access more remote areas. Backcountry skiing and AT are used interchangeably throughout this report.

**snowshoeing** Traveling by snowshoe in the backcountry, on or off groomed trails.

**cross-country skiing on trail (aka nordic track skiing)** Cross-country skiing on trail involves skiing on trails groomed by grooming machines (not by snowmobiles).

**cross-country skiing off trail** Traveling by cross-country skis off of groomed trails, whether on skier-made trails, snowmobile packed trails or where there is no trail at all.

**walking/jogging** This refers to walking or jogging in the backcountry via a packed, groomed trail.

**fat-tire biking** Fat tire bikes are specially made to travel over very soft surfaces, especially snow. Use of fat tire bikes to access the backcountry is a relatively recent phenomenon and appears to be on the rise. A few shops in our study region offer them for rent or for sale.

**local visitor** A local visitor (aka resident) is a visitor to the backcountry who lived in the study region (Teton County, Wyoming; Teton, Bonneville, Madison and Fremont Counties, Idaho; and the town of West Yellowstone, Montana).<sup>1</sup> Local visitors must have lived in the region year-round (resident) or for the *entire* winter season (seasonal resident). This differs from NVUM methodology that defines local visitor as someone who travels less than 50 - 60 miles to a Forest visitation site White and Stynes (2010). Because winter day-use visitors to Teton Pass and other parts of the study region typically drive more than 60 miles one way to recreate for the day (e.g. it's 70 miles from Rexburg to Teton Pass and 76 miles from Idaho Falls to Teton Pass), our definition of non-local visitor more clearly distinguishes between winter backcountry visitors who overnight in the region and those who do not. However the breadth of the region is the source of confusion regarding local versus non-local visits to West Yellowstone. Many who visit West Yellowstone from Teton County, Wyoming and Teton County, Idaho overnight there, but would still be considered local visitors. We describe how we handle lodging expenditures by this group in Section 5.1.3.<sup>2,3</sup> For the purposes of this report, we also include 'seasonal residents' under the category of 'local visitors' unless otherwise noted (see the next term).

**seasonal local** A recreational backcountry visitor who is living in the study region for the winter season. The principal investigator thought it might be of interest to estimate what proportion of winter backcountry visitors are in the region for no more than the

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<sup>1</sup>See Section 2.2

<sup>2</sup>Stynes and White (2006) and White and Stynes (2010) capture spending patterns among forest visitors who travel more than 60 miles but visit for just the day by including a category for 'Non-Local Day Trips' under the visitor spending category.

<sup>3</sup>Kaliszewski (2012) restricts local visitors to communities within 50 miles of the trails focused on in her study. By our standard, 69% of respondents in our survey were local visitors. By NVUM standard, CTNF NVUM Results (2010) 58% of visits to the CTNF in 2010 were local visits (i.e., made by visitors that live within 50 miles of the CTNF). However another 10% of reported visits are non-locals on day trips. In other words, approximately 68% of visits were day trips, a percentage matching the percentage of locals as defined in our study. Farther down in the report, CTNF NVUM Results (2010) notes that 33.7% of visits were made on a trip that included an overnight stay, corroborating our results and supporting our definition of local visitor.

winter season to find employment, usually in tourism-related or ski resort jobs, and avail themselves of recreational amenities, including backcountry recreation. While many seasonal employees chose the Teton and West Yellowstone region over other regions because of the opportunities for recreation, their spending does not technically meet the criterion for economic impact. Thus, for the purposes of this report, we lump seasonal locals in with locals and call them both ‘local’ or ‘resident’ visitors unless specified otherwise.

**non-local visitor** A recreational backcountry visitor from outside the study region.

**visit** We define visit to be one person entering backcountry on public land (National Forest or National Park) to recreate for an unspecified period of time. Thus respondents in our survey might record more than one visit per day (e.g., they may walk or cross-country ski with a pet on a groomed trail in the morning, then AT in the backcountry via a different trailhead later in the day).

**organized visit** An organized visit is a visit by a person who is being commercially guided, participating in a commercially organized avalanche course, or participating in an educational or leadership training program provided by a non-profit. All organizational use must take place as an organized concession operating under the permission of the agency managing the land where the activity is taking place. Some organized activity takes place under the category of ‘special use,’ meaning that the organizer is not necessarily an authorized concessionaire but is organizing a one-off event outside of the concessionaire system (e.g., film permits and non-profit events are typically issued under the special use category).

**GTNP** Grand Teton National Park

**BTNF** Bridger-Teton National Forest

**CTNF** Caribou-Targhee National Forest

**NVUM Program** National Visitor Use Monitoring Program—the program carried out by the USDA Forest Service to estimate use and economic activity related to the use of National Forest lands nationwide.

**RST** Rendezvous Ski Trails

**Bradley-Taggart Trailhead** Bradley-Taggart Trailhead is the trailhead most used for non-

snowmobile winter backcountry recreation in GTNP. It's located at the end of the plowed portion of the park road accessed through the Moose entrance gate.

**Cache Creek Trailhead** Cache Creek Trailhead accesses a multi-use groomed track on the east edge of the town of Jackson.

**Phillips Bench Parking Area** Phillips Bench accesses a trail used by cross-country skiers, snowshoers, backcountry skiers and snowmobilers on the east side of Teton Pass.

**Teton Pass Parking Area** Located at the summit of Teton Pass, the Teton Pass Parking area is a very popular access point for backcountry skiers accessing the popular backcountry skiing off of Glory Peak to the north or extensive terrain to the south.

**Mail Cabin Creek Trailhead/Coal Creek Parking Area** One parking area on the west side of Teton Pass accesses two drainages. To the south, Mail Cabin Creek provides access to extensive backcountry ski terrain. To the north, Coal Creek offers access to Taylor Mountain. Many backcountry skiers who descend the west side of Glory Peak also end up at Coal Creek.

**Teton Canyon Parking Area** Teton Canyon Parking Area provides access to a multi-use, groomed trail that leads to Teton Canyon on the west side of the Tetons. Although the trailhead is in Wyoming, most residents who utilize this parking area live in Idaho.

**Rendezvous Ski Trails** Rendezvous Ski Trails is an extensive network of world class, groomed nordic track located on the out skiers of West Yellowstone, Montana.

## 2.2. Geographic Region

This study estimates the economic contribution of winter backcountry recreation that occurs on a swath of public land swaddling three states. It includes the Snake River Range, portions of the Wyoming Range and Gros Ventre Range, portions of the Absorkas, the entire Teton Range, and areas around the town of West Yellowstone and is collectively referred to in this report as 'the backcountry.' The population who use these public, backcountry lands is comprised of residents living in counties surrounding them and nonresidents visiting from outside these counties as defined in Section 2.1. Communities impacted by the

backcountry recreation in this region include those located in counties proximate to these backcountry areas, plus West Yellowstone. A map of the region is shown in Appendix E.

To facilitate estimation of the overall population of AT skiers, cross-country skiers, snowshoers, walkers/joggers and fat tire bikers, we divide the backcountry region into three subregions.

1. West Yellowstone and its immediate surroundings (aka West Yellowstone Subregion). Aside from being a gateway to Yellowstone National Park for snowmobile and snow coach visitors, West Yellowstone harbors world class nordic skiing at the Rendezvous Ski Trails. West Yellowstone is far enough away from other communities in the region that cross-country skiers from those communities often over-night in West Yellowstone.
2. The Jackson and Victor-Driggs Subregion. This subregion could be broken into two: one on the west side of the Tetons and one on the east. Instead we combined them and applied NVUM data to both, even though that meant mixing 2008 data for BTNF visitation with 2010 data for CTNF visitation. This subregion thus includes the west and east sides of the Tetons. The west side of the Tetons includes the communities of Victor, Driggs and Alta that are proximate to trailheads accessing the west side of the range and areas west of Teton Pass. On the east side of the Tetons, this subregion includes the communities of Jackson, Wilson and Teton Village. The eastern portion of this subregion is surrounded by the Caribou-Targhee National Forest (CTNF), parts of which lie within Caribou, Bannock, Teton, Madison, Bonneville and Fremont Counties, Idaho. Major towns include Idaho Falls and Rexburg. This study focuses on the winter backcountry recreation that occurs on the west slope of the Teton Range outside the towns of Victor and Driggs in Teton County, Idaho, largely in the Teton Basin Ranger District. Some backcountry use occurs on portions of the Palisades Ranger District. There are multiple groomed trails (maintained by Teton Valley Trails and Pathways) and backcountry access points via Teton Canyon, Fox Creek, Darby Canyon, State Line and other trailheads or parking areas. Visitors to Rendezvous Ski Trails from this area typically overnight in West Yellowstone.

The portion of this subregion on the east side of the Tetons includes the town of Jackson and communities such as Wilson, Jackson and Teton Village. This region

is surrounded by the Bridger-Teton National Forest (BTNF). Parts of the BTNF lie within Teton, Lincoln, Sublette and Fremont Counties. The bulk of the non-snowmobile backcountry recreation occurs in the Jackson Ranger District that borders the southern extent of the Teton Range, the northern edge of the Snake River Range along Highway 89 (where it crosses Teton Pass), and areas around the town of Jackson that include nordic trails up Cache Creek and Game Creek. Residents in this region would overnight in West Yellowstone when visiting Rendezvous Ski Trails. Trailheads in this subregion where we recruited survey participants include Cache Creek, Phillips Bench, Teton Pass, Mail Cabin Creek and Teton Canyon.

3. Grand Teton National Park. Grand Teton National Park includes the bulk of the Teton Range and includes the small communities of Moose and Kelly. The primary access point for non-snowmobile winter recreation in Grand Teton National Park is via the Bradley-Taggart parking area located at the end of the plowed portion of the Park Road. Visitors must pass through the Moose entrance station, which has a traffic counter. From the Bradley-Taggart parking area, visitors can walk, cross-country ski or snowshoe along a groomed trail that follows the highway that is unplowed from there on. Or they can enter the backcountry via user created trails leading west towards the mountains. Residents in this area visit the Teton Pass area and west side of the Tetons less frequently, and overnight in West Yellowstone if they visit Rendezvous Ski Trails. We recruited survey participants at the Bradley-Taggart parking area.

## 2.3. Population Estimate

We conservatively estimate that 7,419 residents of the region participate in winter backcountry recreation in the region and that 41,336 nonresidents participated in winter backcountry recreation during the course of their visit to the region. Estimating the total population of backcountry visitors is the biggest hurdle faced by studies of this type. We corroborated our estimate using retail spending data, and we cross-checked it with results from another study done for the BTNF as described below.

The bulk of winter backcountry visitors is between 18 and 64 in age. The average age among survey respondents was 44, with a minimum of 17, a maximum of 78, and 7% total outside

of the range between 18 and 64. According to United States Census Bureau (2013), the number of people between the ages of 18 and 64 living in Teton County, Wyoming; Teton County, Bonneville County, Madison County, and Fremont County, Idaho was 113,136. In a mail survey carried out in 2008, Clement and Cheng (2008) found that 15% of survey respondents from Teton, Sublette, Fremont and Park Counties between those ages participated in backcountry skiing on the Bridger-Teton National Forest (at some point, not just in the past 12 months). Fifteen percent of the 113,136 residents ages 18 to 64 in the counties in the western (Idaho) portion of our study region equals 16,970 backcountry skiers. However this figure is likely high because over 50,000 of those residents live in Idaho Falls and Rexburg (in Bonneville County), communities just far enough away from backcountry recreation of the type contemplated in this study that the participation rate is likely less than 15%. Excluding the 61,343 people in that age group living in Bonneville County leaves 36,750 people between the age of 18 and 64. Fifteen percent of that amount equals 5,513, a figure that is likely too low. Our estimate of 7,149, which includes also includes cross-country skiers, snowshoers, walkers and bikers who utilize groomed snow trails and which includes people older than 64 and younger than 18, thus appears reasonable and probably conservative.

To arrive at our population estimate, we applied trail count and/or National Forest NVUM data specific to each of the three subregions. We then aggregated the data and accounted for the double counting of visitors who recreate across two or more subregions. The total combined population of winter backcountry visitors who cross-country ski, AT ski, snowshoe, walk or fat tire bike is thus the sum of the population from each sub-region, minus those who recreate in any two subregions, plus those who recreate in all three.<sup>4</sup> The estimates for each region are provided below in Section 2.3.1 for Grand Teton National Park (GTNP), 2.3.2 for Bridger-Teton National Forest (BTNF) and Caribou-Targhee National Forest (CTNF), and 2.3.3 for Rendezvous Ski Trails (RST).

We estimate that 4,028 nonresidents visited GTNP backcountry; that 36,388 nonresidents visited the BTNF and CTNF backcountry areas within the study region; and that 1,225 nonresidents visited RST. Assuming that zero nonresidents visited more than one sub-region, we summed the three values for a final estimate of 41,336 nonresident winter backcountry visitors.<sup>5</sup>

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<sup>4</sup>This is based on the counting principal known as inclusion/exclusion.

<sup>5</sup>Because the survey did not ask non-local visitors to specify which trailheads they visited, we have no way

Table 2.1.: **Population estimates by subregion and total after accounting for double counting.**

	Locals:	Non-locals:
GTNP	1,883	3,722
National Forest	5,689	36,388
RST	1,141	1,225
Sum	8,713	41,336
Pop. Estimate	7,419	41,336

We estimate that 1,883 residents visited GTNP; that 5,689 residents visited the BTNF and CTNF areas within the study region; and that 1,141 residents visited RST (8,713 total). This total, however, double counts residents who visited more than one subregion, so the counting technique known as inclusion/exclusion should be applied to find the final overall population. Within our sample, 60 locals visited RST, 278 visited the BTNF and/or the CTNF (National Forest), and 195 visited GTNP for a total of 533. Forty-one visited RST and the National Forest, 24 visited RST and GTNP, and 188 visited GTNP and the National Forest, for a total of 253. Finally, 24 visited all three. Applying inclusion/exclusion to the sample population, we find the sample population of locals to be  $533 - 253 + 24 = 304$ , or 85% of 357 total respondents. A similar percentage of 8,713 amounts to our final estimate of 7,419 as the overall population of resident winter backcountry visitors (i.e., local visitors, in NVUM parlance) within our study region. Details of the population estimates for each sub-region are given in Subsections 2.3.1, 2.3.2 and 2.3.3 below.

### 2.3.1. Grand Teton National Park

Grand Teton National Park staff maintain two trail counters. One lies along a trail heading west from the parking lot that accesses a popular area for AT skiers and snowboarders known as 25 Short. This counter would mostly count AT skiers and snowboarders. Another lies just beyond the gate closing the road for the winter and mostly counts cross-country

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of knowing how many visited more than one sub-region (e.g., Teton Pass in BTNF and Bradley-Taggart in GTNP). However based on field interviews, we feel this is a reasonable assumption.

skiers, snowshoers and walkers. Fat tire biking is not allowed in Grand Teton National Park.

Trail counts are not exact. Unlike permanent summer trails, the location of winter trails is susceptible to the whims of backcountry visitors. Hence the trail to the 25 Short region sometimes shifts outside of the counter's view. Furthermore, wildlife can trigger the counter, and during heavy snowfall events, snowflakes can trigger the counters. Counts are adjusted for obvious aberrations but are not considered exact GTNP Staff (2013a). Still, these are the counts used for GTNP's monthly estimate of visitation (see NPS Stats (2013a) and NPS Stats (2013b)) and are considered to be the most reliable data available once adjusted for false positives.

According to Schuster (2013), the counter labeled 'Taggart Parking/TPR Gate,' recorded 19,338 counts from December 13 through April 4, or 173 per day. Dividing by two to account for returning individuals, the total number of visitors through the TPR Gate is approximately 9,669. The former of the two, labeled '25 Short,' recorded 5,958 total counts from December 15 through April 19, or 48 per day. Divided by two that equals 2,979 people accessing the 25 Short region. The two together equal 12,648 total visits to the GTNP backcountry via the Bradley-Taggart trailhead. According to NPS Stats (2013a), Grand Teton National Park tallied 10,258 *private* (i.e., non-commercial) 'cross-country skiers' for the 2012/2013 season. Since the trail counters can't distinguish between AT skiers, snowshoers and walkers, the term 'cross-country skiers' includes all three GTNP Staff (2013a). Adding commercially guided parties (1,553 according to GTNP Staff (2013b)) to the monthly total of private cross-country skiers increases the total to 12,036, or 612 shy of the total recorded by the counters. The 612 could be accounted for by the proclivity of the trail counter to over-count. We use 10,258 as the estimate for non-guided winter backcountry activity and account for guided activity in section 5.2.

This estimate is conservative. There is a third backcountry access point from the Bradley-Taggart Trailhead which leads to Bradley Lake and the popular Garnet Canyon—the access to the Grand Teton, Middle Teton and South Teton. GTNP staff recognize that there is substantial uncounted backcountry traffic along this trail, and it's slated to have its own counter in the near future GTNP Staff (2013b).<sup>6</sup>

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<sup>6</sup>Data on car traffic also indicate that 10,258 is a low estimate. According to NPS Stats (2013a), 17,147 recreational vehicles entered GTNP through the Moose entrance between December 1st through March 31st. If each car contains an average of 2.4 passengers as recorded in NPS Stats (2005), then approx-

Out of 106 responses from backcountry visitors encountered at Bradley-Taggart trailhead, 62 (58.5%) were local visitors, and 44 (41.5%) were non-local visitors. Given this ratio, local visits comprised 6,000 of the 10,258 recorded visits, and non-local visits comprised 4,258. Locals who visited the backcountry at Bradley-Taggart at least once, averaged 4.8 visits over the course of a season. Non-local visitors averaged 1.25 visits per person. Dividing 6,000 and 4,258 by their respective visits per person, we estimate that 1,253 locals visited GTNP for backcountry recreation while 3,417 non-local visitors visited GTNP for backcountry recreation.

Table 2.2.: **Total private alpine touring, cross-country ski and snowshoe visits to GTNP (total recorded private visits: 10,258).**

	Percent	No. Visits	Visits/Person	Private Visitors	Guided	Total
Non-local	41.5%	4,258	1.2	3,417	306	3,417
Local	58.5%	6,000	4.8	1,253	630	1,883

To estimate the number of local and non-local *guided* visitors to GTNP, we refer to data presented in Subsection 5.2.1. There were a total of 1,553 visits to GTNP by individuals that were either guided or participating in an avalanche course. Based on our sample of backcountry visitors, we estimate that participants in organized activities made on average 1.66 organized visits per person. Dividing 1,553 by 1.66, we estimate that 936 individuals visited GTNP as part of an organized activity. Within our sample, 67% of those who hired a guide were local and 33% were non-local.<sup>7</sup> Applying the same proportions to 936 means we should add  $0.67 * 936 = 630$  guided locals to the 1,253 private local visitors, and  $0.33 * 936 = 306$  guided non-locals to the 3,417 private non-local visitors. Thus we estimate that 1,883 locals and 3,722 non-locals visited the GTNP backcountry in 2012/2013 (Table 2.2).

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imately 41,153 visitors passed through the Moose entrance. This is around 3.5 times the number of people, private and guided, that are estimated to enter the backcountry. While some visitors probably sight-see and never leave the parking lot, in the experience of the surveyors in the field, the majority of cars contained visitors who entered the backcountry.

<sup>7</sup>Intuitively one would expect a higher percentage of non-locals to higher a guide. However a large percent of GTNP ‘guided’ visits are actually participants of avalanche courses, the predominance of which are locals or seasonal locals.

### 2.3.2. Bridger-Teton and Caribou-Targhee National Forests

In lieu of our own trailhead counts, we rely on USDA Forest Service National Visitor Use Monitor data to estimate the populations of local and non-local backcountry skiers, cross-country skiers, snowshoers, walkers and fat tire bikers to the Forest Service Lands surrounding the Victor-Driggs and Jackson Subregions. The most recent data available is from 2009/2010 for the Caribou-Targhee National Forest and from 2007/2008 for the Bridger-Teton National Forest. Combining data from the two separate surveys requires the strong assumption that visitation was similar during the two seasons, which likely not the case. However no better estimates exist.

NVUM questionnaires lump downhill skiing at resorts and backcountry skiing together under the category of ‘Downhill Skiing.’ We parse ‘Downhill Ski’ visits into ski resort visits and backcountry ski visits (alpine touring, aka AT, visits) by subtracting resort skier visits as reported to the Forest Service by ski resorts. According to CTNF NVUM Results (2010), in fiscal year 2010 13.7% (253,724) of all visits to the Caribou-Targhee National Forest were made for the purpose of ‘Downhill Skiing’ BTNF and CTNF Staff (2012). According to Spencer (2013), ski resorts on the CTNF recorded 226,592 skier days in the 2009/2010 season. The difference—27,132—in theory represents the number of visits to the CTNF made for some form of downhill skiing other than what occurs at a resort (i.e., backcountry skiing, or AT).<sup>8</sup> From the same source, 7.2% of CTNF visits (133,344) were made for the purpose of ‘Cross-country Skiing,’ which includes ‘snow shoeing’ (sic) CTNF NVUM Results (2010). Similarly for the BTNF, ‘over 30% of all visits come for that activity,’ meaning downhill skiing BTNF NVUM Results (2009). After stripping out ski resort visits, there were 125,726 visits to the BTNF for the purpose of alpine touring and 202,898 visits for cross-country skiing or snowshoeing.

White and Stynes (2010) estimate that 44% of downhill ski visits were made by non-local over-night visitors.<sup>9</sup> They estimated that 15% of downhill ski visits were non-local day visitors and 32% were local day visitors. Our definition of local would include a

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<sup>8</sup>Note that skier days reported by resorts are ‘proxy’ data and reported without a margin of error. Once those are removed, the remaining visits are ‘General Forest Areas’ (GFA) visits with a fairly wide confidence interval. For the CTNF results, the confidence interval at the 90% level of confidence for GFA visits is 35% CTNF NVUM Results (2010). For the BTNF, the 90% level confidence interval is 32% BTNF NVUM Results (2009).

<sup>9</sup>Technically speaking these were forest visitors who overnighted off of the forest but in the vicinity of the recreation site (i.e., hotel/motel or other resort-based lodging).

Table 2.3.: **Downhill and backcountry skiing and snowboarding (AT) visits.**

	Forest Visits	% Participation	Ski Visits	Ski Area Visits	AT Visits
BTNF 2008	2,181,700	30.8%	671,964	546,238	125,726
CTNF 2010	1,852,000	13.7%	253,724	226,592	27,132
Total	4,033,700		925,688	772,830	152,858

significant portion of those identified by NVUM as non-local, so we combine all day visits to obtain a 47% visitation rate by downhill skiers who visited for the day.<sup>10</sup> Based on these percentages, we estimate that non-local AT visits amounted to 44% of the 152,858 visits, or 67,257 visits, and that local AT visits amounted to 47%, or 71,843 visits to the BTNF and CTNF.<sup>11</sup>

Table 2.4.: **Non-local and local AT visits out of 152,858 combined visits to the BTNF and CTNF.**

	Percent	Final Estimate
% Non-Local	44%	71,843
% Local	47%	67,257

In 2008 there were 202,898 visits to the BTNF made for the purpose of cross-country skiing and about 45% were by people residing more than 75 miles from the forest (i.e., our definition of non-local) BTNF NVUM Results (2009). In 2010 there were 133,344 cross-country visits to the CTNF and about 35% lived more than 75 miles from the forest CTNF NVUM Results (2010). Adding 45% of 202,898 (91,507) and 35% of 133,344 (46,937) to 67,257 non-local AT visits amounts to an estimate of 205,701 combined non-local AT and cross-country/snowshoe visits to National Forest lands within the study region. Adding 55% of 202,898 (111,391) and 65% (86,407) of 133,344 to the 71,843 local AT visits amounts to an estimate of 197,931 combined local AT and cross-country/snowshoe visits (Table 2.5).

Non-locals in our survey who AT ski, cross-country ski and/or snowshoe and who primarily

<sup>10</sup>See section 2.1 for the reasoning here.

<sup>11</sup>The remaining 9% of visits were non-primary.

Table 2.5.: **Non-local and local cross-country ski and snowshoe visits to the BTNF and CTNF.**

BTNF visits: 202,898	% Non-local	45%	% Local	55%
	No. Non-local	91,507	No. Local	111,391
CTNF visits: 133,344	% Non-local	35%	% Local	65%
	No. Non-local	46,937	No. Local	86,407
Total		138,444		197,931

visited BTNF and/or CTNF sites averaged 3.8 visits per person. Thus we estimate that  $\frac{205,701}{3.8} = 53,978$  non-locals visited BTNF and CTNF sites within our study region to AT ski, cross-country ski and/or snowshoe. Locals in our survey who visited BTNF and/or CTNF sites averaged 31.9 visits over the course of the season. Thus we estimate that  $\frac{269,774}{31.9} = 8,444$  locals visited BTNF and CTNF sites to ski or snowshoe (Table 2.6).

Table 2.6.: **Total alpine touring, cross-country ski and snowshoe visits to the BTNF and CTNF.**

	AT and XC Ski Visits	Visits per Person	Skiers & Snowshoers
Non-local	205,701	3.8	53,978
Local	269,774	31.9	8,444

Table 2.7.: **Final population estimates for resident and nonresident visitors to the portion of the study region within BTNF and CTNF, including walkers and fat tire bikers.**

	Skiers & Snow- shoers	Walkers and Bikers	Total Forest Visitors	Regional Forest Visitors
Non-local	53,978	324	54,318	36,388
Local	8,444	51	8,492	5,689

But we also need to account for backcountry visitors who walk, jog or fat tire bike in the

backcountry but don't ski or snowshoe. In our survey, 0.6% of both locals and non-locals *only* walked, jogged or fat-tire biked. Adding those to our estimates above increases our total visitor counts to 54,318 non-locals and 8,492 locals (Table 2.6). Finally, 67% of winter recreation visitors to the BTNF and the CTNF visited an NVUM survey site within our study area USDA National Forest Service NVUM Non-Proxy Results (2013), meaning the population of visitors to Forest Service lands within our study region is 67% of 54,318 and 8,492, or 36,388 non-locals and 5,689 locals (Table 2.7).

### 2.3.3. Rendezvous Ski Trails

Aside from being a gateway into Yellowstone National Park, West Yellowstone's primary winter attraction is Rendezvous Ski Trails (RST), a system of world class nordic trails located on the Gallatin National Forest (GNF). We gathered 42 non-local and 25 local responses, accounting for 948 total skier visits, from cross-country skiers encountered at RST. By combing data from our sample with data FLREA data provided by GNF Staff (2013), we conservatively estimate that 1,141 locals and 1,225 non-locals used RST between December 1, 2012 and March 31, 2013. These are considered conservative because population counts based on a trail counter at the entrance to the trail system results in estimates of 1,718 locals and 1,956 non-locals.<sup>12</sup> Additional November visitation—specifically during the Yellowstone Ski Festival—is based on data cited by Dow (2013) and amounted to a minimum of 423 additional non-locals visitors.

Fee collections and skier visits for the past six seasons are shown in Table 2.8 GNF Staff (2013). Fee collections and skier visits for December 1st, 2012 through March 31st, 2013 are shown in Table 2.9. Daily passes, season passes and family season passes are available. For that period of time, RST sold 2,728 day passes, 117 individual season passes and 118 family season passes GNF Staff (2013).

Our final estimate for the population of visitors to RST requires a few assumptions. The first is that within our sample, any respondent who visited RST less than five times (or recorded less than five visits per person) purchased day passes (see Table 2.9 for why the

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<sup>12</sup>The trail count number represents a high estimate because the counter can be triggered by non-trail users (e.g., people who walk back and forth through the counter but who are not actually using the trail for recreation and wildlife Dow (2013)). The pass sales numbers represent a low estimate because skiers may 'poach,' (i.e., refuse to pay for their visit) so that they are recorded as a skier by the counter but not recorded as a pass sale/fee collection.

Table 2.8.: **Rendezvous Ski Trails annual visitation and fee collections.**

Year	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Fees	\$20,011	\$21,728	\$25,730	\$35,186	\$44,652	\$34,646
Skiers	25,714	20,799	34,341	23,374	31,272	15,077

Table 2.9.: **Rendezvous Ski Trails visitor use data, December, 2012 through March, 2013**

Day Passes		Individual Season		Family Season		Collections	Skiers
Number	Price	Number	Price	Number	Price		
2,728	\$8	117	\$40	118	\$75	\$34,646	15,077

economics make sense). The second is that respondents who answered only for themselves and who visited RST five times or more bought individual season passes. The third is that respondents who answered for more than one person and recorded five or more visits per person bought family season passes. The fourth is that among visitors encountered at West Yellowstone all visits made for the purpose of cross-country skiing on groomed trails were made at RST.<sup>13</sup> Finally, we assume that no non-local visitors bought family season passes.<sup>14</sup> Table 2.10 lists the number of responses by visitor type within our sample and the associated number of people and visits by type.

Table 2.10.: **Distribution of visits to Rendezvous Ski Trails by type within the sample, including visits by people encountered at trailheads other than Rendezvous Ski Trails.**

	Non-Local Day	Local Day	Individual Season	Family Season	Total
Responses	42	43	8	9	102
People	123	91	8	23	145
Visits	119	155	358	316	948
Percent	12.6%	16.4%	37.8%	33.3%	100%

<sup>13</sup>That’s because non-local visitors were not asked to specify which trailheads they visited.

<sup>14</sup>We deem this a safe assumption since the maximum number of days that nonresidents spent cross-country skiing is 3.5, below the 4 day threshold at which it would have made economic sense to buy a season pass.

Forty-two nonresident responses accounted for 123 people and 119 visits ( $\sim 0.97$  visits/person).<sup>15</sup> Forty-three resident responses accounted for 91 individuals and 155 visits ( $\sim 1.70$  visits/person). We assume that one day pass was purchased for each visit so that within our sample non-local and local respondents together bought a total of  $119 + 155 = 274$  day passes. Thus non-locals within our sample accounted for 43.4% of day-pass sales, and locals accounted for 56.6% of day-pass sales. If our sample approximates the population of people who recreated at RST as a whole, then roughly 43% of the 2,728 day passes sold, or 1,185, went to non-local visitors. At 0.97 visits per person, this amounts to 1,225 non-local visitors. Using similar calculations, local visitors accounted for roughly 57%, or 1,543, day passes sold. At 1.70 passes per person this equates to 906 local visitors (Table 2.11).

Using skier visits as recorded from trail counter data, we note that within our sample non-local and local visitors combined recorded 948 total visits to RST.<sup>16</sup> Thus nonresident day pass purchasers within our sample accounted for  $\frac{119}{948} = 12.6\%$ , or 1,893 of the 15,077 recorded skier visits, and residents accounted for  $\frac{155}{948} = 16.4\%$ , or 2,465 visits. At 0.97 and 1.70 visits per person respectively, this amounts to 1,956 non-local visitors and 1,447 local visitors.

Table 2.11.: **West Yellowstone/Rendezvous Ski Trails population by visitor type pass sales versus trail counter.**

		Non-local Day	Local Day	Individual Season	Family Season	Total
<b>By Pass Sales</b>	People	1,225	906	117	301	2,667
	Visits	1,185	1,543	5,236	4,143	12,107
<b>By Trail Counter</b>	People	1,956	1,447	127	366	4,039
	Visits	1,893	2,465	5,693	5,026	15,077

There were 117 individual season pass holders who on average visited RST 44.8 times a season according to our survey results. Multiplied by 117 people, this amounts to 5,236

<sup>15</sup>If this figure is accurate, then not every individual in every party cross-country skied at RST at least once. This makes sense given that some of the respondents indicated something other than cross-country skiing as a primary purpose of their visit. Indeed within the 42 responses, non-local visitors tallied 12 days cross-country skiing not on groomed trails and 3 days snowshoeing.

<sup>16</sup>Note this includes those listed above whom we identified as day-pass purchasers as well as those listed below whom we identified as season pass purchasers.

visits, or 37.8% of all visits. The same percentage of 15,077 trail counter visits amounts to 5,693 visits which, divided by 44.8 amounts to 127 individuals who purchased season passes. The disparity in numbers reflects the inaccuracy within our survey data (visits per season pass holder) and/or within the trail count data (over-counting skier visits).

Table 2.12.: **Final population estimates for resident and nonresident visitors to Rendezvous Ski Trails between December 1st, 2012 and March 31st, 2013.**

		Day	Individual Season	Family Season	Total
<b>By Pass Sales</b>	Non-local	1,225	0	0	1,225
	Local	906	117	301	1,141
<b>By Trail Counter</b>	Non-local	1,956	0	0	1,956
	Local	1,447	127	143	1,718

As noted, GNF Staff (2013) recorded 118 family season pass sales. Within our sample there were nine responses representing 23 individuals (2.6 per response) that would qualify as family season pass holders.<sup>17</sup> Altogether they tallied 316 visits (33.3% of visits), or 13.7 visits per person. Multiplying 118 family passes by 2.6 people per pass amounts to 301 people based on pass sales. Based on 15,077 visits as recorded by the counter, family season pass holders accounted for 5,026 (33.3%) of all skier visits. This amounts to 366 people after dividing by 13.7, or the equivalent of 143 family season passes. Sampling error and over-counting by the trail counter likely account for the discrepancy between this number and the 118 recorded sales.

Table 2.12 shows the final population estimates for RST between December 1st and March 31st. As noted in the introduction to this section, when calculating the economic impact of RST and the region, we use the lower estimates based on pass sales (FLREA data).

## 2.4. Survey Design

We collected data via three different surveys: a backcountry visitor survey designed to estimate overall expenditures by the population of backcountry users, a retailer survey to estimate the overall amount of top-line sales related to backcountry use, and a survey for

<sup>17</sup>To qualify as such they had to have recorded more than five visits per person per response.

organizations operating as authorized concessionaires of the National Forest or National Park used to estimate the average and total amounts of revenue generated via guided backcountry travel, avalanche education and wilderness travel and leadership training. Survey forms are shown in Appendix E.

We designed the backcountry visitor survey to gather expenditure data, basic demographic data, and data about the frequency and geographic distribution of their backcountry visitation. The survey took leakage (i.e., spending on gear purchased outside the region such as items ordered through the internet from on-line retailers) into account by clearly defining the region and explicitly asking respondents to distinguish between expenditures made outside the region and those made inside the region, and to record the amounts in separate columns.

The retailer survey was designed to gather data on the top-line sales of gear, clothing and services (i.e., gear rental and ski tuning/repairs) directly associated with the types of backcountry recreation focused on in this study. It was designed under consultation from a local shop owner to allow flexibility and a level of generality that was appropriate for stores who deemed their data to be of a highly proprietary nature. The survey of guide services and avalanche course providers also adhered to these guidelines. Strict confidentiality was preserved during the course of the surveys.

## **2.5. Sample Design**

We used a stratified design, first designating trailheads as high, medium or low use, then designating weekends and holidays as high use days, and weekdays as low-use days. We weighted days and sites according to estimated use levels by first estimating the percentage of overall backcountry use at the seven different trailheads identified for recruitment of respondents. Then we estimated the percentage of use that occurred on weekends versus weekdays. Survey effort was allocated by multiplying those two percentages. Based on this procedure, we determined that survey participants should be recruited in four hour blocks on 30 weekend and holidays and on 50 weekdays. Two people, lead investigator Mark Newcomb, and associate Karl Meyer, undertook the effort of recruiting survey participants by randomly selecting backcountry visitors and asking if they were willing to take a survey online. Printed rack cards describing the study and Winter Wildlands Alliance were handed

out to those who requested written information. Car counts were taken on several survey days during both the trial and implementation phase of the study, though not on a strictly regimented basis.

Following a three week trial phase in December, we implemented the survey over the course of January, February and March and ended up with 517 useable responses. We also announced the study at three large public events focusing on winter backcountry recreation. The first was the Skinny Skis Avalanche Awareness night held at the beginning of December in Jackson, Wyoming. The second two were backcountry ski oriented film festivals held in January (Jackson, Wyoming) and February (Victor, Idaho). Several interested parties became aware of the survey through these announcements and through word of mouth and contacted the lead investigator expressing a desire to take the survey. We randomly selected a third of the completed surveys from this group.

Since the intent of this study is to measure the direct economic contribution of winter backcountry recreation within the region, it was important to parse those expenditures made within the region from those made outside the region.<sup>18</sup> Hence the survey clearly defined the region and explicitly asked respondents to record expenditures outside the region, whether via on-line transactions or visits outside the region, as well as those expenditures made inside the region.

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<sup>18</sup>Kaliszewski (2012) cited difficulties in separating the two

# 3 Survey Results: General Questions

The average survey respondent was about 40 years old, had a total household income of between \$50,000 and \$100,000 and tended to be male (62% versus 38% female). They visited the backcountry about three to five times a week primarily to AT or cross-country ski. The following sections provide a more detailed description of our sample population.

## 3.1. Survey Results: Response Rate

Karl Meyer and Mark Newcomb together made contact with 1,234 winter backcountry users. Of that group, 679 viewed the survey on line, 575 started the survey, and 509 completed the survey. We received 65 complete responses from backcountry users who heard about the survey through word of mouth. We selected a random sample equal to a third of these 65 surveys to arrive at a total of 530 complete surveys compiled for analysis. Out of that number, we eliminated 13 that contained erroneous data across a significant number of questions.

The 509 usable surveys gathered from field respondents amounts to a response rate of about 41%, which is high compared to other surveys similar in nature. Pollock (2007) reported a response rate of 34% using surveys administered from registration kiosks. An on-line survey used to estimate a travel cost model for ice climbing in Hyalite Canyon, Montana had a 40% response rate Anderson (2010). And a survey on the use and economic impact of snowmobiles for recreation in Wyoming conducted both on-line and by mail had a response rate of about 36% Nagler et al. (2012).

### 3.2. Survey Result: Response by Trailhead

The first question in the survey asked respondents how they were made aware of the survey. Of the completed responses, the vast majority (95%) heard about the survey at a trailhead and later volunteered to take the survey online. Thirteen respondents heard of the survey at a public event via an announcement and chose to later take the survey on-line. Nine others heard of the survey through fliers left at retail shops. And six heard of the survey via an announcement at an avalanche course. The geographic pattern of responses is shown in Table 3.1.

Table 3.1.: **Response by location.**

Location	Frequency	Percent
Teton Pass	147	28.5
Bradley Taggart	105	20.2
Teton Canyon	77	14.8
West Yellowstone	62	11.9
Mail Cabin	48	9.2
Cache Creek	43	8.3
Public Event	13	2.5
Phillips Bench	8	1.5
Email	9	1.7
Avalanche Course	6	1.2
Total	519	100.0

### 3.3. Survey Results: Response by Geographic Region

The survey asked respondents to list the zip code of their home address. Respondents came from 32 states and two Canadian Provinces. As seen in Figure 3.1, the vast majority of responses (390) came from the three states encompassing the study region, Wyoming, Idaho and Montana. The next three most common states were Utah, Colorado and Oregon.

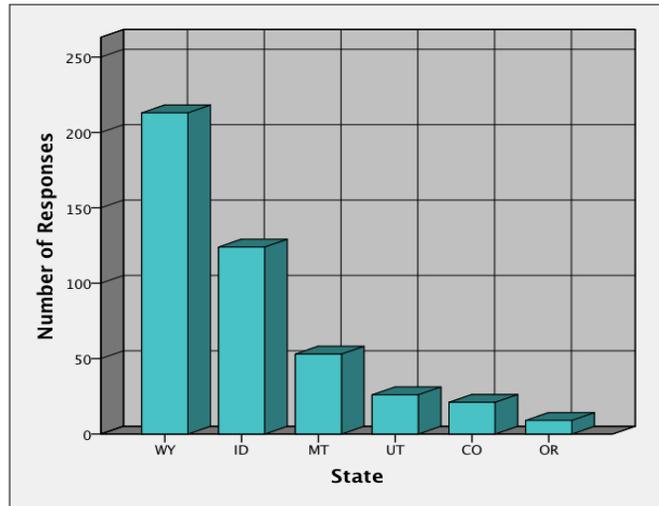


Figure 3.1.: Response frequency by the six most common states.

### 3.4. Survey Results: Backcountry Use and Visitation

Local visitors reported 21,841 winter visits to the region’s backcountry, or almost 63 days per person (median = 54). Some respondents reported backcountry skiing and/or snowboarding as many as 210 days, a number that might reflect ski trips to higher elevation terrain well into the spring or early summer. Given that there are 126 days between Thanksgiving and the end of March, only about 36 of which are weekends, the typical winter enthusiast appears to be more than just a ‘weekend warrior.’ Comments such as, ‘I cross-country ski almost every day of the week because no matter where I am a groomed track is not far away,’ lends credibility to data indicating that many respondents rely on groomed ski trails and easy access to backcountry for almost daily exercise and recreation.<sup>1</sup>

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<sup>1</sup>By comparison, BTNF NVUM Results (2009) found that 14% of NVUM survey respondents visited the Bridger-Teton National Forest between 51 and 100 times over the course of a year. Just over 14% visited at least 100 times. Just under 44% visited one to five times.

### 3.4.1. Backcountry Use by Activity

Figure 3.2 shows the breakdown of days spent recreating by activity. AT, which includes backcountry skiing, backcountry snowboarding, and hiking up a boot-pack—typically up the side of Mount Glory from Teton Pass—dominated user days with 9,329 days spread over 281 respondents. Table 3.2 summarizes the use by category.

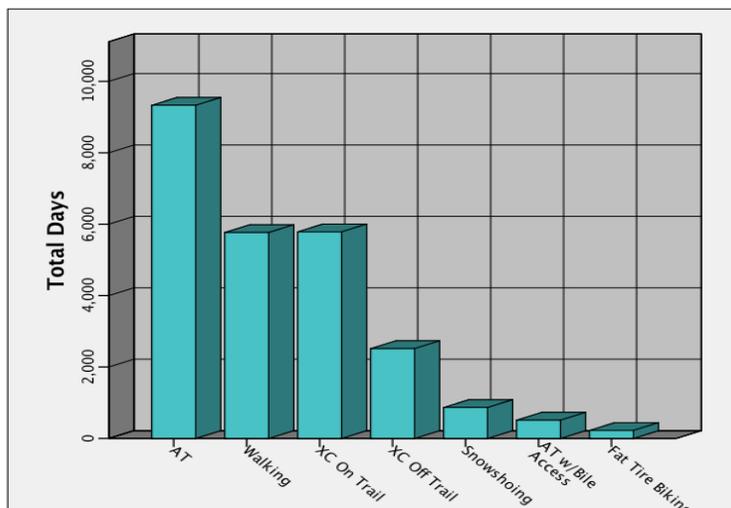


Figure 3.2.: Days spent recreating by activity.

### 3.4.2. Backcountry Visitation by Trailhead

The survey next asked local visitors ‘Which of the following parking areas have you visited in the last 12 months expressly for undertaking one of the winter recreation activities listed above (don’t count summer visits)? Choose all that apply.’ The choices listed seven popular trailheads (described above in section 2.1) used for winter backcountry access and a choice for ‘Other’ that instructed respondents using this choice to list the ‘Single most-visited Teton Region parking area/trailhead not listed above (e.g., Togwotee Pass).’ Fifty-six respondents indicated that they had used one of the seven listed trailheads and/or other trailheads in the region but did not record frequency of visits.

Figure 3.3 shows the number of respondents who used each particular trailhead within the

Table 3.2.: Days spent backcountry recreating over the past 12 months by activity out of 328 responses.

Activity	No. Participants	Days	Mean	Median
AT	282	9,329	33	25
XC on Trail	268	5,785	22	15
Walking	221	5,766	26	10
XC off Trail	206	2,515	12	6
Snowshoe	112	865	8	4
AT via Snowmobile	65	511	8	5
Bike	41	223	6	2

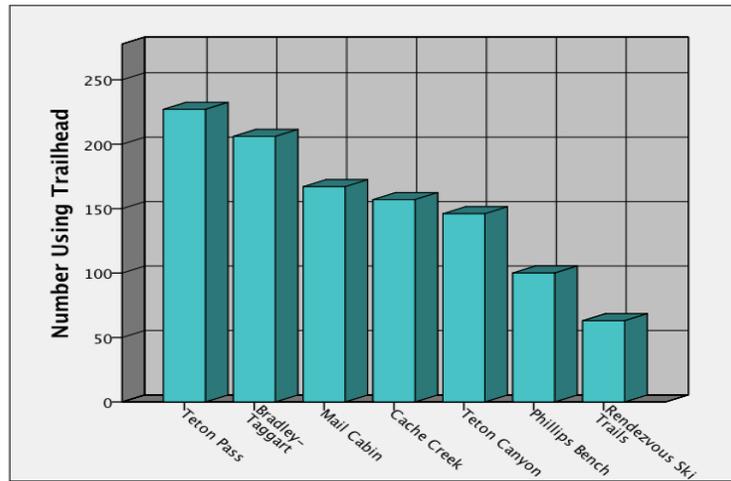


Figure 3.3.: Number of residents (out of 357) who visited each respective trailhead in the past 12 months for backcountry winter recreation.

past 12 months. By this measure, Teton Pass (211) is the most popular trailhead, and Bradley-Taggart (195) is the second most popular.

One hundred, thirty-nine respondents indicated they visited ‘Other’ trailheads than the seven listed in the survey. The most common trailhead listed in the ‘Other’ category was Death Canyon (13) followed by Togwotee Pass (11). State Line parking area, Game Creek and Darby Canyon were each listed 7 times. Granite Canyon was listed by 6 respondents as their most used ‘Other’ trailhead for winter backcountry recreation, although it’s unclear whether these responses referred to the parking area for Granite Canyon at the south end of the un-plowed portion of the Moose-Wilson Road or to visiting Granite Canyon through Jackson Hole Mountain Resort backcountry access gates. Coal Creek was also listed by seven respondents as their most popular trailhead not listed. However the parking to access Coal Creek is the same parking used to access Mail Cabin Creek, indicating some misunderstanding of the question. The Mail Cabin Creek drainage and associated backcountry AT terrain lies south of Highway 22 on the west side of Teton Pass while the Coal Creek drainage lies to the North. Focusing on overall parking lot use rather than specific geographic backcountry areas, we combined ‘Other’ visits recorded as Coal Creek in with the visits to Mail Cabin in the final count of total trailhead visits.

Respondents reported a total of 13,616 total visits to the trailheads listed in the survey and an additional 1,850 visits to trailheads or areas not listed in the survey. The breakdown of total visits by trailhead (Figure 3.4), indicates that Cache Creek and, to some extent, Teton Canyon are more important destinations than Bradley-Taggart for daily or semi-weekly exercise and/or recreation (i.e., they are used more often by fewer respondents). Indeed, the median number of visits per trailhead was highest for Teton Pass at 15. Median visits per respondent to Cache Creek and ‘Other’ was 10. The median for Teton Canyon was eight; five for Bradley-Taggart and Phillips Bench; and 4 for Rendezvous Ski Trails.

The median value for Rendezvous Ski Trails is biased downward due to the effects of geography as described in section 2.2 above. Residents who live in West Yellowstone registered a median of 50 visits per person. Residents who lived outside of West Yellowstone but in other subregions had a median value of 4 visits.<sup>2</sup>

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<sup>2</sup>Three of the 46 who’s home address is not specifically in West Yellowstone indicated they visited Rendezvous Ski Trails 70, 31, and 30 times respectively. These three indicated that they are seasonal residents, by all appearances in or near West Yellowstone. Eight other residents indicated they had visited Rendezvous Ski Trails in the past 12 months but did not record the number of visits.

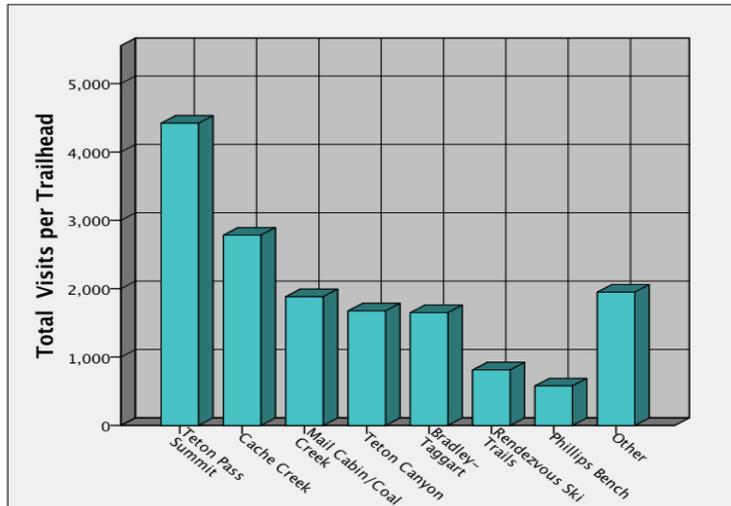


Figure 3.4.: Total visits made to each trailhead by the 357 local and seasonal respondents.

### 3.5. Survey Results: Geographic Distribution of Non-local Visitors

Non-local (nonresident) visitors are those respondents whose home address is outside of the study region but who pursued backcountry recreation in the region over the course of the 2012/2013 winter season. One-hundred sixty respondents indicated they were from outside the study region. Two from Idaho Falls responded as non-locals when they should have responded as locals, and four respondents from Bozeman responded as locals when they should have responded as non-locals.<sup>3</sup> Fifteen respondents visited from Bozeman, Montana; nine from the Denver-Boulder, Colorado area; and seven from the Salt Lake City area. Four respondents visited from each of the following areas: Helena and Missoula, Montana; Pocatello, Idaho; and Lander, Wyoming.

<sup>3</sup>This is an example of the drawback referenced in Chapter 2.2.

### 3.6. Survey Results: Stay Length and Lodging Type of Non-local Visitors

Twenty-seven of the 160 visitors that responded to the survey did not record the length of their stay. The 133 that did spent a cumulative 659 days in the region for the purpose of winter backcountry recreation for an average of four days per response (median stay was three days). The most common length of stay was two days. The longest stay was for 21 days. Visitors most commonly listed ‘Friends’ ( $n = 68$ ) as their means of lodging, followed closely by ‘Hotel’ ( $n = 67$ )—see Figure 3.5. All told, those staying with friends

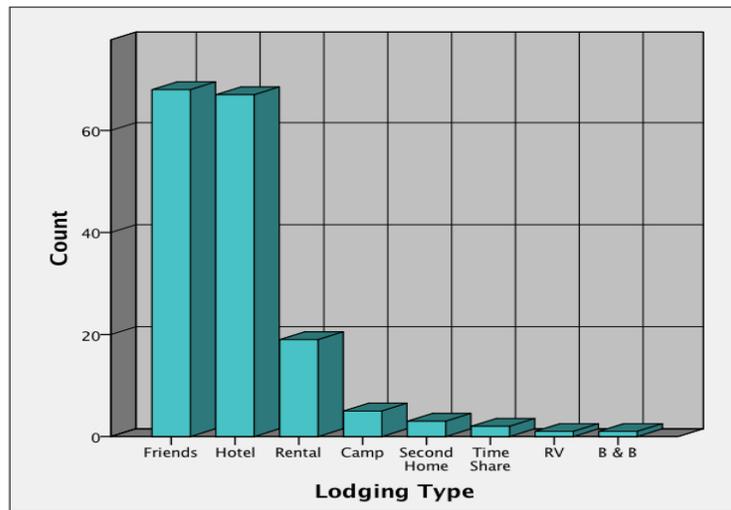


Figure 3.5.: Nonresidents: frequency of lodging by type,  $n = 158$ .

spent 346 nights in the region while those staying in hotels spent 221 nights in the region. Unofficially there were ‘More out-of-state license plates on Teton Pass than ever before,’ (Pistono (2013)) perhaps reflecting sub-normal snow levels and conditions in surrounding states—especially Colorado and Utah—that motivated backcountry skiers to visit friends and backcountry recreate in the region. Seven chose ‘Other’ for lodging: three who came and went the same day, two who stayed at a dude ranch, one that slept in their car and one that stayed with family in a condo rented by the family. Two listed the number of days spent in the region backcountry recreating but did not indicate the type of lodging in which they stayed. Forty-six of those who responded that a primary purpose of their

visit was to backcountry ski stayed with friends, and 22 stayed in hotels. Of those who indicated that cross-country skiing on trails was a primary purpose of their visit, 23 stayed with friends and 43 stayed in hotels.

### 3.7. Survey Results: Purpose for Visiting Region

The survey asked visitors to indicate the purpose of their visit and were allowed to pick more than one choice. Visitors primarily came to the region to either AT or cross-country ski. The next most commonly listed reason to visit was to ski and/or snowboard at one of the region’s alpine resorts. Figure 3.6 shows the breakdown of visits by purpose out of

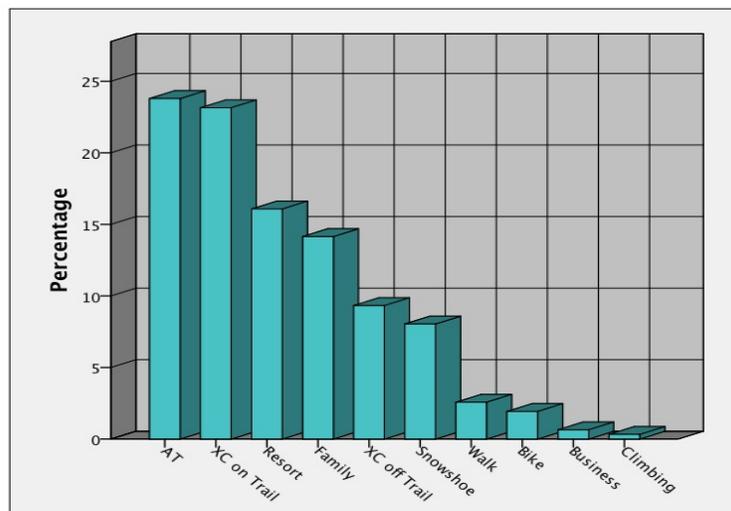


Figure 3.6.: Nonresidents: percentage of nonresidents listing each activity as the primary purpose of their visit  $n = 160$ .

160 total responses.

Non-local visitors were also asked to record the number of days they participated in each of the seven winter backcountry activities. All told visitors from outside the region spent 312 days alpine touring, 203 days cross-country skiing on groomed trails, 63 days cross-country skiing off of groomed trails and 35 days snowshoeing.

## 4 Survey Results: Expenditure Data

The original survey discerned between residents, which included seasonal residents, and nonresidents. In all 312 respondents indicated they were residents (43 indicated they were seasonal residents, meaning they lived in the region for the entire 2012/2013 winter season) for a total of 357 respondents who resided in the Teton Region for the entire season. One-hundred sixty respondents were nonresidents. As a reminder, we sometimes refer to residents as local visitors (i.e., visitors to the backcountry) and nonresidents as non-local visitors.

To make it easier for families with common expenditures such as lodging or snowmobiles to calculate expenditures, the survey could be completed for an individual or for a family.<sup>1</sup> The survey later asked respondents to record the number of people for which the expenditure figures apply (i.e., how many people were in the party/family for which the response was submitted). The 357 local responses in aggregate recorded expenditure data for 607 individuals for an average of 1.7 people per response.<sup>2</sup> Most reported for themselves ( $n = 196$ ). For nonresidents, 160 completed responses were received representing 399 individuals. Over 77% of nonresidents chose to answer for more than one person, most were filled out for two people ( $n = 72$ ), and the average number of people per response was 2.4. In the following analysis, we discern between expenditures per person and expenditures per response as necessary.

We trimmed 13 responses identified as contaminants by the extreme nature of the answers

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<sup>1</sup>The USDA National Visitor Use Monitoring program also tracks visitor spending by individual or by party White and Stynes (2010).

<sup>2</sup>Note that because of the way the survey was structured, backcountry use data reflects that of the 357 specific individuals that actually *took* the survey, while expenditure data reflects that of the 607 individuals for which respondents reported data.

given. In determining outliers (i.e. single data points that overly influence the mean), we considered the fact that an individual might have high expenditures one year—if they happened to have purchased several big-ticket items—and low expenditures most other years.<sup>3</sup> Since purchases of big ticket items have the potential to boost an individual’s annual expenditures well above the mean, we chose a conservative method to identify potential outliers by calculating a reference statistic using *per person* expenditures as described in University of Oregon (2013). The steps to calculate the statistic are:

1. find the median per-person expenditure
2. find the absolute deviation between per-person spending and the median per-person expenditure;
3. find the median of the absolute deviation;
4. compute the ratio of the absolute deviation from step 2 and the median from step 3.
5. compare this ratio to a critical value.

We trimmed those cases (three total) with a resulting statistic greater than ten.<sup>4</sup>

## 4.1. Expenditure Results: Residents

The survey asked residents to record expenditures related to their winter backcountry recreation across 20 different categories: twelve for hard goods such as equipment and clothing; four for entrance fees to parks and trailheads, guide fees, and avalanche course fees and tuition; and four that only applied to owners of snowmobiles who used them for accessing the backcountry expressly for the purpose of backcountry recreation.

One resident indicated that they hadn’t spent any money, and one indicated they only spent \$10 over the past 12 months. The three cases excluded as outliers were implausibly high in almost all categories—one amounted to \$24,531, another to \$14,600 and a third to

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<sup>3</sup>Here are a few examples of ‘big ticket’ items: a two-day backcountry ski clinic can cost \$695 JHMG, a new fat tire bike costs anywhere from \$1,000 to over \$5,000, and new skis cost between \$500 and \$1,000, not including bindings and skins.

<sup>4</sup>NVUM Economic Survey methodology trims responses reporting expenditures of \$500 or more per night (considered outliers), or expenditures of \$500 or more for sporting goods (intended to omit purchases of ‘durable goods,’) or that represent 8 or more people White and Stynes (2010).

\$11,739 (see Figure 4.1 for the distribution after accounting for outliers). See Appendix A

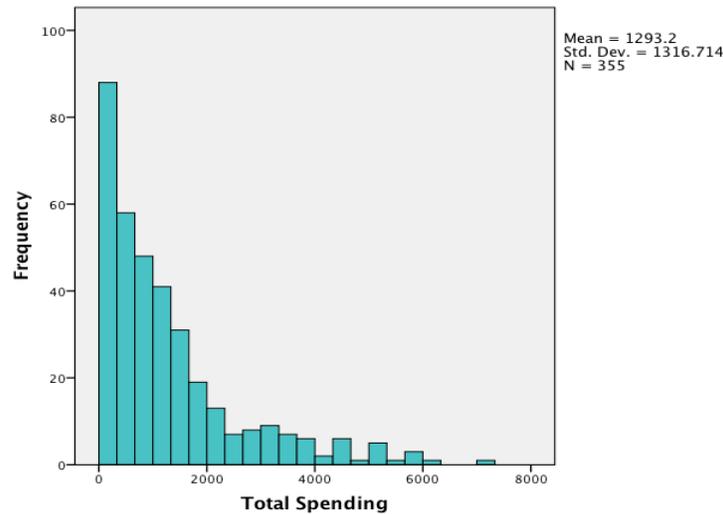


Figure 4.1.: Distribution of total expenditures among local respondents.

for complete data within each category.

Expenditures by residents for all goods and services related to winter backcountry recreation both inside and outside the region totaled \$642,349—\$487,633 in the region and \$154,717 outside the region (Table 4.1). Within the survey sample, full-time residents on average spent more than seasonal residents (\$1,370 vs. \$1,047 per response). And residents on average spent more on hard goods in the region than outside the region (\$679.06 vs. \$254.89 per response).

Table 4.1.: **In-region, out-of-region and total annual expenditures by residents.**

	Per Response	Median	Std. Error of Mean	Per Person
In Region	\$1,373.61	\$850.00	\$80.40	\$803.35
Out of Region	\$435.82	\$100.00	\$37.85	\$254.89
Total	\$1,809.43	\$1,300.00	\$92.15	\$1,058.24

Tables A.2, A.3 and A.4 in Appendix A list sample expenditure data for gear and equipment. Residents spent the most on skis (\$277 per person for in-region expenditures), well above the next highest category of clothing (\$167 per person). Survey respondents most fre-

quently ( $n = 243$ ) reported expenditures in the miscellaneous category—sunglasses, climbing skins and common items such as sun-screen—followed closely by clothing ( $n = 237$ )

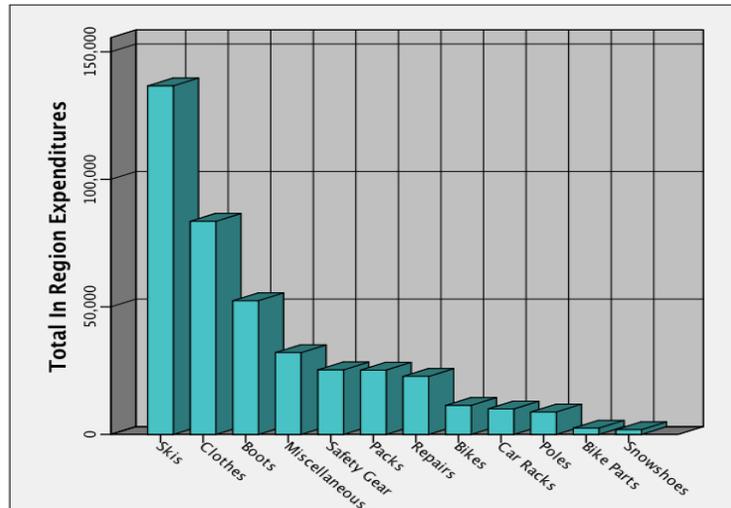


Figure 4.2.: Hard-good in-region expenditures by category.

and skis ( $n = 203$ ).

Resident respondents spent \$106.30 per person on fees and services (Appendix Table A.5). Expenditures were highest (\$30.34 per person) for guide and avalanche course fees, followed by entrance fees (\$27.92 per person)—Figure 4.3.

Twenty-seven respondents indicated they owned a snowmobile and used it to access backcountry recreation. For each respondent, we weighted snowmobile expenditures according to the percentage of days a respondent used snowmobile access (i.e., if 50% of a respondents use of a snowmobile was for access to backcountry AT skiing, then that respondents total snowmobile-related expenditures were multiplied by 50%). Thus calculated, spending on snowmobile access among survey respondents averaged \$18 per person (Figure 4.4).

## 4.2. Expenditure Results: Nonresidents

The survey asked nonresidents to record their expenditures on the same set of 20 categories of goods and services related to their winter backcountry recreation in the region that were

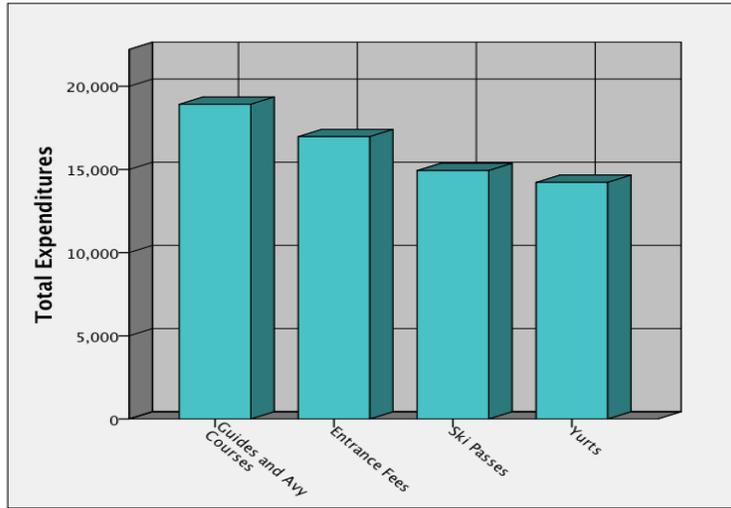


Figure 4.3.: Expenditures for guide services, avalanche courses, yurt stays and miscellaneous fees, by category.

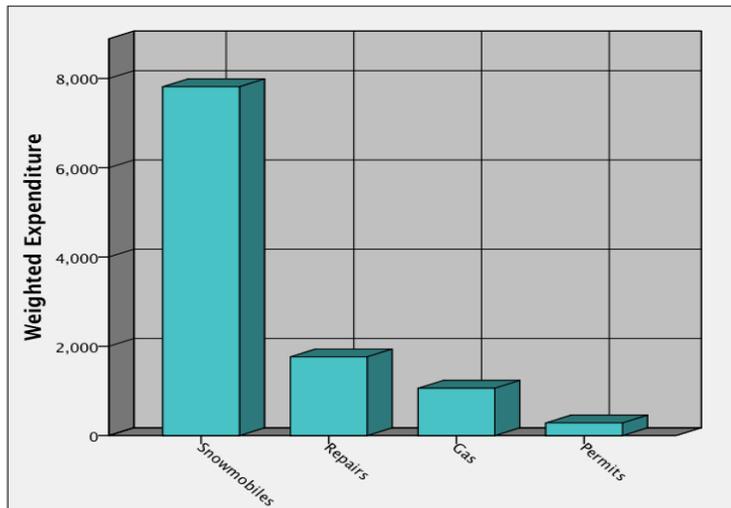


Figure 4.4.: Expenditures for goods, services and fees related to snowmobile access, by category.

posed to residents, as well as their expenditures on food and lodging while in the region. Of the 160 visitors, 158 recorded in-region expenditures on goods and/or services related to their winter backcountry recreation. The two who did not both spent five days in the region. One responded that the primary purpose of their visit was for ‘fishing’ and visiting family, that they stayed with friends and that they spent four days cross-country skiing. The other visited to ski at a resort and to backcountry ski, spent three days backcountry skiing and indicated that they ‘camped.’ Most likely they did spend some amount on at least food while in the region but did not record the amount.

We weighted food, lodging and transportation expenditures according to the percentage of the visit spent recreating in the backcountry (e.g., if expenditures include lodging at a resort for five nights when only one out of the five days was spent backcountry recreating, then it’s reasonable to apply one night’s worth of expenditures towards backcountry recreation). Thirty-nine percent (63) of the visitors in the survey indicated that they backcountry recreated every day of their visit, 43% (69) recreated less than every day of their visit, and 18% (28) visitors did not record the overall length of their stay but did record the number of days during which they undertook some form of backcountry recreation (total of 99 days). To the extent that some respondents who visited the region specifically to backcountry recreate may have recreated less than 100% of their visit, this method understates the amount of those expenditures that could justifiably be attributable to backcountry recreation—the argument being that since backcountry recreation is why they were here, 100% of their lodging, etc. should be included even if they only backcountry recreated 50% of the time.

As with expenditure data for residents, we applied judgement in the identification of outliers. We identified seven as determined by the process described in section 4, leaving 153 valid responses representing spending for 391 individuals. Average expenditure among nonresidents was \$698 per response, or \$273 per person, amounting to \$106,864. Among the valid responses there were no expenditures made for snowmobile access. Total spending in each category is shown in Table 4.2. Appendix A contains a detailed breakdown of visitor spending by category.

In the hard good category (Appendix Table A.7), nonresidents spent the most on skis (\$359 per person), over double that for clothing at \$150 per person.

In the fees and services category (Appendix Table A.8), nonresidents spent the most on

Table 4.2.: **Nonresident expenditures (n = 153).**

Category	Per Response	Median	Std. Error of Mean	Per Person
Hard Goods	\$205.34	\$60	\$38.98	\$80.35
Fees & Services	\$25.58	\$0	\$4.63	\$9.70
Food, Lodging, Transport.	\$468.32	\$238	\$53.21	\$183.26
Total	\$698.46	\$422	\$73.13	\$273.31

nordic ski passes and next most on guide fees and avalanche courses. Of those reporting expenditures on nordic passes ( $n = 42$ ), the mean was \$41, and of those reporting expenditures on guides and/or avalanche courses, the mean was \$199.

In the food and lodging category (Appendix Table A.9), nonresidents spent the most on lodging and next most on dining. Of those who reported lodging expenditures ( $n = 78$ ), the mean was \$318, and of those who reported dining expenditures ( $n = 137$ ), the mean was \$135.

# 5 Economic Contribution of Winter Backcountry Recreation

This chapter summarizes our results and describes how we arrived at them. Winter backcountry recreation in the Yellowstone-Teton region generates jobs and income for the region's population. Nonresident expenditures make a direct economic impact that are accretive to the overall economic output of the region. Resident expenditures on recreation support the local economy. If it weren't for the quality of the backcountry resource in the region, locals might travel outside the region for at least some of their backcountry recreation, thus transferring their expenditures to other rocky mountain areas where backcountry is available for recreational use.<sup>1</sup> And some residents moved here specifically because of the quality of the backcountry as a recreational amenity. This analysis includes the direct economic impact of nonresident backcountry visitors, the direct economic contribution of resident backcountry visitors, the employment and wages supported by the types of winter recreation analyzed in this report, and the state and local tax revenues generated by this economic activity.

Based on our population estimates from Section 2.3 and per person spending as estimated by our survey data, we estimate the regional annual direct economic contribution of winter backcountry recreation, excluding motorized over-snow travel and dogsledding, to be \$22,564,461. We estimate the annual direct economic impact by nonresidents who participate in these activities while visiting the region to be \$12,073,815 and the economic contribution of residents to be \$6,473,919.<sup>2</sup> We estimate that this economic activity annually generates \$2,974,004 in wages paid to employees who work directly in jobs stemming

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<sup>1</sup>We mention this as a possibility, but in this analysis we do not attempt to estimate the extent to which this might occur (i.e., we do not attempt to estimate the net economic impact of winter backcountry recreation).

<sup>2</sup>These totals account for the possibility of double counting expenditures by those who visited the backcountry in more than one subregion. See Sections 5.1 and 2.3 for further details.

from these forms of backcountry recreation. And we estimate that this activity annually contributes \$1,042,723 in tax revenues to state and local government. The calculations are described below in Section 5.1.

## 5.1. Economic Contribution by Region

This section summarizes the economic contribution of each sub-region based on the population estimates from Section 2.3. We infer the probability that a backcountry visitor visited one, some combination of any two, or all three subregions based on our sample data. We use inclusion/exclusion to calculate the final percentage excluding those who were double counted, then apply the result to the population as a whole.

There are two ways to estimate the overall economic contribution of each region. One is to use the estimate of the total population from Section 2.3, then apply an estimate of per person spending using our entire sample (broken down into local versus non-local). The other is to estimate the economic contribution on a subregional basis, applying average spending estimates based on that subregion, then aggregate the three estimates and account for double counting. Because per person spending levels differ across subregions (as would be expected), and because it's enlightening to see how different subregions contribute to the total, we favor the latter method for our final estimate. Tables 5.1 and 5.2 show the results using the former method. Sections 5.1.1 through 5.1.3 detail the results using the latter method, the results of which were listed in the preceding paragraph.

Table 5.1.: **Expenditures attributable to local winter backcountry visitors for the entire region excluding lodging expenditures in West Yellowstone.**

	Gear	Fees	Snowmobile Access	Total
Per Person	\$679.06	\$106.83	\$17.99	\$803.88
Std. Error of Mean	\$69.55	\$18.15	\$20.51	\$80.41
Median	\$690.00	\$80.00	\$0.00	\$850.00
Sample Total	\$412,190	\$64,847	\$10,919	\$487,956
Population Total	\$5,038,094	\$792,608	\$133,460	\$5,964,163

Based on the first method, we estimate the gross contribution of winter backcountry recre-

ation to the region to be \$17,412,375 (Tables 5.1 and 5.2). Referring back to Table 4.1, average in-region spending by locals equaled \$803.35. Multiplied by 7,419, this amounts to \$5,960,215 in spending. Add to this another \$58,948 that locals spent on lodging while visiting West Yellowstone to ski at Rendezvous Ski Trails, and the total economic contribution of locals amounted to \$6,019,163. Referring back to Table 4.2, average spending by nonresidents was \$273.13 over the course of their visit. Multiplied by 41,336, this amounts to \$11,297,397 in spending (i.e., direct economic impacts) to the region as the result of winter backcountry recreation. In addition, non-locals spent \$83,235 on lodging during the West Yellowstone Ski Festival, for a total of \$11,393,212.

Table 5.2.: **Expenditures attributable to non-local winter backcountry visitors for the entire region excluding spending related to the West Yellowstone Ski Festival.**

	Gear	Fees	Food & Lodging	Total
Per Person	\$80.35	\$10.01	\$183.26	\$273.61
Std. Error of Mean	\$38.98	\$4.61	\$53.21	\$73.17
Median	\$60.00	\$0.00	\$238.41	\$422.22
Sample Total	\$31,417	\$3,913	\$71,653	\$106,983
Population Total	\$3,321,327	\$413,673	\$7,574,977	\$11,309,977

### 5.1.1. Economic Contribution: Grand Teton National Park

As calculated based on trail counts and commercial visits reported by concessionaires, Grand Teton National Park attracted approximately 1,883 local backcountry visitors and 3,722 non-local visitors. However the number of local visitors must be adjusted for double counting of those who visited more than one subregion. The adjusted total is 1,603. Based on these numbers and the sample spending per person for locals and non-locals who visited GTNP, the estimated contribution to the local economy was \$2,357,587. We attribute \$1,493,104 of that to locals (Table 5.3) and \$864,483 of it to non-locals (Table 5.4).

Table 5.3.: **Expenditures by local visitors attributable to Grand Teton National Park.**

	Gear	Fees	Snowmobile Access	Total
Per Person	\$805.43	\$122.74	\$3.26	\$931.42
Std. Error of Mean	\$94.62	\$29.51	\$2.86	\$107.90
Median	\$813.00	\$80.00	\$0.00	\$948.00
Sample Total	\$248,071	\$37,805	\$1,003	\$286,878
Population Total	\$1,291,127	\$196,762	\$5,220	\$1,493,104

Table 5.4.: **Expenditures by non-local visitors attributable to Grand Teton National Park.**

	Gear	Fees	Food & Lodging	Total
Per Person	\$55.21	\$3.50	\$173.53	\$232.23
Std. Error of Mean	\$43.80	\$4.91	\$86.31	\$104.69
Median	\$35.00	\$0.00	\$373.00	\$455.00
Sample Total	\$7,343	\$465	\$23,079	\$30,887
GTNP Total	\$205,520	\$13,015	\$645,948	\$864,483

### 5.1.2. Economic Contribution: Bridger-Teton and Caribou-Targhee National Forests

Within the study region, National Forest Lands in the Bridger-Teton and Caribou Targhee attracted approximately 5,689 local backcountry visitors and approximately 36,388 non-local visitors. After accounting for the double counting of local visitors who visited more than one subregion, we estimate the number of local visitors for which expenditures should be calculated to be 4,845. Based on 4,845 locals and 36,388 non-locals, the contribution to the regional economy attributable to winter backcountry recreation on Forest Service lands in the study region was \$14,795,713. We attribute \$4,029,582 of that to locals (Table 5.5) and \$10,766,131 to non-locals (Table 5.6).

Table 5.5.: Expenditures by local visitors attributable to Bridger-Teton and Caribou-Targhee National Forests.

	Gear	Fees	Snowmobile Access	Total
Per Person	\$702.88	\$106.94	\$21.96	\$831.78
Std. Error of Mean	\$77.99	\$22.21	\$26.18	\$92.52
Median	\$750.00	\$66.00	\$0.00	\$880.00
Sample Total	\$326,841	\$49,725	\$10,210	\$386,776
Population Total	\$3,405,156	\$518,054	\$106,372	\$4,029,582

Table 5.6.: Expenditures by non-local visitors attributable to Bridger-Teton and Caribou-Targhee National Forests.

	Gear	Fees	Food & Lodging	Total
Per Person	\$103.02	\$8.19	\$184.66	\$295.87
Std. Error of Mean	\$39.23	\$7.29	\$67.21	\$83.33
Median	\$75.00	\$0.00	\$172.50	\$354.38
Sample Total	\$13,908	\$1,105	\$24,929	\$39,942
Population Total	\$3,748,820	\$297,846	\$6,719,465	\$10,766,131

### 5.1.3. Economic Contribution: Rendezvous Ski Trails

Details of our visitor estimates for Rendezvous Ski Trails (RST) are listed in Section 2.3.3. Based on the more conservative of these estimates (based on pass sales), we calculate the economic contribution of RST to be approximately \$1,394,434 over the course of the 2012/2013 season. If population estimates are based on trail counts rather than pass sales, the contribution could be as high as \$2,137,804. The direct economic impact attributable to non-local visitors and local visitors who over-night in West Yellowstone is approximately \$502,149.<sup>3</sup>

#### Rendezvous Ski Trails: Non-local Visitors

In-region spending among the 123 non-local visitors to RST in our sample averaged \$293.94 (Table 5.7). Multiplying by the estimate of 1,225 visitors based on pass sales results in a low estimate of \$359,967 in direct spending attributable to visitors between December 1st and March 31st. Multiplying by the estimate of 1,956 visitors based on trail count data would amount to a high estimate of \$574,990 in total spending by non-local visitors.

Table 5.7.: **Expenditures by non-locals in West Yellowstone,  $n = 41$ .**

	Gear	Fees	Food & Lodging	Total
Per Person	\$82.65	\$19.05	\$192.24	\$293.94
Std. Error of Mean	79.89	5.95	79.60	128.90
Median	55.00	40.00	226.79	464.50
Sample Total	\$10,166	\$2,343	\$23,644	\$36,153
Total (1,225 visitors)	\$101,233	\$23,332	\$235,466	\$359,967

#### Rendezvous Ski Trails: Local Day Pass Purchasers

In-region spending among the 91 local day pass holders in our sample averaged \$885.52 per person per year. When multiplied by 906 local visitors as measured by pass sales, this

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<sup>3</sup>If this figure were based on trail counts, it could be as high as \$731,632.

equals \$802,292. However this amount double counts a few local visitors who also visited backcountry sites on the Bridger-Teton National Forest, the Caribou-Targhee National Forest, and/or Grand Teton National Park and should not be double counted. Based on the inclusion/exclusion method as described in Section 2.3, the adjusted count should be 737. Based on this number, we estimate local day pass purchasers contribute about \$652,627 in annual spending to the region. However this subpopulation also frequently overnights in West Yellowstone (e.g., visitors from Jackson who visit for more than one day) and spend money on lodging that amounts to an additional economic impact. This spending is detailed in Section 5.1.3 below.

Table 5.8.: **Expenditures by local day pass purchasers in West Yellowstone,  $n = 34$ .**

	Gear	Fees	Snowmobile Access	Total
Per Person	\$727.23	\$154.96	\$3.32	\$885.52
Std. Error of Mean	173.05	42.98	3.57	191.74
Median	660.00	120.00	0.00	963.19
Sample Total	\$40,725	\$8,678	\$186	\$49,589
Total (906 visitors)	\$658,872	\$140,398	\$3,009	\$802,292
Adjusted Total (737):	\$535,970	\$114,209	\$2,448	\$652,627

### **Rendezvous Ski Trails: Individual Season Pass Purchasers**

RST recorded sales of 117 individual season passes GNF Staff (2013). Our sample contained expenditure data for only seven local visitors to RST who would have purchased individual season passes as determined by the fact that they visited RST more than five times. Annual spending by those seven amounted to \$7,820, or \$1,117 per person per year (Table 5.9). While a sample of seven is well less than thirty—the rule-of-thumb sample size that allows for an approximately normal distribution of sample means—the total per person expenditure of \$1,117 is only slightly higher than the expenditure per person across the entire sample of 357 local backcountry visitors (\$1,058—Table ??) and is thus a reasonable estimate. Multiplying \$1,117 by 117 single season pass holders results in an economic

contribution of \$130,705 to the local economy.<sup>4</sup> Given that most respondents within this subgroup lived in the West Yellowstone subregion, much of this spending occurred in the West Yellowstone subregion.

Table 5.9.: **Expenditures by local individual season pass holders in Rendezvous Ski Trails,  $n = 7$ .**

	Gear	Fees	Snowmobile Access	Total
Per Person	\$918	\$199	\$0	\$1,117
Std. Error of Mean	357.03	54.16	0	393.37
Median	\$480	\$180	\$0	\$660
Sample Total	\$6,425	\$1,395	\$0	\$7,820
Total (117 visitors)	\$107,390	\$23,317	\$0	\$130,705

#### **Rendezvous Ski Trails: Family Season Pass Purchasers**

RST recorded sales of 118 family season passes. Our sample contained expenditure data for nine responses representing families that purchased season passes as determined by the fact that they represented two or more individuals and visited RST five times or more per person. Expenditures among this group averaged \$923 per response (Table 5.10). Multiplying by 118 family season passes, the direct economic contribution to West Yellowstone among this subgroup was \$108,953. Based on visits per family pass as estimated using our survey data (35.1), family season pass holders would have visited RST  $118 * 35.1 = 4,143$  times, or 33.3% of the season's visits.<sup>5</sup>

#### **Rendezvous Ski Trails: Over-night Visits by Locals**

The above estimates for the contribution of local visitors, however, don't include lodging-specific expenditures in West Yellowstone by local visitors from the Jackson and Victor-

<sup>4</sup>Based on skier counts, we estimate there would be 127 single-person season pass holders whose economic contribution would amount to \$142,131.

<sup>5</sup>Based on 33.3% of 15,077 visits recorded on the trail counter, there would have been 5,026 visits by family season pass holders, or the equivalent of 143 family season passes, amounting to \$132,157 in spending.

Table 5.10.: **Expenditures by local family season pass holders in West Yellowstone,  $n = 9$ .**

	Gear	Fees	Snowmobile Access	Total
Per Response	\$755	\$168	\$0	\$923
Std. Error of Mean	171.02	41.20	0	187.68
Median	\$675	\$100	\$0	\$750
Sample Total	\$6,795	\$1,515	\$0	\$8,310
Total (118 families)	\$89,090	\$19,863	\$0	\$108,953

Driggs subregion who over-nighted in West Yellowstone and visited RST to recreate or participate in races and events. In-region lodging expenditures are over and above housing expenditures (e.g., rent, mortgage, etc.), and would thus count as a direct impact related to recreating on the backcountry trails at RST (i.e., locals from outside the West Yellowstone subregion would not otherwise be spending money on lodging were it not for the opportunity to recreate at RST).

One way to approximate this economic activity would be to apply the average per night lodging expenditure of non-local visitors to the approximate number of nights spent in West Yellowstone by locals from outside the West Yellowstone subregion (i.e., from the Jackson and Victor-Driggs subregions). Non-local visitors to RST spent \$31.19 per person per night on lodging in West Yellowstone. Altogether 45 respondents (representing 82 individuals) with addresses outside of the West Yellowstone subregion accounted for 296 visits to RST, representing  $\frac{296}{948} = 31.2\%$  of visits within our sample.

31.2% of the 12,107 total visits as based on pass sales amounts to 3,780 visits. Assuming one night spent in West Yellowstone for every two visits means there were  $\frac{3,780}{2} = 1,890$  person-nights spent in West Yellowstone by local visitors from outside the region. Multiplied by \$31.19 amounts to a low estimate of \$58,948 in additional spending on lodging.<sup>6</sup>

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<sup>6</sup>31.2% of the 15,077 skier visits as based on trail counts amounts to 9,415 visits, or 4,707 person-nights. Multiplied by \$31.19, this would amount to \$146,814 in additional spending on lodging.

## **Rendezvous Ski Trails: Impact of November Activity and Yellowstone Ski Festival**

Usually held over the Thanksgiving weekend, the Yellowstone Ski Festival brings up to 3,500 local and non-local visitors to RST West Yellowstone Ski Festival (2013). High caliber racers from national ski teams, college teams and elite ski clubs typically draw large crowds, most of whom overnight in West Yellowstone and utilize the nordic trail system. In November, day passes and November-only passes are made available through the West Yellowstone Ski Education Foundation and are required to participate in the West Yellowstone Ski Festival. For November, 2012, a low snow year, November pass sales amounted to just over \$11,300 in revenues. Also, 459 racers are listed on race results sheets, only 26 of whom are listed as being from an organization that would qualify as local Yellowstone Ski Festival Results (2012). The entry fee for a race is \$35 with a \$10 late fee per race if registration isn't complete by a certain point in time. Thus revenue from race fees would amount to \$16,065. Based on our sample data, spending on food and lodging by the 433 non-local racers would amount to around \$83,235. We are not inclined to estimate the total economic impact of the Yellowstone Ski Festival beyond this level of detail without survey data specific to the event.<sup>7</sup>

## **Rendezvous Ski Trails: Total Economic Contribution**

Using the more conservative population estimates based on pass sales, the total economic contribution attributable to Rendezvous Ski Trails amounts to

$$\$359,967 + \$652,627 + \$130,705 + \$108,953 + \$58,948 + \$83,235 = \$1,394,434.$$

Of this amount, the expenditures by non-locals (\$359,967), the lodging expenditures by locals who overnight in West Yellowstone (\$58,948), and the lodging expenditures attributable to the Yellowstone Ski Festival (\$83,235)—amounting to \$502,149—should be counted as a direct economic impact to West Yellowstone.<sup>8</sup>

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<sup>7</sup>We should note that in November 2011—a more normal snow year—1,100 'November' passes were sold for \$50 each, and 2,400 day passes were sold for \$10 each, generating \$79,000 in trail fees Dow (2013).

<sup>8</sup>Using the higher population estimates based on skier counts, the total economic contribution would be \$2,054,570 with \$731,632 in direct economic impacts.

#### 5.1.4. Economic Contribution of Backcountry Visitation: Total

Combining the totals from above, we estimate that winter backcountry recreation in the Teton-Yellowstone region generates \$18,547,734 in direct spending to local communities. We estimate that nonresidents contribute \$12,073,815 in spending to the regional economy

Table 5.11.: **Total regional expenditures as estimated by subregion and adjusted for double counting.**

Subregion	Local	Non-local	Total
National Forests	\$4,029,582	\$10,766,131	\$14,795,713
Grand Teton NP	\$1,493,104	\$864,483	\$2,357,587
Rend. Ski Trails	\$951,233	\$443,201	\$1,394,434
Sum	\$6,473,919	\$12,073,815	\$18,547,734

and that residents contribute \$6,473,919 in spending (Table 5.11).

## 5.2. Economic Impact of Commercial and Organizational Use

Public lands within the Teton-Yellowstone region not only afford the general public abundant opportunities for self-supported winter recreation, they also sustain a substantial business community oriented towards people who wish to experience the backcountry under the leadership or tutelage of a professional. Many participate in avalanche education and wilderness travel/leadership courses. Others hire guides to take them into the backcountry for alpine touring, cross-country skiing, snowshoe treks, and mountaineering and ice climbing. Commercial and nonprofit entities that operate on public land do so as concessionaires authorized by the agency managing their area of operation.<sup>9</sup> The expenditures of participants in organized winter backcountry activities, as well as the wages and profits generated by this activity, are an important part of the overall economic contribution of winter backcountry recreation to our study region. Altogether we estimate that participants in commercial activities and education programs spent 6,699 days in the backcountry and \$1,652,602 over the course of the 2012/2013 winter season. Of this amount approxi-

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<sup>9</sup>Hereafter these entities are referred to as ‘organizations,’ and their use as ‘organized use.’

mately \$1,578,069 in gross revenues went to organizations based in the region, generating approximately \$826,301 in wages.

We contacted and sent surveys to all 11 organizations that operate in the study region. Six responded. We averaged the per-visit revenue they earned for six guided or instructional activities: AT, cross-country skiing, snowshoeing, mountaineering, avalanche education and outdoor leadership training. We then multiplied those averages by the number of

**Table 5.12.: Survey results from which per-visit expenditures were calculated for organized winter backcountry visitation.**

Activity	Days	Revenue	Revenue/Visit	No. Companies
Alpine Touring	179	\$48,418	\$270	3
X-Country Skiing	64	\$10,000	\$156	2
Snowshoeing	668	\$60,000	\$90	1
Mountaineering	4	\$1,520	\$380	1
Avalanche Instruction	783	\$140,000	\$179	5
Outdoor Leadership	400	\$62,345	\$156	1

organized visits undertaken for each activity as reported by BTNF and CTNF Staff (2012) and GTNP Staff (2013b).

Survey data was insufficient to estimate the percentage of participants in organized activities who were non-local visitors and whose expenditures would count as a direct economic impact. However two of the larger guide services proffered data indicating that about 85% of guided clients and about 40% of avalanche course clients were nonresidents.<sup>10</sup> If these ratios held across the population of backcountry visitors who hired guides or took avalanche courses, it would mean that expenditures for winter guiding and avalanche education result in over \$1,000,000 in direct economic impacts by nonresidents.

Wages to guides, avalanche course instructors and wilderness leadership trainers make a direct economic contribution to the region. Guide services and avalanche course providers typically have low overhead for infrastructure and pay out a much higher percentage of gross sales as wages than do retail stores. Typically wage expenses amount to around 50–

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<sup>10</sup>This ratio of residents to nonresidents likely varies across organizations, and we don't believe this is accurate of the population of guided/educational winter backcountry visits as a whole.

60% of gross revenues.<sup>11</sup> Based on gross income of \$1,652,602, 50–60% amounts to between \$826,301 and \$991,561 in wages related to guiding and avalanche course activity within the study region. Consistent with our efforts to remain conservative in our estimates, we use \$826,301 as the contribution of wages. The next two sections discuss our estimates of organized use in Grand Teton National Park and Bridger-Teton and Caribou-Targhee National Forests.

Another source of spending related to organized backcountry recreation in Yellowstone National Park are snowcoach tours offered by Yellowstone Vacations that depart from West Yellowstone. The owner doesn't track sales of snowcoach rides used specifically for accessing Yellowstone Park's backcountry. He estimated that customers spend \$4,500 dollars a season for private coach rides to go cross-country skiing or snowshoeing in Yellowstone Park. And he estimated that six to eight customers per week, at \$114 each, bring their skis or snowshoes along on the trip to make excursions into the backcountry where time permitted during the snowcoach tour. Over the course of a 13 week operating season, this would amount to between \$13,392 and \$16,356. Since our study did not evaluate whether these customers paid for snowcoach rides specifically for the opportunity to snowshoe or ski tour, or whether they would have paid for snowcoach rides regardless, and since the owner's estimate of the private business was his 'best guess,' we didn't include these revenues in the final estimate of the total economic contribution of backcountry recreation in the region.

### **5.2.1. Organizational Use: Grand Teton National Park**

The population estimates for Grand Teton National Park, listed in section 2.3.1, are for private (i.e., non-guided) visitors. In addition to those counts, GTNP staff keep detailed records of backcountry visits by individuals participating in organized activities. In the winter of 2012/2013, GTNP recorded 369 visits for guided cross-country ski tours, 643 visits for guided snowshoe tours, and 541 visits for guided AT tours. Visits undertaken for avalanche education, which comprise a significant percentage of organized visits, are included under the category of AT.<sup>12</sup>

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<sup>11</sup>This is based on the author's experience as a former part-owner of a local guide service, as the operations manager for another ski guide service, and working in a family run avalanche course provider.

<sup>12</sup>Grand Teton National Park counts visits as visitors where one visit by one person is counted as a 'Visitor.' Technically, of the 1,553 visitors recorded by GTNP officials, many of them may have been repeat visitors

### 5.2.2. Organizational Use: Bridger-Teton and Caribou-Targhee National Forests

The Forest Service counts one visit by one individual participating in a guided or educational activity as a ‘service day.’ As with GTNP’s counts, the 4,912 service days recorded by the Forest Service could include repeat visitors. So it’s important to note that that service days as recorded by the Forest Service represent visits, not *visitors*.

CTNF staff provided data on the total number of service days available in the Teton Basin Ranger District (the portion of the CTNF within our study region). Together with data provided by operators, we estimate expenditures on fees and tuition by participants in guided and educational activities on backcountry areas in the CTNF amounted to \$879,066, \$671,466 of which went to local operators such as Teton Backcountry Guides, Yostmark Backcountry Tours and Hole Hiking Experience.<sup>13</sup>

BTNF staff provided data on the average level of service days used for the period 2004 through 2008. According to BTNF and CTNF Staff (2012) allotted use days have not increased since that time period. On average 1,245 days per season are recorded for AT (82% utilization rate of total available service days), 421 days per season are recorded for avalanche education (105% utilization rate) and 213 days per season are recorded for guided snowshoe tours (71% utilization rate). Based on the amounts spent per day (i.e., per visit) obtained via the guide/outfitter survey, this number of utilized service days amounts to approximately \$503,390 in fees and tuitions paid by participants (earned by providers).

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(e.g., participants in avalanche courses may visit GTNP more than once during the course). Hence 1,553 should be seen as the total number of visits, not the total number of *visitors*.

<sup>13</sup>Approximately \$207,600 was spent on tuition to an avalanche forecasting training course offered by Prescott College, an out-of-region higher education institution. However the instructors were local, so their wages (approximately \$18,000) could be counted as an economic impact. So could the \$3,000 spent on lodging and the approximately \$9,900 (\$30/day per student and staff member) on food.

### **5.3. Economic Contribution: Backcountry Recreation Related Retail**

Backcountry recreation supports a substantial amount of retail activity throughout the study region. We view top line sales of gear, clothing and other items required for winter backcountry recreation as another way to estimate the direct economic contribution of winter backcountry recreation. It also allows us to corroborate our survey data and population estimates. Stores participating in our survey recorded total top-line sales of \$6,508,189 in goods and services (including shop repairs and rentals) related to winter backcountry recreation.<sup>14</sup> Employment directly related to sales of winter backcountry gear would generate approximately \$2,147,703 in wages based on the rule of thumb that wages amount to a third of gross revenues in this type of retail business Leeds (2013).

Census data for 2011 reports a total of 47 businesses employing 507 people under the category of ‘Sporting Goods’ operating within our study region U.S. Census (2012). Since this broad-level definition covers all sporting goods, including motorized sports, hunting, fishing, boating and many others unrelated to the focus of our study, we narrowed that total down to 16 stores that sold items specifically related to winter non-motorized backcountry recreation. We personally contacted each of these 16 franchises. Ultimately eight were willing to share sales data. These eight included the shops that focus almost exclusively on sales of gear and clothing for backcountry recreation. Two larger chain stores and several smaller stores that operated in the alpine ski category as well as the backcountry ski category declined to participate.

We asked stores to record their top line sales within a few different categories of gear and clothing used for winter backcountry recreation. They could either enter an exact amount or choose a range provided in the survey. They were then asked to estimate the percentage of sales they thought were specifically for the kinds of winter backcountry recreation included in the study. Clearly this entails judgement, especially when it comes to clothing. Nevertheless, much gear is designed specifically for backcountry recreation, especially in a category we identify (partly on the advice of some of the store owners and employees) as ‘Ski Hard Goods,’ and retailers did not seem to have a problem identifying such goods.

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<sup>14</sup>This includes sales and rentals of fat tire bikes

### **5.3.1. Economic Contribution: Retail Sales Tax Revenue**

Our study cannot break down overall spending by county in order to apportion total sales and use taxes on a county by county basis. While it would be possible using our population estimates and/or survey data to estimate how many residents live in various parts of the study region, it would be conjecture on our part to assume that people spend all or most of their money strictly at shops within the county where they live. Nonetheless, tax rates across the region are similar, and we can apply a rough average to estimate region-wide tax revenues related to sales and rental of goods related to winter backcountry recreation. A large proportion of sales occur in Teton County, Wyoming where there's a 6% sales tax, 4% of which goes to the state and 2% of which is retained by the county. Another large percentage of retail sales occur in Idaho, which has a statewide 6% sales and use tax. Driggs, Idaho adds an additional half cent for local purposes. Finally, a not insignificant amount of sales occur in West Yellowstone, Montana, the one part of our study region which has no sales tax.

In Section 5.1.3 we estimated that backcountry recreation at Rendezvous Ski Trail accounts for about \$1,311,199 million in economic activity. Reducing the regional total by that amount, and applying 6% to the remaining \$17,378,717, we estimate that winter backcountry recreation generates \$1,042,723 in revenues for state and local governments.

### **5.3.2. Corroboration of Population Estimate Based on Retail Sales**

Sales data also enables us to corroborate our estimates of the regional populations of resident and non-resident winter backcountry visitors. Based on our sample, about 61% of total sales (\$3,954,425) were to full-time or seasonal residents, and about 39% (\$2,553,764) were to nonresidents. Again based on our sample, in-region spending on gear and rentals by residents was about \$679 per person for locals and about \$80 per person for nonresidents. Dividing top line sales by their respective per person estimates, we would estimate that 5,823 residents and 31,783 nonresidents bought gear in the region during the 2012/2013 season. Given that not all shops responded to the survey, and that not all members of the population bought gear during the past 12 months, these figures roughly corroborate our regional population estimates of 7,419 residents and 41,336 nonresidents who use the backcountry for winter backcountry recreation.

## 5.4. Total Economic Contribution of Winter Backcountry Recreation

Table 5.13 presents the overall results of our economic analysis of winter backcountry recreation in a specific region incorporating parts of northwestern Wyoming, Eastern Idaho and the town of West Yellowstone, Montana. The results are based on survey data gathered over the winter of 2012/2013. These results are applied to population estimates made using Federal Lands Recreation Enhancement Act data, Grand Teton National Park trail counts and concessionaire use data, Bridger-Teton 2008 National Visitor Use Monitor data, and 2010 Caribou-Targhee National Visitor Use Monitor Data. The study was directed by Mark Newcomb, MS Economics University of Wyoming under the auspices of Winter Wildlands Alliance. It is the first study to focus specifically on these types of winter backcountry recreation in this region.

Table 5.13.: **Total estimated economic contribution of winter backcountry recreation in the Teton-West Yellowstone region.**

Expenditures, Residents	\$6,473,919
Expenditures, Nonresidents	\$12,073,815
Expenditure, Total	\$18,547,734
Wages, Guiding	\$826,301
Wages, Retail	\$2,147,703
Wages, Total	\$2,974,004
State and Local Tax Revenues	\$1,042,723
TOTAL	\$22,564,461

To put these numbers in perspective, Kaliszewski (2012) found that summertime trail use of the trails system in Teton County, Wyoming resulted in \$18,496,495 of economic activity (2010 dollars). She concluded that about 1,439 locals used the trails and spent about \$784,255. She estimated that 105,430 non-locals used the trails and spent about \$168 per day, which amounted to \$17,712,240 in total spending. She estimated that this economic activity generated \$1,109,790 in state and local taxes, 194 jobs and \$3,598,045 in wages and salaries.

Taylor et al. (2013) calculated a statewide estimate of the economic contribution of non-motorized trail use specifically on Forest Service Lands within the state of Wyoming. They attributed \$55.1 million in direct economic activity to non-motorized trail use. Using IMPLAN software, they estimated that non-motorized trail use resulted in \$67,901,054 total direct and indirect impacts, generated 600 jobs and generated \$17,785,359 in wage income. This study was based entirely on NVUM data for both visitation and spending and included both summer and winter trail use, though did not distinguish between the two.

Trout Unlimited (2005) estimated that anglers, residents and nonresidents alike, spend \$423 million in all of Wyoming. And Loomis (2005) estimated that boating and fishing on a region including the Henry's Fork and South Fork of the Snake River, as well as Southwest Wyoming generated \$46 million (2005 dollars) in current income and creates 1,460 jobs.

# 6 Winter Backcountry Recreation Opinion Questions: Residents

Both resident and visitor survey participants were asked a series of questions about their recreation experience. The first question asked about their experience backcountry skiing, snowshoeing, cross-country skiing, walking/running and/or fat tire biking. The next set asked for opinions regarding basic infrastructure and backcountry use statements (e.g., ‘Plowed parking areas for winter backcountry recreation are sufficient in size’). The final question was meant to gauge the efficacy of the Teton Pass Ambassador program—a program designed to address congestion and safety concerns for both parking and backcountry recreation.

## 6.1. Satisfaction Levels: Residents

Residents reported a very high level of satisfaction with their backcountry experience in almost all categories. Participants were asked to ‘rate your overall level of satisfaction undertaking the following activities....’ They were given choices of ‘Very Dissatisfied,’ ‘Dissatisfied,’ ‘Neither Dissatisfied nor Satisfied,’ ‘Satisfied,’ ‘Very Satisfied’ and ‘NA’ (Table 6.1). The percentage of those reporting that they were ‘Very Satisfied’ with their experience peaked in the AT category where 74% of residents who skied and/or snowboarded in the backcountry in the last 12 months reported that they were ‘Very Satisfied,’ 20% reported that they were ‘Satisfied’ and only 5% reported anything less than ‘Satisfied.’ The percentage of those who reported ‘Satisfied’ was greater than the percentage of those who reported ‘Very Satisfied’ in only one activity, fat tire biking where 31% reported they were

Table 6.1.: Satisfaction rates according to activity—locals.

	Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
Walking	2%	2%	6%	39%	52%
Snowshoeing	2%	0%	9%	38%	51%
X-country On-trail	2%	2%	4%	32%	59%
X-country Off-trail	2%	0%	4%	31%	62%
Alpine Touring	3%	0%	2%	20%	74%
Snowmobiling	4%	3%	24%	24%	46%
Fat Tire Biking	2%	7%	18%	42%	31%

‘Very Satisfied,’ 42% reported they were ‘Satisfied,’ and 27% reported they were something less than ‘Satisfied.’

## 6.2. Opinions: Residents

Survey participants were next asked how strongly they agreed or disagreed with a series of 12 issues relating to the existing state of backcountry recreation amenities, access and management strategies. Every topic in the list offered respondents a chance to choose from a range of levels from ‘Strongly Disagree’ to ‘Strongly Agree’ and then to record the level of importance they attached to that issue, ranging from ‘Not Important’ to ‘Very Important.’ There was also an ‘N/A’ choice. Tables B.1 through B.12 in Appendix B, Section B.1 list further details.

In order to estimate the overall sentiment among residents who responded to the survey, we report the mean and mode of all valid non-‘N/A’ responses. A non-‘N/A’ response reflects a level of familiarity and interest in the topic on the part of the respondent. Hence the inverse of the total number of ‘N/A’ responses for particular topic reflects the overall level of interest in, and knowledge of, that topic within the sample population. The mean score listed in the tables thus reflects the average opinion among those who took the survey, have knowledge of the topic and have an opinion on that topic. The higher the mean, the higher the level of agreement or importance, depending on which is being asked. Thus

someone may choose 1 (‘Strongly Disagree’) for the statement that ‘There are sufficient groomed trails where over-snow (aka fat-tire) biking is allowed,’ and then choose 1 (‘Not Important’) regarding the level of importance they personally assign to that issue. Table 6.2 presents a summary of the mean levels of importance and agreement ascribed to each issue by residents who responded to the survey.

Table 6.2.: Mean levels of importance and agreement regarding winter backcountry issues among resident survey respondents.

Issue	Importance	Agreement
Too much area for non-motorized use	4.43	1.50
Too much area for multi-use	3.92	3.08
Parking lots sufficient in size	4.26	3.10
Parking lots sufficient in number	4.20	3.92
Parking lots sufficient in location	4.22	3.21
Sufficient groomed x-country ski trails	4.15	3.96
Sufficient grooming of x-country ski trails	4.08	4.01
Sufficient trails for dog walking	3.72	3.92
Sufficient groomed trails for fat-bire biking	2.60	3.40
Signage sufficiently placed and visible	3.83	3.75
Sufficient Forest Service staff in field	3.12	2.93
Sufficient Park Service staff in field	3.07	3.19

### 6.2.1. Non-motorized and Multi-use

The topic of how much area to set aside for non-motorized access had the highest mean level of importance (table B.5). When presented with the statement, ‘Too much area is set aside exclusively for *non-motorized* access and use,’ 222 respondents (62.2%) indicated it was a ‘Very Important’ topic. Mean overall importance was 4.43. Mean agreement for this topic was 1.50 (halfway between ‘Strongly Disagree’ and ‘Disagree’) with 237 respondents in strong disagreement with the statement.

Despite the above consensus that there *is not* too much area set aside for *non-motorized* use, there was less consensus about whether there *is* too much area designated as *multi-use* where snowmobiles are allowed (table B.6). Mean importance assigned to the issue was 3.92. It was considered ‘Important’ or ‘Very Important’ by 56% of respondents and

‘Unimportant’ or ‘Not Important’ by 8% of respondents. Mean agreement with the issue was 3.08. Almost 30% chose 3 (equivalent to ‘Neither Agree nor Disagree’), around 29% either disagreed or strongly disagreed, and around 32% agreed or strongly agreed.

### **6.2.2. Plowed Parking Areas**

There were three statements in the survey regarding the sufficiency of plowed parking areas: one about size, one about number and one about location. This threesome garnered the second highest level of importance with mean ratings of 4.26, 4.20 and 4.22 respectively (see tables B.7, B.8 and B.9). Mean levels of agreement for the three statements regarding parking areas for backcountry access was 3.10 for size, 3.92 for number and 3.21 for location. ‘N/A’ responses comprised 5% or less of the responses for all three questions. Open-ended comments (see Appendix D) indicate that concern among some residents about congested parking areas may have weighed down agreement levels for size and location.

### **6.2.3. Groomed Trails**

Residents also assigned a high importance level to the statement ‘There are sufficient groomed trails designated for cross-country skiing.’ The topic received a mean importance rating of 4.15 with almost 46% (163) of respondents rating it as a very important issue (table B.2). A solid majority (67.2%) indicated that the existing quantity of groomed trails is sufficient. The mean level of agreement on the issue was 3.96 with 29% (104) of respondents indicating they ‘Strongly Agree’ and another 38% (138) indicating they ‘Agree.’

The statement, ‘There is sufficient grooming of existing machine-groomed trails,’ was the only other topic to receive a mean importance level greater than 4 (4.08, table B.4). Mean agreement was 4.01. Notable comments that disagreed to this statement were specific to the Park Road north from the Bradley-Taggart Trailhead (Chapter 8 and Appendix D).

Access to dog walking was moderately important among respondents. Mean importance was 3.72, and mean agreement was 3.92. About 62% of residents responding to the survey agreed or strongly agreed that there are sufficient groomed trails for dog walking, walking

and jogging (table B.1). Comments, however, indicate that some trail users would prefer to separate walking and dog walking from cross-country skiing (Appendix D).

Whether or not there are sufficient groomed trails for fat tire biking had the lowest score for mean level of importance at 2.6 (table B.3). It also had the highest 'N/A' response rate at 50.7% for the agreement category and 42.6% for the importance category. About 18% of residents agreed or strongly agreed that there are sufficient groomed trails where over-snow biking is allowed. Just over 8% disagreed or strongly disagreed, and just over 13% were ambivalent. Mean agreement was 3.4. Among residents who reported biking at least one day during the winter season, mean importance rose to 3.83, and mean agreement rose slightly to 3.46.

#### **6.2.4. Signage**

About 60% of resident respondents strongly agreed or agreed with the statement 'Signage at trailheads and wilderness boundaries is sufficient in visibility and placement.' Just over 58% of respondents deemed it an important or very important issue, giving it a mean importance rating of 3.83 (table B.10). Residents moderately agreed, assigning the issue a mean agreement level of 3.75.

#### **6.2.5. NFS and NPS Staff in the Field**

About 34% of respondents felt the presence of National Forest Service staff to be an important or very important issue, about 26% were ambivalent, and about 26% deemed the issue 'Unimportant' or 'Not Important.' Its mean level of importance was 3.12. On average residents slightly disagreed with the statement 'National Forest staff *in the field* are sufficient in number and visibility,' assigning it a mean agreement level of 2.93 (table B.11). Thirty-three percent disagreed or strongly disagreed, 26% were ambivalent and about 28% agreed or strongly agreed.

When presented with the same statement about National Park Service staff, residents indicated slightly stronger agreement (mean = 3.19), and about the same level of importance (mean = 3.07) (table B.12). About 24% disagreed or strongly disagreed. Just under 28% were ambivalent. And about 24% agreed or strongly agreed.

### 6.3. Teton Pass Ambassador: Residents

A final question in this section regarded the Teton Pass Ambassador program, a partnership between Friends of Pathways and the Forest Service that pays for an ambassador, currently Jay Pistono, to be present on Teton Pass. The ambassador engages with public entering and exiting the backcountry, making them aware of parking lot etiquette, backcountry etiquette

Table 6.3.: Resident opinions regarding the Teton Pass Ambassador Program

Choice	Frequency	Percent	% of Those Aware
Poor	3	0.8%	1.0%
Fair	12	3.4%	4.4%
Good	106	29.9%	38.8%
Excellent	121	34.2%	44.4%
Undecided	31	8.8%	11.4%
Unaware	81	22.9%	—
Total	354	100.0%	100.0%

and backcountry travel safety precautions. At times the ambassador helps resolve disputes that arise when parking is tight and trails are crowded.

The survey stated that the ‘purpose of the Ambassador Program is to communicate backcountry ethics, safety information, and reduce user conflict on Teton Pass.’ It then asked respondents to ‘Please rate this program in terms of its *overall effectiveness in meeting this goal*’. The survey presented respondents with six choices: ‘Poor,’ ‘Fair,’ ‘Good,’ ‘Excellent,’ ‘Undecided,’ and ‘N/A—I’m unaware of the Teton Pass Ambassador Program.’

Residents who responded to the survey gave the program a high rating in terms of effectiveness with over 34% giving it an ‘Excellent’ rating and another 30% giving it a good rating (table 6.3). Only 4% gave it anything less than a ‘Good’ rating. The mean effectiveness rating was 3.47, or about half way between ‘Good’ and ‘Excellent.’

Almost 23%, or 81 of the 354 valid responses, indicated that they were unaware of the program. When responses are sorted by those that backcountry recreated at Teton Pass less than 25% of the time in the last 12 months, 55 were unaware of the program. In other words, 68% of the 81 that chose ‘N/A, I’m unaware of the program’ recreated at Teton Pass relatively infrequently compared to their overall use of the backcountry. Thus

the apparently high percentage of respondents unaware of the program may be an artifact of the geographic size of the survey region and breadth of the survey—respondents from West Yellowstone or those that predominantly cross-country ski or walk on groomed trails appear to be less likely to be aware of the Ambassador Program.

# 7 Winter Backcountry Recreation Opinion Questions: Nonresidents

Nonresidents were asked to respond to the same set of questions posed to residents regarding their satisfaction with their backcountry experience and regarding their opinion about 12 backcountry and backcountry recreation infrastructure issues.

## 7.1. Satisfaction Levels: Nonresidents

Nonresidents responded similarly to residents when asked to ‘rate your overall level of satisfaction undertaking the following activities...’ (table 6.1). As with residents, alpine touring garnered the highest satisfaction rate with 81% of nonresidents who alpine toured during their stay reporting that they were ‘Very Satisfied.’ Those who cross-country skied on trails also had a high likelihood of reporting that they were ‘Very Satisfied.’ There were only three respondents who used snowmobiles for accessing the backcountry. Two of them were ‘Very Satisfied’ with their experience, and one was ‘Neither Dissatisfied nor Satisfied.’

## 7.2. Opinions: Nonresidents

Nonresidents were asked the same set of questions regarding their opinion about 12 issues relating to the existing state of backcountry recreation amenities, access and management strategies. Tables B.13 through B.24 with data for each response are listed in Appendix

Table 7.1.: nonresident satisfaction rates according to activity.

	Very Dissat- isfied	Dissat- isfied	Neither	Satis- fied	Very Satis- fied
Walking	2.9%	2.9%	8.6%	37.1%	48.6%
Snowshoeing	0.0%	3.1%	9.4%	28.1%	59.4%
X-country On-trail	4.4%	1.1%	5.5%	16.5%	72.5%
X-country Off-trail	8.2%	2.0%	4.1%	36.7%	49.0%
Alpine Touring	3.8%	1.3%	2.5%	11.3%	81.3%
Snowmobiling	0.0%	0.0%	33.3%	0.0%	66.7%
Fat Tire Biking	0.0%	0.0%	14.3%	28.6%	57.1%

B, Section B.2.

### 7.2.1. Non-motorized and Multi-use

When presented with the statement, ‘Too much area is set aside exclusively for *non-motorized* access and use,’ 85 nonresidents (53.1%) indicated it was a ‘Very Important’ topic. Mean overall importance was 4.3, and mean agreement was 1.43—closer to ‘Strongly Disagree’ than to ‘Disagree.’ Ninety-four respondents were in strong disagreement with the statement.

As with residents, nonresidents were more ambivalent about whether or not there is too much area set aside for *multi-use* where snowmobiles are allowed (table B.18). Mean importance dropped to 3.95 (though more respondents chose ‘Very Important’ than any other level of importance), and mean agreement was 3.19 with a mode of 3—about the equivalent of ‘Neither Disagree nor Agree.’ It was considered ‘Important’ or ‘Very Important’ by 45% of respondents and ‘Unimportant’ or ‘Not Important’ by 7% of respondents.

### 7.2.2. Plowed Parking Areas

Nonresident opinion tracked that of residents in identifying parking lot size, number and location as important issues with mean importance levels of 4.08, 4.06 and 4.14 respectively

Table 7.2.: Mean levels of importance and agreement regarding winter backcountry issues among nonresident survey respondents.

Issue	Importance	Agreement
Too much area for non-motorized use	4.3	1.43
Too much area for multi-use	3.95	3.19
Parking lots sufficient in size	4.08	3.33
Parking lots sufficient in number	4.06	3.46
Parking lots sufficient in location	4.14	3.89
Sufficient groomed x-country ski trails	4.45	4
Sufficient grooming of x-country ski trails	4.12	3.91
Sufficient trails for dog walking	3.72	3.92
Sufficient groomed trails for fat-bire biking	2.75	3.91
Signage sufficiently placed and visible	3.83	3.8
Sufficient Forest Service staff in field	3.12	2.87
Sufficient Park Service staff in field	3.07	3.19

(see tables B.19, B.20 and B.21). Mean levels of agreement for the size and number of parking areas for backcountry access were 3.33 and 3.46, indicating that nonresidents only marginally agreed that the size and number of parking lots is sufficient. However nonresidents mostly agreed that parking areas are located in appropriate locations, with 51.9% either agreeing or strongly agreeing (mean = 3.89).

### 7.2.3. Groomed Trails

Nonresidents assigned the highest importance rating out of all topics to that of groomed trail availability ('There are sufficient groomed trails designated for cross-country skiing'). Mean importance among nonresidents was 4.45 with 55.6% finding it either 'Very Important' or 'Important' (table B.14). Almost 49% strongly agreed or agreed that the existing quantity of groomed trails is sufficient, while 18.1% neither agreed nor disagreed.

The statement, 'There is sufficient grooming of existing machine-groomed trails,' also received a mean importance level greater than 4 (mean = 4.12, table B.16). The number of nonresidents who strongly agreed or agreed comprised 43.1% of all responses, and mean importance was 3.91.

Nonresidents did not feel strongly that sufficiency of groomed trails for dog walking was an important issue, assigning it a mean importance rating of 3.72. And they were only slightly more opinionated about their agreement as to the sufficiency of such groomed trails, assigning it a mean agreement level of 3.92.

Nonresidents did not deem groomed trails for fat tire biking to be an important topic, giving importance an average importance rating of 2.75 (table B.15). And they largely agreed that there are sufficient groomed trails available for fat tire biking—the average agreement level was 3.91. As with resident respondents, the ‘N/A’ response rate was high (64.4 % for the agreement category and 41.9% for the importance category).

#### **7.2.4. Signage**

About 58% of the nonresidents we surveyed strongly agreed or agreed with the statement ‘Signage at trailheads and wilderness boundaries is sufficient in visibility and placement.’ The mean level of agreement was 3.8. Just over 58% of nonresidents also deemed it an important or very important issue. Mean importance was 3.83 (table B.22).

#### **7.2.5. NFS and NPS Staff in the Field**

On average nonresidents slightly disagreed with the statement ‘National Forest staff *in the field* are sufficient in number and visibility,’ assigning it a mean agreement level of 2.87 (table B.23). twenty-three percent disagreed or strongly disagreed, 27.5% were ambivalent and 14.4% agreed or strongly agreed. About 26% of respondents felt it to be an important or very important issue, 25.6% were ambivalent, and 18.1% deemed the issue ‘Unimportant’ or ‘Not Important,’ resulting in a mean level of importance of 3.12.

When presented with the same statement about National Park Service staff, nonresidents on average neither agreed nor disagreed (mean = 3.19), and on average did not seem to think it was unimportant or important (mean = 3.07) (table B.24). About 19% disagreed or strongly disagreed; about 19% agreed or strongly agreed and 24.4% were ambivalent.

### 7.3. Teton Pass Ambassador: Non-locals

Not unexpectedly, almost 70% of nonresidents who took the survey were unaware of the Teton Pass Ambassador Program (table 7.3). Of those who were aware of it, however,

Table 7.3.: Nonresident opinions regarding the Teton Pass Ambassador Program

Choice	Frequency	Percent	% of Those Aware
Poor	1	0.6%	1.8%
Fair	7	4.4%	13.3%
Good	25	15.6%	47.1%
Excellent	16	10.0%	30.2%
Undecided	4	2.5%	7.6%
Unaware	107	66.9%	—
Total	160	100.0%	100.0%

the response was largely favorable. Over 30% rated the effectiveness of the program to be ‘Excellent’ and 47.1% rated the effectiveness to be ‘Good.’ Only 15.1% rated it ‘Fair’ or ‘Poor.’

## 8 Open-ended Comments

One-hundred fifty-six comments were received, 109 from residents and 47 from nonresidents. A complete list of comments is given in Appendix D. The analysis below is not exact in that not all responses were clear and specific in their intent. However it gives a rough indication of the breakdown of sentiment among those respondents who took the time to comment.

Twenty-two comments expressed an overall high level of satisfaction and appreciation for the quality and quantity of backcountry recreation opportunities. One expressed clear dissatisfaction, specifically with cross-country skiing and how the groomed trails were damaged by dog-walkers and snowmobilers and were too flat. Commensurate with the overall level of appreciation came support for preserving and maintaining access to backcountry areas for winter recreation. Two respondents indicated they moved here for its opportunities for winter backcountry recreation.

There were 20 comments about crowded parking areas. Eleven of them thought there should be more parking, whether via more parking areas or via the expansion of existing areas. Eight thought parking could be addressed through the use of shuttle busses. About four comments related to parking stated that there's a need for plowed pull-out zones to pick up backcountry skiers hitch-hiking back to the top of Teton Pass, mostly on the east side. One respondent said that a small parking area should be plowed at the end of the road to the Teton Science School, allowing access to the Ditch Creek area.

Fifteen respondents commented that there should be fewer snowmobiles. Four commented that there should be more biles—one stated that there is a need for more motorized access for disabled individuals. About two of the comments regarding reduced use of snowmobiles stated that snowmobile use should be restricted to the east side of Teton Pass (Phillips Bench and Cache Creek). These were balanced by two other comments that said use should be restricted to the trails on the west side of the Tetons. Three comments concerned the

impact of snowmobiles on trails groomed for cross-country skiing. One comment explicitly listed Togwotee Pass as an area where there is too much snowmobile use disturbing too much terrain that should be available for other forms of non-motorized winter backcountry recreation. One explicitly listed Beard Mountain as an area overly disturbed by snowmobile use. And one stated that they didn't know who to call if they witnessed snowmobile use in restricted (e.g., wilderness) areas.

Thirteen respondents commented that there should be more grooming. Four explicitly listed the Grand Teton National Park road north from the Bradley-Taggart trailhead. One listed areas near Kelly Canyon, Idaho. Another was explicitly for bike paths in the region and included a preference for grooming rather than plowing pathways. Four others were more generally in favor of more grooming of existing trails, partly as a way to mitigate the impacts of dog walkers and snowmobilers. Related to comments addressing the need for more grooming were five comments explicitly requesting more groomed trails exclusively for dog walking.

Eight respondents commented that trail uses should be separated. Four stated that cross-country skiers and snowshoers should have their own trails. Two commented that walkers and snowshoers should have their own trails and stay off of ski touring trails. One commented that dog walkers and cross-country skiers should have separate trails.

Eight respondents commented that the Teton Pass Ambassador is an important and beneficial management program. One suggested that it should be permanently funded by entities other than non-profits (currently Friends of Pathways).

Eight respondents commented that the Park road from Bradley-Taggart Trailhead to Jenny Lake (and in one instance Signal Mountain) should be plowed to provide easier access to backcountry alpine touring terrain in the central and northern portions of the Teton Range.

Several comments addressed backcountry management (interpreting 'backcountry management' loosely). Two expressed concern about protecting wildlife and wildlife habitat. One commented that 'No semi-automatic weapon fire should be allowed from the Horseshoe Canyon parking lot.' One suggested that Grand Teton National Park should be privatized. Another explicitly stated a need for more Park and Forest Service staff in the field. Another commented that skiing at Rendezvous Ski Trails should be free because the trails are on public land. And two indicated that a growing demographic group of retirees appreci-

ate accessible groomed trails. One of these stated, ‘The Park Service needs to groom the Riverside Trails down to the Madison River and the loops near the river often for us older folks who these days prefer groomed x-c ski trails to the backcountry that we used to do.’ The other stated, ‘(We) used to spend a lot of time skiing in the back country.....but now are limited to groomed trails.’ Other management related comments concerned signage, backcountry etiquette and backcountry safety.

Four comments expressed concern about the impact of poorly handled dogs both on trails and in the backcountry.

Three comments specifically listed congestion as an issue, one specifically at Cache Creek.

The most frequent comment ( $n = 11$ ) from nonresidents was about how happy they were with their experience backcountry recreating in the area and about how outstanding the terrain is, the access is and the opportunities are, for winter backcountry recreation.

## 9 Conclusion

Public lands in the Yellowstone-Teton region provide exceptional opportunities for winter backcountry recreation. Anecdotal evidence suggests that use of the backcountry for winter recreation is increasing. Space to park at backcountry access points, once plentiful, on many days now requires a wait. Extensive networks of groomed trails supported by partnerships between the Forest Service and local organizations reflect community support for maintaining opportunities for winter backcountry recreation. And residents and nonresidents alike were very satisfied with the quality, accessibility and variety of winter backcountry recreation opportunities. Winter access to Federal public land is based on land management policies that reflect the mandate of the agency which oversees it. Those policies support extensive winter backcountry recreation, much of it of the non-motorized nature, that directly contributes over \$20 million to local communities on an annual basis. The direct economic impact of nonresidents who visit the region and take advantage of these opportunities amounts to over \$11 million. Wages comprise almost \$3 million of the total, and state and local tax revenues amount to over \$1 million of the total.

This study generated a substantial body of data on the annual expenditures of residents and the per trip expenditure by backcountry visitors, data that has never before been gathered. Residents spend on average just over \$800 a year in the region for gear, clothing, avalanche education, guide services and outdoor leadership training. Aggregate annual *in-region* expenditures of local backcountry visitors for clothing, gear and services related to their backcountry use is over \$6 million. Residents annually spend another \$250 outside the region for additional purchases of gear and clothing—of interest because, in this age of on-line shopping, there's a loss of local tax revenue associated with such purchases.

The sample size is sufficient to use this data to estimate annual expenditures among different subsets within the sample. For example, if a researcher wanted to, he could estimate the annual expenditure of local backcountry visitors who largely cross country ski compared

to the annual expenditure of local backcountry visitors who largely backcountry ski. Two other surveys gathered data on regional top-line retail sales of backcountry gear and on gross revenues to organizations providing backcountry guide services, avalanche education and winter outdoor leadership training. Again, this type of data has never been gathered and examined as it has in this study.

Survey data also included opinions regarding several issues related to the quality of the backcountry recreation experience. Not unexpectedly, most survey participants recreate in the backcountry under human power. This type of backcountry visitor feels that the issue of how much public land is set aside for non-motorized recreation is an important issue and that more such land could be set aside exclusively for non-motorized use. That being said, there is a not insignificant population of backcountry users who avail themselves of motorized transport, usually snowmobiles but also snow coaches, to reach more remote areas to AT, cross-country ski or snowshoe. By their comments, they feel that more terrain could be opened for multi-use that would include the use of snowmobiles. Their contribution in terms of money spent on snowmobiles and related equipment, in proportion to the amount they use snowmobiles for accessing terrain for backcountry recreation, is included in our estimate of gross expenditures.

## **9.1. Opportunities for Further Research**

There are two ways to extend this research. The first is to address the issue of estimating the population of backcountry visitors. While the data gathered by the survey adequately reflects average and median levels of expenditures, the accuracy of our final estimate is limited by the lack of solid population estimates for the total number of backcountry recreation oriented visitors. This study focused on gathering expenditure data and relied on trail counts and visitation data gathered by Federal land management agencies. While this technique has been used in other studies such as Kaliszewski (2012) and Taylor et al. (2013), the use of this data has its drawbacks.

NVUM data applies to the specific Forest in which it was gathered, and Forest boundaries do not always reflect the boundaries of a recreational amenity whose economic impact is being assessed. In this case, the boundary between the BTNF and the CTNF bisects our study region. Estimating the population of backcountry visitors within our study region

thus required merging CTNF NVUM data with BTNF NVUM Data. However The NVUM is only administered every five years per Forest on a rotating basis, forcing our study to rely on data gathered in 2008 for the Bridger-Teton National Forest and 2010 data for the Caribou-Targhee National Forest, then estimating how many backcountry visitors were double counted (i.e., once in the BTNF survey and once in the CTNF survey). Furthermore, NVUM lumps downhill skiing at ski resorts and AT into one category, ‘downhill skiing.’ This required that we indirectly estimate visitation by subtracting skier visits as reported by ski resorts to the Forest Service from total ‘downhill skiing’ visits as recorded in NVUM survey data. Despite the error introduced by merging disparate data sets, our overall estimate of resident and nonresident populations appears reasonable and is roughly corroborated by retail sales data as described in Section 5.3.2.

Estimating the population of backcountry visitors is no easy task. For example, the population of nonresidents might vary substantially from season to season depending on snow conditions in the study region relative to those in other Rocky Mountain Regions. The population of residents is also hard to define in a strict sense. Prior to the opening of the ski areas, for example, skiers may use the backcountry by hiking (boot packing) with their alpine ski gear. Once the ski area opens, they may never use the backcountry again unless it is through an access point from the resort boundary. Whether or not their expenditure on their alpine ski gear should be included in the economic contribution of backcountry recreation as defined in this study is thus not entirely clear.

Better estimates of the total number of people that use the backcountry for winter recreation would dramatically improve the results of future studies. This might entail increasing field resources to better count traffic at trailheads, or the utilization of technology such as web-cams for monitoring parking lot traffic and improved trail counters to better estimate backcountry visitation, or even some combination of both. Or it might entail another mail survey similar in nature to that of Clement and Cheng (2008).

The second important extension to this study would be to understand how the purchase of second homes in the region is influenced by the quality and quantity of winter backcountry recreation opportunities. While not specifically addressed in this study, at least a few seasonal residents expressed that the opportunities for backcountry recreation were a key part of their reason for purchasing a second home in the region. The economic impacts associated with second homes is substantial. Identifying the portion of those impacts

directly related to the recreational amenity focused on in this study would add substantially to our understanding of its overall value to the community.

This study broke important new ground in helping our community understand the important role of winter backcountry recreation from a purely economic point of view. It shows that people who recreate in the backcountry make a significant contribution to the local economy via their purchase of gear and services related to this recreation. Benefits extend beyond purely economic ones. Teton County was recently ranked as having the State's best overall health outcomes Robert Wood Johnson Foundation (2013). While difficult to measure, this is certainly due in part to the availability, quality and ease of access to opportunities for human-powered backcountry recreation. This study is an important first step in creating a foundation for valuing the natural and recreational amenities of the region and understanding the importance of protecting and preserving them.

# A Appendix: Tables of Expenditure Data

## A.1. Resident Expenditure Data

Table A.1.: In-region, out-of-region and total annual expenditures by residents.

	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
In Region	1,373.61	80.402	803.35	487,633
Out of Region	435.82	37.85	254.89	154,717
Total	1,809.43	92.152	1,058.24	642,349

Table A.2.: Resident in-region expenditures on hard-goods (\$).

	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Skis	384.88	30.186	225.10	136,634
Clothes	235.35	16.888	137.64	83,550
Boots	147.60	13.006	86.32	52,397
Miscellaneous	90.28	5.701	52.80	32,048
Safety Gear	71.24	8.86	41.66	25,290
Packs	70.94	9.703	41.49	25,185
Repairs	64.06	9.697	37.46	22,741
Bikes	31.93	14.972	18.67	11,335
Car Racks	28.14	7.486	16.46	9,990
Poles	24.69	2.742	14.44	8,764
Bike Parts	6.87	3.119	4.02	2,440
Snowshoes	5.11	1.538	2.99	1,815
Total Gear	1,161.10	69.548	679.06	412,190

Table A.3.: Resident out-of-region expenditures on hard-goods (\$).

	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Skis	144.34	19.433	84.42	51,242
Clothes	107.25	10.883	62.72	38,074
Boots	64.73	9.015	37.86	22,979
Miscellaneous	34.18	5.824	19.99	12,135
Safety Gear	24.81	5.402	14.51	8,806
Packs	22.06	3.26	12.90	7,832
Repairs	14.76	4.509	8.63	5,239
Bikes	7.82	1.883	4.57	2,775
Car Racks	7.58	2.695	4.43	2,690
Poles	6.46	2.528	3.78	2,295
Bike Parts	1.83	1.133	1.07	650
Snowshoes	0	0	0.00	0
Total Gear	433.36	37.725	254.89	154,717

Table A.4.: **Total resident expenditures on hard-goods (\$).**

	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Skis	529.23	35.812	309.52	187,876
Clothes	342.6	20.29	200.37	121,624
Boots	212.33	14.98	124.18	75,376
Miscellaneous	112.34	6.622	65.70	39,880
Safety Gear	105.42	10.15	61.66	37,425
Packs	95.75	11.009	56.00	33,991
Repairs	70.52	10.05	41.25	25,036
Car Racks	42.9	8.644	25.09	15,229
Poles	32.5	3.232	19.01	11,539
Fat Tire Bikes	31.93	14.972	18.67	11,335
Snowshoes	12.69	3.087	7.42	4,505
Bike Parts	8.7	3.449	5.09	3,090
<b>Total</b>	<b>1,596.92</b>	<b>81.25</b>	<b>933.95</b>	<b>566,906</b>

Table A.5.: **Resident expenditures on fees and services (\$).**

	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Guides & Avalanche Ed.	51.88	13.19	30.34	18,418
Entrance Fees	47.74	8.26	27.92	16,949
Ski Passes	42.06	5.884	24.60	14,932
Yurts	40.07	7.157	23.43	14,225
<b>Total</b>	<b>181.76</b>	<b>18.16</b>	<b>106.30</b>	<b>64,524</b>

Table A.6.: **Resident expenditures on snowmobile access (n = 357)(\$).**

	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Snowmobiles	22.01	17.52	12.87	7,814
Repairs	4.97	2.55	2.90	1,763
Gas	2.99	1.321	1.75	1,060
Permits	0.79	0.335	0.46	282
<b>Total</b>	<b>30.76</b>	<b>20.505</b>	<b>17.99</b>	<b>10,919</b>

## A.2. Nonresident Expenditure Data

Table A.7.: Nonresident expenditures on hard goods (n = 153).

Category	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Skis	63.27	20.346	24.76	9,680
Clothes	34.25	7.533	13.40	5,240
Merchandise	33.09	6.883	12.95	5,063
Miscellaneous	21.33	3.519	8.35	3,264
Safety Gear	12.42	5.019	4.86	1,900
Boots	9.77	4.114	3.82	1,495
Ski Repairs	7.88	3.564	3.08	1,205
Poles	6.67	2.267	2.61	1,021
Snowshoes	6.04	2.774	2.36	924
Packs	5.78	3.77	2.26	885
Car Racks	3.59	2.544	1.41	550
Fat Tire Bikes	1.24	0.876	0.49	190
Fat Tire Bike Parts	0.16	0.163	0.06	25
Total	205.34	38.98	80.35	31,417

Table A.8.: Nonresident expenditures on fees and services (n = 153).

Category	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Nordic Passes	11.37	1.991	4.45	1,739
Guide & Avy Course Fees	7.81	3.719	3.06	1,195
Entrance Fees	3.79	1.215	1.48	580
Yurt Stays	1.83	1.303	0.72	280
Total	24.8	4.625	9.70	3,794

Table A.9.: **Nonresident expenditures on food and lodging weighted according to percent applicable to that portion of the stay related to backcountry recreation (n = 153).**

Category	Per Response (\$)	Std. Error of Mean	Per Person (\$)	Sum (\$)
Lodging	161.9	27.569	63.35	24,770
Dining	120.74	11.77	47.25	18,473
Groceries	59.6	7.361	23.32	9,120
Own Car	51.05	5.643	19.98	7,811
Entertainment	50.33	10.041	19.70	7,701
Services	36.79	26.321	14.40	5,629
Rental Car	25.31	7.092	9.91	3,873
Total	468.32	53.206	183.26	71,653

# B Appendix: Opinions On Winter Backcountry Recreation Issues

## B.1. Residents

Table B.1.: There are sufficient groomed trails designated for walking, dog-walking and jogging: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	6	1.7	Not Important	31	8.7
2	20	5.6	2	28	7.8
3	63	17.6	3	54	15.1
4	123	34.5	4	74	20.7
Strongly Agree	96	26.9	Very Important	117	32.8
N/A	35	9.8	N/A	26	7.3
<b>Total</b>	<b>343</b>	<b>96.1</b>	<b>Total</b>	<b>330</b>	<b>92.4</b>
Missing	14	3.9	Missing	27	7.6
<b>Mean</b>	<b>3.92</b>	—	<b>Mean</b>	<b>3.72</b>	—
<b>Mode</b>	<b>4</b>	—	<b>Mode</b>	<b>5</b>	—

Table B.2.: There are sufficient groomed trails designated for cross-country skiing: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	6	1.7	Not Important	10	2.8
2	22	6.2	2	26	7.3
3	55	15.4	3	35	9.8
4	136	38.1	4	72	20.2
Strongly Agree	104	29.1	Very Important	163	45.7
N/A	26	7.3	N/A	27	7.6
<b>Total</b>	<b>349</b>	<b>97.8</b>	<b>Total</b>	<b>333</b>	<b>93.3</b>
Missing	8	2.2	Missing	24	6.7
<b>Mean</b>	<b>3.96</b>	<b>—</b>	<b>Mean</b>	<b>4.15</b>	<b>—</b>
<b>Mode</b>	<b>4</b>	<b>—</b>	<b>Mode</b>	<b>5</b>	<b>—</b>

Table B.3.: There are sufficient groomed trails where over-snow biking is allowed: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	7	2	Not Important	47	13.2
2	23	6.4	2	33	9.2
3	47	13.2	3	35	9.8
4	34	9.5	4	29	8.1
Strongly Agree	30	8.4	Very Important	17	4.8
N/A	181	50.7	N/A	152	42.6
<b>Total</b>	<b>322</b>	<b>90.2</b>	<b>Total</b>	<b>313</b>	<b>87.7</b>
Missing	35	9.8	Missing	44	12.3
<b>Mean</b>	<b>3.4</b>	<b>—</b>	<b>Mean</b>	<b>2.6</b>	<b>—</b>
<b>Mode</b>	<b>3</b>	<b>—</b>	<b>Mode</b>	<b>1</b>	<b>—</b>

Table B.4.: **There is sufficient grooming of existing machine-groomed trails: Level of agreement and level of importance.**

	Frequency	Percent		Frequency	Percent
Strongly Disagree	2	0.6	Not Important	7	2
2	17	4.8	2	14	3.9
3	58	16.2	3	55	15.4
4	127	35.6	4	89	24.9
Strongly Agree	100	28	Very Important	127	35.6
N/A	36	10.1	N/A	34	9.5
<b>Total</b>	<b>340</b>	<b>95.2</b>	<b>Total</b>	<b>326</b>	<b>91.3</b>
Missing	17	4.8	Missing	31	8.7
<b>Mean</b>	4.01	—	<b>Mean</b>	4.08	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.5.: **Too much area is set aside exclusively for *non-motorized* access and use: Level of agreement and level of importance.**

	Frequency	Percent		Frequency	Percent
Strongly Disagree	237	66.4	Not Important	11	3.1
2	61	17.1	2	8	2.2
3	23	6.4	3	35	9.8
4	11	3.1	4	42	11.8
Strongly Agree	7	2	Very Important	222	62.2
N/A	11	3.1	N/A	14	3.9
<b>Total</b>	<b>350</b>	<b>98</b>	<b>Total</b>	<b>332</b>	<b>93</b>
Missing	7	2	Missing	25	7
<b>Mean</b>	1.5	—	<b>Mean</b>	4.43	—
<b>Mode</b>	1	—	<b>Mode</b>	5	—

Table B.6.: Too much area is designated as *multi-use* where snowmobiles are allowed: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	30	8.4	Not Important	10	2.8
2	73	20.4	2	19	5.3
3	106	29.7	3	73	20.4
4	60	16.8	4	83	23.2
Strongly Agree	54	15.1	Very Important	118	33.1
N/A	23	6.4	N/A	21	5.9
<b>Total</b>	<b>346</b>	<b>96.9</b>	<b>Total</b>	<b>324</b>	<b>90.8</b>
Missing	11	3.1	Missing	33	9.2
<b>Mean</b>	<b>3.08</b>	<b>—</b>	<b>Mean</b>	<b>3.92</b>	<b>—</b>
<b>Mode</b>	<b>3</b>	<b>—</b>	<b>Mode</b>	<b>5</b>	<b>—</b>

Table B.7.: Plowed parking areas for backcountry access are sufficient in size: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	33	9.2	Not Important	4	1.1
2	89	24.9	2	5	1.4
3	67	18.8	3	48	13.4
4	92	25.8	4	109	30.5
Strongly Agree	47	13.2	Very Important	152	42.6
N/A	18	5	N/A	13	3.6
<b>Total</b>	<b>346</b>	<b>96.9</b>	<b>Total</b>	<b>331</b>	<b>92.7</b>
Missing	11	3.1	Missing	26	7.3
<b>Mean</b>	<b>3.1</b>	<b>—</b>	<b>Mean</b>	<b>4.26</b>	<b>—</b>
<b>Mode</b>	<b>4</b>	<b>—</b>	<b>Mode</b>	<b>5</b>	<b>—</b>

Table B.8.: Plowed parking areas for backcountry access are sufficient in number: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	32	9	Not Important	5	1.4
2	63	17.6	2	5	1.4
3	82	23	3	47	13.2
4	101	28.3	4	111	31.1
Strongly Agree	47	13.2	Very Important	141	39.5
N/A	25	7	N/A	22	6.2
<b>Total</b>	<b>350</b>	<b>98</b>	<b>Total</b>	<b>331</b>	<b>92.7</b>
Missing	7	2	Missing	26	7.3
<b>Mean</b>	<b>3.92</b>	<b>—</b>	<b>Mean</b>	<b>4.2</b>	<b>—</b>
<b>Mode</b>	<b>4</b>	<b>—</b>	<b>Mode</b>	<b>5</b>	<b>—</b>

Table B.9.: Plowed parking areas for backcountry access are located in appropriate locations: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	4	1.1	Not Important	2	0.6
2	14	3.9	2	6	1.7
3	80	22.4	3	59	16.5
4	134	37.5	4	103	28.9
Strongly Agree	93	26.1	Very Important	139	38.9
N/A	27	7.6	N/A	20	5.6
<b>Total</b>	<b>352</b>	<b>98.6</b>	<b>Total</b>	<b>329</b>	<b>92.2</b>
Missing	5	1.4	Missing	28	7.8
<b>Mean</b>	<b>3.21</b>	<b>—</b>	<b>Mean</b>	<b>4.22</b>	<b>—</b>
<b>Mode</b>	<b>4</b>	<b>—</b>	<b>Mode</b>	<b>5</b>	<b>—</b>

Table B.10.: Signage at trailheads and wilderness boundaries is sufficient in visibility and placement: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	11	3.1	Not Important	13	3.6
2	32	9	2	19	5.3
3	77	21.6	3	83	23.2
4	121	33.9	4	101	28.3
Strongly Agree	92	25.8	Very Important	106	29.7
N/A	17	4.8	N/A	7	2
<b>Total</b>	350	98	<b>Total</b>	329	92.2
Missing	7	2	Missing	28	7.8
<b>Mean</b>	3.75	—	<b>Mean</b>	3.83	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.11.: National Forest staff *in the field* are sufficient in number and visibility: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	43	12	Not Important	43	12
2	75	21	2	49	13.7
3	93	26.1	3	91	25.5
4	62	17.4	4	70	19.6
Strongly Agree	39	10.9	Very Important	51	14.3
N/A	32	9	N/A	21	5.9
<b>Total</b>	344	96.4	<b>Total</b>	325	91
Missing	13	3.6	Missing	32	9
<b>Mean</b>	2.93	—	<b>Mean</b>	3.12	—
<b>Mode</b>	3	—	<b>Mode</b>	3	—

Table B.12.: National Park Service staff *in the field* are sufficient in number and visibility: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	26	7.3	Not Important	45	12.6
2	59	16.5	2	49	13.7
3	99	27.7	3	92	25.8
4	72	20.2	4	61	17.1
Strongly Agree	49	13.7	Very Important	49	13.7
N/A	38	10.6	N/A	28	7.8
<b>Total</b>	<b>343</b>	<b>96.1</b>	<b>Total</b>	<b>324</b>	<b>90.8</b>
Missing	14	3.9	Missing	33	9.2
<b>Mean</b>	<b>3.19</b>	<b>—</b>	<b>Mean</b>	<b>3.07</b>	<b>—</b>
<b>Mode</b>	<b>3</b>	<b>—</b>	<b>Mode</b>	<b>3</b>	<b>—</b>

## B.2. Nonresidents

Table B.13.: **There are sufficient groomed trails designated for walking, dog-walking and jogging: Level of agreement and level of importance.**

	Frequency	Percent		Frequency	Percent
Strongly Disagree	2	1.3	Not Important	9	5.6
2	7	4.4	2	8	5
3	20	12.5	3	18	11.3
4	27	16.9	4	21	13.1
Strongly Agree	27	16.9	Very Important	36	22.5
N/A	62	38.8	N/A	44	27.5
<b>Total</b>	145	90.6	<b>Total</b>	136	85
Missing	15	9.4	Missing	24	15
<b>Mean</b>	3.92	—	<b>Mean</b>	3.72	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.14.: There are sufficient groomed trails designated for cross-country skiing: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	3	1.9	Not Important	0	0
2	4	2.5	2	6	3.8
3	29	18.1	3	15	9.4
4	32	20	4	13	8.1
Strongly Agree	46	28.8	Very Important	76	47.5
N/A	37	23.1	N/A	27	16.9
<b>Total</b>	151	94.4	<b>Total</b>	137	85.6
Missing	9	5.6	Missing	23	14.4
<b>Mean</b>	4		<b>Mean</b>	4.45	
<b>Mode</b>	5		<b>Mode</b>	5	

Table B.15.: There are sufficient groomed trails where over-snow biking is allowed: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	3	1.9	Not Important	16	10
2	6	3.8	2	11	6.9
3	13	8.1	3	15	9.4
4	4	2.5	4	6	3.8
Strongly Agree	5	3.1	Very Important	11	6.9
N/A	103	64.4	N/A	67	41.9
<b>Total</b>	134	83.8	<b>Total</b>	126	78.8
Missing	26	16.3	Missing	34	21.3
<b>Mean</b>	3.07	—	<b>Mean</b>	2.75	—
<b>Mode</b>	3	—	<b>Mode</b>	1	—

Table B.16.: There is sufficient grooming of existing machine-groomed trails:  
Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	1	0.6	Not Important	5	3.1
2	6	3.8	2	4	2.5
3	26	16.3	3	19	11.9
4	37	23.1	4	21	13.1
Strongly Agree	32	20	Very Important	54	33.8
N/A	43	26.9	N/A	32	20
<b>Total</b>	145	90.6	<b>Total</b>	135	84.4
Missing	15	9.4	Missing	25	15.6
<b>Mean</b>	3.91	—	<b>Mean</b>	4.12	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.17.: Too much area is set aside exclusively for *non-motorized* access and  
use: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	94	58.8	Not Important	6	3.8
2	30	18.8	2	7	4.4
3	6	3.8	3	14	8.8
4	4	2.5	4	15	9.4
Strongly Agree	1	0.6	Very Important	85	53.1
N/A	16	10	N/A	17	10.6
<b>Total</b>	151	94.4	<b>Total</b>	144	90
Missing	9	5.6	Missing	16	10
<b>Mean</b>	1.43	—	<b>Mean</b>	4.3	—
<b>Mode</b>	1	—	<b>Mode</b>	5	—

Table B.18.: Too much area is designated as *multi-use* where snowmobiles are allowed: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	12	7.5	Not Important	2	1.3
2	14	8.8	2	9	5.6
3	48	30	3	29	18.1
4	19	11.9	4	25	15.6
Strongly Agree	20	12.5	Very Important	47	29.4
N/A	30	18.8	N/A	26	16.3
<b>Total</b>	143	89.4	<b>Total</b>	138	86.3
Missing	17	10.6	Missing	22	13.8
<b>Mean</b>	3.19	—	<b>Mean</b>	3.95	—
<b>Mode</b>	3	—	<b>Mode</b>	5	—

Table B.19.: Plowed parking areas for backcountry access are sufficient in size: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	7	4.4	Not Important	2	1.3
2	26	16.3	2	4	2.5
3	37	23.1	3	21	13.1
4	34	21.3	4	48	30
Strongly Agree	24	15	Very Important	45	28.1
N/A	18	11.3	N/A	14	8.8
<b>Total</b>	146	91.3	<b>Total</b>	134	83.8
Missing	14	8.8	Missing	26	16.3
<b>Mean</b>	3.33	—	<b>Mean</b>	4.08	—
<b>Mode</b>	3	—	<b>Mode</b>	4	—

Table B.20.: Plowed parking areas for backcountry access are sufficient in number: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	4	2.5	Not Important	1	0.6
2	18	11.3	2	5	3.1
3	36	22.5	3	24	15
4	45	28.1	4	43	26.9
Strongly Agree	18	11.3	Very Important	44	27.5
N/A	28	17.5	N/A	22	13.8
<b>Total</b>	149	93.1	<b>Total</b>	139	86.9
Missing	11	6.9	Missing	21	13.1
<b>Mean</b>	3.46	—	<b>Mean</b>	4.06	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.21.: Plowed parking areas for backcountry access are located in appropriate locations: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	1	0.6	Not Important	2	1.3
2	7	4.4	2	1	0.6
3	26	16.3	3	22	13.8
4	53	33.1	4	40	25
Strongly Agree	30	18.8	Very Important	46	28.8
N/A	31	19.4	N/A	24	15
<b>Total</b>	148	92.5	<b>Total</b>	135	84.4
Missing	12	7.5	Missing	25	15.6
<b>Mean</b>	3.89	—	<b>Mean</b>	4.14	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.22.: Signage at trailheads and wilderness boundaries is sufficient in visibility and placement: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	2	1.3	Not Important	4	2.5
2	11	6.9	2	3	1.9
3	33	20.6	3	34	21.3
4	58	36.3	4	42	26.3
Strongly Agree	34	21.3	Very Important	51	31.9
N/A	15	9.4	N/A	8	5
<b>Total</b>	153	95.6	<b>Total</b>	142	88.8
Missing	7	4.4	Missing	18	11.3
<b>Mean</b>	3.8	—	<b>Mean</b>	3.99	—
<b>Mode</b>	4	—	<b>Mode</b>	5	—

Table B.23.: National Forest staff *in the field* are sufficient in number and visibility: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	8	5	Not Important	13	8.1
2	28	17.5	2	15	9.4
3	44	27.5	3	41	25.6
4	15	9.4	4	28	17.5
Strongly Agree	8	5	Very Important	13	8.1
N/A	40	25	N/A	24	15
<b>Total</b>	143	89.4	<b>Total</b>	134	83.8
Missing	17	10.6	Missing	26	16.3
<b>Mean</b>	2.87	—	<b>Mean</b>	3.12	—
<b>Mode</b>	3	—	<b>Mode</b>	3	—

Table B.24.: National Park Service staff *in the field* are sufficient in number and visibility: Level of agreement and level of importance.

	Frequency	Percent		Frequency	Percent
Strongly Disagree	7	4.4	Not Important	13	8.1
2	24	15	2	16	10
3	39	24.4	3	38	23.8
4	17	10.6	4	26	16.3
Strongly Agree	13	8.1	Very Important	15	9.4
N/A	43	26.9	N/A	27	16.9
<b>Total</b>	143	89.4	<b>Total</b>	135	84.4
Missing	17	10.6	Missing	25	15.6
<b>Mean</b>	3.05	—	<b>Mean</b>	3.13	—
<b>Mode</b>	3	—	<b>Mode</b>	3	—

# C Appendix: NVUM Expenditure Data

NVUM four-year spending data: Stynes and White (2005), White and Stynes (2010). Round 2 includes data from 70 forests over four years from fiscal year 2005 through fiscal year 2009. Spending profiles describe the average amount spent within several categories *per party* within 50 miles of the survey site. Local nonresidents are defined as those traveling 60 miles or less from home to reach the recreation site. Excluding downhill skiers, in 2007, local nonresidents spent on average \$33 per day. Nonlocal nonresidents not engaged in downhill skiing spent on average spend 4.9 nights (4.7 nights for the Caribou-Targhee) in the local area and spent on average \$119 per day, or about \$525 per visit. Caribou-Targhee had average spending of \$47 per day for day trips and \$415 total on overnight trips. Similar data isn't available for Bridger-Teton.

According to White and Stynes (2010), 4% of *all* (not just winter) nonresidents to US Forest Service lands reported that the primary purpose for their visit was cross-country skiing; 19% reported it was for downhill skiing, which in NVUM studies includes alpine touring; and 3% reported it was for snowmobiling. 64% of cross-country skiing visits were day visits by residents, 8% were day visits by nonresidents and 18% were by overnight by nonresidents. 32% of of down-hill skiing visits were day visits by residents, 15% were day visits by nonresidents and 44% were overnight visits by nonresidents. For snowmobiling, the respective percentages were 51%, 16%, and 19%.

# D Appendix: List of Open Ended Comments

1. I think the loudest people are the few who think, as snowmobilers we are destroying the back-country, but we put a lot more money into the valley and have just as much right to access as they do. I also skin and Hike in the mountains and think that the people trying limit motorized access are doing it only because they don't like it.
2. The teton pass parking is also an issue and in winter and summer it would be great if a shuttle program could be created. People have tried but because of insurance it's hard to get a recreational shuttle but if the forrest service could get involved a shuttle would drastically reduce the traffic.
3. It would also help to plow out the space across from glory bowl so cars can have a place to stop and pick people up without stopping on the road.
4. plow to Jenny lake. lupine. easier access
5. Better signage in certain winter recreation areas suggesting to people that do not have avalanche gear or knowledge that they recreate elsewhere - mainly Teton Pass for the safety of themselves and others
6. Thank you for doing this, great work. I suggest more parking, especially in all three skier parking areas on Teton Pass, and Taggart in the Park. Also, too many snowmobiles are allowed, we should restrict it to just skiers. Thanks,
7. I am very concerned with the negative impacts of snowmobiles. Noise, traffic, over-consumption of the resource of untracked snow. In particular, I would like to see zero snowmobile traffic in the palisades wilderness study area, and Philip's canyon on Teton Pass. Snowmobiles should be banned in cache Creek. It is simply too busy an area, and should be managed as it is in summer - no motorized recreation!

Enforcement of wilderness poaching by snowmobiles is too weak on the west side of the Tetons.

8. The volume of dog traffic on teton pass & Cache creek is such that the dog shit situation is literally toxic. I can understand that people want to recreate with their pets, but after so many years of attempted education the situation has not improved, it is time to consider more punitive and/or restrictive measures.
9. I would like the national park to plow the road through the park in the winter for more dispersed trail head usage and better access.
10. I included my JHMR ski pass in my cost of access, as I primarily use my ski pass for backcountry access. Last season I logged over 160 days skiing, and I ended up with 39 days scanned at JHMR.
11. Lets get the road plowed to signal mountain. That acces would turn the Tetons into a world class ski snowboard touring destination on par with many places in the alps. This would help boost our local economy
12. Thank you for letting me have the opportunity to take this survey.
13. Would like to see expanded parking or better system for parking on Teton Pass; it gets busier each year. Ambassador does a good job in educating etiquette, etc. however, size is insufficient for much of the season.
14. Education
15. please boost the pass ambassador program, it has been critical to keeping things running smoothly up on teton pass! thanks for your hard work–
16. Having been paying attention to discussion nationally of increasing back country rescues and how to pay for them, i am interested to understand the financial impact of outdoor recreation and how deserving rescues are of public funds.
17. Snow biking should continue to expand in our area, and it should be allowed in a MUCH wider area than it is. Bikes are a fun, silent means of enjoying the outdoors, particularly in the winter, and there is no reason responsible snow bike riders shouldn't be allowed access more broadly in GTNP and Yellowstone.
18. The grooming in grand teton national park and specifically at the Bradley Taggart

trailhead is inconsistent and unreliable and as a result i don't drive all the way up there to skate or XC ski as there is no webcam or updated website info to check on trail conditions before driving. The information I have rec'd at the nonresident center over the phone has not been accurate and VC staff are often unable to tell me if the trail has been groomed at all, etc. Otherwise I love our BC skiing and would love to see better parking situation at top of pass and at coal creek. thanks

19. Curious as to the impact of/potential for allowing access to more GTNP trailheads in winter and potential expansion of parking lot at top of pass.
20. I am concerned for access from the teton pass winter trailhead and believe that the Teton pass ambassador program has helped to educate users on ettiquete, as well as sustainable parking practices.
21. We are retired so spending savings and no income.
22. Also want to note there was a 'powered by ?? bar' that came up on some pages that kept me from answering 2 or 3 questions as it blocked the questions...
23. Thanks Mark for undertaking this survey. Long overdue !
24. I rated some items geared towards my experience as a backcountry splitboarder to be lower as recently skiers have become quite aggressive while assuming we were snowshoeing in the skin track and also running sleds in the area, all of which were not true as we were splitboarding...Wish everyone could be respectful of others!
25. I love the Back Country and all it has to offer!
26. trail grooming in teton park should be more consistent.
27. I'm unhappy with the amount of snowmachine access to the backcountry. I believe it defeats the purpose of a backcountry/wilderness experience. I come from the 'Earn the turn' philosophy and think it is too bad that folks have to rely on snowmachines to get in the backcountry. I love being able to ski into a trailhead and not see, smell, or hear a snow machine. That is the experience for me. There are plenty of snow machine user friendly trailheads that folks can use. For example, in Teton Valley, ID, I would like to see the accesses on the east side of the Teton Valley reserved for skiers and on the west side of the Tetons , snowmobiles. That keeps us all happy being in designated areas.

28. The two National Parks GRTE and YELL should embrace winter nonmotorized access - The parks need to groom better for skiers, fat bikes, and groom in more places like the Moose-Wilson road corridor.
29. Teton pass is a mess. Need more parking and a long term plan to address the amount of use and skier visits. The current system is not working. Lots are small and overcrowded. If you have to wait you get harassed by the cops. Park past the sign and u get towed. This is a high use area and it needs a parking area and a few small pull off locations to address ride sharing without blocking the flow of traffic.. These small projects could make a huge difference on he pass. Having cops posted at the top harassing skiers,and generic threats from both wy dot and the FS about shutting down access is not constructive. We need a plan to deal with the fact that Teton pass is a popular bc ski destination. I bet it nets more user days per season than snow king and there's no lifts.
30. Also, snowshoers at Bradley/taggert are annihilating the ski track despite there being 3 sometimes 4 snowshoe tracks. Trying to get back to the parking lot on icy bomb holed tracks on my splitboard makes my knees hurt and takes forever. Some signage at the th and some education could go a long way. The first mile or so from the th are the worst, making ski travel difficult to impossible.
31. Also, too many park snowmobiles on the death canyon rd. I know they are renovating the white grass ranch, but probably not in winter. The snowmobiles the park uses are not 4 stroke and do not comply with their own regulations...shame on nps. Makes lots of noise and ruins the skin track.
32. Snowmobiles should be banned from Cache Creek and Phillips Bench areas.
33. There is always room for improvment within any program. Personally, I think the recreation opportunities in Teton Valley are incredible. Any one that takes the time to complain about grooming, parking, or availability should use that time and energy to get outside and find a location that suits their needs.
34. If you are doing an economic impact survey and you expect that some of your respondents are from outside the area, then you should also be polling them on other things they spend money on, such as hotels and restaurants, as well as duration of stay.

35. the teton region is a huge place for winter recreation and should have some sort of representation to maintain its health. thanks!
36. I can't remember ever seeing Nat'l Park or Forest Service employees in the back country in winter time.
37. I often recreate in other areas in the region outside of West Yellowstone, however this survey was regarding the last 12 months. I did not recreate out of the W.Y. area as much this winter. I feel questions regarding hotel and restaurant expenditures would be relevant in regards to economic impact of these activities in the region. Thank you
38. To many snowmobiles are allowed to roam all over Togowtee Pass, this ruins the wilderness experience.
39. The Pass Ambassador should be allowed to issue citations to individuals that don't pick up after their dogs. Same applies to individuals on the trails around town. Plus leash laws should be enforced on multi use trails. To many close calls while skate skiing. Owners not having control over their dogs.
40. The Teton Pass is one area that I think has a parking issue. Not enough of it.
41. # of seasons was vague, we left that open. Did you mean 4 seasons per year, or thinking of a winter season?
42. I would like to see more dog-friendly groomed trails for Cross Country/Skate Skiing skiing in Victor. I appreciate the Victor City Park grooming, but it is not always in the best of shape as snow can be grim and grooming only takes place once a week. I also believe Teton Pass is going to need a shuttle of sorts to work out the parking issues that have become apparent in the last few seasons. Overall, we live in the most bad-ass area ever and the more we put into winter trail systems will only benefit our community. Thanks for setting this survey up.
43. Keeping trails open to dog use is a priority to me. It's something that makes Jackson enjoyable and rewarding for me - getting to share time in the outdoors with my canine companion. If I could no longer do that, I'd have to move.
44. I think there is enough parking on the pass. You have to wait, but I don't see that as a bad thing. More is less in this instance. If we could simply tighten up people's

parking up there, we could easily park 1/4 more cars. I think the ambassador program is a great thing. I'd like it to be even more robust.

45. Thank you for taking the time to do this!!!
46. Limit the number dogs per individual or a leash law for Cache Creek. Most people are no compliant to dog at large policy or voice command. I have seen more dogs than people on most if not all of my visits. Most do not even attempt voice communication. Skiing 60 days this winter has shown this to me. Most dog owners do not recognize the impact to the resource and the other forest users.
47. Love the Teon range and want to keep it viable. It should be used and enjoyed. Thanks for your efforts.
48. Love the teton ambassador program, but it needs to be its own entity and not under FoP
49. Dollars spent on internet purchases takes money out of our community. Snowmobiling skiers are accessing the Teton yurt system and reducing the experience for those who skinned in. Perhaps a forest order is needed to protect this special use experience?
50. good work Mark
51. I value non motorized use of the backcountry. Opening nonmotorized use areas to motorized use would ruin my backcountry experience.
52. All people should be encouraged to get outside and exercise. More plowed parking access along the mountain roads would be appreciated by many. On the first part of the survey under number of seasons participated it was not clear if this referred to over the past 4 seasons or over my whole life...
53. I never visit the summit of Teton Pass in the winter because it is way too busy and chaotic. I use the Mt. Oliver and Mail Cabin parking areas instead. It would be nice to have better parking access of the Do-its area so people aren't walking along the road. I would recommend more smaller parking areas for a greater variety of access points. It would also be great to have the information about winter range more accessible and better signed. I would also LOVE to see better signage about TRAPS along highly used trails (i.e. Flemming canyon), so I can be aware that I am bringing my dogs into an area with traps.

54. No semi-automatic weapon fire should be allowed from the Horseshoe Canyon parking lot.
55. It's unfortunate that one can ride horses on trails in Grand Teton National Park but not mountain bikes.
56. Please help with funding for Upper Kelly Canyon Nordic ski area. They are in need of a new snowmobile and Idaho Falls Nordic Ski Patrol might be able to match some funds for equipment needed for their grooming needs.
57. We often stay overnight in West Yellowstone. We also eat in restaurants in West, buy maps, purchase books and souvenirs. Thanksgiving weekend is traditionally a time we enjoy going to West to ski both in the park and on the Rendezvous Trails. The new 'dog friendly' trails groomed by the Forest Service in West are awesome! The Park Service needs to groom the Riverside Trails down to the Madison River and the loops near the river often for us older folks who these days prefer groomed x-c ski trails to the backcountry that we used to do.
58. It would be great to have more groomed trail access that allowed dogs, close to town. I fully support keeping dogs out of sensitive wildlife areas, but the only option for xc-skiing with your dogs free is up Cache Creek which can be very congested. With dogs, not allowed on school property (which I agree with) it would be nice to have a place to take older dogs with you on a groomed trail. Backcountry cross country skiing is difficult on dogs' joints. It would be nice to have access. Also, a few years back a small parking lot was plowed up near Ditch Creek past the Kelly Campus of the Teton Science Schools. It was one of the best places to snowshoe or ski. I wish this was still open. I also think it is ridiculous that we paid for these great pathways in town that could be groomed for winter recreation and many are plowed. They should be groomed so we can get the most bang for our buck out of them during the four seasons.
59. The paved paths are always icy , could they be groomed instead?
60. Might be interesting in the economic section to ask how much money of those purchases is going to ProDeals. It's leaving Jackson, but not necessarily going towards other retailers.
61. Might be worth clarifying some of the Coal Creek/Mail Cabin questions and how

they relate to Teton Pass. Not sure to answer in terms of Idaho folks hitch up from CC and accessing Teton Pass.

62. Glad to see this happening!
63. I would like to be able to snow bike in GTNP and Yellowstone NP.
64. Thanks for putting this together!
65. We are really lucky to live in a place with so many resources. Great BC skiing and lots of FREE XC! Thanks for your study.
66. The only bummer regarding trail use for walking dogs is that owners won't pick up their dogs' crap, this despite the fact that there PAWS does a good job of making mutt mitts available. The dike can be really disgusting to walk at times...
67. Designated hitch hiking pick up areas on teton pass- once it is legalized.
68. Plow the Teton Park road up to String Lake!
69. I love to skate ski and find it very hard to use some of the machine groomed trails after a snowmobile has gone through and torn up the track. It is a bit frustrating. It would be nice if the snowmobiles could be on a different trail.
70. You can ride a snow bike anywhere. (roads, snowmobile trails, dirt, ice, snow...) I think Nordic track skiers should not be over run by the growth of fatbikes. Track skiing (skate, classic track) can ONLY be done on a prepared track. Don't get me wrong. My son and I have had fat bikes for 3 years but we don't see any need to ride Nordic ski trails. We prefer those for Nordic skiing.
71. Is there anyway signage could help keep snowshoers OFF ski trails?
72. Thank you for your work!
73. we badly need more motorized access for the disabled
74. I learned to ski on Teton Pass. The recent explosion of back county skiing has changed it. However, I feel limiting the parking is the best way to control use for the time being.
75. posting how to report when I see motorized use in areas that are designated for non-motorized

76. Ambassador program is excellent and should be expanded
77. Snow biking prob should not be included in this group of sports. Seems unrelated and hard to consider that 'backcountry' activity.
78. I would love to see more groomed X-country trails where dogs can be taken, I understand that they wreck the trails, but for those of us who are not in training, it would be nice to have a place to take the dog that is NOT on scary snowmobile trails, but on trails specifically groomed where pets are allowed.
79. Parking on Teton Pass and Coal Creek is an issue. Seems like a shuttle system would be wise and used enough to make it viable.
80. Lets get a larger, safer parking area at the top of Teton Pass.
81. Strong need to have separate trails for mtn biking, winter biking and hikers/dog walkers. Too many conflicts with mtn bikers, creating a poor wilderness experience. Had numerous dangerous encounters with mtn bikers.
82. the grooming program in Teton Canyon is VERY beneficial. Mark is courteous & professional.
83. I wasn't sure what staff visibility was referring to on the previous page.
84. It would be nice if there were more nordic trail options open to the public that also allowed over-snow biking
85. As you can see, Ken and I are getting on in age. Ken used to spend a lot of time skiing in the back country, and loved it. We wish we could still do it, but now are limited to groomed trails. he is 82. Thanks for your work. Bobbi
86. More could be done to get the word out about nordic trails that are outside of the island park area. The Teton valley and parts around jackson have great nordic systems but they are not as well know
87. We love our mountains. I think there is plenty of access.
88. I wish the town would groom all trails rather than plowing some. Not sure who makes that choice, but I think it would be better for everyone. I also wish the winter closures were a bit less restrictive. How much habitat are we really creating for mule

deer/moose by closing the Wildlife trailhead by the library or the Nelson-accessed section of putt-putt, for example? I'd love to ski in those areas.

89. I included 2 trailheads in the 'other' category though I know it said one only. Sorry but at the time, I couldn't decide—both were equally important to me.
90. Survey is a great idea.
91. Appreciate you spending time on this, super appreciative to have all the amazing access to trails and wild places to walk, run, be with my dogs and mostly back country ski. I think the parking areas could be bigger, and, I am not sure we want the growth up there either. A shuttle system in place instead perhaps- but I don't see it as WYDOTs job to make more parking for us all, many of whom aren't respectful of what the highway is really there for. I will be interested to hear the results of this survey and what changes might occur as a result. I think as a whole community we could be more appreciative of how much access we do have, and the work that goes on to support us having the access we do.
92. I love our area and the activities it allows me.
93. Setting aside walking and dog areas is important not because I use them, but as a nordic (primarily skate) skier, I don't want to have beautifully groomed trails walked upon. My days on Teton Pass and west are exclusively on weekdays as weekends just seem too busy. I love being able to check beacons on the pass with the new checker. We were drawn to and moved to this area in large part for winter recreation so appreciate that there is energy to maintain our lovely forests and backcountry areas for public non-motorized use. thanks!
94. I enjoy snowmobiling but not to get me somewhere for skiing. Did not address just snowmobiling and I think it should. Some snowmobiles damage the groomed tracks in Teton Canyon.
95. designated ski and walking trails to prevent user conflict and maintain grooming for skiers
96. it would be nice to see more parking on Teton pas and Pine pass I know that there is not the volume on pine as there is on Teton butt all the same the places there is to park could be better maturated

97. This is my first winter season in the tetons. My numbers reflect that i moved here jan 2, 2013. The winter rec opportunities here are amazing and the access is excellent. Keep up the good work!
98. Teton Pass Ambassadors should be more visible. More parking/pull out areas on Teton Pass would give more access and shorten walking on the road which is dangerous.
99. There are too few areas that are accessible but do not allow snowmobiles, bikes, dogs, etc. Would be good to have more areas set aside for just skiing/snowshoe access.
100. Thank you for taking a interest in the management of this exquisite area.
101. please send me the results of the study and insure that anonymity is maintained in my responses
102. Thanks for your efforts.
103. Beard mountain needs to be closed to snowmobile use on the mountain. Park the sled at the base of the mountain and hike would be my preferred rule on that area. It is now a zoo and riding in on the sled should be enough.
104. I very much support all efforts made by our community to educate backcountry travelers how to recreate safely in the winter backcountry.
105. We appreciate TVTAP and the grooming in Teton Canyon and the Alta course. We are lucky to have these in our back yard.
106. Strongly believe in the maintenance and availability of non-motorized backcountry/outdoors access and activities.
107. the recreational use of snow machines is fine, but some restrictions are necessary
108. Thanks.
109. Improved plowing of the access road to Teton Pass parking area is needed.

## D.1. Nonresident Comments

1. I was really disappointed with the quality of xc skiing areas (not back country) and can not recommend the Jackson area for xc skiers. The nice trails are FULL of dogs or snowmobiles and there are few tracks with hills. (strange with all the mountains around) I'll take Norway next time.
2. I know there are too many people going into the back country and that it is seriously effecting wildlife. As a naturalist tracker from The Wilderness Awareness School in Washington, I noticed very little animal sign in areas tracked out by skiing both in the resorts and on the easily assessable places for back country like the pass. Most of my skiing was done out the back door in Teton Valley, but the snow machine was really fun and helpful in getting us up into the high country, but I know it was very disruptive. Where we went did have a lot more animal sign. A bobcat had been feeding on a dead moose, elk and deer had been around, etc. I saw none of that on the pass or in Jackson Hole Resort. Places like the pass might as well be considered resort terrain and maintained as such for the safety of the people, but if you stop maintaining/plowing/grooming, without accessibility, most people don't try to get out there, however, ski bums in Jackson seem very determined. What they don't all realize is the true impact of their presence in the back country. I hope you are better able to study and confirm our effect. Wild places aren't so wild when the animals are suppressed by non-wild use. People are loud and obtrusive to the animals, especially with snow machines, but damn they are fun! though I loved my adventure on one, I don't think they should be out there. It's going to decimate animal territorial rage and push out wildness over time. I hope your study supports this theory and form it, action is taken to remove us from that wildness because there are too many people and it will only get worse with time. Let the resort be our smear on the mountains and leave the rest of it to the animals who were there first.
3. The east side of the Tetons are ideal for non-motorized recreational use while the west side (Idaho) are better situated for motorbikes, snowmachines, and chainsaws (the best recreation of all is cutting fall firewood). Look to Sun Valley, Idaho and the joint 'gentleman's agreements' to separate the sledheds from the pinheads. I do both, but would never consider bringing my motors with to Jackson.

4. We LOVE the Teton region and would love to keep visiting. You have such a gorgeous area to protect and share with visitors. Keep up the good work (and good luck!).
5. I struggle just to afford backcountry skiing. I hope there are no tolls or additional fees for this activity that should be free.
6. Yes – the large 'other' purchase was by my friend, who purchased a biathlon rifle from a store in W. Yellowstone. He also bought a harness, case, and ammunition. Gun was about 3k. *All the other stuff was about another 1k.* This was a one-time purchase. Atypical.
7. Some of the questions in this survey were too specific.
8. Overall, this is an incredible part of the world. I have had a wonderful time and my wife has as well. We hope to come back again.
9. I've been traveling to this area many times, over 10 visits, due to its beauty, activities, ease of access, lack of crowds in winter, terrain, wildlife. will probably continue.
10. Groom the bike path in Jackson...take a look at the Winthrop, WA cross country ski model. Their Methow Valley Trails are incredible and they do not have the economic support that the Teton Valley maintains! They've made a tiny town into a destination for all cross country skiers...
11. I drive up weekly, just for the day. I grocery shop and recreate I thought your representative did a very good job of explaining the survey and its uses.
12. I mistakenly put *0 spending for accommodations, my group spent 400* on lodging.
13. During my recent visit to the Tetons, I very much enjoyed the backcountry access. It was a great vacation!
14. Answers do not include another family member, his friend, and two of my friends. Substantial rental car costs; lodging costs (same location) about \$3500.
15. I think the Jackson area is well suited for winter recreation of all kinds.
16. Thanks for the survey, I think it's a great topic to research!
17. Ski Hard, Take Chances!!
18. Thank you for helping balance use in this region.

19. keep up the good work
20. I'm conflicted about parking on the pass. More parking will reduce congestion at times, but ultimately the added parking will also get filled up; it just 'pushes' the problem down the road & discourages carpooling. Too bad vehicles don't pick up hitchhikers much anymore.
21. I have visited the Teton area over the past 15 plus years. It is an area that needs protection and oversight. Areas such as this can be both over loved and over exploited. This is a difficult balance. The question I always ask is when do you start to lose the experience of nature and turn your community into the Jersey Shore. (I was raised on the South Jersey shore). Once it is broken it is so hard to fix. Good Luck Keep it up! Thanks for this information.
22. As a first time visitor to this area, we were delighted to find the Teton Canyon XC groomed runs that included dogs!
23. Yesterday was my first day on the Rendezvous Ski Trails. We were blown away by the beauty of the system and how well maintained and groomed the trails were. The warming house at the entrance was out of maps, though, and we had to go to Free Heel and Wheel to get one.
24. Please support wildlife management efforts to reduce stress to Bighorns, etc. in the Teton Range by stressing the importance of seasonal closures that protect wildlife. I love to ski in the Tetons, but I gladly avoid harassing wildlife.
25. Skiing in the park is amazing. I guess I feel that access should be heightened, especially for the north end of GTNP!
26. I come up about once a winter to stay with friends that are from Teton county, hence the relative lack of expeditions. Having traveled around the country and abroad, the backcountry winter experience in Teton county is quite unique, and should be preserved.
27. I am personally more annoyed with people dragging their dogs with them everywhere and not picking up after them than I am with having a snowmobile or two go by me when I'm skiing. As a resident in the GYA I think we have crippled our economies with the underutilization of multi use opportunities. And no, I'm not a snowmobiler

28. I do think government budgeting should increase in areas of providing personelle for national parks and forests, especially in the winter when critical game habitat might be intruded upon. Keep up the good work!
29. I live in canada
30. More free ski days at the Rendezvous Trails in W Yellowstone! It's national forest land - it should be free.
31. i work for the national park service in california and i feel that in the northern rockys many people care less about protecting the land for future generations than they do about there own they do about thier own abilities to exploit it via snowmobiles and other detrimental activities. please stop killing wolves, they are gods creatures too the road should be plowed further into the park in the winter to spread out backcountry users
32. Give the survey in the lot while we're waiting.
33. We are from Utah and greatly appreciate the Rendezvous Ski Trails.
34. no
35. The tetons are a GREAT place to visit and ski. Thank you for your time in insuring a great experience.
36. Thanks for the survey, and I hope I will receive information on the joint association with the Pathways group. I think a few of the questions were repeated on the survey, and that the wording was a little confusing - or I may have been reading into the question...
37. I found the trail grooming program to Jenny Lake by NPS to be rather perplexing. They don't have a grooming schedule and I don't think they post the information when they do groom. There policy of grooming once after a significant snowfall is unrealistic. It would need to be groomed at least twice to create a firm base. They have expensived equipment for grooming, but it is going to waste. NPS needs to either really get in or get out of the grooming business. There current plan (?) is aggrevating since it is a long way to the trailhead and you have no way to know if it is worth the drive or not.

38. Cache Creek Trail too crowded, not enough parking
39. Jackson town sidewalks are a disaster in terms of ice/snow removal and a danger to all pedestrians!
40. I love the idea of having recreational opportunities close by. That is why we moved to Montana and have lived here for more than thirty years. Please continue to have funding for recreational opportunities in Montana and the surrounding areas!
41. too much of the area is centered around snowmobiles. a cross country groomed around Henry lake would be nice. also, access to that park in the winter would be a grand idea. there is a need for more yurts!!!!!!!!!!!!!!
42. Love the Tetons and the backcountry. I am not skilled enough to take full advantage but what I can do, I do.
43. Don't overuse or abuse the data from this survey. The responses are general in nature and not meant to sway management decisions only to provide information.
44. My biggest concern is the unregulated and apperant wide open territory that motorized vehicles (i.e. snowmachines) are allowed. I ski on Togwotee pass area and there is NOWHERE that is off limits to machines, even on the disignated and very limited X-country ski trails at Deception and Falls Creek area. It really sucks that there is apparent Zero regulations limiting where machines can go. It shouldn't be wide open for one use when it impacts other recreation activities. Lander.
45. the Ambassador in the parking lot is a very good thing.
46. Some kind of shuttle bus would be a lot more proficient and safe!
47. Way to many employees in the Park. They do not work nearly hard as any private employee. Make the Park Privately controlled.

# **E Appendix: Map of Region and Survey Forms**

# Winter Recreation Survey Locations

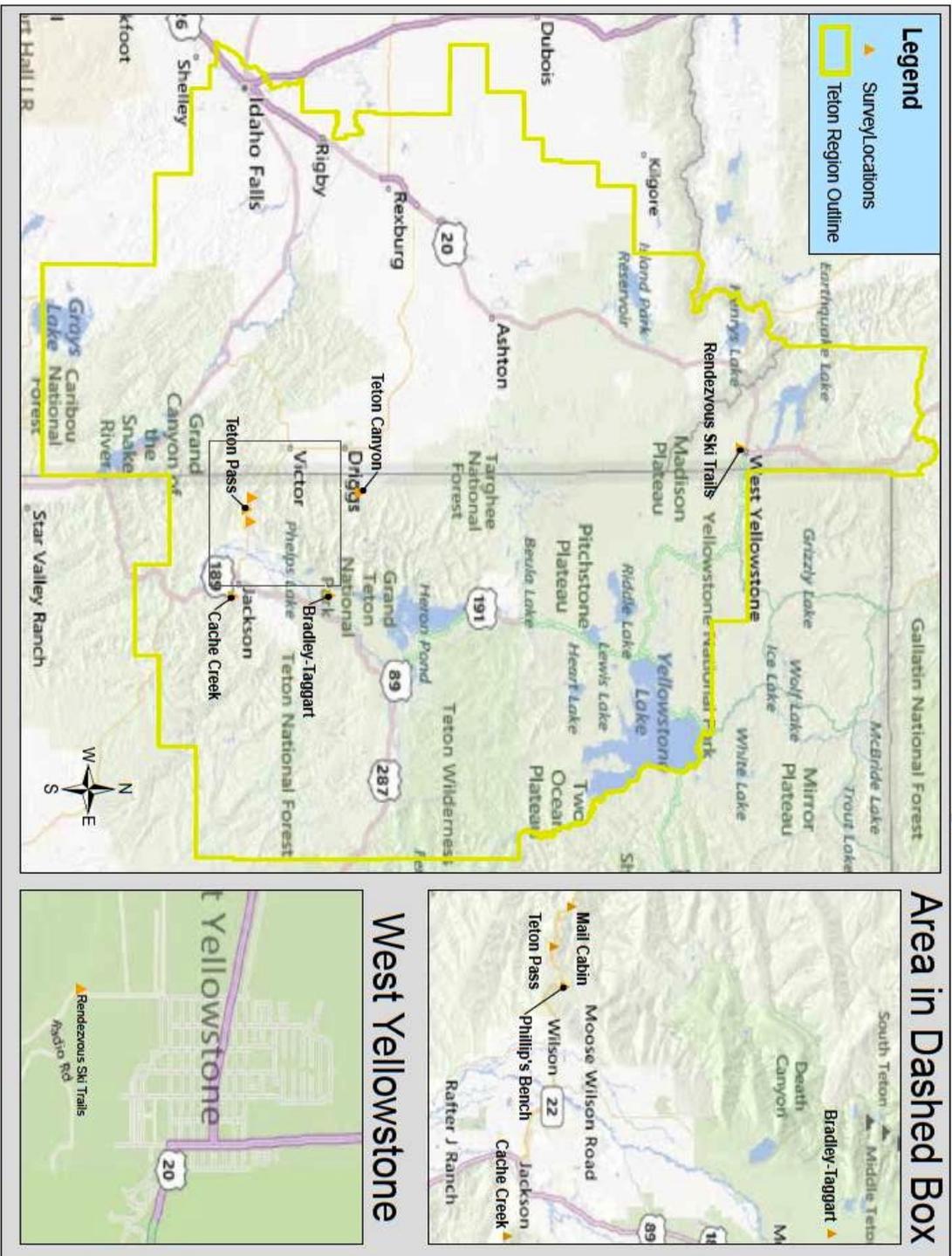


Figure E.1.: Map of the study region.

## Survey: WinterRecSurvey

Teton Region Backcountry Winter Recreation Survey

**By taking this survey, you will help us quantify the regional economic contribution of backcountry winter recreation. Your responses will play an important role in future decisions about winter recreation and management of public lands. As a token of our appreciation, once you complete the survey, your e-mail address will be entered in a random drawing for one of eleven pieces of Marmot gear.**

**Your participation is voluntary. All information will be confidential and will be used only as totals. No individual names or information will be released to any person or agency. Your e-mail address will only be used for sending you a unique url for the on-line survey and for notification in the event you win a prize.**

**This research is being conducted by Mark Newcomb who is contracting with Winter Wildlands Alliance. If you have questions or comments about the survey, please contact Mark at:**

**marknewcomb11@gmail.com**

**Thank you for helping us with our study.**

**The survey has been designed to be easy to take and has been kept as short as possible. Please keep the following in mind as you take the survey:**

- 1. The Teton Region is the geographic region covered by this study. It includes Teton County, Wyoming; Teton County, Bonneville County, Madison County, and Fremont County, Idaho; and the area in and around West Yellowstone (Southern tip of Gallatin County, Montana). The attached map shows the region and survey locations ([View File](#). Click the Back button to return to the survey). Note: *Togwotee Pass area is included*.**
- 2. The 2012/2013 Winter Season refers to the period of time between Thanksgiving (November 22, 2012) and the end of March, 2013 (approximately 18 weeks).**

**Please start with the survey now by clicking on the Continue button below.**

**How were you made aware of this survey? I was...**

- Contacted at a trailhead or parking area
- Contacted in the classroom while in an avalanche class
- Contacted at a public event (e.g., Avalanche Awareness Night, competition awards ceremony, etc.)
- Contacted via e-mail or personal contact other than one of the above

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**Please list the zip code of your home address: \***

To help us guarantee the accuracy of our results and to enter the drawing for Marmot gear, please record your Email Address?

Based on the definition of the Teton Region above, please choose one of the following: \*

- I live in the Teton Region year-round (i.e. all four seasons).
- I am a seasonal resident (live in the region most of the winter season, use a second home here, etc.).
- I am/was *visiting* the Teton Region.
- Other

First column: About *how many days in the last 12 months* did you undertake each of the following activities within the *Teton Region* (note: the Teton Region includes the Togwotee Pass area--see map: [View File](#)--Click the Back button to return to the survey)?

Second column: Regardless of where, about *how many total seasons*, including this season, have you participated in the following activities?

	Days	Seasons
Walking/jogging on a snowmobile packed or machine-groomed trail	<input type="text"/>	<input type="text"/>
Snowshoeing	<input type="text"/>	<input type="text"/>
Cross-country skiing on machine-groomed trails	<input type="text"/>	<input type="text"/>
Cross-country skiing not on machine-groomed trails	<input type="text"/>	<input type="text"/>
Backcountry skiing/snowboarding <i>without Snowmobile Access</i>	<input type="text"/>	<input type="text"/>
Backcountry skiing/snowboarding <i>with Snowmobile Access</i>	<input type="text"/>	<input type="text"/>
Over-snow biking on machine-groomed trails	<input type="text"/>	<input type="text"/>

Which of the following parking areas have you visited *in the last 12 months* expressly for undertaking one of the winter recreation activities listed above (don't count summer visits)? Choose all that apply.

- Bradley-Taggart, Grand Teton National Park
- Rendezvous Ski Trails, West Yellowstone
- Cache Creek, East Jackson
- Teton Pass, Summit
- Phillips Bench, East Teton Pass
- Mail Cabin Creek/Coal Creek, West Teton Pass
- Teton Canyon

Single most-visited Teton Region parking area/trailhead not listed above. Please list (e.g. Togwotee Pass):

How many winter recreation visits to Bradley-Taggart in the past 12 months: XTR

How many winter recreation visits to Rendezvous Ski Trails in the past 12 months: XTR

How many winter recreation visits to Cache Creek in the past 12 months: XTR

How many winter recreation visits to Teton Pass in the past 12 months: XTR

How many winter recreation visits to Phillips Bench in the past 12 months: XTR

How many winter recreation visits to Mail Cabin Creek in the past 12 months: XTR

How many winter recreation visits to Teton Canyon in the past 12 months: XTR

How many winter recreation visits to single most-visited other parking area/trailhead in past 12 months: XTR

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You can answer the following questions as an individual or as a household. If you answer as a household, please note the number of people included in the expenditure calculations where asked.

To help us quantify the direct economic impact of winter backcountry recreation, please think back over the *past 12 months* and recall what items out of the following list you and/or your household bought or rented during that time. Please be as accurate and thorough as possible. *All your answers will remain CONFIDENTIAL.*

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**PAST 12 MONTHS SPENDING ON GEAR:** Please estimate the amounts spent by you, or by you and your household, *in the last 12 months* to purchase or rent the following items. Estimate the total for shops *specifically in the Teton Region* (map of Teton Region: [View File](#). Click the Back button to return to the survey). If you purchased items from shops *outside* the Teton Region or if you *mail-ordered items from outside* the Teton Region, enter those amounts in the second column. *Leave the cell blank if you did not spend money on that item.*

	Amount In Teton Region (\$)	Amount Outside Teton Region (\$)
Snowshoes	<input type="text"/>	<input type="text"/>
Skis/Snowboards and/or bindings for use in the backcountry	<input type="text"/>	<input type="text"/>
Ski poles for use in the backcountry	<input type="text"/>	<input type="text"/>
Boots for use in the backcountry	<input type="text"/>	<input type="text"/>

Bike(s) used for over-snow biking	<input type="text"/>	<input type="text"/>
Bike parts/repair/service for bikes used for over-snow biking	<input type="text"/>	<input type="text"/>
Backpacks, hip belts and hydration systems for winter recreation	<input type="text"/>	<input type="text"/>
Helmets, avalanche beacons, shovels, probes and other safety-related equipment	<input type="text"/>	<input type="text"/>
Outdoor clothing for winter backcountry activities	<input type="text"/>	<input type="text"/>
Items such as climbing skins, wax, sunglasses, goggles, water bottles, etc.	<input type="text"/>	<input type="text"/>
Ski tuning/repair, other equipment upkeep expenses	<input type="text"/>	<input type="text"/>
Ski racks, cargo boxes and other car-top or related ski/snowboard carriers	<input type="text"/>	<input type="text"/>

**PAST 12 MONTHS SPENDING ON FEES AND SERVICES:** Please estimate the amounts spent by you, or by you and your household, for the following fees and services *in the Teton Region over the past 12 months*. Leave the cell blank if you did not spend money on that item.

	Amount (\$)
Entrance fees specifically for backcountry winter recreation (e.g., Park entrance pass)	<input type="text"/>
Nordic Ski Trail Passes and Race entrance fees	<input type="text"/>
Backcountry Guide Services and/or Avalanche Courses	<input type="text"/>
Yurt/Camping fees	<input type="text"/>

**Do you own a snowmobile that you use for backcountry skiing and/or snowboarding? \***

- Yes
- No

**SPENDING ON SNOWMOBILE ACCESS.** Please estimate the amounts spent by you, or by you and your household, *in the Teton Region over the past 12 months* to buy or rent the following items related to your use of snowmobiles for backcountry skiing or snowboarding (map of Teton Region: [View File](#)--Click the Back button to return to the survey). Leave the cell blank if you did not spend money on that item.

	Amount (\$)
Snowmobile(s)	<input type="text"/>

Gasoline for snowmobiles

Oil/repairs/maintenance for snowmobiles

Permits/fees/insurance and related expenses

---

**Over the past 12 months, approximately *what percentage of the days* you used a snowmobile did you use it for backcountry skiing/snowboarding?**

---

**This section will give us important information about the economic contribution of visitors who winter backcountry recreate in the Teton Region. All your answers will remain *CONFIDENTIAL*.**

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**How many days did you spend in the Teton Region during your most recent visit (map of Teton Region: [View File](#)--Click the Back button to return to the survey)?**

---

**Where did you stay while in the Teton Region (select all that apply)?**

- Hotel/Motel
- Bed and Breakfast
- Rental Unit (House, Cabin, Condo)
- Timeshare
- Second Home/Vacation Home that you own
- RV/Trailer Park
- Friends/Relatives
- Backcountry camping
- Other

---

**Please mark the primary objective(s) of your visit? (Choose all that apply)**

- Walking/Jogging on a snowmobile packed or machine-groomed trail
- Cross Country Skiing on a machine-groomed trail.
- Cross Country Skiing not on a machine-groomed trail
- Snowshoeing
- Backcountry Skiing and/or Snowboarding
- Over-snow Biking
- Skiing/Snowboarding at a Resort
- Mountaineering/Ice Climbing

- Business
- Visiting Friends and/or Family
- Other

**Please estimate the number of days you undertook the following activities during your stay in the Teton Region.**

	Days
Walking/jogging on a snowmobile packed or machine-groomed trail	<input style="width: 40px; height: 20px;" type="text"/>
Snowshoeing	<input style="width: 40px; height: 20px;" type="text"/>
Cross-country skiing on machine-groomed trails	<input style="width: 40px; height: 20px;" type="text"/>
Cross-country skiing not on machine-groomed trails	<input style="width: 40px; height: 20px;" type="text"/>
Backcountry skiing/snowboarding <i>without Snowmobile Access</i>	<input style="width: 40px; height: 20px;" type="text"/>
Backcountry skiing/snowboarding <i>with Snowmobile Access</i>	<input style="width: 40px; height: 20px;" type="text"/>
Over-snow biking on machine-groomed trails	<input style="width: 40px; height: 20px;" type="text"/>

***MOST RECENT TRIP EXPENDITURES, GEAR.*** You can answer the following questions for yourself, or for your entire group or household. Either way, when asked, please note the number of people included in the following expenditure data.

**Please estimate the amounts spent by you, or by you and your household (or group), to purchase or rent the following items from shops *specically in the Teton Region* during your most recent visit. *If you mail-ordered items from a shop in the region prior to or after your visit, please include those amounts* (map of the Teton Region: [View File](#)--Click the Back button to return to the survey). *Leave the cell blank if you did not spend money on that item.***

	Amount (\$)
Snowshoes	<input style="width: 40px; height: 20px;" type="text"/>
Skis/Snowboards and/or bindings for use in the backcountry	<input style="width: 40px; height: 20px;" type="text"/>
Ski poles for use in the backcountry	<input style="width: 40px; height: 20px;" type="text"/>
Boots for use in the backcountry	<input style="width: 40px; height: 20px;" type="text"/>
Bike(s) used for over-snow biking	<input style="width: 40px; height: 20px;" type="text"/>
Bike parts/repair/service for bikes used for over-snow biking	<input style="width: 40px; height: 20px;" type="text"/>
Backpacks, hip belts and hydration systems for winter recreation	<input style="width: 40px; height: 20px;" type="text"/>
Helmets, avalanche beacons, shovels, probes and other safety-	<input style="width: 40px; height: 20px;" type="text"/>

related equipment

Outdoor clothing for winter backcountry activities

Miscellaneous items such as wax, sunglasses, goggles, water bottles, etc.

Ski tuning/repair, other equipment upkeep expenses

Ski racks, cargo boxes and other car-top or related ski/snowboard carriers

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**MOST RECENT TRIP EXPENDITURES, FEES AND SERVICES.** Please list the amounts spent by you, or by you and your household (or group), for the following fees and services *in the Teton Region* during your most recent trip to the Teton Region. Enter '\$0,' if you did not spend money on that item.

Amount (\$)

Entrance fees specically for backcountry winter recreation (e.g., Park entrance pass)

Nordic Ski Trail Passes

Backcountry Guide Services and/or Avalanche Courses

Yurt/Camping fees

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**Please estimate how much money you, or you and your household (or group), spent on the following items over the course of your stay in the Teton Region:**

Amount (\$)

Dining at restaurants and/or bars

Groceries

Recreation and Entertainment

Shopping other than for gear or equipment listed above

Your own vehicle (gas, etc.)

Rental vehicle(s)

Other goods and services not including lodging

Lodging

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**Did you and/or your family use a snowmobile(s) for backcountry skiing and/or snowboarding during your most recent visit? \***

- Yes  
 No



Please indicate your level of agreement with each of the following statements. Then indicate how important that element of your backcountry recreation experience is to you.

	Agreement						Importance					
	Strongly Disagree		Strongly Agree		N/A	N/A	Not Important		Very Important		N/A	
	1	2	3	4			5	1	2	3		4
There are sufficient groomed trails designated for walking, dog-walking and jogging.	<input type="radio"/>											
There are sufficient groomed trails designated for cross-country skiing.	<input type="radio"/>											
There are sufficient groomed trails where over-snow biking is allowed.	<input type="radio"/>											
There is sufficient grooming of existing machine-groomed trails.	<input type="radio"/>											
Too much area is set aside exclusively for <b>non-motorized</b> access and use.	<input type="radio"/>											
Too much area is designated as <b>multi-use</b> where snowmobiles are allowed.	<input type="radio"/>											
Plowed parking areas for backcountry access are sufficient in size.	<input type="radio"/>											
Plowed parking areas for backcountry access are sufficient in number.	<input type="radio"/>											
Plowed parking areas for backcountry access are located in appropriate locations.	<input type="radio"/>											
Signage at trailheads and wilderness boundaries is sufficient in visibility and placement.	<input type="radio"/>											
National Forest staff <i>in the field</i> are sufficient in number and visibility.	<input type="radio"/>											
National Park Service staff <i>in the field</i> are sufficient in number and visibility.	<input type="radio"/>											

The **Teton Pass Ambassador program** is a partnership between Friends of Pathways and the Forest Service. Its goal is to communicate backcountry ethics, safety information, and reduce user conflict on Teton Pass. Please rate this program in terms of its **overall effectiveness in meeting this goal**.

- Poor
- Fair
- Good

- Excellent
- Undecided
- NA--I'm unaware of the Teton Pass Ambassador Program.

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**Answers to the following questions are vital for our statistical analysis. All data is CONFIDENTIAL and will only be used in aggregated form.**

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**How old are you?**

**What is your gender?**

- Female
- Male

**What is the income before taxes of your household? *This question is vital for our economic analysis. We very much appreciate your accurate answer, and we remind you that all of your answers are completely confidential.***

- Under \$24,999
- \$25,000 - \$49,999
- \$50,000 - \$99,999
- \$100,000 - \$199,999
- More than \$200,000

**Do you have any other Comments/Suggestions?**

## Survey: WinterRecRetailer

Hello:

The following survey is part of a study on the economic contribution of winter backcountry recreation to the Teton Region. Our goal is to measure the economic impact of winter backcountry recreation--largely nonmotorized--in the Teton Region.

Clearly the opportunities in this area for backcountry recreation generate substantial economic activity. And winter backcountry recreation in the area appears to be on the rise. It's important to have good data to inform management decisions that affect those lands. Reasonably good data exists for the economic contribution of groups such as fishermen, snowmachiners and hunters. To participate in those activities on public land, one has to buy a license or permit, leaving a database of contact information that can be used for mail-in or phone surveys. With no such requirement, backcountry skiers, nordic skiers, snowshoers, etc. are harder to contact, making it hard to collect data about their economic contribution.

This past winter, I've been working for Winter Wildlands Alliance in an effort to quantify the economic impact of winter backcountry recreation in the Teton Region, including walking/running on groomed trails, nordic skiing of all kinds, backcountry skiing, snowshoeing, fat tire biking, etc. We've defined the Teton Region to include communities in Teton County, Wyoming; Teton, Madison, Fremont and Bonneville Counties, Idaho; and the southern end of Gallatin County, Montana (West Yellowstone).

I've been randomly surveying backcountry users as they pass through various trailheads in the region in order to assess their backcountry activity and expenditures over the past year on backcountry related gear and services.

Over the next month, I'd like to survey retailers and commercial operations that offer winter backcountry guide services, avalanche education and wilderness travel instruction in the region. The data will provide a second viewpoint for the study and help corroborate the data gathered from the backcountry user survey. The final report will be publicly available through WWA. Or you can request it from me personally.

Your data is integral to the study. But your participation is completely voluntary. If you feel uncomfortable answering any questions, you can withdraw from the survey at any point.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Mark Newcomb at 307.413.9690 or by email at [marknewcomb11@gmail.com](mailto:marknewcomb11@gmail.com).

Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

Sincerely,

Mark

### Instructions:

For each category below, please indicate how much revenue your store earned over the course

of the 2012/2013 winter season (roughly October through March).

Each category has two options for entering the data as well as a comment box. The first option allows you to directly state the amount of top line sales within that category. Please enter it to the nearest \$100. If you would rather not divulge the actual amount, leave that box blank and continue to the next question that allows you to choose the appropriate range within which your sales figure lies. If none of the available ranges includes your amount, please use the "Other" option and enter the average (i.e., mean or center) value of the range that does include your value. For example, if under the "Skis and ski related hard goods" category, your top line sales are \$865,000 (above any of the ranges listed), enter 875,000 (without the dollar sign), indicating that your sales were in the range of \$850,000 to \$900,000. Use the comment box to make any special notes about your entry. For example, if something impacted your sales for that category so that they were well off your expected or typical sales for the season, please note that that was the case and indicate whether sales were above or below expectations (and, if you are willing, by how much).

We've included a brief list of key items we think should be within each category. If the way you track sales and inventory roughly match the category description, give or take a few items, that shouldn't matter. But if a category listed in the survey appears to have only a few items compared to your store's comparable category, or vice versa, use the comment box to give some idea what items are included or excluded. For example one store's ski hard goods category may strictly mean skis, boots, bindings, poles, while another's may include a much broader list of items that might be categorized as Accessories by other stores. If something like that is the case, use the comment box to mention that your definition of the ski category includes items from the accessories category (no need to list all the items). Some questions may require considerable interpretation on your part. Specifically, the questions that ask "roughly what percentage of (the above category) can be used in the backcountry?" are meant to get at a rough estimate of what percentage of overall gear sales *could* be used in the backcountry. I'll have to make some inferences to decide what percentage of those sales can be applied to backcountry recreation.

---

**All skis and ski related hard goods (skis, boots, bindings, poles) to nearest \$100 without dollar sign:**

**All skis and ski related hard goods (boots, bindings, poles) within a range:**

- \$100,000 - \$149,999
- \$150,000 - \$199,999
- \$200,000 - \$249,999
- \$250,000 - \$299,999
- \$300,000 - \$349,999
- \$350,000 - \$499,999
- \$500,000 - \$549,999
- Other: Average value of the \$50,000 increment within which your figure lies (without dollar sign):

**Roughly what percentage of the amount entered above is for gear that could be used for alpine touring? Enter non-decimal value without % sign.**

**Comments:**

**Snowshoes to nearest \$100 (without dollar sign). Leave blank if you don't sell any:**

**Snowshoes range:**

- Don't sell snowshoes
- \$1,000 - \$4,999
- \$5,000 - \$9,999
- \$10,000 - \$14,999
- \$15,000 - \$19,999
- \$20,000 - \$24,999
- \$25,000 - \$29,999
- \$30,000 - \$34,999
- Other: Average value of the \$5,000 increment within which your figure lies (without dollar sign):

**Comments:**

**Ski and backcountry ski/snowshoe related accessories (e.g., avalanche rescue gear: shovels, probes, avalanche beacons, avy lungs, float airbags; backpacks; skins; hydration systems) to nearest \$100 (without dollar sign):**

**Ski and backcountry ski/snowshoe related accessories (e.g., avalanche rescue gear: shovels, probes, avalanche beacons, avy lungs, float airbags; backpacks; skins; hydration systems) within a range:**

- \$15,000 - \$24,999
- \$25,000 - \$34,999
- \$35,000 - \$44,999
- \$45,000 - \$54,999
- \$55,000 - \$64,999
- \$65,000 - \$74,999
- \$75,000 - \$80,000
- Other: Average value of the \$5,000 increment within which your figure lies (without dollar sign):

**Comments:**

**All rentals, regardless of whether for backcountry use or not, to nearest \$100 (without dollar sign):**

**All rentals, regardless of whether for backcountry use or not, within a range:**

- \$50,000 - \$99,999
- \$100,000 - \$149,999
- \$150,000 - \$199,999
- \$200,000 - \$249,999
- \$250,000 - \$299,999
- \$300,000 - \$349,999
- \$350,000 - \$499,999
- Other: Average value of the \$50,000 increment within which your figure lies (without dollar sign):

**Do you rent Fat Tire bikes?**

- Yes
- No

---

**Roughly what percentage of your rental income comes from renting Fat Tire bikes (don't include % sign):**

**Comments:**

**All labor (mounting, tuning, repairs, etc.) to nearest \$100 (without dollar sign):**

**All labor (i.e., ski tuning/repair, mounting and related services):**

- \$5,000 - \$14,999
- \$15,000 - \$24,999
- \$25,000 - \$34,999
- \$35,000 - \$44,999
- \$45,000 - \$54,999
- \$55,000 - \$64,999

- \$65,000 - \$75,000
- Other: Average value of the \$50,000 increment within which your figure lies (without dollar sign):

**Comments:**

**All clothing (including hats, gloves and socks if not included a prior category) to nearest \$100 without dollar sign:**

**All clothing (including hats, gloves and socks if not included in a prior category) within a range:**

- \$100,000 - \$149,999
- \$150,000 - \$199,999
- \$200,000 - \$249,999
- \$250,000 - \$299,999
- \$300,000 - \$349,999
- \$350,000 - \$499,999
- \$500,000 - \$549,999
- Other: Average value of the \$50,000 increment within which your figure lies (without dollar sign):

**Comments:**

**Fat Tire bikes to nearest \$100 without dollar sign:**

**Fat Tire bikes range:**

- \$5,000 - \$7,499
- \$7,500 - \$9,999
- \$10,000 - \$12,499
- \$12,500 - \$14,999
- \$15,000 - \$17,499
- \$17,500 - \$19,999
- \$20,000 - \$22,499
- Other: Average value of the \$50,000 increment within which your figure lies (without dollar sign):

**Comments:**

[Empty rectangular box with a light blue border]



Hello,

The following survey is part of a study on the economic contribution of winter backcountry recreation to the Teton Region. Our goal is to measure the economic impact of winter backcountry recreation--largely nonmotorized--in the Teton Region.

Clearly the opportunities in this area for backcountry recreation generate substantial economic activity. And winter backcountry recreation in the area appears to be on the rise. It's important to have good data to inform management decisions that affect those lands. Reasonably good data exists for the economic contribution of groups such as fishermen, snowmachiners and hunters. To participate in those activities on public land, one has to buy a license or permit, leaving a database of contact information that can be used for mail-in or phone surveys. With no such requirement, backcountry skiers, nordic skiers, snowshoers, etc. are harder to contact, making it hard to collect data about their economic contribution.

This past winter, I've been working for Winter Wildlands Alliance in an effort to quantify the economic impact of winter backcountry recreation in the Teton Region, including walking/running on groomed trails, nordic skiing of all kinds, backcountry skiing, snowshoeing, fat tire biking, etc. We've defined the Teton Region to include communities in Teton County, Wyoming; Teton, Madison, Fremont and Bonneville Counties, Idaho; and the southern end of Gallatin County, Montana (West Yellowstone).

I've been randomly surveying backcountry users as they pass through various trailheads in the region in order to assess their backcountry activity and expenditures over the past year on backcountry related gear and services.

Over the next month, I'd like to survey retailers and commercial operations that offer winter backcountry guide services, avalanche education and wilderness travel instruction in the region. The data will provide a second viewpoint for the study and help corroborate the data gathered from the backcountry user survey. The final report will be publicly available through WWA. Or you can request it from me personally.

Your data is integral to the study. But your participation is completely voluntary. If you feel uncomfortable answering any questions, you can withdraw from the survey at any point.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Mark Newcomb at 307.413.9690 or by email at marknewcomb11@gmail.com.

Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

Sincerely,

Mark

---

**Would you be willing to all your company's name to be used in the final report so long as it was only linked with the aggregated data (e.g. Companies that offer guided backcountry ski tours include xxxx, xxx and xxxx. In total they generated \$yyyy of total economic activity related to guided backcountry activities.)?**

- Yes
- No

**Which of the following services do you offer (Select all that apply)? \***

- Guided alpine touring (backcountry skiing/snowboarding in alpine terrain)
- Guided cross-country skiing (in non-alpine terrain)
- Guided snowshoe and walking tours

- Guided fat tire bike tours
  - Guided winter mountaineering and ice climbing (including instruction)
  - Outdoor leadership instruction involving backcountry travel
  - Avalanche education
  - Gear rental
  - All other winter backcountry commercial operations (short list):
- 

**If willing, please enter gross receipts for guided alpine touring (backcountry skiing/snowboarding in alpine terrain) earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for guided cross-country skiing earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for guided snowshoe and walking tours earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for guided fat tire bike tours earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for guided mountaineering and ice climbing (including instruction) earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for outdoor leadership instruction involving backcountry travel earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for avalanche education earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for gear rental earned in the Teton Region for the 2012/2013 season (nearest \$100): [XTR](#)**

**If willing, please enter gross receipts for all other winter backcountry commercial operations earned in the Teton Region for the 2012/2013 season (nearest \$100):**

---

**If willing, please enter the number of user days you recorded for guided alpine touring (backcountry skiing/snowboarding in alpine terrain) in the Teton Region during the 2012/2013 winter season: [XTR](#)**

**If willing, please enter the number of user days you recorded for guided cross-country skiing (in non-alpine terrain) in the Teton Region during the 2012/2013 winter season: [XTR](#)**

**If willing, please enter the number of user days you recorded for guided snowshoe and walking tours in the Teton Region during the 2012/2013 winter season: [XTR](#)**

**If willing, please enter the number of user days you recorded for guided fat tire bike tours in the Teton Region during the 2012/2013 winter season: [XTR](#)**

**If willing, please enter the number of user days you recorded for guided mountaineering and ice climbing (including instruction) in the Teton Region during the 2012/2013 winter season: [XTR](#)**

If willing, please enter the number of user days you recorded for outdoor leadership instruction involving backcountry travel in the Teton Region during the 2012/2013 winter season: XTR

If willing, please enter the number of user days you recorded for avalanche education in the Teton Region during the 2012/2013 winter season: XTR

If willing, please enter the number of user days you recorded for all other backcountry activities in the Teton Region during the 2012/2013 winter season: XTR

Please choose the dollar range within which your gross receipts from each activity fall. These amounts should be dollars earned strictly within the Teton Region and during the 2012/2013 winter season.

	100 to 9,999	10,000 to 29,999	30,000 to 39,999	40,000 to 49,999	50,000 to 69,999	70,000 to 89,999	90,000 to 109,999	110,000 to 149,999	150,000 to 174,999	175,000 to 200,000
Guided alpine touring (backcountry skiing/snowboarding in alpine terrain) <u>XTR</u>	<input type="radio"/>									
Guided cross-country skiing (in non-alpine terrain) <u>XTR</u>	<input type="radio"/>									
Guided snowshoe and walking tours <u>XTR</u>	<input type="radio"/>									
Guided fat tire bike tours <u>XTR</u>	<input type="radio"/>									
Guided winter mountaineering and ice climbing (including instruction) <u>XTR</u>	<input type="radio"/>									
Outdoor leadership instruction involving backcountry travel <u>XTR</u>	<input type="radio"/>									
Avalanche education <u>XTR</u>	<input type="radio"/>									
Gear rental <u>XTR</u>	<input type="radio"/>									
All other backcountry operations:	<input type="radio"/>									

# Bibliography

NVUM Count Data. Personal correspondence, December, 2012 - July, 2013 .

SIA Releases August - January RetailTrak<sup>TM</sup> Data, 2013. URL <http://www.snowsports.org/blog/index.php/tag/sia-research/>.

D. Mark Anderson. Estimating the Economic Value of Ice Climbing in Hyalite Canyon: An Application of Travel Cost Count Data Models that Account for Excess Zeros. *Journal of Environmental Management*, 91:1012–1020, 2010.

BTNF and CTNF Staff. Personal Correspondence with USDA Forest Service Staff. Personal correspondence, November 2012.

BTNF NVUM Results. Bridger-Teton National Forest National Visitor Use Monitoring Results. Downloaded from: [http://www.fs.fed.us/recreation/programs/nvum/2009/BridgerTeton\\_FY2008.pdf](http://www.fs.fed.us/recreation/programs/nvum/2009/BridgerTeton_FY2008.pdf), February 2009.

Jessica M. Clement and Antony S. Cheng. Report: Study of Preferences and Values on the Bridger Teton National Forest. Downloaded from: [https://fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsbdev3\\_063287.pdf](https://fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_063287.pdf), 2008.

Cordell, H. Ken, Project Leader. Internet Research Information Service Recreational Trends. Downloaded from: <http://warnell.forestry.uga.edu/nrrt/nsre/IRISRec/IRISRec23rpt.pdf>, January 2012.

CTNF NVUM Results. Visitor Use Report; Caribou-Targhee NF, FY 2010. Downloaded from: [http://apps.fs.usda.gov/nrm/nvum/results/ReportCache/Rnd3\\_A04015\\_Master\\_Report.pdf](http://apps.fs.usda.gov/nrm/nvum/results/ReportCache/Rnd3_A04015_Master_Report.pdf), May 2010.

Dean Runyan Associates. Wyoming Travel Impacts; 1998 - 2011. Downloaded from: [http://www.deanrunyan.com/doc\\_library/WYSt11p.pdf](http://www.deanrunyan.com/doc_library/WYSt11p.pdf), May 2012.

Moira Dow. Yellowstone Ski Festival Numbers, 2012. Personal correspondence, May 2013.

- Donald B.K. English, Susan M. Kocis, Stanley J. Zarnoch, and J. Ross Arnold. Forest Service National Visitor Use Monitoring Process: Research Method Documentation. Downloaded from: [http://srnr.arizona.edu/gimblett/gtr\\_srs057.pdf](http://srnr.arizona.edu/gimblett/gtr_srs057.pdf), July 2002.
- GNF Staff. Rendezvous Ski Trails Totals. Personal correspondence, May 2013.
- GTNP Staff. Grand Teton National Park Trail Count Data, 2012/2013. Personal Correspondence with GTNP Staff, May 2013a.
- GTNP Staff. Grand Teton National Park Winter Concessionaire Activity. Personal Correspondence with GTNP Staff, May 2013b.
- JHMG. Jackson Hole Mountain Guides Private Backcountry Ski Clinic. Viewed at <http://www.jhmg.com/backcountry-skiing-snowboarding.html>.
- Nadia Kaliszewski. Jackson Hole Trails Economic Impact. Downloaded from: [www.friendsofpathways.org/assets/291/kaliszewski\\_JHTP\\_final-1.pdf](http://www.friendsofpathways.org/assets/291/kaliszewski_JHTP_final-1.pdf), August 2012.
- Phil Leeds. Phil Leeds, Co-owner Skinny Skis. Personal correspondence, May 2013.
- John Loomis. The Economic Value of Recreational Fishing & Boating to Visitors & Communities along the Upper Snake River. Downloaded from: <http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/Final%20Loomis%20%20HFF%20TU%20SR%20Full%20Report%205-02-05.pdf>, May 2005.
- Ian A. Munn, Anwar Hussain, Stan Spurlock, and James E. Henderson. Economic Impact of Fishing, Hunting and Wildlife-Associated Recreation Expenditures on the Southeast U.S. Regional Economy: An Input-Output Analysis. *Human Dimensions of Wildlife*, 15:433–449, 2010.
- Amy M. Nagler, Christopher T. Bastian, David T. Taylor, and Thomas K. Foulke. 2011-2012 Wyoming Comprehensive Snowmobile Recreation Report. Downloaded from: [http://www.snowmobileinfo.org/snowmobile-access-docs/Wyoming-Comprehensive-Snowmobile-Recreation-Report\\_2012.pdf](http://www.snowmobileinfo.org/snowmobile-access-docs/Wyoming-Comprehensive-Snowmobile-Recreation-Report_2012.pdf), October 2012.
- NPS Stats. Grand Teton National Park Public Use Reporting and Counting Instructions. Linked to from: <https://irma.nps.gov/Stats/Reports/ReportList?id=GRTE>, 2005.
- NPS Stats. GRTE Monthly Public Use. Linked to from: <https://irma.nps.gov/Stats/Reports/ReportList>, Last viewed: July 2013a.
- NPS Stats. Recreation Visitors Grand Teton NP. Linked to from: <https://irma.nps.gov/Stats/Reports/ReportList>, Last viewed: July 2013b.
- NVUM. National Visitor Use Monitoring Program. <http://www.fs.fed.us/recreation/programs/nvum/>.

NVUM Handbook. National Visitor Use Monitoring Handbook. Downloaded from: <http://www.fs.fed.us/recreation/programs/nvum/reference/index.shtml>, July 2007.

Daniel Otto. The Economic Importance of Snowmobiling in Iowa. Downloaded from: <http://www.econ.iastate.edu/sites/default/files/publications/papers/p12391-2011-01-22.pdf>, 2011.

Outdoor Industry Association. The Outdoor Recreation Economy: Wyoming. Downloaded from: [http://www.outdoorindustry.org/images/ore\\_reports/WY-wyoming-outdoorrecreationeconomy-oia.pdf](http://www.outdoorindustry.org/images/ore_reports/WY-wyoming-outdoorrecreationeconomy-oia.pdf), February 2013.

PAC. 2013 Participation Report. Downloaded from: [http://www.physicalactivitycouncil.com/PDFs/2013\\_PAC\\_Overview\\_Report\\_Final.pdf](http://www.physicalactivitycouncil.com/PDFs/2013_PAC_Overview_Report_Final.pdf), March 2013.

Michael Pearlman. Can there be peace on the pass. Downloaded from: [http://www.jhnewsandguide.com/article.php?art\\_id=2656](http://www.jhnewsandguide.com/article.php?art_id=2656), January 2008.

Jay Pistono. Pistono. Personal correspondence, 2013.

Noah Pollock. Economic impact assessment of paddler recreation in the Adirondacks; A summary report. Downloaded from: <http://www.uvm.edu/~snrvtdc/NFCT/NFCTAdirondackSummaryReport.pdf>, September 2007.

Rendezvous Ski Trails. Cross-Country Skiing on the Rendezvous Ski Trails, West Yellowstone, MT. Viewed at <http://www.xcskiresorts.com/xcMTRendez.php>, December 2012.

Robert Wood Johnson Foundation. County Health Rankings & Roadmaps. Downloaded from: [http://www.countyhealthrankings.org/app/wyoming/2013/teton/county/outcomes/overall/snapshot\\_rank](http://www.countyhealthrankings.org/app/wyoming/2013/teton/county/outcomes/overall/snapshot_rank), April 2013.

Doug Schnitzpahn. Backcountry Ski Teton Pass, Wyoming. On line: <http://adventure.nationalgeographic.com/adventure/trips/americas-best-adventures/ski-teton-pass/>, January 2012.

Ryan Schuster. Bradley-Taggart Trailhead Counts. Personal Correspondence with GTNP Staff, May 2013.

SGMA. 2012 Sports, Fitness and Leisure Activities Topline Participation Report. Downloaded from: [http://assets.usta.com/assets/1/15/SGMA\\_Research\\_2012\\_Participation\\_Topline\\_Report.pdf](http://assets.usta.com/assets/1/15/SGMA_Research_2012_Participation_Topline_Report.pdf), 2012.

SIA. SIA Releases 2012 Participation Report, 2013. URL <http://www.snowsports.com>.

[org/SuppliersServiceProviders/Resources/PressReleases/SIAPressReleases/PressReleaseDetail/contentid/2029.](http://www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf)

- Ray Spencer. BTNF: Region 4 Resort Skier Visits. Personal correspondence, July 2013.
- Daniel Stynes. Economic Impacts of Tourism. Downloaded from: <https://www.msu.edu/course/prr/840/econimpact/pdf/ecimpvol1.pdf>, October 2000.
- Daniel J. Stynes and Eric M. White. Spending Profiles of National Forest Visitors, NVUM Four Year Report. Downloaded from: <http://www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf>, May 2005.
- Daniel J. Stynes and Eric M. White. Spending Profiles for National Forest Recreation Visitors by Activity. Downloaded from: [http://www.fs.fed.us/recreation/programs/nvum/spending\\_profiles\\_2006.pdf](http://www.fs.fed.us/recreation/programs/nvum/spending_profiles_2006.pdf), February 2006.
- David T. Taylor, Amy Nagler, Christopher T. Bastian, and Thomas K. Foulke. The Economic Impact of Non-motorized Trail Usage on national Forests in Wyoming. Personal Correspondence: Tim Young of Wyoming Pathways, June 2013.
- Trout Unlimited. The Economic Value of Healthy Fisheries in Wyoming. Downloaded from: [http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/Ecomonics.Fisheries\\_WY.pdf](http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/Ecomonics.Fisheries_WY.pdf), 2005.
- United States Census Bureau. United States Census Bureau; State & County QuickFacts. Viewed at: <http://quickfacts.census.gov/>, September 2013.
- University of Oregon. Dealing with ‘Outliers’: Maintain Your Data’s Integrity. Downloaded from: <http://rfd.uoregon.edu/files/rfd/StatisticalResources/outl.txt>, 2013.
- U.S. Census. Census County and Zipcode Business Patterns. Viewed at: <http://www.census.gov/econ/cbp/>, March 2012.
- U.S. Fish and Wildlife Service. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Downloaded from: [www.census.gov/prod/2008pubs/fhw06-nat.pdf](http://www.census.gov/prod/2008pubs/fhw06-nat.pdf), September 2006.
- USDA National Forest Service NVUM Non-Proxy Results. NVUM: Non-Proxy Results by Survey Day. Downloaded from: <http://apps.fs.usda.gov/nrm/nvum/results/>, 2013.
- West Yellowstone Ski Festival. West Yellowstone Ski Festival. Viewed at: <http://www.yellowstoneskifestival.com/>, 2013.
- Eric M. White and Daniel J. Stynes. Spending Profiles of National Forest Visitors, NVUM Round 2 Update. Downloaded from:

[http://www.fsl.orst.edu/lulcd/Publicationsalpha\\_files/White\\_Stynes\\_NVUM2010a.pdf](http://www.fsl.orst.edu/lulcd/Publicationsalpha_files/White_Stynes_NVUM2010a.pdf),  
March 2010.

Yellowstone Ski Festival Results. Ski Festival Race Results, 2012. Downloaded from:  
<http://www.yellowstoneskifestival.com/results/>, November 2012.