



Oregon Off-highway Vehicle (OHV) Participation and Priorities

Report in support of the 2015-2024 Oregon Trails Plan

Conducted by Oregon State University for the Oregon Parks and
Recreation Department

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Executive Summary

In preparation for the 2015-2024 Oregon Trails Plan, the Oregon Parks and Recreation Department contracted with Oregon State University to conduct surveys of Oregon residents regarding their participation in four categories of trail-related recreation: non-motorized trail, non-motorized boat, motorized (ATV / OHV), and snowmobile recreation. Each survey was designed to elicit information on current use patterns (amount, location, and type of use), user experiences and preferences, and the economic contribution of the recreation activity. This report provides the results of the OHV survey component, which covered recreational riding on public lands.

The project involved both probability and convenience samples. The probability main sample was designed to be as representative as possible of Oregon resident OHV riders. It was drawn at random from the list of all persons with off-highway vehicles (OHVs / ATVs) registered with OPRD. Results from this sample are the main focus of this report.

The probability main sample was complemented by a probability training sample, using a random sample of Class I and Class III safety education card holders, both Oregon resident and out-of-state. Though this was a probability sample, it only represented persons who ride Class I and III vehicles, and the survey was available only online. There also was an online convenience sample. For the convenience sample, 62 OHV clubs (user groups) in Oregon were contacted and asked to encourage survey participation via e-newsletters, Facebook posts, and other avenues.

The probability sample response rate of 25% was comprised of 21% engaging in OHV use in the past year (2,139 respondents) and 4% not engaging. Data were weighted based on age and region of residence.

With respect to demographics, 89% of respondents were male and 11% female, but there was a more even balance when other OHV riders in the household were included (62% male and 38% female). The average age of respondents was 41 years old. With other household OHV riders included, the average age was 33 years old. OHV riders tend to have a higher income level than Oregonians as a whole.

One-sixth (17%) of respondents belonged to an OHV organization or club. On average, respondent households own 1.44 Class I vehicles, 0.89 Class II vehicles, 1.01 Class III vehicles, and 0.22 Class IV vehicles.

Almost all respondents (96%) took at least one day trip and 86% took at least one multi-day trip in the previous 12 months. Three-quarters (75%) of the “typical” day trips were within 60 miles of home while 67% of the multi-day trips were further than 60 miles from home.

With outliers excluded, the average number of persons per travel party was 3.5 for day trips and 3.9 for multi-day trips. The median multi-day trip was 3 days long, with 13% of respondents having typical multi-day trips of 10 or more days. More respondents have increased the number of their day and multi-day trips in the past five years, relative to those that have decreased the number of trips.

OHV riders engaged in a variety of activities while on OHV riding trips, with exploring the town (46%) and watching wildlife (45%) being mentioned most. RV / tent camping in dispersed areas was the most common form of lodging on multi-day trips (41%), followed by RV / camper in campgrounds (38%).

On average, respondents rode their OHV 34 days in the past year. Winchester Bay was the area ridden the most (4.4 days on average), with the top three sites being in the Oregon Dunes National Recreation Area. There was some variation by class of OHV ridden most, with Tillamook State Forest being the site most visited by Class III riders.

Based on the 2015 fuel consumption report and the OPRD database of permits, in 2014 there were an estimated 3.1 million OHV riding days in Oregon by Oregon residents. Region 5, which contains the Oregon Dunes NRA, represented 34% of the riding days.

Respondents reported the class of vehicle they most often use when riding in 1) the 48 designated riding areas and 2) other areas, such as dirt roads on public land. In designated riding areas, 42% of respondents most often rode Class I vehicles, 17% Class II, 32% Class III, and 9% class IV. In other areas, 34% of respondents most often rode Class I vehicles, 26% Class II, 29% Class III, and 11% class IV.

Respondents also evaluated change in the availability of riding opportunities in the past 10 years, with 39% indicating a decrease in opportunities in designated riding areas and 24% an increase. For other areas, 62% reported a decrease and 7% an increase.

Respondents reported one-way driving distance traveled from home to their “most often visited” site. The John Day Area site was the site most distant from respondent homes, with OHV riders traveling an average of 227 miles to the site.

Direct access to riding areas was the most important consideration in deciding where to ride, with 77% of respondents rating it as somewhat or very important, followed by availability of bathrooms (60%). Maintaining trails in good condition was the highest priority for funding (56% rated it somewhat or very important), followed by provision of trails maps and information (52%).

When choosing between prioritizing purchasing of land to add new riding areas versus improving existing areas, 39% strongly prioritized adding new areas while 13% strongly prioritized improving existing areas. More than a third (37%) prioritized all OHV classes equally when developing new areas, with smaller percentages prioritizing each of the four classes individually.

With respect to problems on OHV trails, 60% reported that trail closure was a moderate or serious problem, followed by 54% for closure of logging roads.

Amongst respondents completing the survey online, 64% indicated they were very or somewhat satisfied with OHV trail opportunities in Oregon, with 24% indicating they were very or somewhat dissatisfied.

With respect to increasing the 2-year permit fee from \$10 to \$15 in order to expand funding for facilities and opportunities, 60% indicated they strongly or somewhat supported the increase and 25% indicated they somewhat or strongly opposed it.

On a per-trip basis, Oregon resident OHV riders spent more than OHV riders across all national forests in the country, perhaps due in part to more riders in each travel party and more nights per trip. Spending by Oregon residents on OHV riding trips (local and distant, day and multi-day) was an estimated \$100 million per year across the state. In turn, this expenditure contributed 869 jobs, \$35 million in value added, and \$23 million in labor income. When out-of-state visitors are included, the estimated amounts increase to 1,120 jobs, \$45 million in value added, and \$29 million in labor income.

1. Introduction

1.1. Background

In preparation for the 2015-2024 Oregon Trails Plan, the Oregon Parks and Recreation Department (OPRD, Oregon State Parks) contracted with Oregon State University (OSU) to conduct surveys of Oregon residents regarding their participation in four categories of trail-related recreation: non-motorized trail, non-motorized boat, motorized (OHV / ATV), and snowmobile recreation. Each survey was designed to elicit information on current use patterns (amount, location, and type of use), user experiences and preferences, and the economic contribution of the recreation activity. This report provides the results of the off-highway vehicle (OHV) survey component, which was focused on recreational OHV riding on public lands.

The OHV survey covered the four classes of OHV / ATV vehicles:

- Class I, quads and three-wheel ATVs.
- Class II, dune buggies, and rails, 4x4 vehicles, and side-by-sides greater than 65 inches in width.
- Class III, off-road motorcycles.
- Class IV, side-by-sides 65 inches or less in width.

1.2. Data presentation

The results for all questions are presented at the statewide level for the four classes of vehicles combined. Results for many questions are presented also by region (in Appendix 1; see Figure 1.1 and Appendix 5 for region boundaries) and by class. Many OHV riders own vehicles across more than one class, so the “by class” results are based on the type of vehicle used most often when riding on public lands in Oregon in the past 12 months (Q3). That question was not in all versions of the survey. In addition, some respondents reported different classes for “in the 48 designated riding areas” versus “in other areas or routes.” Those observations are treated as missing values; they are included in the statewide (all combined) results, but not within results for specific classes.

For ease of reading, numbers are rounded in this report; this may lead to some percentages not totaling 100. All averages in this report are means rather than medians. There are “missing values” for many variables. For example, some people did not answer the income question. Percentages shown in this report are “valid percentages” unless otherwise noted; valid percentages adjust for missing values and total 100.

Exclusion of missing values also leads to discrepancies. For example, there were 2,139 completes in the probability sample (Table 1.1), but only 2,127 with an identifiable region – from self-report or mailing address. Table 1.2 only includes the latter respondents.

The mail (paper) version of the questionnaire is included in Appendix 4. In presenting results, reference is made to question numbers in the paper version (e.g., Q7). Note that there were two slightly different versions of the mail version. Appendix 4 contains Version 1. The three questions that appeared only in Version 2 are appended to the end of the Version 1 survey and are referred to in the body of the report as “Version 2, Q...”.

1.3. Survey methodology

The probability main sample was designed to be as representative as possible of Oregon resident OHV riders. It was drawn at random from the list of all persons with off-highway vehicles (OHVs /

ATVs) registered with OPRD.¹ Results from this sample are the main focus of this report; the sample is referred to as “probability.”

The probability main sample was complemented by a probability training sample. All riders of Class I and Class III vehicles must possess a safety education card.² A random sample of card holders, both Oregon resident and out-of-state, was contacted by email and invited to complete the survey online. Though this is a probability sample, it only represents persons who ride Class I and III vehicles, and the survey was available only online. Thus, results from this sample were analyzed separately from those of the probability main sample; this sample is referred to as “training.”

The probability main sample also was complemented by an online convenience sample. For the convenience sample, 62 OHV clubs (user groups) in Oregon were contacted and asked to encourage survey participation via e-newsletters, Facebook posts, and other avenues. Results from this sample also were analyzed separately; the sample is referred to as “convenience.”

Persons in the probability sample could complete the questionnaire in either online or mail (paper) format. Each person in the probability sample was sent the following correspondence:

- A “pre-letter” from OPRD explaining the reason for the questionnaire and encouraging participation.
- An invitation letter from OSU, with the URL for the online questionnaire and a postage-paid reply postcard for those preferring to complete the questionnaire in traditional paper format. Paper questionnaires were sent to those returning the postcard.
- A reminder letter and reply postcard from OSU, sent to persons who had not completed the online questionnaire or returned the postcard within approximately one week.
- A reminder letter from OSU, with the URL for the online questionnaire, as well as a copy of the paper questionnaire and postage-paid reply envelope, sent to persons who had not completed the questionnaire within approximately three weeks.

For households with more than one adult OHV rider, the invitation letter requested that the adult OHV rider with the most recent birthday complete the questionnaire.

The questionnaire was developed in collaboration with OPRD and the project planning advisory committee.³ In addition, it was revised based on results from a pre-test administration that involved the same procedure as the main administration.

Response rates are shown in Table 1.1 below. The probability sample response rate of 25% (21% + 4%) is lower than for recent OHV surveys in Oregon. However, it is typical by current survey standards, especially given its length; the median completion time for the online probability survey was 23 minutes.

¹ <http://www.oregon.gov/oprd/atv/pages/permits.aspx>

² <http://www.oregon.gov/oprd/ATV/Pages/safety.aspx>

³ The advisory committee included: Tim Custer (ATVAC member at large), Steve Doane (Class III rep ATVAC), Randy Drake (PNW4WDA Exec Director), Barret Brown (OMRA), Tyrell Hart (MRA), Ed Ariniello (OMRA), Rob Thorton (Lakeview), Tom Harris (Four Runners 4wd club), Steven McIntyre (MRA), Henry Buckalew (Hood River County & class III rider), Ron Grace (Ochoco Trail Riders), Fred Way (USFS), Chuck Frayer (USFS), Rolando Mendez (BLM), Jahmaal Rebb (ODF), Larry Robinson (Coos County).

Table 1.1. Response rates				
	Probability	Training		Convenience
		In-state	Out-of-state	
Initial sample	10,297	8,000	8,000	
Eligible (sample less undeliverables)	10,084	7,104	7,309	
Responded, did not ride in past 12 months	430	133	97	288
Percent of eligible	4%	2%	1%	
Responded, rode in past 12 months	2,139	780	558	341
Percent of eligible	21%	11%	8%	

For the probability sample, 65% of the questionnaires were completed online and 35% in paper format.

Figure 1.1 shows the planning regions across the state, and Table 1.2 shows the number of respondents by region. Table 1.2 reflects respondents who rode OHVs in the past 12 months and whose region of residence could be identified.

Figure 1.1. Map of planning regions

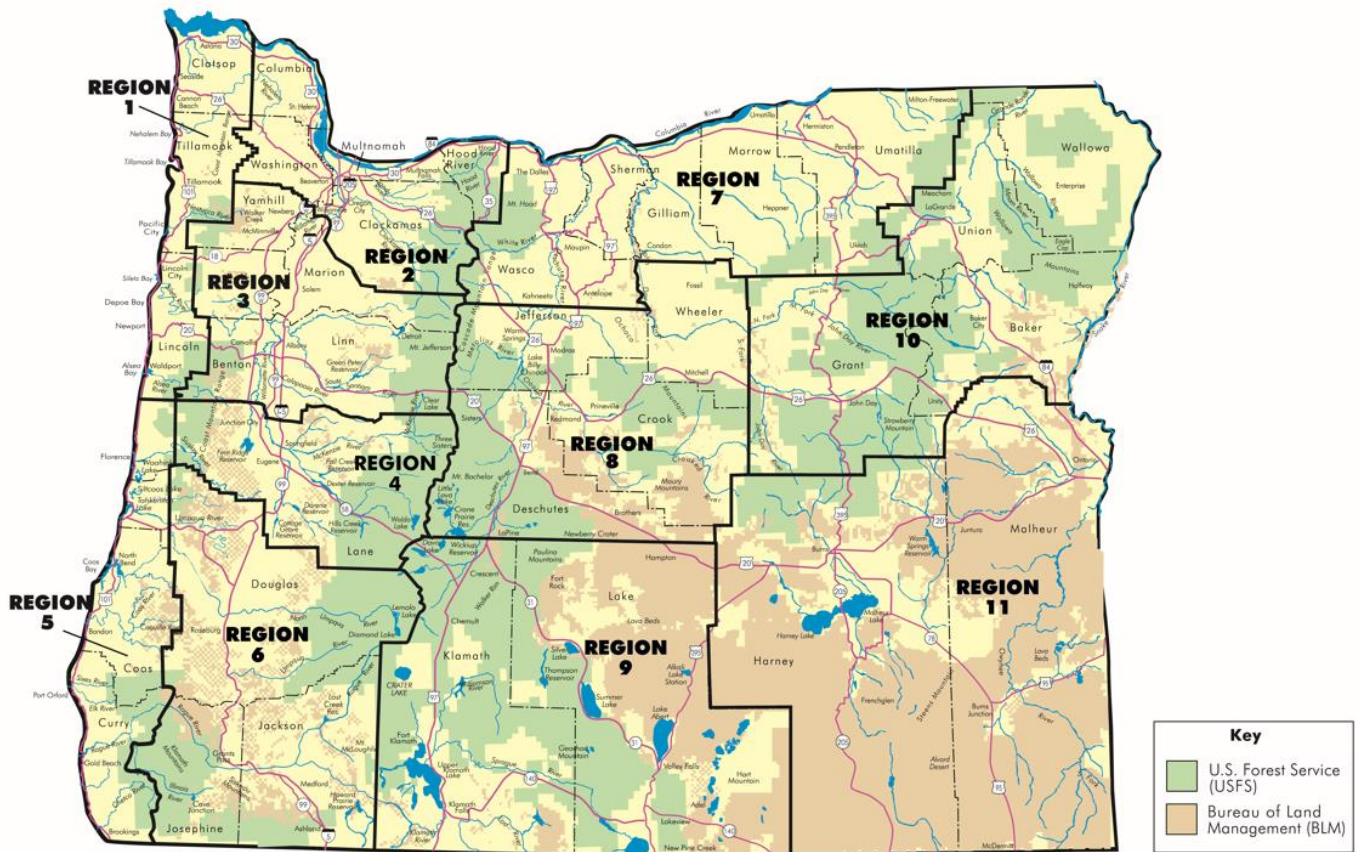


Table 1.2. Number of respondents who rode OHVs in the past year, by region		
Region	Probability	Percent of statewide probability sample
1	162	8
2	216	10
3	223	11
4	231	11
5	137	6
6	205	10
7	181	9
8	190	9
9	194	9
10	216	10
11	172	8
Statewide total	2,127	

1.4. Maximizing data accuracy

The goal of surveys such as this one is to use a sample (limited number of respondents) to obtain information on the population (everyone of interest, in this case all resident OHV riders in Oregon). Because only a portion of the population is sent a questionnaire, and not all recipients complete the questionnaire, this type of data collection is susceptible to various sources of error.

This survey administration addressed the four main potential sources of error in the following ways:

- Coverage error was addressed through the use of the OPRD registration list sampling frame.
- Sampling error was addressed through a large sample size.
- Measurement error was addressed through an extensive questionnaire development and review process.
- Non-response error was addressed by maximizing response rates via multiple mailings, as well as identifying and correcting for potential non-response error via weighting.

Non-response error arises when those who complete the questionnaire (respondents) differ from those who do not (non-respondents) on a variable of interest. Sample data were weighted by age and region. OPRD does not record age in the OHV permit registration process, so the reference point was the age distribution of OHV riders (all classes combined) from the 2011 survey conducted for the 2013-2017 Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP).

The OPRD registration list was used as the reference for the regional distribution. This list was “cleaned” by removing persons with a mailing address outside Oregon. Duplicate entries per household were removed using zip code and street address within the Excel Remove Duplicates function. The age-weighted region distribution in the current trail sample was then further weighted to correspond to the region distribution of OHV households in the OPRD registration list.

The list of survey recipients involved oversampling of rural regions and OHV classes other than Class I, in order to obtain sufficient data to present results by region and class. The above regional weighting corrects for the oversampling by region. Responses to “which class of vehicle did you use most often while riding in designated areas and other areas” (survey question 3) indicated the sample did not match statewide ownership patterns by class, with Class IV being overrepresented in the data. Weighting by class was not used given the lack of Q3 data for many respondents, the complexity of weighting on more than two variables (including issues of small cell sizes), and because results are presented by class.

A non-response check was conducted via phone calls to a sample of persons who did not complete the survey, though such checks themselves are susceptible to error given the difficulty of reaching persons by phone. The check suggests that survey respondents were more likely to have ridden OHVs in the past 12 months than were survey non-respondents, though the average number of days riding among respondents (34 days, as shown in Table 2.1) is quite close to the average among non-respondents based on the phone check (35 days).

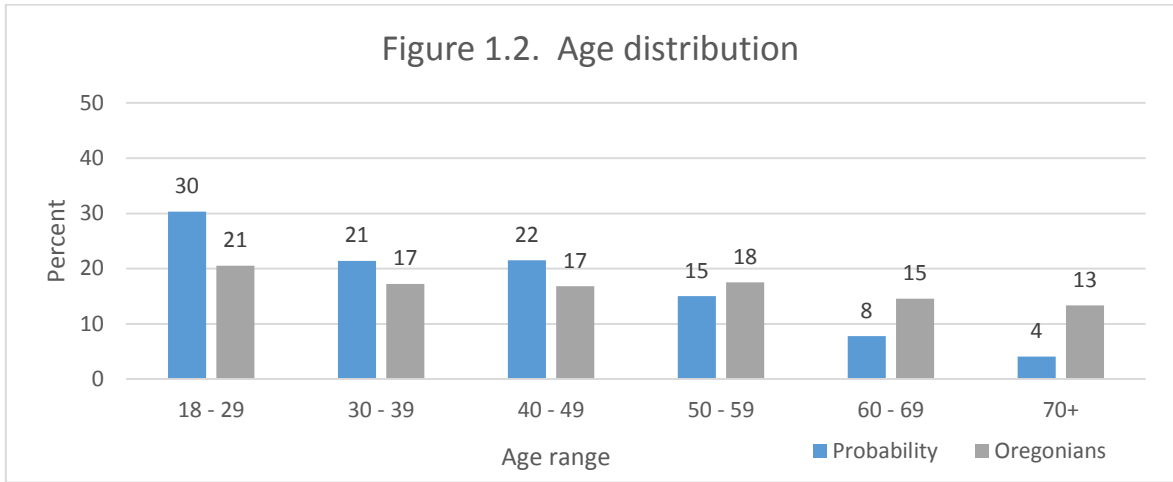
Combined, the weighting used here helps adjust for variable sampling intensity and potential non-response error, notably due to low response rates for younger OHV riders. Nonetheless, the potential for some error is inevitable in survey research.

1.5. Demographics and OHV ownership

This section presents demographic results from the OHV survey probability sample. Within that sample, 89% of respondents were male and 11% female. Respondents also reported the gender and age of additional OHV riders in the household. When these additional OHV riders are accounted for, the distribution was more equally balanced (Table 1.3). Across all listed OHV riders, 62% were male and 38% female. Note that the number of observations decreased as one moved from respondent to 6th OHV rider (i.e., there are fewer households with 6 OHV riders than with 1 or 2 OHV riders).

	Male	Female
Respondent	89	11
2nd OHV rider	37	63
3rd OHV rider	58	42
4th OHV rider	50	50
5th OHV rider	58	42
6th OHV rider	49	51
Total	62	38

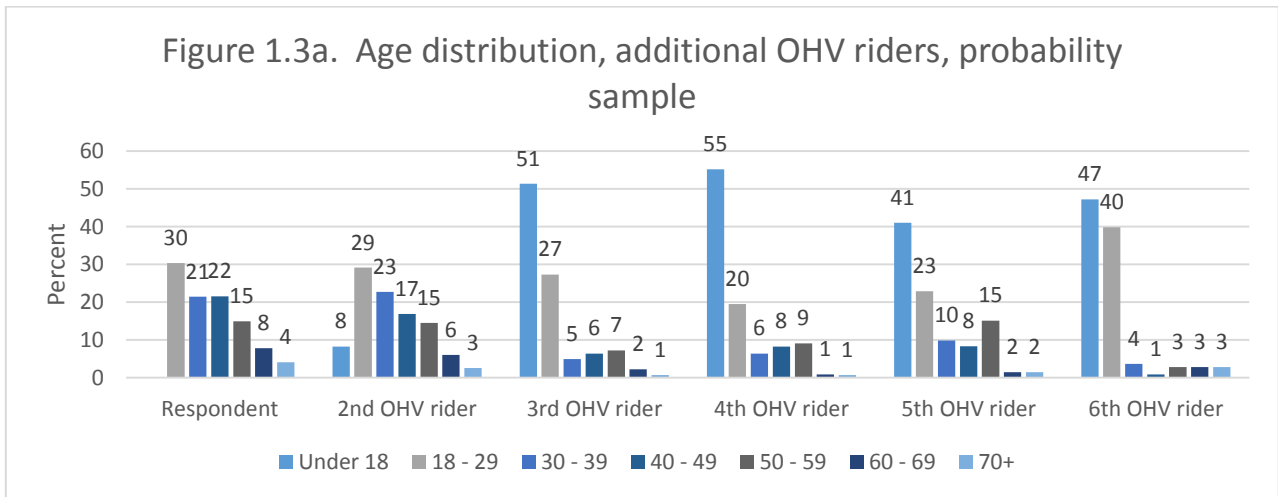
Figure 1.2 shows the age distribution for respondents and for all adult Oregonians. OHV riders tend to be younger than the Oregon population as a whole.



As with gender, respondents reported the ages of additional OHV riders in the household. As shown in Table 1.4, the age of additional OHV riders is lower than that of the respondent. The average age across all OHV riders was 33.

	Mean age
Respondent	41
2nd OHV rider	37
3rd OHV rider	22
4th OHV rider	22
5th OHV rider	26
6th OHV rider	21
Total	33

Evaluation of the full distributions suggests that the "2nd OHV rider" typically was an additional adult, whereas the 3rd or higher OHV riders often were children (Figure 1.3a). Figure 1.3b shows the combined age distribution across all OHV riders in households.



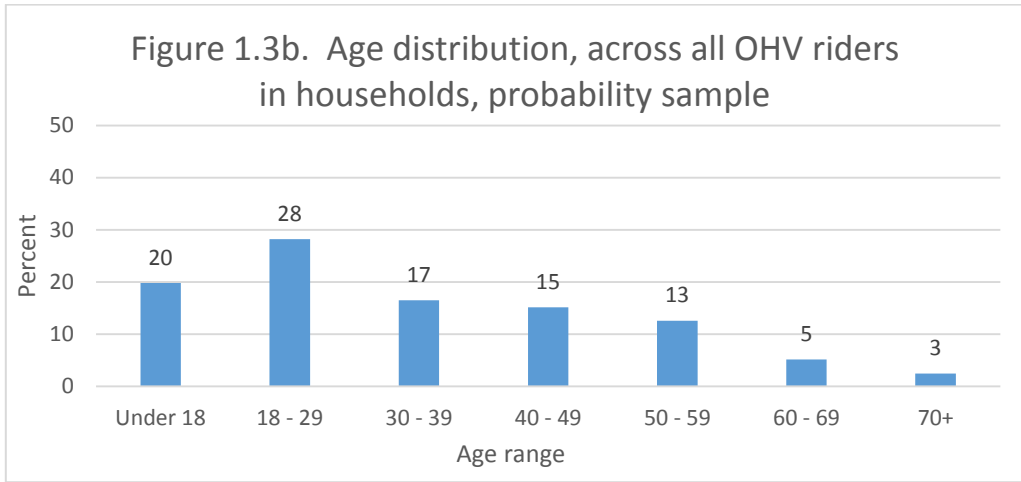
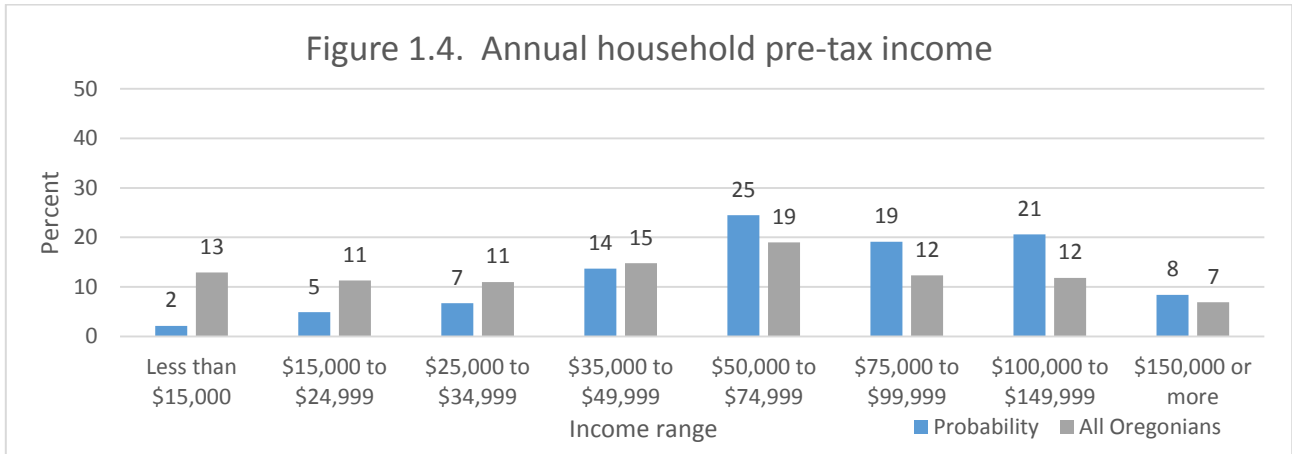


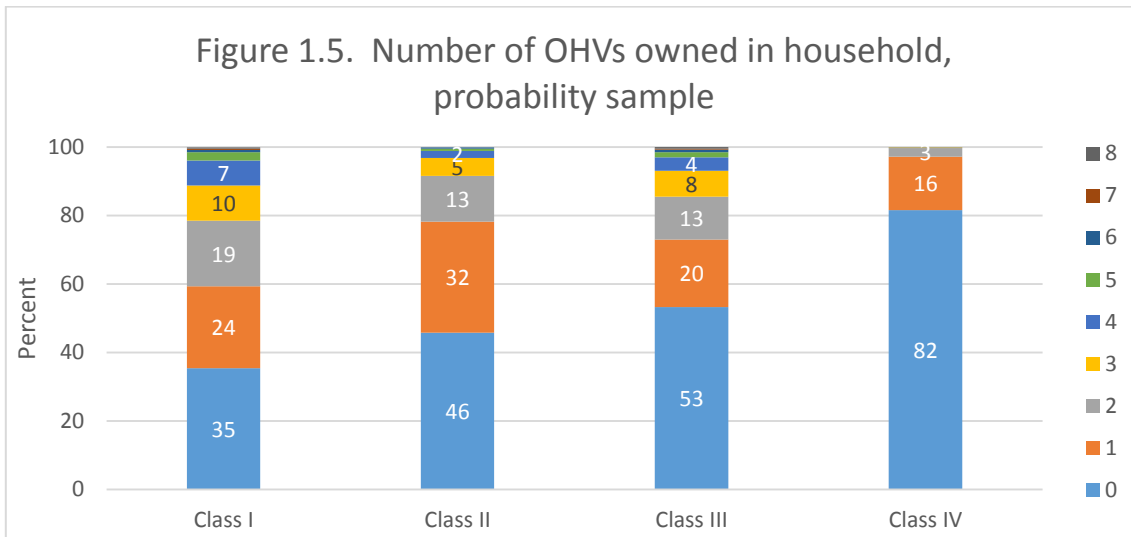
Figure 1.4 shows the distribution of annual household pre-tax income. OHV riders – at least those with their own OHVs – tend to have a higher income level than Oregonians as a whole.



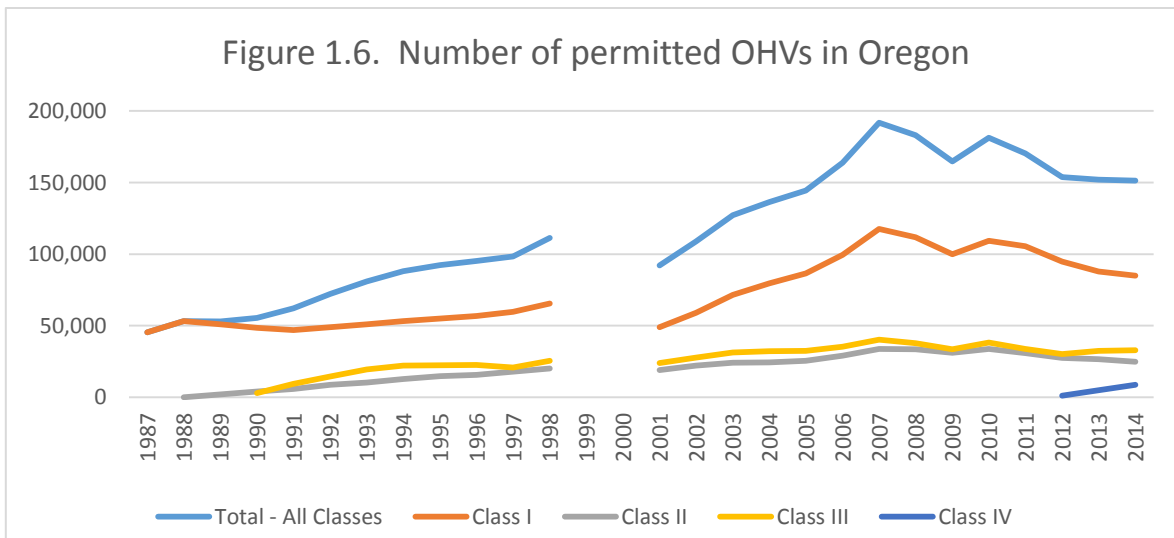
Amongst probability sample respondents, 17% belonged to an OHV organization or club, 81% did not, and 2% were unsure (Q28).

Figure 1.5 shows number of vehicles owned by OHV households, across class (Q1). For example, 35% of OHV households do not own a Class I vehicle (though they received the survey because they registered at least one OHV across the four classes). A quarter (24%) own one Class I vehicle, 19% own two, and so on. As expected, Class IV vehicles were the least likely to be owned and were owned in the smallest numbers; very few households own more than two Class IV vehicles.

With the negligible number of “more than 8 vehicles in a given class” responses set to eight, the average number of vehicles owned by OHV household is 1.44 Class I vehicles, 0.89 Class II vehicles, 1.01 Class III vehicles, and 0.22 Class IV vehicles.



All OHVs operated on public lands in Oregon must be registered with OPRD, and Figure 1.6 shows registration counts by class over time. Permit sales from 1999 are missing from agency records; because permits are valid for two years, numbers from both 1999 and 2000 are missing. Registrations peaked in 2007 at 191,782 vehicles across all classes.



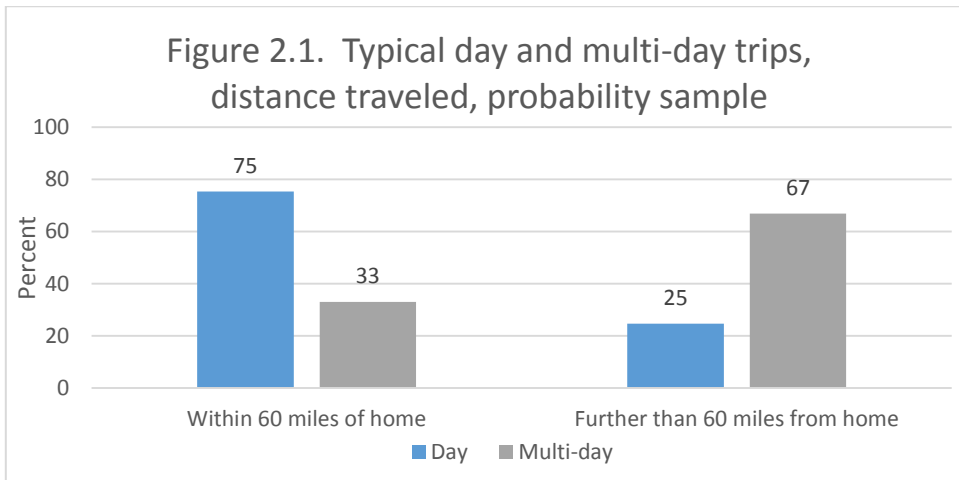
2. Trip characteristics and participation

This section presents trip characteristics and participation estimates. See also the Section 3 results for “most often visited” site, including distance traveled to those sites.

2.1. Day trip and multi-day trip characteristics

Almost all respondents (96%) took at least one day trip and 86% took at least one multi-day trip in the previous 12 months. Multi-day trips are defined as those involving an overnight stay away from home, even if the respondent only rode an OHV one day during the trip. The day versus multi-day distinction is used in presenting results in this section as well as in estimating economic contribution in Section 4.

The following results are for the "typical" day and multi-day trips, defined as the single location where respondents most often engaged in each type of trip in the past 12 months. Figure 2.1 indicates that three-quarters of day trips (75%) were within 60 miles of home while two-thirds (67%) of multi-day trips were more than 60 miles from home (Q19 and Q23).



The remaining results in this section and in section 4 (expenditure and economic significance) are based on travel parties. The National Visitor Use Monitoring (NVUM) approach to outliers is followed here, with observations excluded if reported travel party was eight or more persons, length of stay was more than 30 days, total expenditure was \$500 or more per night (per day for day trips), or sporting goods expenditure was \$500 or more.⁴ Exclusion was "listwise" across the set of questions within each type of trip. For example, if one of the above conditions was met for multi-day trips, the respondent does not appear in the results for any of these questions within the multi-day trip analysis.

Figure 2.2 shows number of persons in travel party for day and multi-day trips. The average number of persons is 3.5 for day trips and 3.9 for multi-day trips.

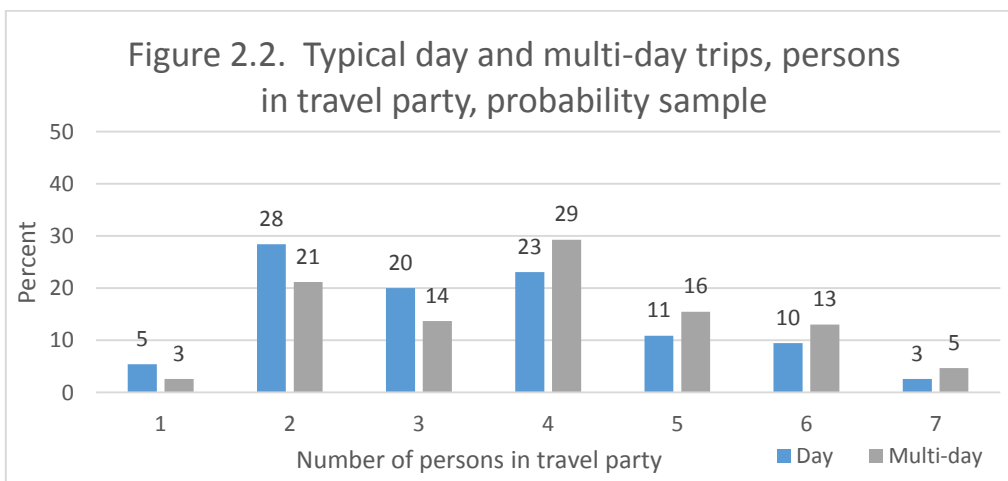
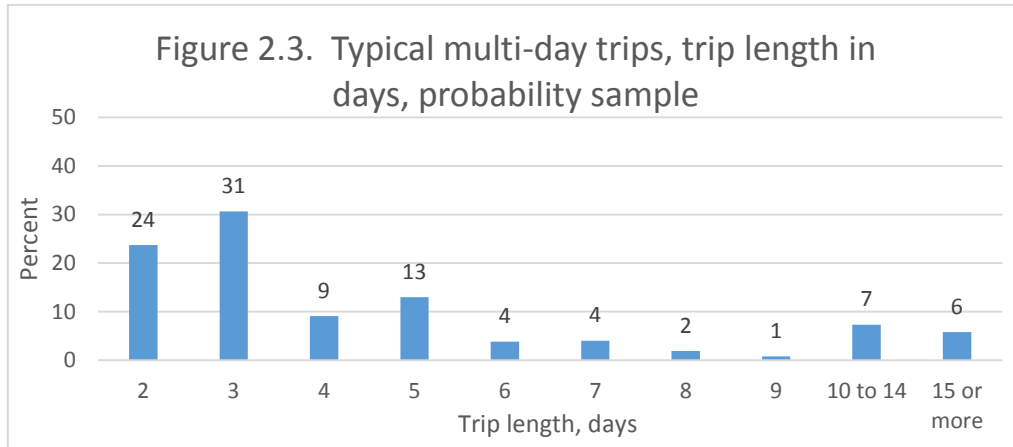


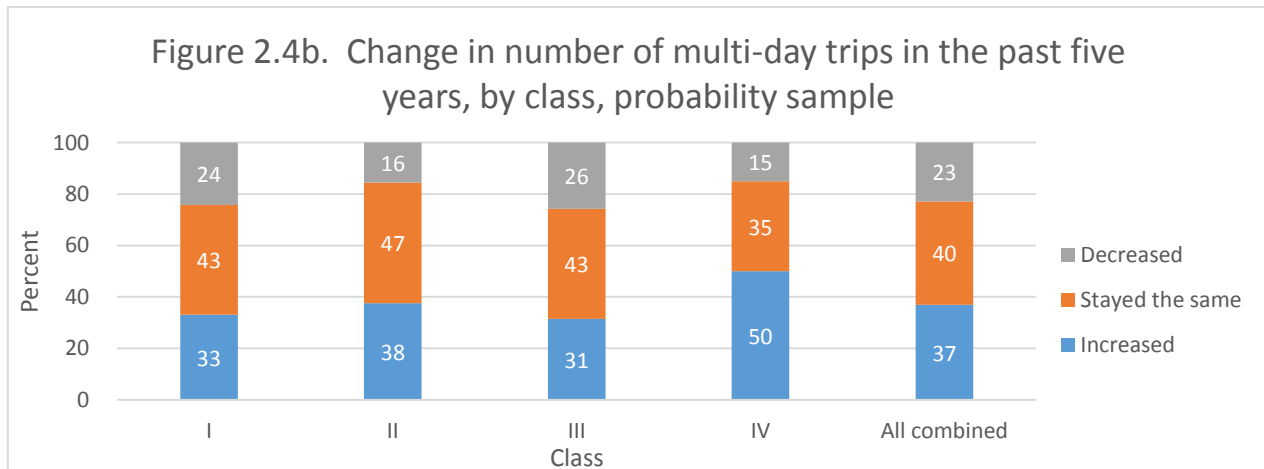
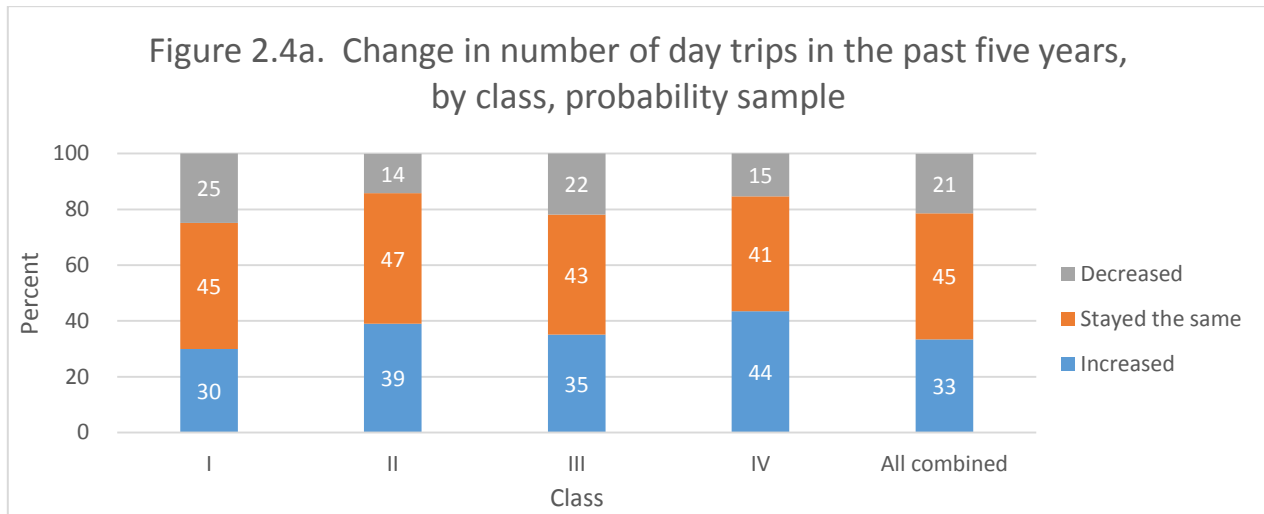
Figure 2.3 shows number of days for multi-day trips. As a reminder, this includes trip days that did not involve OHV riding. Three days is the most common trip length, which may reflect a high

⁴ White, E.M., D.B. Goodding, and D.J. Stynes. 2013. Estimation of national forest visitor spending averages from National Visitor Use Monitoring: round 2. Gen. Tech. Rep. PNW-GTR-883. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

proportion of "long weekend" trips. The average number of days was 5.2 days, keeping in mind that this mean is "pulled up" by longer trips (10 or more days). The median is 3 days.



Respondents indicated whether the numbers of each type of trip (day trip and multi-day trip) had increased in the past five years (Q12), with results in Figure 2.4a (day trips) and 2.4b (multi-day trips). Results are similar across trip type, with the percentage of respondents for whom number of trips has increased being larger than the percentage for whom number of trips has decreased.



Among the reasons for change (Q13), more free time was mentioned by 27% of the respondents who indicated a change in either type of trip, more income was mentioned by 16%, the high cost of fuel was mentioned by 16%, less free time was mentioned by 17%, and less income was mentioned by 12%. The open-ended reasons for increased trips were diverse, with increased interest amongst family (often children) and friends being a common response. Reduced access was the main open-ended reason for decreased trips.

OHV riders engaged in a variety of activities while on day or multi-day trips (Q15, Figure 2.5), with exploring the town / area and watching wildlife being mentioned most. Responses in the Other category were diverse and included hiking, golfing, boating, geocaching, mushroom hunting, prospecting / mining, and casino visits.

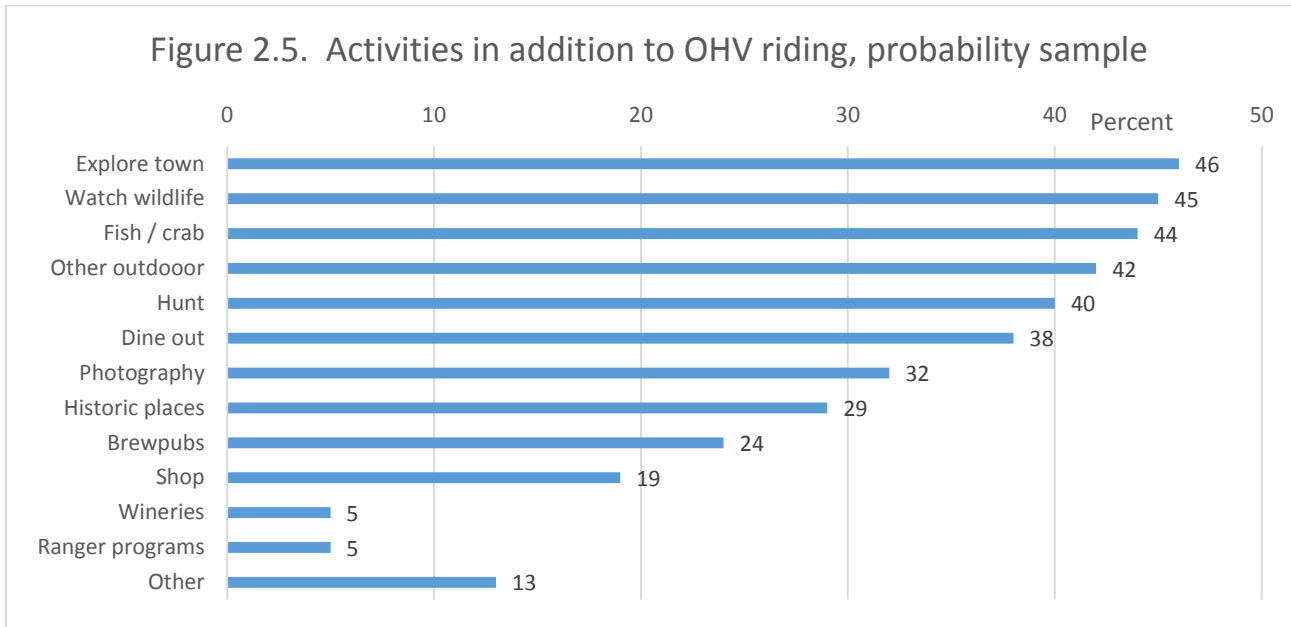
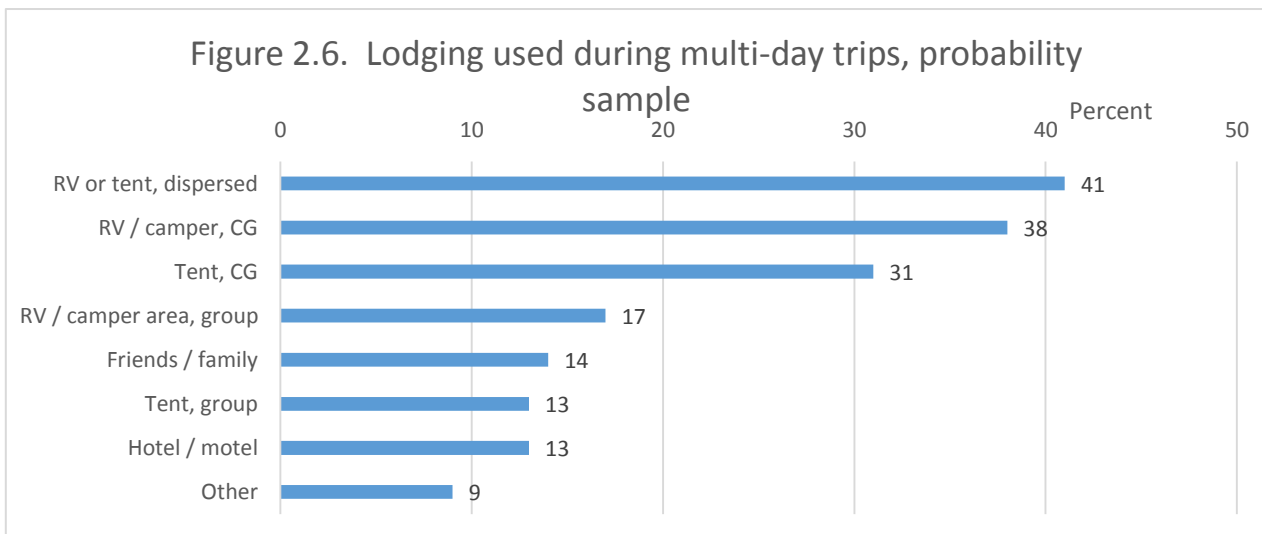


Figure 2.6 indicates that RV or tent camping in dispersed areas was the most commonly used form of lodging while on multi-day trips (Q14). Responses in the Other category were varied, with common responses being cabins and vacation rentals.



2.2. Participation by riding area and region

Table 2.1 shows the average number of days by riding area, across all respondents in the probability sample (Q6). The Other category for each region (e.g., R10 Other) reflects days ridden on other areas on public land, such as dirt roads.

The table is sorted by number of days for all classes combined, with the “Top 5” sites for each class highlighted in yellow. Winchester Bay is the site ridden most for all classes combined (4.43 days), and it is in the Top 5 for Class I, Class II, and Class IV riders. It is not in the Top 5 for Class III riders. Tillamook State Forest is the site ridden most by Class III riders, but it is not in the Top 5 for the other three classes.

As noted in Section 1.2, the “All classes combined” column includes respondents who did not answer the “most often” question and respondents who reported different “most often” classes for designated versus other areas. Thus, it is possible for the value in that column to appear inconsistent with the values in the “by class” columns, as is the case for Winchester Bay.

Table 2.1. Days riding per year by site, average number of days by “most often” class						
Site number	Site name	I	II	III	IV	All classes combined
	<i>All listed sites combined</i>	26.26	41.91	26.95	29.46	33.87
7	Winchester Bay	2.08	3.19	1.10	3.33	4.43
6	South Jetty	2.63	2.71	1.07	2.60	3.06
8	Horsfall	1.63	5.18	1.30	2.48	2.75
2	Tillamook State Forest	0.88	2.10	2.56	0.35	1.93
	R10 Other	1.74	2.90	0.95	2.72	1.36
	R6 Other	2.36	0.60	0.77	0.50	1.07
4	Sand Lake	1.10	1.15	0.38	0.65	1.03
	R1 Other	0.68	1.70	1.16	0.24	1.00
43	Blue Mountain	0.61	1.15	0.27	0.95	0.94
	R9 Other	1.00	1.46	0.49	1.66	0.84
	R8 Other	0.42	2.35	1.18	0.95	0.80
35	East Fort Rock	0.42	1.02	1.32	0.22	0.76
	R3 Other	0.86	0.79	0.62	0.35	0.69
1	Nicolai Mountain	0.21	0.46	0.47	0.06	0.67
	R11 Other	0.76	0.74	0.49	2.05	0.64
46	Mt. Emily	0.84	0.59	0.13	0.66	0.62
	R2 Other	0.18	1.56	0.61	0.28	0.62
44	Virtue Flat	0.22	1.94	0.17	0.22	0.60
	R7 Other	0.56	0.69	0.24	0.63	0.59
25	Shotgun Creek	0.29	0.14	1.21	1.20	0.58
	R4 Other	0.50	0.36	0.45	1.01	0.54
	R5 Other	0.45	1.59	0.59	0.62	0.53
33	Millican Valley	0.60	0.54	0.77	0.14	0.51
37	Christmas Valley	0.35	0.82	0.42	0.64	0.51
26	Northwest Area	0.18	0.86	0.68	0.07	0.43
3	Upper Nestucca	0.52	0.41	0.38	0.02	0.41

45	Winom-Fraiser	0.36	0.08	0.81	0.49	0.41
42	John Day Area	0.42	0.29	0.04	0.98	0.38
40	Morrow/Grant Cty Trails	0.40	0.43	0.42	0.35	0.37
29	Santiam Pass	0.20	0.46	0.39	0.16	0.36
30	Cline Buttes	0.37	0.81	0.33	0.13	0.35
9	Winchester Trails	0.15	0.22	0.27	0.09	0.33
20	North Umpqua	0.10	0.20	0.02	0.08	0.32
24	Huckleberry Flats	0.17	0.24	0.43	0.08	0.26
16	Timber Mountain	0.00	0.02	0.90	0.16	0.25
23	Cottage Grove	0.14	0.15	0.49	0.18	0.23
19	Prospect	0.22	0.03	0.18	0.46	0.22
10	Blue Ridge	0.11	0.24	0.11	0.06	0.21
15	Lily Prairie	0.00	0.11	0.75	0.03	0.21
47	Breshears	0.25	0.20	0.19	0.22	0.21
21	Diamond Lake	0.18	0.13	0.05	0.59	0.18
11	Chetco	0.08	0.03	0.19	0.07	0.16
48	Upper Walla Walla	0.15	0.03	0.22	0.00	0.15
27	McCubbins Gulch	0.06	0.04	0.18	0.04	0.14
39	Radar Hill	0.16	0.06	0.00	0.13	0.14
22	Three Trails	0.03	0.10	0.14	0.16	0.13
34	Edison Butte	0.09	0.34	0.08	0.10	0.12
31	Henderson Flat	0.10	0.03	0.20	0.01	0.11
5	Mt. Baber	0.07	0.14	0.19	0.00	0.10
18	Klamath Sportsman Park	0.03	0.06	0.10	0.05	0.10
13	Galice	0.04	0.04	0.04	0.02	0.08
32	Green Mountain	0.05	0.10	0.14	0.01	0.08
38	Crane Mountain	0.07	0.05	0.01	0.00	0.07
14	McGrew 4x4 Trail	0.05	0.11	0.03	0.01	0.06
36	Rosland	0.03	0.00	0.14	0.05	0.06
12	Pine Grove / Ill. River	0.05	0.05	0.01	0.00	0.05
28	McCoy MRA	0.02	0.07	0.05	0.00	0.05
17	Elliott Ridge	0.00	0.00	0.03	0.04	0.04
41	West End (Sunflower)	0.04	0.05	0.04	0.11	0.03

The sum across all listed sites (33.87 days, in All classes combined column) is higher than the results of the recent fuel consumption report (see Table 6a in that report).⁵ However, that report presents days ridden per vehicle whereas this report presents days ridden per respondent. Though the current survey did not ask number of vehicles ridden or days ridden per vehicle, results indicate that it is common for respondent households to own multiple vehicles (see Section 1.5).

Table 2.2 shows the estimated annual number of days riding per respondent by region, reflecting the sum of Table 2.1 results across sites within each region.

⁵ OSU Survey Research Center. 2015. Procedures and Results of Data Collected for the 2014 Oregon Off-Highway Vehicle Survey on Fuel Consumption. Report to the Oregon Department of Transportation and Oregon Parks and Recreation Department.

Region	Days per respondent	Percent of total
Region 1	5.14	15.2
Region 2	1.05	3.1
Region 3	1.10	3.2
Region 4	1.61	4.8
Region 5	11.47	33.9
Region 6	2.48	7.3
Region 7	1.66	4.9
Region 8	2.82	8.3
Region 9	1.65	4.9
Region 10	4.11	12.1
Region 11	0.78	2.3
Statewide	33.87	

2.3. OHV riding days by region

The annual number of riding days statewide was estimated based on the OPRD database of permits by vehicle class (see Figure 1.6) and the annual number of days ridden for recreational purposes on public land, by class, from the 2014 fuel consumption report referenced in footnote 5 (see page 8 of that report for recreational days per vehicle and page 10 for proportion on public land). Results are shown in Table 2.3.

Class	Permits (vehicles)	Days ridden on public land per vehicle	Days
I	84,871	19.8	1,684,520
II	24,909	21.7	541,173
III	32,799	20.5	671,323
IV	8,846	24.6	217,337
Total	151,425		3,114,353

The statewide total number of days (3.1 million) was then allocated to regions based on the percentages shown in Table 2.2, with the allocation shown in Table 2.4.

Region	Days
Region 1	472,624
Region 2	96,548
Region 3	101,145
Region 4	148,040
Region 5	1,054,669
Region 6	228,036
Region 7	152,637
Region 8	259,300
Region 9	151,718
Region 10	377,915
Region 11	71,721
Statewide	3,114,353

3. Riding types, experiences, preferences, and priorities

Recreational OHV riding in Oregon was grouped into two main types:

- The 48 designated riding areas, which are listed in Q6 in the questionnaire in Appendix 4 and shown on the map in Appendix 5.
- Other areas or routes, such as dirt roads open for riding on Forest Service, BLM, state forest, or county lands.

Figure 3.1 shows the class of vehicle used most often for each type of riding (Q3). In designated riding areas (first column), 42% of respondents most often rode Class I vehicles, 17% Class II vehicles, 32% Class III vehicles, and 9% Class IV vehicles. The distribution for other areas differs from that for designated areas in that Class II and Class IV are somewhat more likely to be the “most often” class of vehicles used.

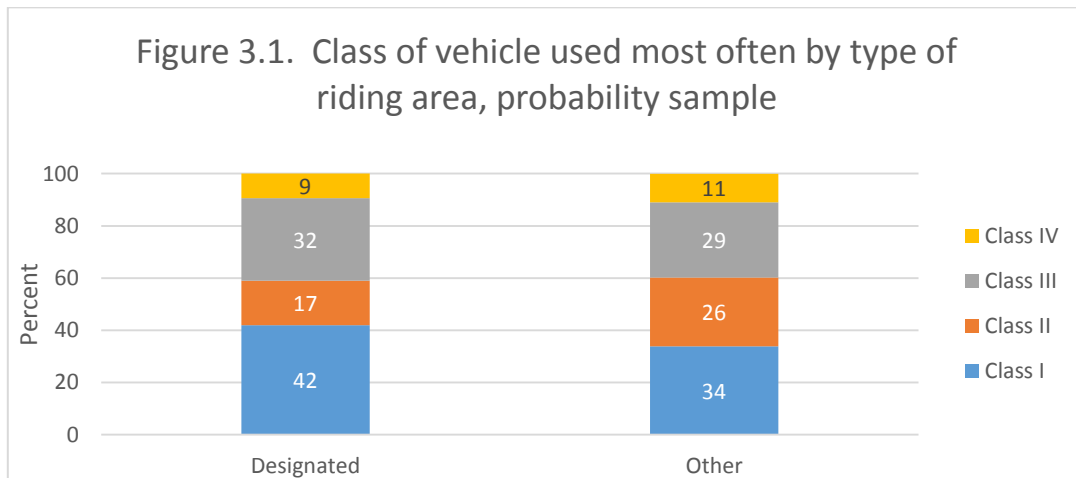
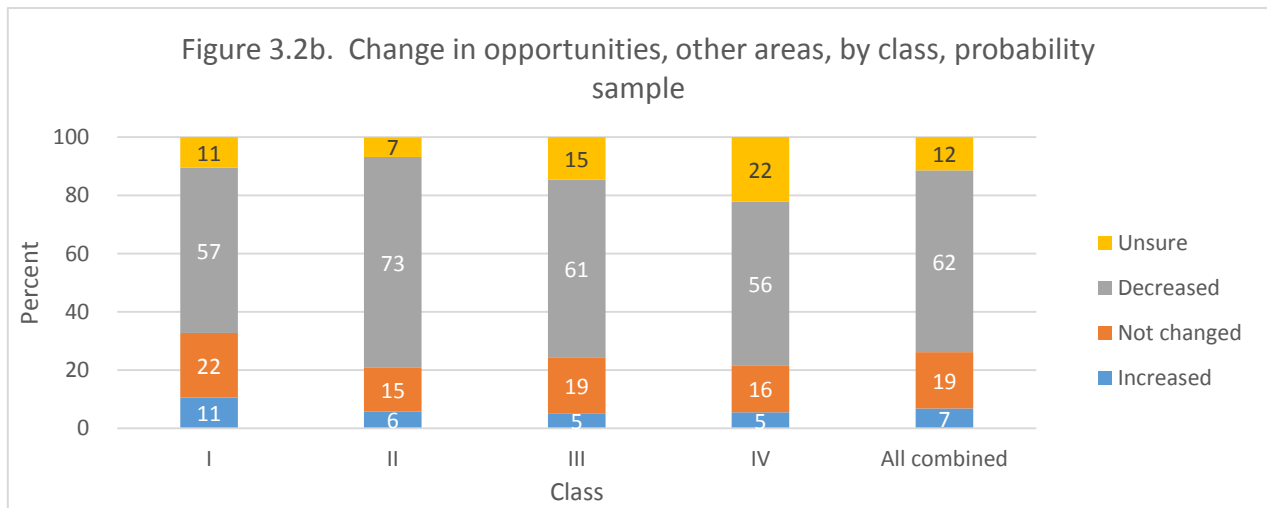
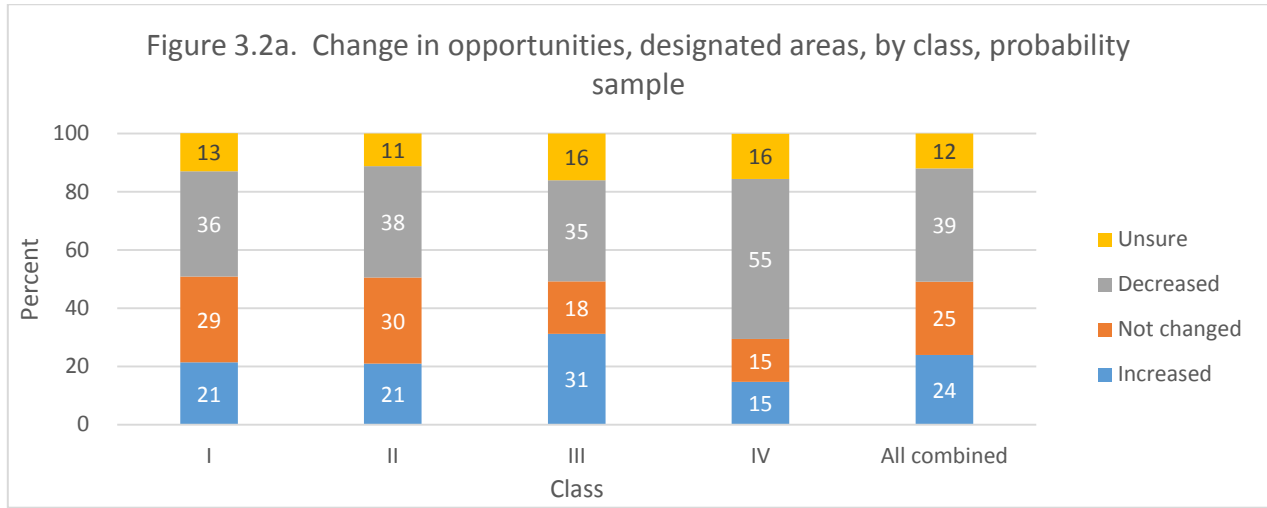


Figure 3.2a and Figure 3.2b show respondent evaluation of the change in availability over the past 10 years for each type of riding. For both types, the percentage for decreased was greater than for increased, but this was especially the case for Other areas.



Respondents indicated the riding area where they rode most (Q7), then reported the distance traveled to the area (Q8, one-way driving miles from home).

Mail survey respondents reported one statewide “most often visited” area, while online survey respondents reported a “most often visited” area for each region in which they rode. Thus, online respondents may report multiple “most often visited” areas across the state.

Table 3.1 presents results, sorted by the number of observations for each riding area. Among sites with at least ten observations, the John Day Area (site 42) was the site most distant from home, with OHV riders traveling an average of 227 miles to the site.

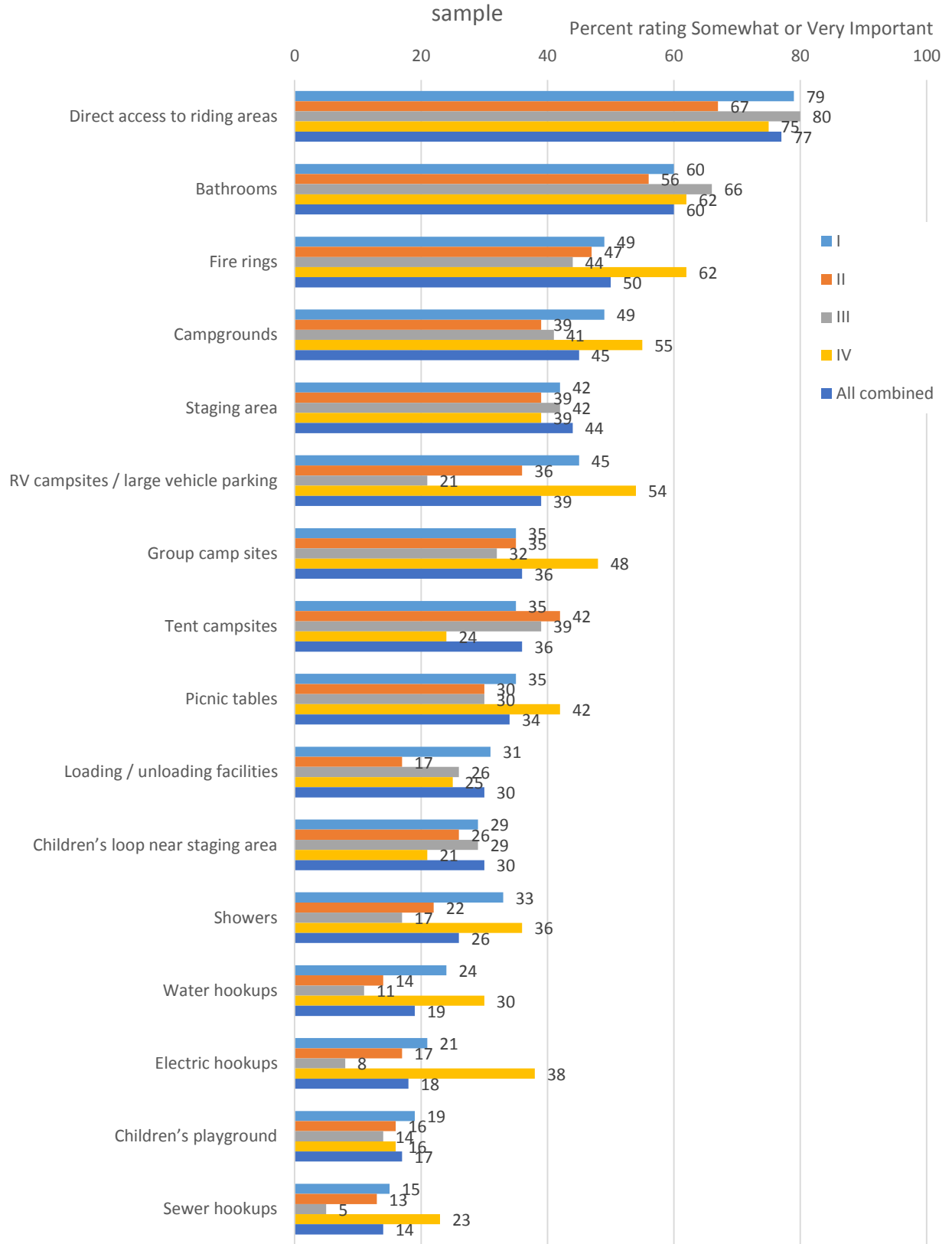
Site 49 reflects the “all other public land” category, while sites 51 through 57 reflect sites written in as visited (not necessarily the most visited) by at least five respondents, yet not on the lists of 48 designated areas.

Table 3.1. Travel distances by “most often visited” site				
Site number	Site name	Observations	Distance (miles)	
			Mean	Median
	<i>All sites combined</i>	3,187	113	93
49	Other public land	1,061	106	67
2	Tillamook State Forest	233	65	51
7	Winchester Bay	197	148	147
8	Horsfall	161	120	120
6	South Jetty	139	108	106
37	Christmas Valley	129	185	195
35	East Fort Rock	125	146	149
4	Sand Lake	117	102	95
26	Northwest Area	94	98	80
27	McCubbins Gulch	89	109	85
33	Millican Valley	83	149	162
29	Santiam Pass	74	79	74
25	Shotgun Creek	71	50	36
24	Huckleberry Flats	53	95	76
42	John Day Area	44	227	245
30	Cline Buttes	43	111	132
31	Henderson Flat	32	118	131
21	Diamond Lake	32	95	69
28	McCoy MRA	25	81	78
23	Cottage Grove	24	54	47
14	McGrew 4x4 Trail	23	218	220
9	Winchester Trails	23	78	37
46	Mt. Emily	19	151	73
43	Blue Mountain	19	106	73
40	Morrow/Grant Cty Trails	18	145	114
45	Winom-Fraiser	18	115	82
15	Lily Prairie	17	81	19
3	Upper Nestucca	17	33	36
32	Green Mountain	15	119	146
16	Timber Mountain	15	103	72
19	Prospect	15	102	85
22	Three Trails	15	98	71
1	Nicolai Mountain	13	91	33
20	North Umpqua	13	63	35
5	Mt. Baber	13	51	39
12	Pine Grove / Ill. River	12	122	113
13	Galice	12	109	25
34	Edison Butte	10	162	172
11	Chetco	9	54	19

52	Spinreel	8	137	155
39	Radar Hill	7	212	233
51	Riley Ranch	6	111	107
55	Sumpter area	5	267	255
38	Crane Mountain	5	263	260
44	Virtue Flat	4	171	149
47	Breshears	4	163	62
10	Blue Ridge	4	156	176
17	Elliott Ridge	4	61	68
41	West End (Sunflower)	3	203	200
53	China Hat	3	123	156
18	Klamath Sportsman Park	3	52	28
48	Upper Walla Walla	3	38	21
57	Steens	2	301	311
54	Ochocos	2	74	74
56	Owyhee	1	70	71
36	Rosland	1	23	23

Figure 3.3 shows the importance of considerations when deciding where to ride (Q11), percent rating 4 or 5 on a 5-point scale, sorted by All respondents combined. The top consideration was direct access to riding areas.

Figure 3.3. Considerations in deciding where to ride, by class, probability



Respondents indicated the importance of various potential improvements (Q10), with Figure 3.4 showing percent rating 4 or 5 on a 5-point scale. Maintenance of existing trails and more trail maps and information were rated most important across all respondents.

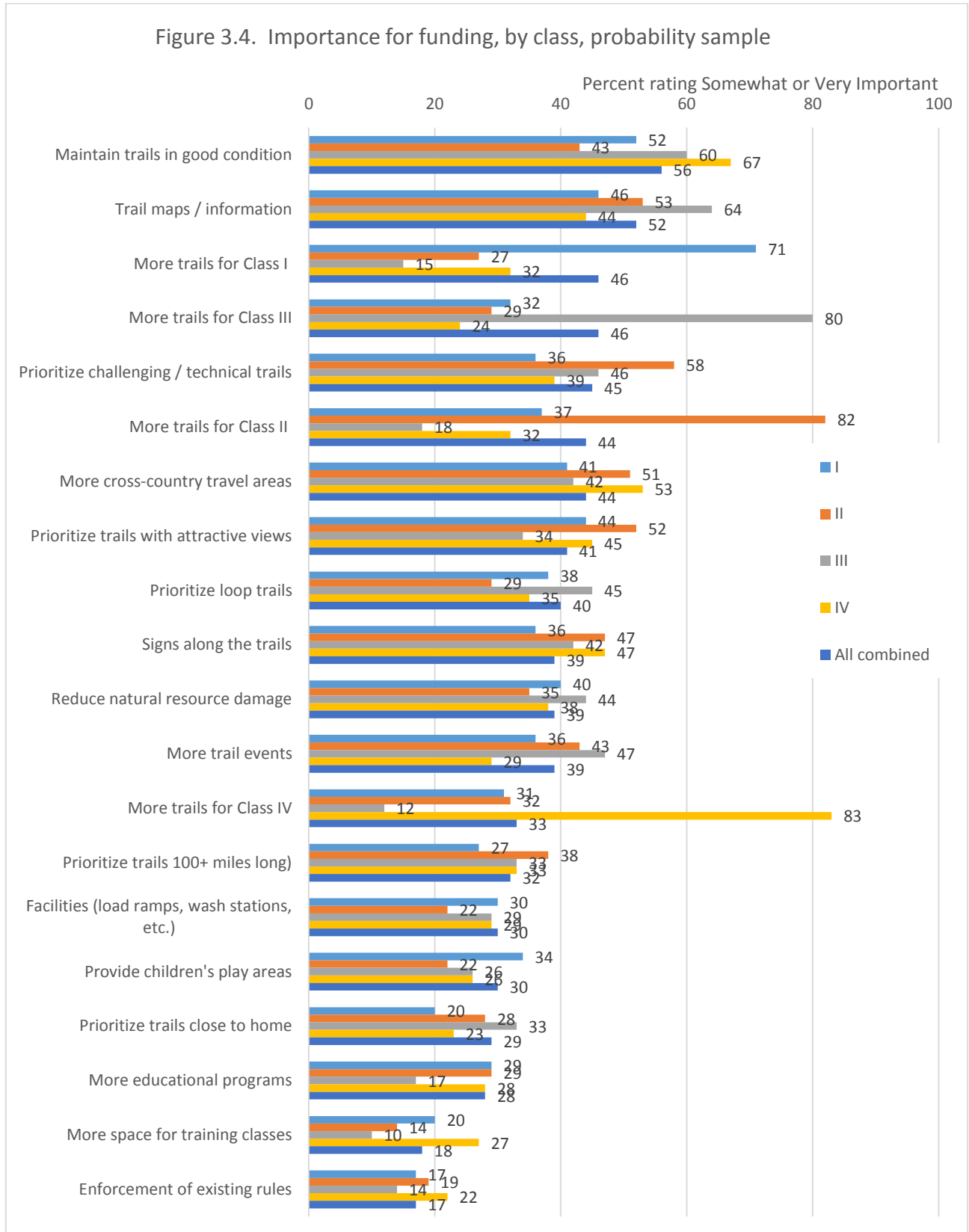
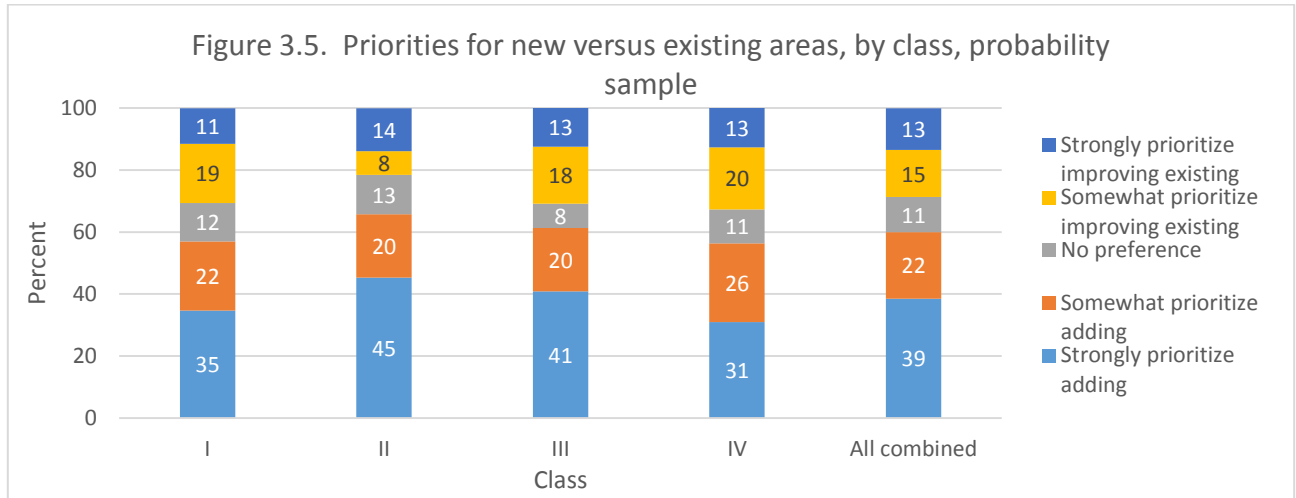


Figure 3.5 presents priorities for purchasing land to add new riding areas versus improving existing areas (Q9 in Version 2). In general, preferences favored adding new areas.



Respondents who preferred adding new areas typically prioritized the development of trails for either their “most often ridden” class or for all classes equally (Figure 3.6, Q10 in Version 2).

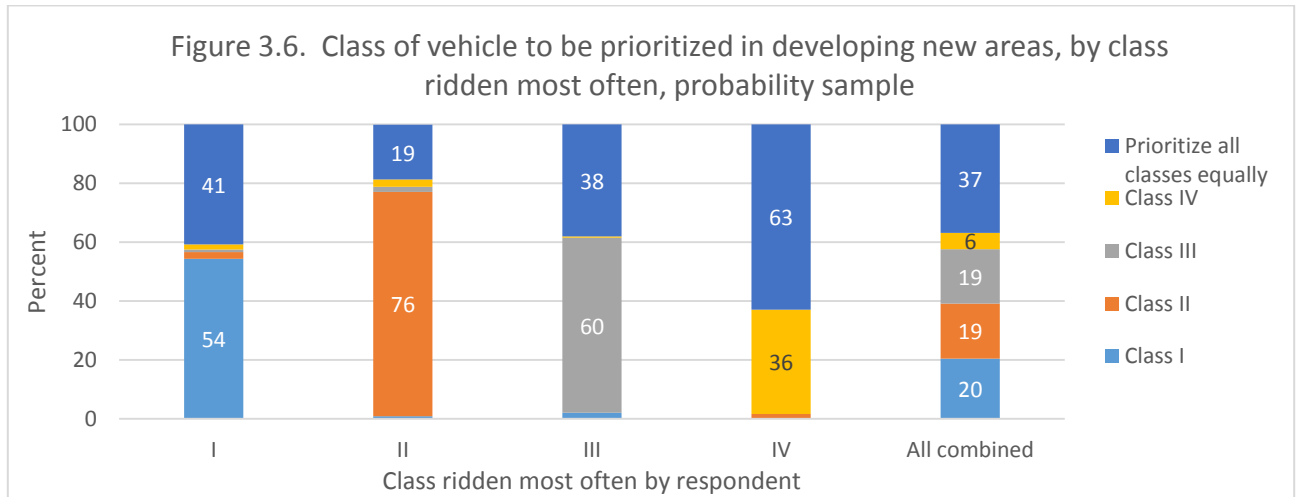
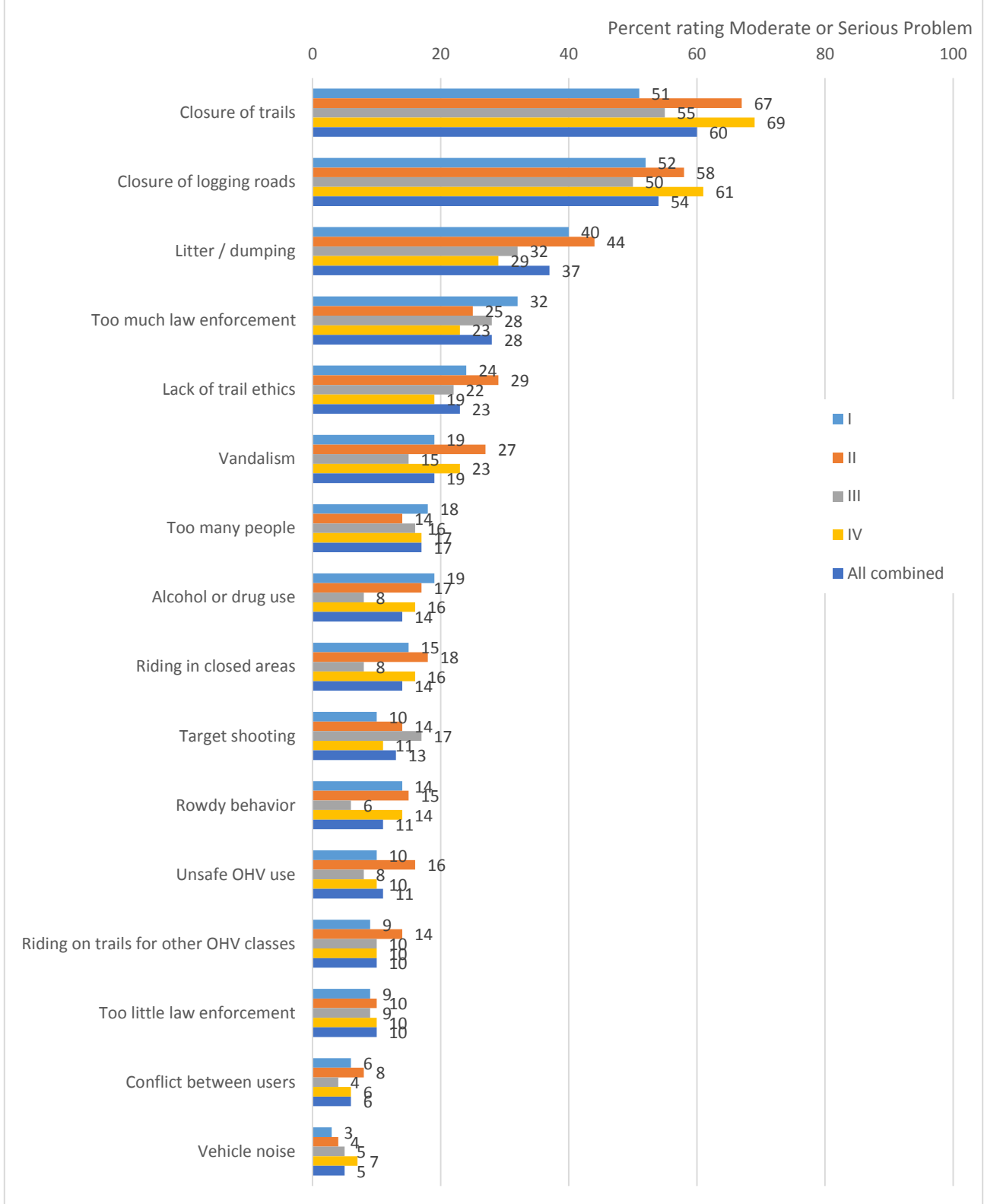
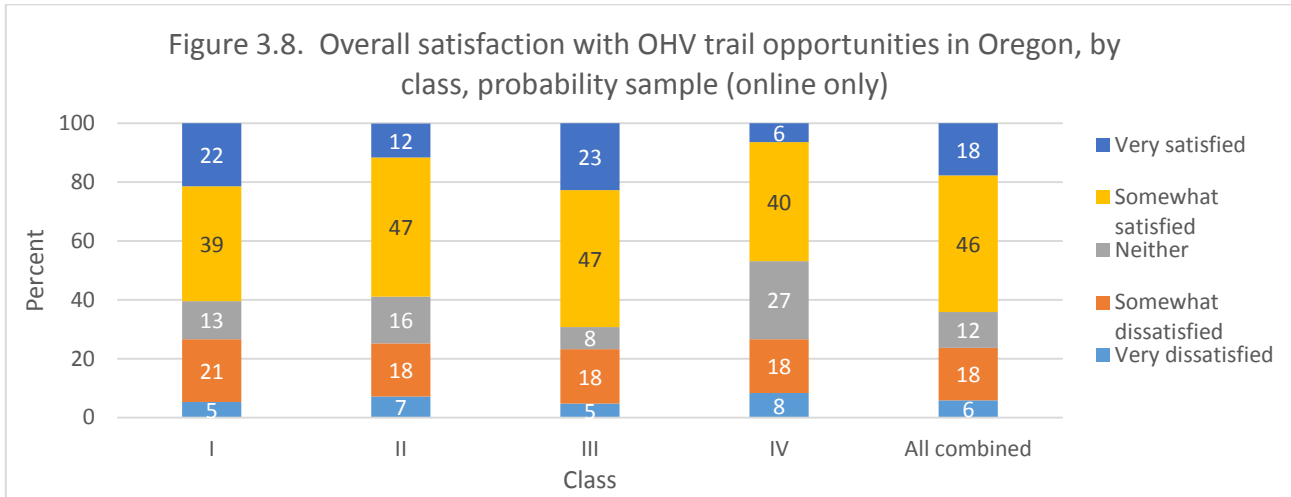


Figure 3.7 shows ratings of problems based on respondent experiences while riding OHVs (Q27), percent rating 4 or 5 on a 5-point scale. Closure of trails and logging roads are the most commonly rated problems, especially for Class II and Class IV riders.

Figure 3.7. Problems on OHV trails, by class, probability sample



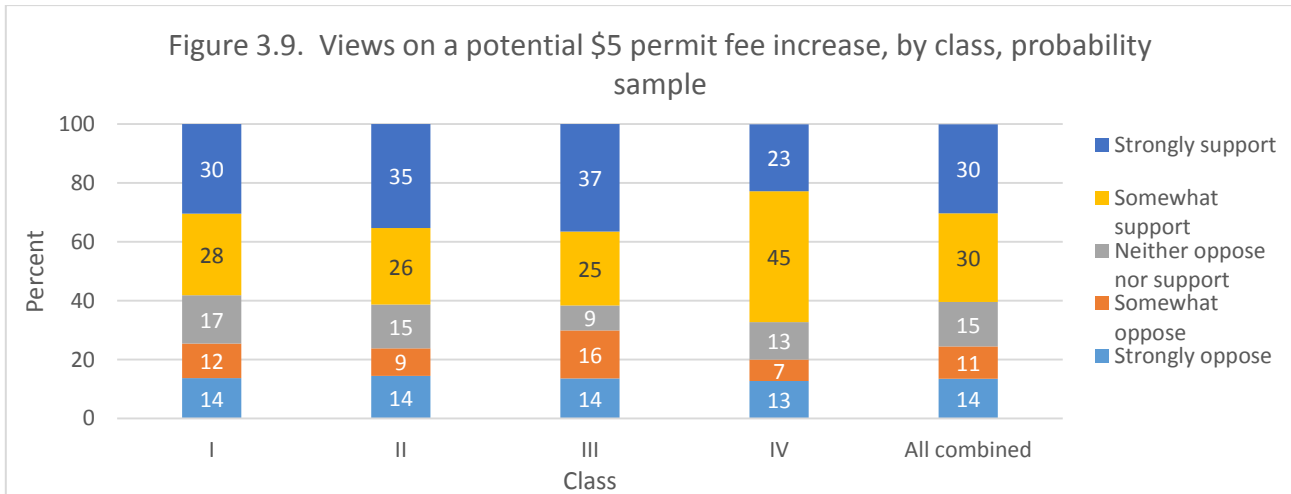
Respondents completing the survey online were asked how satisfied they were, overall, with trail opportunities on public land in Oregon. Results in Figure 3.8 indicate a higher percentage who are satisfied than dissatisfied.



Respondents were asked whether they would oppose or support an increase in the permit fee to expand facilities and opportunities (Version 2, Q27). The specific wording was:

An ATV permit is required when riding an OHV on public land in Oregon. The permit is valid for two years and currently costs \$10. Permit revenue is used to provide facilities and riding opportunities in Oregon. Would you support or oppose an increase in the permit fee from \$10 to \$15 to expand funding for facilities and opportunities?

Results in Figure 3.9 indicate greater support than opposition to such an increase.



4. Expenditure and economic contribution

This section outlines OHV rider expenditure, based on the "typical trips" described in Section 2.1. Note that this expenditure is only associated with travel, not with equipment purchase or maintenance. The expenditure and economic contribution reflects OHV riding activity by both local (to the OHV riding location) and non-local Oregon residents.

As noted in Section 2.1, these results are based on travel parties. The National Visitor Use Monitoring (NVUM) approach to outliers is followed here, with observations excluded if reported travel party was eight or more persons, length of stay was more than 30 days, total expenditure per travel party was \$500 or more per night (per day for day trips), or sporting goods expenditure per travel party was \$500 or more.⁶ Exclusion was "listwise" across the set of questions within each trip type. For example, if one of the above conditions was met for multi-day trips, the respondent does not appear in the results for any of these questions within the multi-day trip analysis.

Table 4.1 provides an NVUM reference point for expenditure estimates. The probability sample data reflect Oregon residents OHV riding in Oregon. For expenditure and persons per party, the NVUM data reflect national averages for in-state and out-of-state visitors (Table 3 and Table A-2 in White and Stynes 2010⁷). Both probability sample and NVUM expenditure data are dollars per party per trip, amounts spent within 50 miles (for the probability sample, within 50 miles of the riding location; for NVUM, within 50 miles of the on-site survey location). The NVUM data are inflation adjusted from 2007 to 2014. The NVUM nights per trip data reflect Oregon resident OHV riders on national forests in Oregon.

Expenditure in the probability sample is significantly higher than the NVUM equivalents. The difference may be explained by a variety of factors, including significantly more persons per party, potentially higher fuel prices, and potentially greater distances from population centers to OHV riding locations. However, reporting errors, including respondent overestimation, also may occur.

Table 4.1. Expenditure and party size, probability sample and NVUM reference point				
	Local day trips	Local multi-day trips	Non-local day trips	Non-local multi-day trips
<i>Expenditure, \$ per party per trip</i>				
Probability sample	116	286	167	466
NVUM, national, OHV	66	153	124	316
<i>Persons per party</i>				
Probability sample	3.4	4.0	3.6	3.9
NVUM, national, OHV	2.1	2.3	2.5	2.4
<i>Nights per trip</i>				
Probability sample		4.2		4.2
NVUM, Oregon resident OHV riders		2.9		3.8

Table 4.2 presents expenditure by destination region and trip type. Expenditure per person per day matches the days riding metric described in Section 2.3; it is calculated by dividing total expenditure in each region by the number of person days in the region, based on Q20, Q21, Q24, Q25, and Q26. Expenditure per person per day is much lower than expenditure per party per trip (Table 4.1) due to the relatively large number of persons per travel party and, for multi-day trips, the relatively long trip duration. Regional expenditure is the product of expenditure per person per day and number of days riding.

⁶ White, E.M., D.B. Goodding, and D.J. Stynes. 2013. Estimation of national forest visitor spending averages from National Visitor Use Monitoring: round 2. Gen. Tech. Rep. PNW-GTR-883. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

⁷ White, E.M. and D.J. Stynes. 2010. Updated spending profiles for national forest recreation visitors by activity. Report under Joint Venture Agreement # 10-JV-11261955-018.

The total days riding per region estimates are from Section 2.3. Those days are allocated into the day and multi-day columns based on survey responses. In the mail questionnaire, respondents reported the number of days riding OHVs on day trips and the number of days on multi-day trips for each region (Q17). In the online questionnaire, respondents reported the number of days riding OHVs at specific designated areas by region, with an “other areas on public land” category for sites not listed. The total number of days across sites in a given region was then presented, and respondents identified the number of days spent specifically on day trips.⁸

Table 4.2. Annual expenditure by destination region and trip type

Region	OHV survey, expenditure, \$ per person per day		Days riding (see Section 2.3)			Regional expenditure (millions of dollars)		
	Day	Multi-day	Total	Day	Multi-day	Total	Day	Multi-day
1	38	24	472,600	249,900	222,700	14.8	9.6	5.2
2	48	14	96,500	67,600	29,000	3.6	3.2	0.4
3	37	14	101,100	71,700	29,500	3.1	2.7	0.4
4	42	14	148,000	115,300	32,700	5.3	4.9	0.5
5	39	25	1,054,700	538,000	516,700	33.7	21.0	12.7
6	27	22	228,000	157,400	70,600	5.9	4.3	1.5
7	47	23	152,600	83,500	69,100	5.5	3.9	1.6
8	36	24	259,300	142,300	117,000	7.9	5.1	2.8
9	45	19	151,700	92,600	59,100	5.2	4.1	1.1
10	38	20	377,900	234,900	143,100	11.8	9.0	2.9
11	51	18	71,700	42,100	29,700	2.7	2.1	0.5
Total	39	22	3,114,400	1,795,200	1,319,200	99.6	69.9	29.7

Note that expenditure per day for multi-day trips is based on overall trip expenditure and trip length, including days that did not involve riding. However, days riding and regional expenditure only reflect days engaged in OHV riding. Due to the limited number of observations, regions 2, 3, and 4 were combined when estimated expenditure for multi-day trips.

The expenditure of OHV riders by region was “run” through the IMPLAN input-output model to estimate “multiplier effects” of money flowing through the local economy. To illustrate, assume that an OHV rider eats lunch at Restaurant X in Region 8. In order to provide the lunch, Restaurant X hires employees and purchases food that is then prepared for customers. Food is an input purchased from another business, and this process generates indirect effects. Wages paid to employees generate induced effects, because those employees spend a portion of their income in the local economy (perhaps by eating at Restaurant Y or shopping at Supermarket Z). Additional information on input-output and its application for this analysis is provided in Appendix 3.

Table 4.3 shows the expenditure breakdown across categories and trip type, in dollars per person per day. Expenditure categories were as follows:

⁸ Multiple “waves” of the survey were conducted. The overall task was the same across waves, but details of the reporting approach varied. The approach was modified to make this complex reporting task as easy as possible. The total days riding figures are derived from the separate fuel consumption study, but the potential for reporting errors should be kept in mind when interpreting the figures for days spent on day versus multi-day trips.

- Hotel, motel, condo, cabin, B&B, or other lodging except camping
- Camping (RV, tent, etc.)
- Restaurants, bars, pubs
- Groceries
- Gas and oil
- Other transportation
- Park / forest entry, parking, or recreation use fees
- Recreation and entertainment, including guide fees
- Sporting goods
- Other expenses, such as souvenirs

	Day	Multi-day
Hotel	0.00	1.11
Camping	0.00	2.07
Restaurants	5.91	2.62
Groceries	7.99	5.28
Gas	19.72	7.81
Other transportation	1.20	0.53
Recreation fees	1.78	0.60
Recreation + guiding	0.63	0.54
Sporting goods	1.60	0.76
Other	0.62	0.45
Total	39.44	21.76

The relatively small amount spent on hotels may be surprising, but it is consistent with the lodging patterns shown in Figure 2.6. In addition, these figures are per person, with lodging expenditure being split across potentially multiple persons per hotel room or RV / camp site.

Likewise, these figures are per day. Given that expenditure is spread across fewer days (only one) in the case of day trips, it is understandable that amounts are higher for day trips. For example, OHV riders may drive further to destination regions for multi-day trips (see Figure 2.1), but then drive less (in street vehicles) during days in the region. This may explain the lower per-day gas expenditure for multi-day trips.

Table 4.4 shows the results of the multiplier analysis, by region. The columns are as follows:

- Employment, full-time or part-time jobs
- Labor income, which includes employee compensation (including wages, salaries, and benefits) and proprietary income (including self-employment income).
- Value added, which includes labor income, rents, profits, and indirect business taxes.
- Output, which is the dollar value of goods and services sold.

Note that much travel-related expenditure is on retail items, with only the retail margin included in this analysis. As a result, output may be lower than expenditure, despite the multiplier effect.

Region	Employment	Labor Income	Value Added	Output
1	122	3,471,100	5,346,800	8,705,800
2	29	1,079,600	1,595,500	2,489,100
3	25	717,900	1,088,500	1,744,700
4	43	1,307,300	1,993,000	3,101,900
5	288	7,376,600	11,534,000	19,311,500
6	50	1,451,800	2,247,300	3,668,800
7	50	1,149,100	1,740,300	2,978,700
8	70	2,119,600	3,316,100	5,401,000
9	51	1,082,800	1,650,300	2,866,100
10	116	2,252,500	3,639,900	6,421,800
11	25	506,200	777,400	1,360,500
Total	869	22,514,500	34,929,200	58,049,700

Statewide, OHV riding by Oregon residents annually contributes 869 jobs, \$23 million in labor income, and \$58 million in value added.

A 2009 report on the economic impact of OHV recreation in Oregon⁹ had a different scope and used a different methodology, such it does not provide a direct comparison for the results in Table 4.4. However, that report – and the sources it utilized – provides a reference point for the relative contribution of non-resident OHV riding in Oregon. In that analysis, 34% was used as the proportion of all riding days on the South Coast (Region 5) being from out-of-state visitors, with 15% used for all other regions. Thus, out-of-state riders are estimated to contribute an additional 52% of the Region 5 amount in Table 4.4 (34% / 66%) and an additional 18% (15% / 85%) of the amounts for other regions. Table 4.5 shows the statewide total for in-state riders from Table 4.4, together with the estimated contribution from out-of-state riders.

Origin	Employment	Labor Income	Value Added	Output
In-state	869	22,514,500	34,929,200	58,049,700
Out-of-state	251	6,471,500	10,070,300	16,784,500
Combined	1,120	28,986,000	44,999,500	74,834,200

⁹ Lindberg, K. 1999. The Economic Impacts of Off-Highway Vehicle (OHV) Recreation in Oregon. Report to the Oregon Parks and Recreation Department.

Appendix 1. Results by region, probability sample

This appendix includes tables of results by region, in percentage within each region. Read down the column for each region.

Table numbers (e.g., Table 3.1) match figure numbers in the body of the text. Because not all results shown in the figures are presented by region, the table numbering pattern is not continuous.

Table 3.1a. Class of vehicle used most often in designated riding areas												
	1	2	3	4	5	6	7	8	9	10	11	Total
Class I	40	38	41	44	48	49	46	34	50	51	63	42
Class II	15	17	22	16	14	14	9	19	13	21	0	17
Class III	42	36	31	29	26	23	37	41	26	17	21	32
Class IV	4	9	6	11	12	14	7	6	11	11	16	9

Table 3.1b. Class of vehicle used most often in other riding areas												
	1	2	3	4	5	6	7	8	9	10	11	Total
Class I	39	27	34	30	32	36	41	33	49	49	54	34
Class II	25	39	21	27	27	22	16	21	16	26	13	27
Class III	32	26	37	30	29	26	31	37	20	9	17	29
Class IV	5	8	8	14	13	16	12	9	14	16	17	11

Table 3.2a. Change in opportunities in past 10 years, designated riding areas												
	1	2	3	4	5	6	7	8	9	10	11	Total
Increased	23	30	25	24	12	14	26	24	18	33	17	24
Not changed	26	28	26	20	21	27	23	25	22	28	30	25
Decreased	43	35	39	49	54	40	37	29	42	30	35	39
Unsure	8	8	11	7	12	19	14	23	18	9	17	12

Table 3.2b. Change in opportunities in past 10 years, other areas												
	1	2	3	4	5	6	7	8	9	10	11	Total
Increased	6	10	3	11	9	5	2	4	2	7	16	7
Not changed	14	26	17	19	17	19	15	14	14	19	32	19
Decreased	75	52	63	62	66	61	74	72	78	71	44	62
Unsure	6	12	18	8	9	15	10	11	6	3	8	12

Table 3.3. Considerations in deciding where to ride, percent rating Somewhat or Very Important												
	1	2	3	4	5	6	7	8	9	10	11	Total
Direct access to riding areas	80	80	81	84	73	80	80	65	71	57	59	77
Bathrooms	58	58	64	72	67	63	56	50	47	39	45	60
Fire rings	55	45	52	52	47	63	54	38	54	47	34	50
Campgrounds	51	47	50	51	43	47	40	27	49	30	38	45
Staging area	51	44	48	65	35	47	41	33	35	25	21	44
RV campsites / large vehicle parking	31	36	37	46	32	46	49	35	40	30	35	39
Group camp sites	45	35	41	39	43	39	47	16	38	25	34	36
Tent campsites	43	35	42	39	44	36	21	23	39	36	29	36
Picnic tables	39	32	30	40	41	39	35	31	30	30	35	34
Loading / unloading facilities	23	30	23	46	25	42	27	23	20	22	17	30
Children's loop near staging area	44	25	28	32	41	41	31	25	27	18	26	30
Showers	30	29	23	31	27	31	28	10	21	8	19	26
Water hookups	21	15	20	22	24	27	20	14	18	11	10	19
Electric hookups	14	18	16	23	25	29	17	11	11	9	7	18
Children's playground	28	14	12	24	28	27	18	14	10	9	13	17
Sewer hookups	16	12	14	18	16	23	14	9	13	4	8	14

Table 3.4. Importance for funding, percent rating Somewhat or Very Important												
	1	2	3	4	5	6	7	8	9	10	11	Total
Maintain trails in good condition	51	63	51	66	46	59	62	40	46	59	41	56
Trail maps / information	52	56	55	51	41	43	58	53	51	54	52	52
More trails for Class I	48	40	47	57	50	49	56	29	51	50	53	46
More trails for Class III	56	48	39	52	53	51	36	43	46	33	38	46
Prioritize challenging / technical trails	53	51	42	41	49	49	36	36	36	46	30	45
More trails for Class II	39	47	44	50	49	42	34	38	33	42	30	44
More cross-country travel areas	42	38	39	42	46	54	52	45	62	65	50	44
Prioritize trails with attractive views	40	38	38	46	39	44	41	41	43	53	44	41
Prioritize loop trails	46	43	39	35	40	35	48	37	39	39	34	40
Signs along the trails	34	46	45	40	30	34	35	37	32	27	20	39
Reduce natural resource damage	34	39	42	43	33	41	37	30	31	37	33	39
More trail events	47	41	36	41	38	47	41	22	34	40	27	39
More trails for Class IV	39	33	27	44	39	33	25	22	35	41	37	33
Prioritize trails 100+ miles long)	45	29	32	26	32	32	37	31	28	49	31	32
Facilities (load ramps, wash stations, etc.)	31	29	28	42	30	32	31	27	27	29	28	30
Provide children's play areas	36	25	31	34	38	43	26	26	21	26	16	30
Prioritize trails close to home	39	36	20	26	23	25	24	33	35	25	25	29
More educational programs	24	23	31	31	26	33	28	17	34	40	34	28
More space for training classes	13	19	14	21	21	17	15	14	17	24	21	18
Enforcement of existing rules	14	15	23	20	17	13	17	14	17	9	18	17

	1	2	3	4	5	6	7	8	9	10	11	Total
Strongly prioritize adding areas	41	39	34	46	28	41	54	42	33	30	38	39
Somewhat prioritize adding areas	18	25	29	18	23	18	12	18	12	13	14	22
No preference	10	5	8	10	17	17	12	15	28	23	24	11
Somewhat prioritize improving existing areas	18	13	17	9	26	16	7	15	14	23	14	15
Strongly prioritize improving existing areas	14	18	12	16	6	8	14	11	14	11	10	13

	1	2	3	4	5	6	7	8	9	10	11	Total
Closure of trails	53	57	51	64	71	66	71	49	72	75	49	60
Closure of logging roads	46	51	48	47	61	54	72	49	75	80	58	54
Litter / dumping	39	32	38	41	40	42	33	42	37	45	34	37
Too much law enforcement	22	26	24	31	30	39	26	27	38	30	21	28
Lack of trail ethics	18	20	28	25	32	14	25	19	26	28	20	23
Vandalism	18	15	18	26	19	20	21	17	30	29	22	19
Too many people	13	17	17	26	21	15	19	16	24	9	10	17
Alcohol or drug use	18	7	14	27	24	18	10	8	15	15	18	14
Riding in closed areas	10	7	14	17	21	16	19	15	17	20	17	14
Target shooting	11	13	12	16	8	12	10	21	10	16	8	13
Rowdy behavior	11	5	13	17	14	9	13	11	20	18	15	11
Unsafe OHV use	12	7	11	18	14	12	10	12	19	6	10	11
Riding on trails for other OHV classes	7	8	11	13	6	13	13	11	14	10	10	10
Too little law enforcement	8	8	13	11	12	11	8	8	13	9	7	10
Conflict between users	8	6	3	8	3	5	6	10	9	5	7	6
Vehicle noise	4	2	4	9	12	7	5	4	3	6	3	5

Appendix 2. Training and convenience sample results

This appendix includes results for the training and convenience samples. The questionnaires for those samples were much shorter than for the probability sample. The following are the key results for content covered across the samples. Figure numbers match figure numbering in the body of the text.

Given the nature of the different samples, these analyses utilized weighting based on age but not region. Thus, they cannot be directly compared to the results in the main body of the report. They are presented to provide a broad sense of potential differences in characteristics and preferences across the samples.

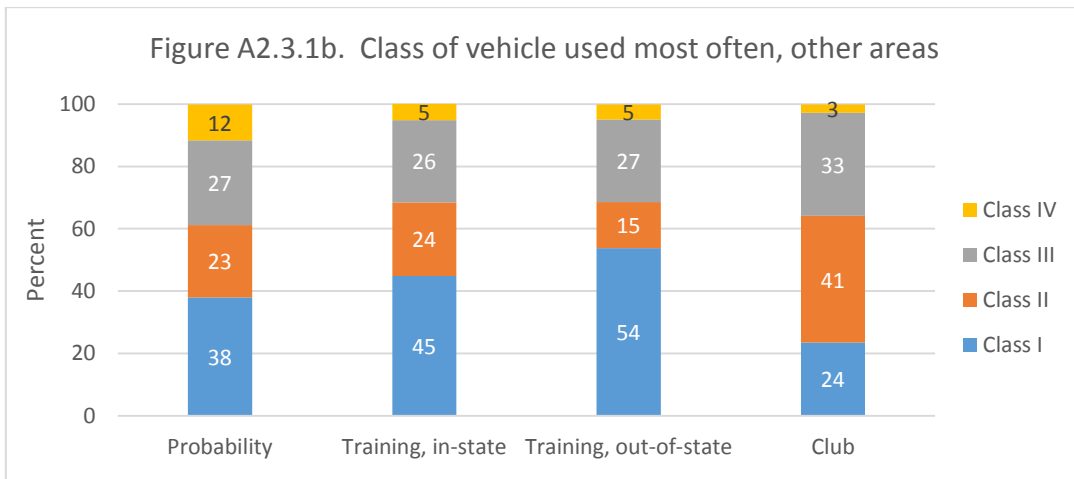
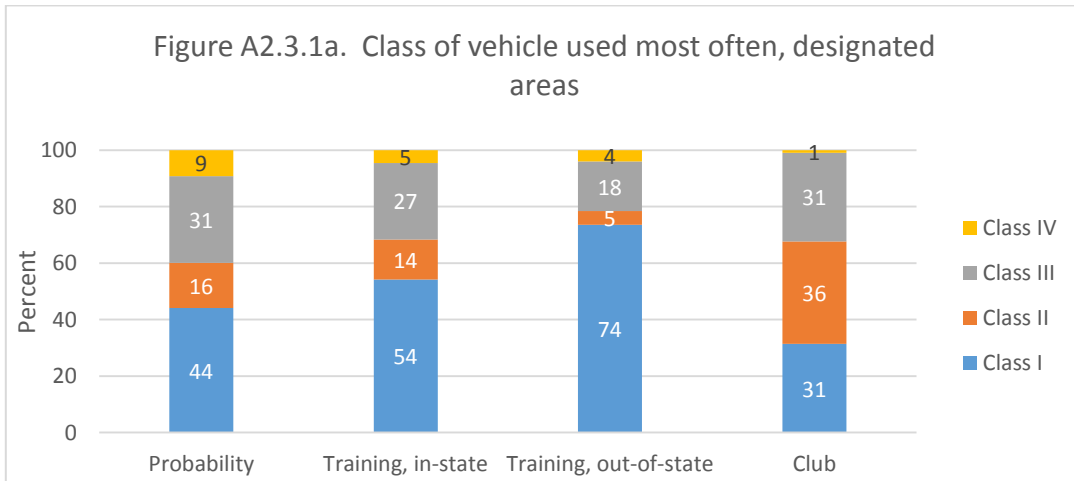
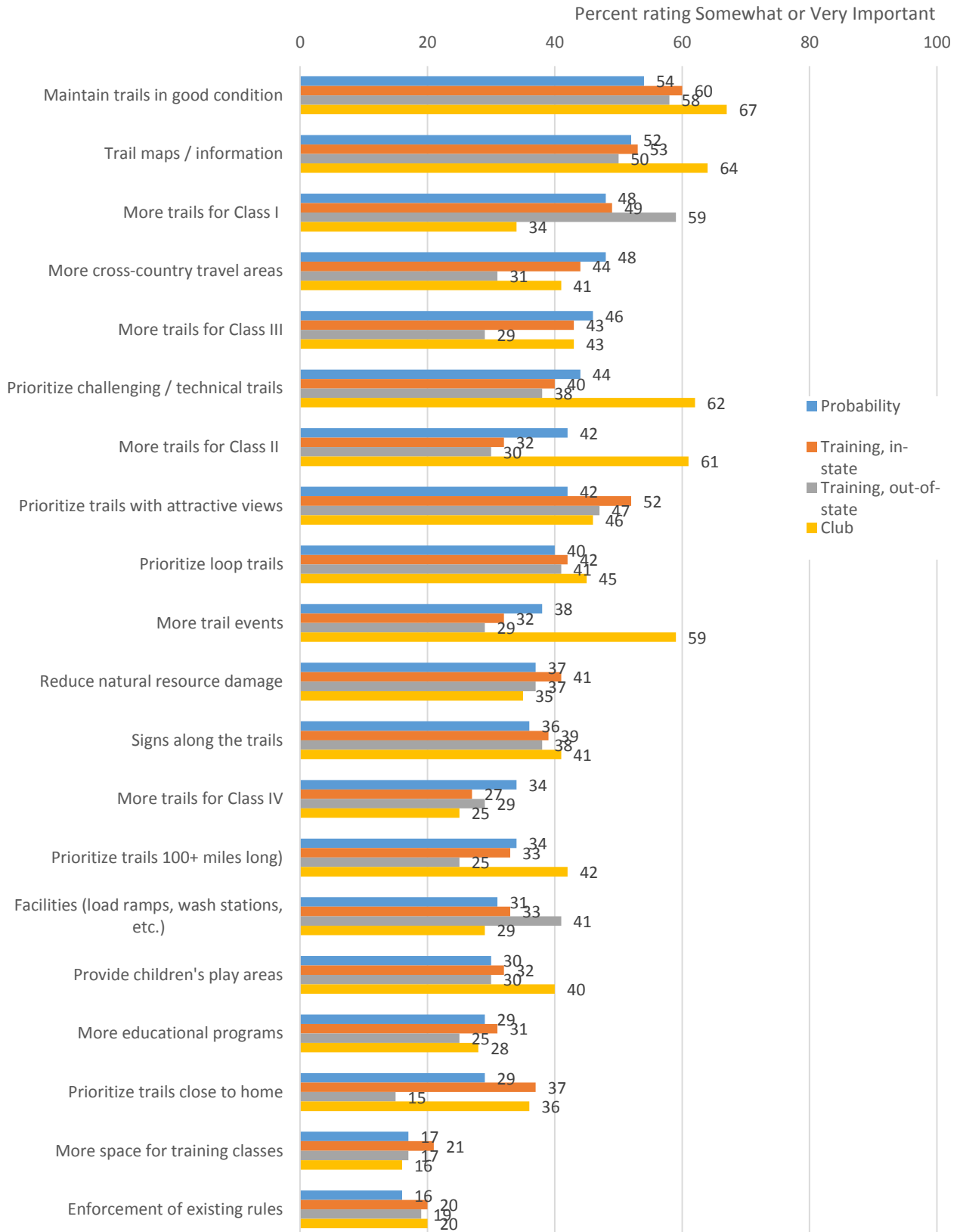


Figure A2.3.4. Importance for funding, by sample, sorted by probability sample



Appendix 3. Calculation of economic contribution

The following steps were used in estimating the economic contribution of expenditure by OHV riders.

1. An IMPLAN model was created for the state, with 2012 economic structure data.
2. IMPLAN default values were used and Type SAM multipliers were created. These multipliers treat households as endogenous and thus include induced effects.
3. An impact scenario was created by allocating visitor expenditure into relevant IMPLAN categories (bridging). Spending in the groceries, gas and oil, and miscellaneous categories was treated as retail expenditure and margined.
4. Impact estimates were generated. Impact results are shown in 2014 dollars.

Input-output analysis assumptions

IMPLAN is based on input-output (IO) analysis and is widely used to estimate the economic contribution of tourism, recreation, and other activities. The IO approach involves several assumptions. These assumptions generally are not met in their entirety, but IO (and IMPLAN in particular) provides a good balance between practicality and accuracy. That is particularly true in cases, such as the present, in which the impact being evaluated is a small proportion of the overall study area economy. In such cases, non-linearities can be reasonably approximated with the linear relationships inherent in IO. IO assumptions include the following.

1. All businesses within each sector produce a single, homogeneous product or service; the input procedures used in the production process are identical.
2. An increase of production will lead to purchase of inputs in the proportions shown in the technical coefficients matrix. In technical terms, the production function is linear and homogeneous. This assumption restricts economies of scale; IO analysis assumes a business always will use the same proportion of inputs regardless of how much it grows.
3. When households are included in the analysis (as is done for this analysis), their spending patterns (consumption functions) also are assumed to be linear and homogeneous.
4. The structure of the economy will not change. Many input-output models, including the one used here, are static in nature. They are based on data from a single year, in this case 2012. Dramatic structural changes in the economy would mean the relationship between expenditure and impact would be different in future years.
5. When IO is used to estimate the effect of changes in final demand (as in the present case), there must be unemployed resources available to be brought into the sector as inputs.

Appendix 4. Questionnaire instrument (mail version)

Version 1 of the mail questionnaire is reproduced below. Note that online version functionality allowed for region-by-region reporting, including region-level travel distance for “ride most often” sites.

Following Version 1 below are the three questions included only in Version 2.

Oregon All-Terrain Vehicle Recreation



Please Complete This Survey and Return It As Soon As Possible

Your Input Helps Inform Future Trail Opportunities

Thank You for Your Participation



This research survey, and each question in it, is voluntary. Your responses will be anonymous – responses will only be reported as part of larger groups. We do not anticipate any direct risks or benefits in completing the survey, but your responses may enhance future riding opportunities for you and other riders. The survey takes approximately 15 to 20 minutes to complete, depending on your riding patterns.

If you have any questions about the survey, please contact Principal Investigator Kreg Lindberg at 541-322-3126 or by e-mail at kreg.lindberg@osucascades.edu. If you have any questions about your rights as a survey participant, please contact the OSU Institutional Review Board (IRB) Human Protections Administrator at 541-737-8008 or by e-mail at IRB@oregonstate.edu

V1

1. How many off-highway vehicles (OHVs) in each class are owned within your household? Write in the number for each class.

Vehicle class	Number of vehicles in class in household
Class I (quads and three-wheel ATVs)	
Class II (dune buggies and rails, 4x4 vehicles, and side-by-sides greater than 65 inches wide)	
Class III (off-road motorcycles)	
Class IV (side-by-sides 65 inches or less wide)	

Please answer the remaining questions only with respect to recreational OHV riding on public lands in Oregon in the past 12 months (October 2013 through September 2014). This includes US Forest Service, Bureau of Land Management (BLM), state forest, and county lands.

If you did not ride recreationally on public lands in Oregon in the past 12 months, please tick this box , skip the remaining questions, and return the survey in the postage-paid envelope.

The enclosed map shows the 48 designated ATV / OHV riding areas in Oregon. The map also splits Oregon into 11 regions. Each of the 48 areas is in one of the 11 regions.

There are two broad types of recreational OHV riding in Oregon:

- Designated riding areas, which are listed in Question 6 below and shown on the map.
- Other areas or routes, such as dirt roads open for riding on Forest Service, BLM, state forest, or county lands.

2. Of all the time you spent OHV riding on public lands in Oregon in the past 12 months (October 2013 through September 2014), approximately what percent was for each type of riding? Please write in the percentage for each. Together, they should total 100%.

_____ % in the 48 designated riding areas listed in Question 6, all combined

_____ % in other areas or routes, such as dirt roads

3. Which class of vehicle did you use most often while OHV riding on public lands in Oregon in the past 12 months? Please tick one box for each type of riding you engaged in in Oregon in the past 12 months.

Type of riding	For this type of riding, I most often used the following class of vehicle:			
In the 48 designated riding areas	<input type="checkbox"/> Class I	<input type="checkbox"/> Class II	<input type="checkbox"/> Class III	<input type="checkbox"/> Class IV
In other areas or routes, such as dirt roads	<input type="checkbox"/> Class I	<input type="checkbox"/> Class II	<input type="checkbox"/> Class III	<input type="checkbox"/> Class IV

4. In the past 10 years, would you say the availability of opportunities for each type of riding has increased, not changed (stayed the same), or decreased? Please tick one box for each type of riding.

Type of riding	For this type of riding, opportunities have:			
In the 48 designated riding areas	<input type="checkbox"/> Increased	<input type="checkbox"/> Not changed	<input type="checkbox"/> Decreased	<input type="checkbox"/> Unsure
In other areas or routes, such as dirt roads	<input type="checkbox"/> Increased	<input type="checkbox"/> Not changed	<input type="checkbox"/> Decreased	<input type="checkbox"/> Unsure

If all (100%) of your riding time in the past 12 months was spent in the 48 designated riding areas, skip to Question 6.

5. Of all the days in the past 12 months you spent riding in other areas or routes, such as dirt roads, in which region did you spend the most days? Refer to the enclosed map, which splits Oregon into 11 regions. Write the number below, between 1 and 11, for the region where you spent the most days doing this type of riding.

I rode most often in region _____ when riding in other areas or routes (write in the number for one region)

6. In the past 12 months, how many days did you ride in each of the following 48 designated OHV riding areas? See enclosed map to locate each area, then write in the days for each area in which you rode. Any portion of a day counts as a full day. If you did not ride in any of these areas in the past 12 months, please skip to Question 11.

Riding area	Days
1. Nicolai Mountain	
2. Tillamook State Forest	
3. Upper Nestucca	
4. Sand Lake	
5. Mt. Baber	
6. South Jetty	
7. Winchester Bay	
8. Horsefall	
9. Winchester Trails	
10. Blue Ridge	
11. Chetco	
12. Pine Grove + Illinois River Trails	
13. Galice	
14. McGrew 4x4 Trail	
15. Lily Prairie	
16. Timber Mountain	
17. Elliott Ridge	
18. Klamath Sportsman's Park	
19. Prospect	
20. North Umpqua	
21. Diamond Lake	
22. Three Trails	
23. Cottage Grove	
24. Huckleberry Flats	

Riding area	Days
25. Shotgun Creek	
26. Northwest Area	
27. McCubbins Gulch	
28. McCoy MRA	
29. Santiam Pass	
30. Cline Buttes	
31. Henderson Flat	
32. Green Mountain	
33. Millican Valley	
34. Edison Butte	
35. East Fort Rock	
36. Rosland	
37. Christmas Valley	
38. Crane Mountain	
39. Radar Hill	
40. Morrow / Grant County Trails	
41. West End (Sunflower)	
42. John Day Area	
43. Blue Mountain	
44. Virtue Flat	
45. Winom-Fraiser	
46. Mt. Emily	
47. Breshears	
48. Upper Walla Walla	

7. From the list in Question 6 above, please write the name of the area where you rode most often in the past 12 months. If there is a tie, write the name for your favorite among those in the tie.

I rode most often at site _____ (write in the name)

8. For the area you wrote in above (rode in most), approximately how many miles do you travel one-way from your home to that area? Write in the number of miles.

_____ miles

9. For the area you wrote in above (rode in most), what can be done to improve your experience riding at that area? Please write your suggestion.

10. Trail managers have limited resources to provide for all types of OHV trail experiences. How important is each of the following for you at the area you wrote in above (rode in most)? Circle one number for each action.

Action	Not important				Very important
More signs along the trails	1	2	3	4	5
More trail maps and information	1	2	3	4	5
More enforcement of existing rules/ regulations in trail areas	1	2	3	4	5
Maintain existing trails in good condition	1	2	3	4	5
Reduce natural resource damage near trails	1	2	3	4	5
More educational programs promoting safe/responsible riding	1	2	3	4	5
More space for ATV training classes	1	2	3	4	5
More support facilities (such as loading ramps and wash stations)	1	2	3	4	5
More trails for Class I (quads and three-wheel ATVs)	1	2	3	4	5
More trails for Class II (dune buggies, and rails, 4x4 vehicles, and side-by-sides greater than 65 inches in width)	1	2	3	4	5
More trails for Class III (off-road motorcycles)	1	2	3	4	5
More trails for Class IV (side-by-sides 65 inches or less in width)	1	2	3	4	5
Prioritize loop over out-and-back trails	1	2	3	4	5
Prioritize challenging / technical trails	1	2	3	4	5
Prioritize long-distance trails (more than 100 miles long)	1	2	3	4	5
Prioritize trails with attractive views	1	2	3	4	5
Prioritize trails near where people live (close to home)	1	2	3	4	5
More cross-country travel areas	1	2	3	4	5
More trail events (such as poker runs, races, and dual sports)	1	2	3	4	5
Provide children's play areas near staging areas	1	2	3	4	5

11. There are various considerations – from convenience to facilities – in deciding where to ride. How important is each of the following when you decide which area to ride in? Circle one number for each facility.

Facility	Not important					Very important
Campgrounds	1	2	3	4	5	
Group camping sites	1	2	3	4	5	
Electric hookups	1	2	3	4	5	
Water hookups	1	2	3	4	5	
Sewer hookups	1	2	3	4	5	
Tent campsites	1	2	3	4	5	
RV campsites / parking for large vehicles	1	2	3	4	5	
Staging area	1	2	3	4	5	
Loading / unloading facilities	1	2	3	4	5	
Bathrooms	1	2	3	4	5	
Showers	1	2	3	4	5	
Picnic tables	1	2	3	4	5	
Fire rings	1	2	3	4	5	
Direct access to riding areas	1	2	3	4	5	
Children's loop near staging area	1	2	3	4	5	
Children's playground	1	2	3	4	5	

Please tell us more about your OHV riding trips. Day trips do not involve an overnight stay away from home. Multi-day trips involve an overnight stay.

12. In the past five years, has the number of trips you've taken increased, stayed the same, or decreased? Please tick one box for each type of trip.

Type of trip	In the past 5 years, the number of this type of trip has...		
Day trip	<input type="checkbox"/> Increased	<input type="checkbox"/> Stayed the same	<input type="checkbox"/> Decreased
Multi-day trip	<input type="checkbox"/> Increased	<input type="checkbox"/> Stayed the same	<input type="checkbox"/> Decreased

13. If the number of either type of trip has increased or decreased, please indicate why. Tick all that apply.

- | | |
|---|---|
| <input type="checkbox"/> More free time | <input type="checkbox"/> Less free time |
| <input type="checkbox"/> More disposable income | <input type="checkbox"/> Less disposable income |
| <input type="checkbox"/> High cost of fuel | <input type="checkbox"/> Other (please describe): _____ |

14. For multi-day trips, what type of overnight accommodation do you use? Tick all that apply.

- | | | |
|--|---|---|
| <input type="checkbox"/> RV / camper in campground | <input type="checkbox"/> Group RV / camper area | <input type="checkbox"/> RV or tent <u>dispersed</u> / dry camp |
| <input type="checkbox"/> Tent in campground | <input type="checkbox"/> Group tent area | <input type="checkbox"/> Hotel / motel |
| <input type="checkbox"/> At home of local friends/family | <input type="checkbox"/> Other (please describe): _____ | |

15. While on day trips or multi-day trips, what activities do you typically do (or would you like to do) in addition to riding? Check all that apply.

- | | | |
|---|--|--|
| <input type="checkbox"/> Explore the town / area | <input type="checkbox"/> Dine out | <input type="checkbox"/> Visit brewpubs / breweries |
| <input type="checkbox"/> Visit vineyards / wineries | <input type="checkbox"/> Visit historic places | <input type="checkbox"/> Attend a ranger-led program |
| <input type="checkbox"/> Shop | <input type="checkbox"/> Watch wildlife | <input type="checkbox"/> Hunt |
| <input type="checkbox"/> Fish / crab | <input type="checkbox"/> Photography | <input type="checkbox"/> Other outdoor activities |
| <input type="checkbox"/> Other (please describe): _____ | | |

16. There are 11 regions in Oregon shown on the map. Please indicate in which of the 11 regions you live. If you moved across regions, indicate the region where you lived the most days in the past 12 months. Write in one number between 1 and 11.

I live in region _____

17. Below, please write the number of days you rode during the past 12 months in each of the regions (1 through 11) shown on the map. This includes days riding in designated riding areas and in other areas on public land, such as dirt roads. Any portion of a day counts as a full day.

In the first column, write the number of riding day trips you took in the region, such as riding on BLM or US Forest Service land near your home after work or on weekend mornings.

In the second column, write the number of days you rode while on overnight trips away from home, regardless of whether the reason for the trip was to ride OHVs.

Assume you live in the Example region and rode in areas near your house on 24 days in the past twelve months. You also took a week-long trip in the region to visit family, and rode 3 days during that week. In the Example row, you would write 24 in the first column and 3 in the second column.

Region	<u>Day trips</u> riding on public land	Days riding on public land away from home – <u>involved</u> overnight stays
Example	24	3

Please indicate your days riding in the rows and columns below

Region	<u>Day trips</u> riding on public land	Days riding on public land away from home – <u>involved</u> overnight stays
Region 1		
Region 2		
Region 3		
Region 4		
Region 5		
Region 6		
Region 7		
Region 8		
Region 9		
Region 10		
Region 11		

Please tell us more about your "typical" day OHV riding trip. This would be at the one location where you most often rode on public lands during the past 12 months, when this did not involve an overnight stay away from home – for example, after work or on a weekend morning.

Locations are where you ride on public lands. The location could be a designated riding area or other area on public land, such as dirt roads.

If you did not take any day OHV riding trips on public land in the past 12 months, please skip to Question 21.

18. In which of the 11 Oregon regions was the location (where you rode) on your typical day OHV riding trip? It may be the same as the region you live in. Write in one number.

My typical day off-highway vehicle riding trip was in region _____ (write one number between 1 and 11)

19. Is the location for your typical OHV day trip within 60 driving miles of your home? Tick one box.

- Yes, it is within 60 miles of my home
- No, it is further than 60 miles from my home

20. Including yourself, how many people usually are in your travel party for your typical day OHV riding trip? This includes everyone who travels with you to the location. Write in the number of people, including yourself.

_____ person(s)

21. On this typical day OHV riding trip, how much do you and other members of your travel party spend within 50 miles of the location? If the typical trip is a short trip near your home, it is possible that you spend little or no money. Write in the amount for each item, rounding off to the nearest dollar.

Item	Amount spent by everyone in travel party within 50 miles of the location
Hotel, motel, condo, cabin, B&B, or other lodging <u>except camping</u>	\$
Camping (RV, tent, etc.)	\$
Restaurants, bars, pubs	\$
Groceries	\$
Gas and oil (for the OHVs and any vehicles used to transport them)	\$
Other transportation	\$
Park / forest entry, parking, or recreation use fees	\$
Recreation and entertainment	\$
Sporting goods	\$
Other expenses, such as souvenirs	\$
Total	\$

- I don't recall my trip spending
- I don't want to report my trip spending

Now please tell us more about your "typical" multi-day OHV riding trip. This would be at the one location where you most often rode on public lands during the past 12 months, when this did involve an overnight stay away from home – even if you only rode one day (or part of a day) during the trip.

The location could be a designated riding area or other area on public land, such as dirt roads.

If you did not take any multi-day OHV riding trips in the past 12 months, please skip to Question 26.

22. In which of the 11 Oregon regions was the location (where you rode) on your typical multi-day OHV riding trip? It may be the same as the region you live in. Write in one number.

My typical multi-day off-highway vehicle riding trip was in region _____ (write one number between 1 and 11)

23. Was the location on this typical multi-day OHV riding trip within 60 driving miles of your home? Tick one box.

- Yes, it was within 60 miles of my home
- No, it was further than 60 miles from my home

24. On this typical multi-day OHV riding trip, how many days did you spend within 50 miles of the location? Write in the number of days.

_____ days on my typical multi-day trip

25. Including yourself, how many people usually are in your travel party for your typical multi-day OHV riding trip? This includes everyone who travels with you to the location. Write in the number of people, including yourself.

_____ person(s)

26. On this typical multi-day OHV riding trip, how much do you and other members of your travel party spend within 50 miles of the location? Write in the amount for each item, rounding off to the nearest dollar.

Item	Amount spent by everyone in travel party within 50 miles of the location
Hotel, motel, condo, cabin, B&B, or other lodging <u>except camping</u>	\$
Camping (RV, tent, etc.)	\$
Restaurants, bars, pubs	\$
Groceries	\$
Gas and oil (for the OHVs and any vehicles used to transport them)	\$
Other transportation	\$
Park / forest entry, parking, or recreation use fees	\$
Recreation and entertainment	\$
Sporting goods	\$
Other expenses, such as souvenirs	\$
Total	\$

- I don't recall my trip spending
- I don't want to report my trip spending

27. Based on your OHV riding in the past 12 months, how much of a problem do you think each of the following is on OHV trails on public land in Oregon? Circle one number for each issue.

Issue	Not a problem					A serious problem				
	1	2	3	4	5	1	2	3	4	5
Vehicle noise	1	2	3	4	5	1	2	3	4	5
Alcohol or drug use	1	2	3	4	5	1	2	3	4	5
Rowdy behavior	1	2	3	4	5	1	2	3	4	5
Vandalism	1	2	3	4	5	1	2	3	4	5
Litter / dumping	1	2	3	4	5	1	2	3	4	5
Lack of trail ethics by other users	1	2	3	4	5	1	2	3	4	5
Riding on trails designated for other OHV classes	1	2	3	4	5	1	2	3	4	5
Riding in closed areas	1	2	3	4	5	1	2	3	4	5
Too little law enforcement	1	2	3	4	5	1	2	3	4	5
Too much law enforcement	1	2	3	4	5	1	2	3	4	5
Closure of trails	1	2	3	4	5	1	2	3	4	5
Closure of logging roads	1	2	3	4	5	1	2	3	4	5
Unsafe off-highway vehicle use	1	2	3	4	5	1	2	3	4	5
Too many people	1	2	3	4	5	1	2	3	4	5
Target shooting	1	2	3	4	5	1	2	3	4	5
Conflict between users	1	2	3	4	5	1	2	3	4	5

28. Do you currently belong to an OHV organization or club? Tick one box.

- Yes
 No
 Unsure

29. For each person in your household who participated in recreational OHV riding on public lands in Oregon in the past 12 months, please tick the relevant box for their gender and write their age in years.

Rider	Gender (tick one)	Current age (write in age)
Yourself	<input type="checkbox"/> Male <input type="checkbox"/> Female	_____ years old
2 nd OHV rider in household	<input type="checkbox"/> Male <input type="checkbox"/> Female	_____ years old
3 rd OHV rider in household	<input type="checkbox"/> Male <input type="checkbox"/> Female	_____ years old
4 th OHV rider in household	<input type="checkbox"/> Male <input type="checkbox"/> Female	_____ years old
5 th OHV rider in household	<input type="checkbox"/> Male <input type="checkbox"/> Female	_____ years old
6 th OHV rider in household	<input type="checkbox"/> Male <input type="checkbox"/> Female	_____ years old

30. What is your household's total annual income before taxes? Include income for all persons that regularly live in your household and all sources of income – salary, pensions, interest or dividends, and all other sources. Tick one box.

- Less than \$10,000
 \$25,000 to \$34,999
 \$75,000 to \$99,999
 \$10,000 to \$14,999
 \$35,000 to \$49,999
 \$100,000 to \$149,999
 \$15,000 to \$24,999
 \$50,000 to \$74,999
 \$150,000 or more

The following three questions were asked in Version 2, but not Version 1, of the paper survey:

9. With limited funding, should trail managers prioritize purchasing land for additional riding areas or improving existing areas? Tick one box.

- Strongly prioritize adding areas Somewhat prioritize adding areas No preference Somewhat prioritize improving existing areas Strongly prioritize improving existing areas

10. If you selected strongly or somewhat prioritize adding areas in Question 9 above, which class of vehicle should be prioritized in developing the new areas? Tick one box.

- Class I Class II Class III Class IV Prioritize all classes equally

27. An ATV permit is required when riding an OHV on public land in Oregon. The permit is valid for two years and currently costs \$10. Permit revenue is used to provide facilities and riding opportunities in Oregon. Would you support or oppose an increase in the permit fee from \$10 to \$15 to expand funding for facilities and opportunities? Please tick one box.

- Strongly oppose Somewhat oppose Neither oppose nor support Somewhat support Strongly support

Appendix 5. Map of OHV designated riding areas and regions

