

2017 Virginia Outdoors Demand Survey



Report of Results

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Matthew Starnowski, Project Coordinator, assisted with coordination of the project.

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The Center for Survey Research (CSR), a unit of the Weldon Cooper Center for Public Service at the University of Virginia, is responsible for any errors in this report. Inquiries may be directed to: Center for Survey Research, University of Virginia, P.O. Box 400767, Charlottesville, VA 22904-4767. The Center can be reached by telephone at 1-434-243-5222, by e-mail to surveys@virginia.edu, or through the World Wide Web at <https://csr.coopercenter.org>.

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Executive Summary

Purpose of the Survey

Every five years in preparation for the development of the Virginia Outdoors Plan, the Virginia Department of Conservation and Recreation (DCR) conducts an outdoor recreation survey. The main purposes of the 2017 Virginia Outdoors Demand Survey (VODS) are to assess Virginians' attitudes about outdoor recreation resources, estimate participation in and demand for a wide variety of recreational activities, and provide a channel of citizen input into the 2017 Virginia Outdoors Plan.

The VODS establishes a base of statewide data from which to estimate outdoor recreation use. The survey helps recreation providers strategically plan future facilities based on the needs estimated from the survey responses. Larger, more populous localities often use this information as a basis for preparing a more detailed local outdoor recreation survey. Smaller, less populous localities use the VODS data as direct input for comprehensive master planning and for local park planning.

This information will assist DCR and local providers in determining recreation needs. It will also help in identifying ways in which DCR can improve the state parks system and how best to protect Virginia's natural and open space resources.

Survey Methods

Probability-Based Sample

The 2017 VODS was offered to a probability sample of Virginia addresses. It was designed to obtain participation rates for 101 outdoor recreation activities (up from about 50 in 2011). The survey also included specific questions to assist with future planning for local and regional parks, Virginia State Parks and Natural Area Preserves. In addition, there were several opinion questions regarding funding for outdoor recreation needs, including support for or opposition to a tax increase.

Crowd-Sourced Sample

As part of the 2017 VODS, a non-probability "crowd-sourced" version of the survey was also made available to the general public. DCR

solicited participation in the crowd-sourced survey by social media and contacts with interest groups.

Unless otherwise noted, results in this report pertain only to the probability-based VODS.

Data Collection

Out of the probability sample of 14,000 Virginians contacted by mail and asked to participate in the survey, 3,252 responded.

This equates to a response rate of approximately 23.2 percent and a margin of error due to sampling of approximately +/- 2.3 percentage points¹.

Note that random sampling error is not the only potential source of error in surveys. Non-response error, for example, is also of concern insofar as those Virginians who responded to the survey may differ in their attitudes toward, or frequency of participation in, outdoor recreation activities compared to those who did not respond.

The sample was stratified by planning districts to ensure representation from areas with smaller populations. In some cases, planning districts were combined into one area for sampling purposes.

The data were weighted to adjust for the disproportionate sampling by geography, and to bring the demographics more into line with statewide proportions.

At DCR's request, CSR experimented with mail and web-based modes of data collection in this study. There was also an experiment on whether brown or white envelopes for the survey packets influenced response rates. Because the differences by mode and by envelope color did not appear to be extensive or extreme, the combined data were used without adjustments for the experimental conditions. Based on these experiments, for future iterations of the survey CSR recommends an initial data collection phase by Internet followed by a full postal survey protocol for all cases using brown envelopes for the survey packet mailings. This approach should maximize participation and minimize costs.

The survey protocols had multiple points of contact by U.S. mail, including an advance

¹ The sampling error calculation takes into account the impacts of weighting the data and using a disproportionate stratified design. See Appendix G for details.

notification letter from DCR, two reminder postcards and two survey packet mailings. Households in the web-based protocol received one additional letter.

There were 2,389 respondents to the crowd-sourced survey. DCR promoted the crowd-sourced survey using Facebook, Twitter and email notifications to existing contacts.

The probability sample was offered in English but respondents had the option to request a Spanish version of the questionnaire on paper. No requests were received for a Spanish questionnaire. The crowd-sourced survey was conducted only by web but it included a Spanish translation of the survey online. Very few surveys were started in Spanish and none were complete enough to be part of the dataset for analysis.

Overview of Survey Results

The 2017 Virginia Outdoors Demand Survey (VODS) again finds high regard for the importance of outdoor recreation opportunities and a strong commitment to the protection of natural areas among the general public. The survey finds strong support for public funding and public management of lands in pursuit of the protection of natural areas.

In addition, about half of the respondents would support an increased state tax to fund outdoor recreation in Virginia, about a quarter would oppose such a tax, and the rest would neither support nor oppose it or did not know.

The four most frequently mentioned activities in which respondents had participated in the last 12 months were visiting natural areas, driving for pleasure, walking for pleasure, and visiting parks (local, state or national).

When presented with a list of which outdoor recreation opportunities were most needed in Virginia, respondents mainly saw the need for more access to natural areas, parks, trails and water access.

Survey Results

Access to Outdoor Recreation

An overwhelming majority of respondents – more than nine in ten – consider access to outdoor recreation to be “very important” or “important.”

Respondents under the age of 65 were especially likely to consider such access to be “very important.”

This combined support is comparable to the 2011 VODS, although the percentage of respondents who consider such access to be “very important” increased markedly, from 56 percent in 2011 to 71 percent in 2017. The majority of respondents, and respondents under age 65, participate in outdoor recreation “mostly on weekends.”

Most Needed Recreation Opportunities

The survey asked respondents to select up to three recreation opportunities that are “most needed in Virginia” from a list of possibilities. The most frequently selected choices were access to:

1. Natural areas (54%)
2. Parks (49%)
3. Trails (43%)
4. Water access (43%)

Respondents 65 years of age and older were more interested in historic areas and scenic drives compared to younger respondents.

Preference for Developed Parks or Natural Areas

About five in ten respondents expressed either an equal preference or no preference between developed parks and natural areas. Among those expressing a preference however, the majority favored natural areas. This tendency was particularly pronounced among respondents aged 18-24.

Participation in Recreational Activities

Respondents were asked if they or anyone in their household had participated in any of 101 different recreational activities within the past 12 months. The four most frequently mentioned activities were:

1. Visiting natural areas (71%, up from 50% in 2011)
2. Driving for pleasure (67%)²
3. Walking for pleasure (67%, down from 82% in 2011)

² The 2011 survey did not ask about “driving for pleasure,” which was mentioned by 55% in 2006, making it the third-most popular activity then.

4. Visiting parks (local, state, national) (56%, up from 51% in 2011)

One in five (20%) reported camping in a Virginia state park in the last 12 months.

The three “organized sports” most commonly participated in were:

1. Basketball (15%)
2. 18-hole golf (14%)
3. Soccer (11%)

The three water-related activities most frequently participated in were:

1. Swimming in an outdoor pool (48%)
2. Sunbathing/relaxing on a beach (47%)
3. Viewing the water (38%)

Overall, more than three-quarters of respondents (80%) said they participated in at least one water-related activity. This figure still exceeded three-quarters (77%) when excluding swimming in an outdoor pool.

The “wheeled activities” most frequently participated in were:

1. Activities on paved or gravel bicycle trails (11%)
2. Bicycle touring on roads (9%)
3. (tie) Driving an ATV or UTV off-road (6%)
3. (tie) Driving a 4-wheel off road (6%)

The three winter activities most frequently participated in were:

1. Snow sledding/tubing (15%)
2. Downhill skiing (9%)
3. Ice skating outdoors (7%)

The three miscellaneous activities grouped as “other activities” that were most frequently participated in were:

1. Visiting parks (local, state and national) (56%)
2. Visiting historic areas (35%)
3. Gardening (27%)

“Destination activities” was a new category added for 2017. The three “destination activities” most frequently participated in were:

1. Outdoor festivals (34%)
2. Visiting working farms/corn mazes and the like (31%)

3. Music festivals (28%)

Sources of Information about Recreational Activities

Listed in descending order, the top three sources of outdoor recreation information were “word of mouth,” “Internet” and “social media.” The Internet was mentioned more frequently by respondents aged 18 to 39 compared to older respondents and by respondents with household incomes at or above \$50,000. The Internet was mentioned a little more frequently in the Urban Corridor region of the state (71%) than the other regions of the state (60% to 61%).

Use of Technology During Outdoor Recreation

Younger respondents (especially those under 40 years of age) were more likely to use some – but not all – technologies in conjunction with outdoor recreation. Technology use was also slightly more frequent in the Urban Corridor region, although certain technologies were mentioned more frequently in other regions (GPS tracking in the Chesapeake region and remote cameras in the Mountain and Piedmont regions).

Amenities, Camping and State Parks

For overnight stays in a Virginia state park or other natural setting, respondents most preferred to have:

1. Cabins (77%)
2. Drive-in campsites with water and electric hookups (37%)
3. Camp cabins or yurts (29%)

A majority (62%) said that they would be more likely to stay overnight if a state park has cabins.

For those who had done drive-in camping in the last 12 months, the most popular drive-in camping amenities were:

1. Flush toilets (85%)
2. Showers (84%)
3. Security patrol (70%)

Safety

The most frequently selected improvements to ensure safety in parks and outdoor recreation settings were:

1. Well-maintained parks, equipment and trails (71%)
2. Lighting (55%)
3. Park personnel being out and about (44%)

Trails

The amenities considered most important by respondents when using trails were:

1. Bathrooms (74%)
2. Trailhead parking (54%)
3. Drinking water (48%)

The top three reasons given for using trails were:

1. Pleasure or relaxation (88%)
2. Scenery and natural environment (71%)
3. Health and physical training (65%)

Crowding in State Parks

A little fewer than one in ten (9%) said they or someone else in the household had been turned away or left a state park due to crowding in the last 12 months.

Natural Areas and Their Protection

More than four in five respondents (82%) rated the protection of natural areas as “very important,” while almost no one (1%) rated such protection as “not too important” or “not important at all.”

A substantial proportion of respondents (42%) were unsure as to whether natural areas are adequately protected at present, with a slight majority of the remainder answering “no.”

Respondents were provided with a definition of Virginia’s Natural Area Preserves. A large majority of respondents (70%) said that it was “very important” to have the system.

Respondents were asked about three possible approaches to managing publicly owned park land:

1. Publicly owned park land should be available for conversion to private development based on future community needs
2. Permanently protected from development only if the park protects water quality or threatened species
3. Permanently protected from development in all cases

Half (50%) chose permanent protection in all cases, just under a quarter (24%) chose protection only for environmental reasons, about one-fifth (19%) did not know, and very few (7%) chose making publicly owned park land available for conversion to private development based on future community needs.

State Spending on Outdoor Recreation

Forty-four percent of respondents said state spending for outdoor recreation should increase, about one-third (30%) said it should stay the same, one-quarter did not know (25%) and the remainder (2%) said it should decrease.

Race, Ethnicity and Recreational Activities

Generalizations about racial and ethnic groups are sometimes risky because racial and ethnic subgroups are not monolithic populations. There is much variety within almost any demographic subgroup. But some trends do seem to be useful to consider in a broad, general way.

Research about Hispanic Americans demonstrates many similarities to other Americans in terms of placing high value on recreational opportunities and participating in many of the same popular activities. But there are some cultural differences in how Hispanics participate in and relate to outdoor activities because Hispanic culture emphasizes extended family, community solidarity and individual expression within those structures. In addition, Hispanics in some areas of the country may not participate in nature-focused activities at the same rates as others do³.

African-Americans tend to place slightly less value on outdoor recreational opportunities, and tend to participate in a more limited range of activities that is not strongly focused on hiking, camping or other ways of connecting to nature⁴.

In general, the results from the 2017 VODS show that Hispanics, in comparison to non-Hispanics,

³ See, for example, <http://www.outdoorfoundation.org/pdf/ResearchHispanics.pdf> and http://www.fs.fed.us/psw/publications/documents/psw_sp012/psw_sp012.pdf.

⁴ See <http://www.outdoorafro.com/> for an example of a personal response to this tendency.

were especially likely to consider access to outdoor recreational opportunities as “very important”. They were more willing to spend public funds to protect natural areas than were non-Hispanics. They were more likely to consider the Virginia Natural Area Preserve System “very important”. They were less likely to obtain information about recreational opportunities from printed materials. They were more likely to support a state tax increase to fund outdoor recreation.

Hispanic respondents were more likely to say that one of the top three reasons they use trails is for family or social outings. Hispanic respondents were more likely to say they had gone to a state park and left or been turned away due to crowding.

Compared to other racial and ethnic groups, African-Americans were more likely to have heard about recreation opportunities through advertisements, and were the least likely to hear about them through the Internet. While the majority of African-Americans support access to outdoor recreation, respondents were less likely to say that access to outdoor recreation is “very important.” They were also less supportive of spending public funds to protect natural areas and open spaces. African-Americans were somewhat more likely compared to whites and Hispanics to say they did not know enough about Virginia’s Natural Area Preserve System to rate the importance of having it.

The appendices to this report provide detailed “crosstabulation” data tables supporting this analysis.⁵

Crowd-Sourced Survey

The crowd-sourced survey is based on a “convenience sample” – a non-probability sample drawn from people conveniently at hand. In this case, respondents could hear about the survey through DCR’s social media posts or by word of mouth. Therefore, the crowd-sourced data should not be generalized to the full population of Virginia, but it provides useful information about

⁵ The crosstabulation tables count the number of respondents who simultaneously belong to categories defined by two different variables in the dataset. For example, a crosstabulation table may break down opinions about protecting natural areas by race and ethnicity, or by region of the state. Properly calculated percentages allow for comparisons across subgroups.

Virginia residents who heard about the crowd-sourced survey effort and may be more frequent and motivated users of outdoor recreation resources.

The respondents to the crowd-sourced survey reported higher household incomes and were less racially and ethnically diverse than were respondents to the probability survey. The crowd-sourced respondents were also more likely to engage in some outdoor activities, and to live in the Richmond area (Richmond City and the counties of Charles City, Chesterfield, Goochland, Hanover, Henrico, New Kent and Powhatan). However, on some of the survey items such as technology used during outdoor recreation and preferences for cabins in state parks, they did not differ appreciably from the probability survey respondents (see Appendix G).

Summary

The 2017 VODS provides a useful basis to support strategic planning for Virginia’s outdoor recreational needs. The results of the survey are similar to those obtained in 2011, although self-reported participation in some outdoor activities is a little lower in 2017. Because of significant changes to the lineup of outdoor activities in the 2017 survey, comparisons to 2011 should be made carefully.

Public support is very strong for public access to open spaces and outdoor recreational opportunities, as well as for public expenditures to make those opportunities available. Public support is also strong for natural areas and conserved lands.

The four activities most frequently mentioned by respondents as something they or a household member did in the last 12 months were similar (but not identical) to the top choices in 2011 and 2006.

Respondents in the younger age groups, particularly those aged 18 to 24, tended to be more active and to have less desire for cabins in state parks.

Participation in some activities was related to the region of the state in which the respondent lived. For example, hunting was less popular in the Urban Corridor region than in the others. And as in 2011, salt water fishing and power boating were more popular in the Chesapeake region.

The methods experiments conducted in the 2017 VODS indicate that a hybrid method should be considered in 2022. This hybrid would use a web-based invitation with two follow-up contacts to obtain completed surveys by Internet. Then a full postal survey protocol would be used to fill out the data collection and maximize response rates. This approach might save \$7,600 compared to a postal-only method.

There were no requests in the probability sample for Spanish-language materials. DCR reached out to Spanish-language contacts as part of the crowd-sourced survey communications plan (see Appendix H and Appendix I for details), but fewer than five Spanish-language crowd-sourced surveys were started with none of them meeting the threshold for retention in the analysis dataset. This

surprisingly low use of the Spanish option in both versions of the survey may call into question the use of scarce funds to support this form of outreach next time around.

The information from the 2017 VODS is only a portion of the information used by DCR staff in their extensive review and update of the 2017 Virginia Outdoors Plan. We are pleased to contribute to this important effort on behalf of Virginia's residents.

I. Introduction

Purpose of the Survey

Every five years in preparation for the development of the Virginia Outdoors Plan, the Virginia Department of Conservation and Recreation (DCR) conducts an outdoor recreation survey. The main purposes of the 2017 Virginia Outdoors Demand Survey (VODS) are to assess Virginians' attitudes about outdoor recreation resources, estimate participation in and demand for a wide variety of recreational activities, and provide a channel of citizen input into the 2017 Virginia Outdoors Plan.

The 2017 VODS was offered to a probability sample of Virginia addresses. It was designed to obtain participation rates for 101 outdoor recreation activities (up from about 50 in 2011). The survey also included specific questions to assist with future planning for local and regional parks, Virginia State Parks and Natural Area Preserves. In addition, there were several opinion questions regarding funding for outdoor recreation needs, including support for or opposition to a tax increase.

As part of the 2017 VODS, a non-probability "crowd-sourced" version of the survey was also made available to the general public. Unless otherwise noted, results in this report are for the probability-based VODS.

The VODS establishes a base of statewide data from which to estimate outdoor recreation use. The survey helps recreation providers strategically plan future facilities based on the needs estimated from the survey responses. Larger, more populous localities often use this information as a basis for preparing a more detailed local outdoor recreation survey. Smaller, less populous localities use the VODS data as direct input for comprehensive master planning and for local park planning projects.

This information will assist DCR and local providers in determining recreation needs. It will also help in identifying ways in which DCR can improve our state parks system and how best to protect Virginia's natural and open space resources.

About the Report

The report body is divided into two major sections: Survey Methods and Survey Results.

The Survey Methods section presents a summary of the survey planning and questionnaire development process, as well as data on response rates and margin of error. See Appendix H for more detail about the methods.

The Survey Results section presents a summary of the survey findings and is sub-divided into the following main areas:

- Subgroup Analysis
- Overview of Respondents
- Access to Outdoor Recreation
- Outdoor Recreation Activities
- Virginia's State Parks
- Protection of Virginia's Natural Areas and Open Space Resources
- State Funding for Outdoor Recreation
- Opinions about Trails
- Crowd-Sourced Data
- Summary

The report body is supplemented by the following appendices:

- Appendix A: Questionnaires
- Appendix B: Activity Grid Tables
- Appendix C Weighted Frequencies
- Appendix D: Unweighted Frequencies
- Appendix E: Weighted Crosstabulation Tables (Age, Hispanic Origin and Region)
- Appendix F: Weighted Crosstabulation Tables (Homeownership, Gender, Race and Income)
- Appendix G: Weighted Crosstabulation Tables (Urban-Rural, Probability Sample and Crowd-Sourced Survey, Households with and without Children)
- Appendix H: Methods
- Appendix I: Probability Sample Mailing Materials and Crowd-Sourced Survey Contact Posts
- Appendix J: Open-End Responses

II. Survey Methods

The survey methods for the 2017 Virginia Outdoors Demand Survey (VODS) were based on the principles of the “Tailored Design Method” (TDM) of web survey administration.⁶ TDM is a set of related techniques that optimizes cooperation, response rates, and accuracy in web surveys without compromising confidentiality. There were essentially two surveys conducted.

First, a probability-based sample of 14,000 Virginia households was used to provide representative data from which statistical inferences were made for the whole population of Virginia as well as individual planning district commissions. Households could participate in the probability survey by mail or web.

There were 3,252 usable responses to the probability sample. For both the probability and crowd-sourced surveys, “usable responses” were those that answered at least four of the six demographic questions and contained at least 200 items overall that had valid survey responses⁷. The response rate for the probability sample was 23.2%. The margin of error is approximately +/- 2.3 percentage points at the 95 percent level of confidence.⁸ The comparable numbers in the 2011 VODS were 22.7% response rate and +/- 2.9 percentage points margin of error.

Second, a “crowd-sourced” version of the survey was promoted to anyone willing to take the time to do the survey by web. There were 2,389 usable responses to the crowd-sourced survey. A response rate and margin of error cannot be

⁶ See Don A. Dillman *et al.*, *Internet, Phone, Mail and Mixed-Mode Surveys: The Tailored Design Method* (Hoboken, NJ: John Wiley and Sons, 4th ed., 2014).

⁷ Note that there were two “checkbox” items for each of the 98 activities found in the seven activity grids in the questionnaire. (The other three of the 101 activities stood alone prior to the activity grids.) For one of these checkbox items (“Check if anyone did this”), any value (checked or unchecked) was counted as valid if the web page containing the activity grid(s) had been viewed by the respondent. So the threshold of 200 items was both a measure of valid responses and a measure of progress through the survey even if no responses were being given to non-checkbox items. The threshold was determined after review and analysis of the data.

⁸ The margin of error is affected by the stratified sample design and the weighting of the dataset. The estimate of +/- 2.3 percent takes those factors into account. See Appendix H for more details.

calculated for the crowd-sourced survey because it is not based on a probability sample.

The survey was conducted by CSR for the Virginia Department of Conservation and Recreation (DCR). DCR funded the survey through a combination of state and grant funding from the Land and Water Conservation Fund.

Questionnaire

CSR used the 2011 Virginia Outdoors Demand Survey as a starting point for developing the 2017 VODS. The project team at CSR worked with leaders at DCR to identify questions to drop or modify due to lack of utility, lack of response, and excessive uncategorized “other-specify” responses in 2011. This review also incorporated feedback from DCR and the Virginia Outdoors Plan Technical Advisory Committee regarding new topics and concepts that would be useful in the 2017 VODS.

Focus Group Testing

CSR conducted a focus group on April 20, 2017 with a randomly selected group of residents from the greater Richmond area to test the survey instrument. Participants were recruited into the focus group by telephone using random-digit dial cellular and landline sample, and by Facebook using targeted online advertising.

Pretest

With feedback from the focus group, CSR made edits to the survey and proceeded to conduct an abbreviated mail survey protocol pretest with a sample of 100 Virginia residents. After reviewing the completed surveys from the pretest, CSR and DCR finalized an extensive 16-page survey instrument. The questionnaire contains seven main sections:

1. Access to Outdoor Recreation
2. Outdoor Recreation Activities (includes detailed tables to obtain information about the household’s participation in outdoor activities)
3. Virginia’s State Parks
4. Protection of Virginia’s Natural Landscape
5. State Funding for Outdoor Recreation
6. Additional Trails Questions

7. General Information (includes demographic information)

English and Spanish

The questionnaire was created and tested in English then translated into Spanish by Research Support Services, Inc. CSR produced a paper questionnaire in Spanish and a web-based survey in Spanish. The Spanish paper questionnaire was available by request to CSR. The web-based questionnaire for the probability sample was available only in English. The web-based questionnaire for the crowd-sourced survey was available in Spanish as well as English. The Spanish version could be accessed by selecting the preferred language at any time on the screen. Respondents could switch languages back and forth.

Sample

The sample for 2017 VODS was a randomly selected group of 14,000 residential mailing addresses in the state of Virginia. The sample was disproportionately stratified by 17 Planning Districts (PD) or PD equivalents (in two cases, two PDs were combined into one unit for sampling purposes and in one case, three PDs were combined). These sampling areas were grouped into four large regions of the state for analysis. See Figure II-1 for a map of the regions used in this study. New for 2017, sample areas were also grouped into a Rural and Urban scheme for analysis. See Figure II-2 for that map.

The households are part of an address-based sample (ABS) drawn from a commercial database that is based on the delivery sequence file maintained by the US Postal Service. No names were purchased with the sample. All contacts with those households were addressed as “Virginia Residents At” in the first line of the mailing labels and inside address on the cover letters. Appendix H contains details about the methods and sampling procedures.

There was no sample for the crowd-sourced version of the VODS. To promote the crowd-sourced survey, the DCR Public Communications Office used the DCR home page, Facebook, Twitter and outreach to college outdoors groups and young professionals groups between late July and late August of 2017. See Appendix H and Appendix I for more details.

Weighting

When surveying the general population, the demographic composition of the actual survey respondents rarely matches the composition of the entire population under study. Random sampling error, systematic differences in rates of refusal between different groups, and differences among households regarding the availability of someone being in the home to do the survey often result in datasets that somewhat over-represent females, over-represent homeowners, and under-represent minorities. Also, the 2017 VODS sample was selected disproportionately from different geographies within Virginia. Accordingly, statistical weighting of the survey results was designed to accomplish two objectives: (1) to proportionally represent the geographic areas from which the original sample was drawn and (2) to properly represent certain demographic characteristics of the population.

Unless otherwise noted, the data presented in this report are weighted data. Appendix H contains details about the methods and weighting procedures.

Figure II-1: Map of regions used in the study

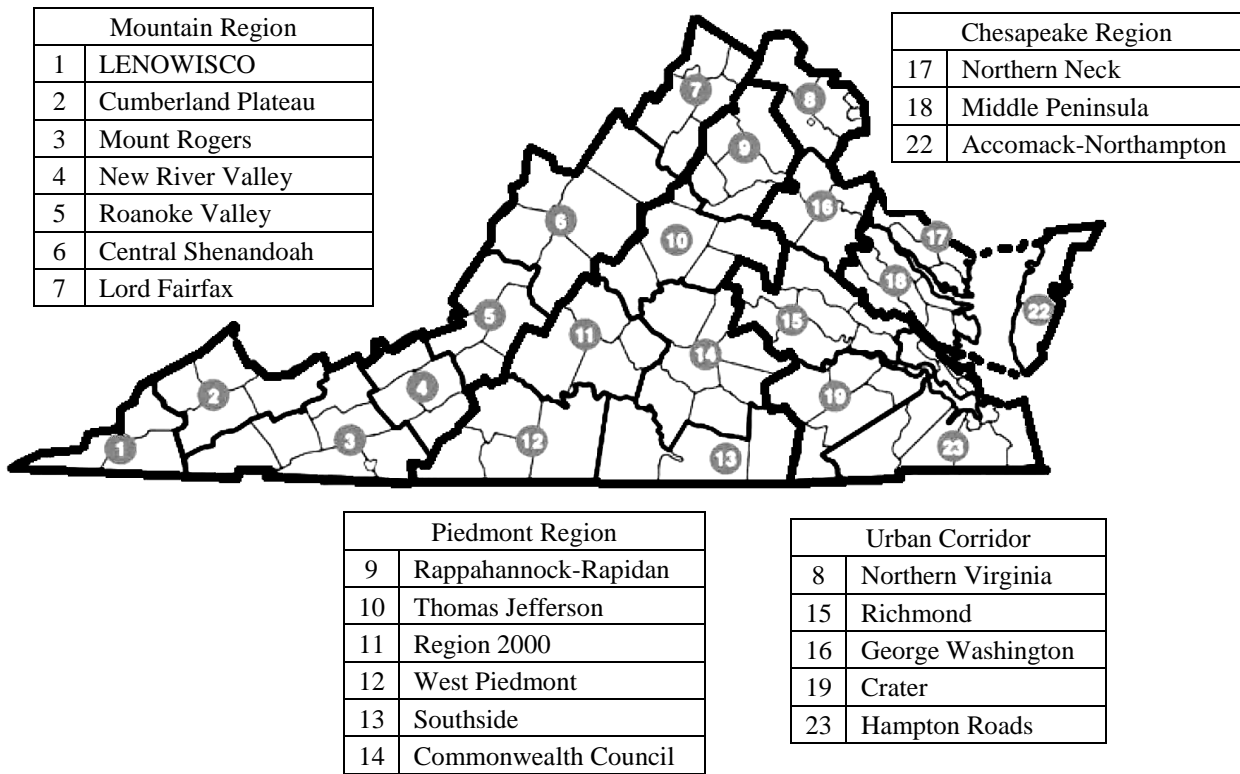
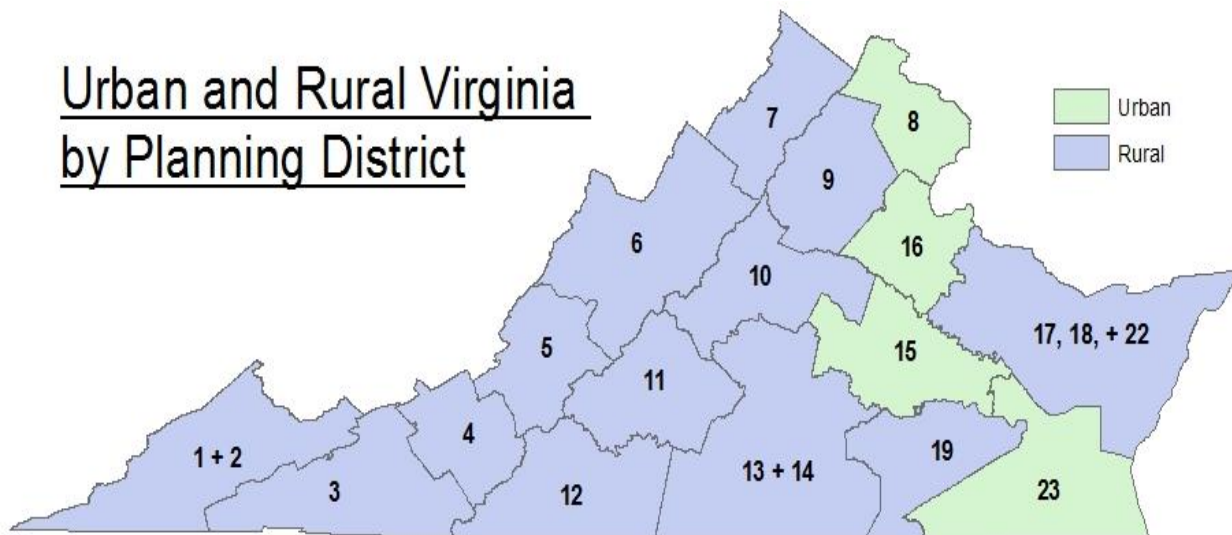


Figure II-2: Map of urban-rural designations used in the study



Survey Protocol

The study proposal extrapolated findings in methods experiments in the 2011 VODS to call for a “web-forward” protocol for the probability-based survey that would include an advance notification letter from DCR, two mail contacts promoting a URL to do the survey by web, then a full mail protocol to nonresponders that would include a survey packet, a thank you/reminder postcard one week after that, and a second packet about two to three weeks after that.

After discussion, CSR finalized a study protocol in which 28 percent of the sample received the web-forward protocol and 72 percent received a mail-forward protocol that would start as a traditional mail survey and then introduce the web mode later on. This was a more conservative approach.

CSR also experimented with brown and white envelopes for the probability sample survey packets to see if response rate would be affected by envelope color.

The two experiments were fully interpenetrated with PD to avoid potential confounding effects from geography. This resulted in four treatment groups:

- 1) Treatment Group 1 – 5,040 households – Mail-Forward Protocol with Brown Envelopes.
- 2) Treatment Group 2 – 5,040 households – Mail-Forward Protocol with White Envelopes.
- 3) Treatment Group 3 – 1,960 households – Web-Forward Protocol with Brown Envelopes.
- 4) Treatment Group 4 – 1,960 households – Web-Forward Protocol with White Envelopes.

None of these considerations applied to the crowd-sourced survey, which was available only by web and promoted by email and social media. See Appendix H for more detail about the survey methods and the mode experiment.

Production

Full production of the survey began in June 2017 with the mailing of an advance letter to the first two treatment groups. Table II-1 shows the full production timeline with the actual number of pieces mailed by Treatment Group.

Table II-1: Production timeline

Treatment Group	Mailing	Quantity	Date Mailed
Groups 1 and 2 Mail-forward	Advance letter	10,080	6/29/2017
	First paper survey packet	10,080	7/7/2017
	Thank-you/reminder postcard	10,080	7/13/2017
	Second paper survey packet	7,938	7/28/2017
	Web appeal postcard	7,811	8/10/2017
Groups 3 and 4 Web-forward	Advance letter	3,920	6/29/2017
	Invitation letter	3,920	7/7/2017
	Thank-you/reminder postcard	3,920	7/13/2017
	First paper survey packet	3,687	7/18/2017
	Thank-you/reminder postcard	3,467	7/28/2017
	Second paper survey packet	3,063	8/10/2017

Survey Response

The majority of the respondents (87%) completed the survey using the paper-version. The remaining completions were conducted on the web (432 completions). Response varied across the four treatment groups as shown in Table II-2.

Table II-2: Response by treatment groups

Treatment Group	Complete	% of all Responses	% of Group
Group 1 Mail, brown	1,204	37.1%	23.9%
Group 2 Mail, white	1,144	35.2%	22.7%
Group 3 Web, brown	472	14.5%	24.1%
Group 4 Web, white	426	13.1%	21.7%
TOTAL	3,246	100%	23.2%

Results of the Mode Experiment

As in 2011, which also offered the probability-based survey by web and mail to different treatment groups, substantive data contributed by those who took advantage of the web mode showed a few differences compared to those who used the paper mode but not many. Those who responded by web were more likely to use the Internet, smart-phone, Internet mapping and GPS in connection with outdoor recreation, but use of social media was the same across paper and web respondents. Web respondents were also younger compared to those who responded on paper. Web respondents were somewhat more enthusiastic about supporting a tax increase to fund outdoor recreation in Virginia (58% support vs 46% support from paper respondents).

But households responding by web did not differ appreciably from paper respondents in their engagement in any of the activities covered in the questionnaire. There were also no significant differences in the high levels of public support for opportunities to participate in outdoor recreation or protection of Virginia’s natural and open space resources.

Results of the Envelope Experiment

Discussion among CSR staff revealed different expectations for how the color of the survey packet envelope might influence response rates.

One thought was that the white envelope looked friendlier, more modern or of a higher class, which might lead to a higher “open rate.” Another thought was that the rather nondescript brown envelope might look more mysterious, leading the recipient to be more curious about what was inside, leading to a higher open rate.

The use of brown envelopes increased the response rates in both the mail-forward and web-forward protocols by about 1.5 to 2 percentage points.

None of the differences in the modal or color experiments appear to be extreme and/or strongly systematic. Data from all four response modes were combined for analysis without weighting or adjusting for mode.

Recommended Data Collection Approach for 2022

Web-based data collection should not be used as the only mode of data collection because of the lower response rates associated with it. These lower response rates are due in large part to the lack of good email addresses, which could be used to send email invitations containing a live link to the survey for each respondent. It is unlikely that this situation will be significantly improved in five years, although perhaps not impossible given the rapid changes in technology occurring all the time.

However, assuming that the situation in 2022 is not radically different from today, it seems best to use the web method as an “early responder” appeal then follow up with a full mail protocol. At the scale of the VODS, and estimating the per-case processing cost of a mail survey case at \$10 in 2022 and the cost of setting up and managing the web survey to be \$4,500, saving the mailing expenses for perhaps 15% of the sample that might choose to respond early by web would net about \$7,600 in savings.

Margin of Error

The margin of error due to sampling for the survey is approximately +/- 2.3 percent at the 95 percent level of confidence. This means that if the survey were to be repeated with 100 different random samples, the results of this survey would be within 2.3 percentage points of 95 out of those 100 iterations of the survey. Note that there are other

sources of error in surveys besides sampling error that can be difficult or impossible to measure.

The margin of error is affected by the stratified sample design and the weighting of the dataset. The estimate of +/- 2.3 percent takes those factors into account.

The margins of error are larger for questions answered by smaller numbers of respondents, and for subgroups in the data. See Appendix H for more detail about the margin of error.

III. Survey Results

This chapter presents results of the 2017 Virginia Outdoors Demand Survey. The first section of this chapter discusses unweighted frequencies to provide a demographic profile of the actual survey respondents. The next sections of the chapter discuss weighted frequencies (a.k.a. topline results) and, where appropriate, demographic correlations of these topline results and/or comparisons of these topline results with results from 2011.

Subgroup Analysis

The responses were broken out and analyzed by several demographic categories. In discussing the results, we report those instances in which relevant differences or patterns were observed among demographic subgroups, for example, between women and men, or among residents of different regions of the state. The demographic variables listed below were those principally used in our subgroup analysis. In some cases, categories from the original questionnaire were combined to facilitate comparisons.

- Age. Age was divided into five categories for most analyses: 18-24, 25-39, 40-64, and 65 or older.
- Hispanic identity. Two separate questions in the interview ask about race and ethnicity. Respondents are first asked if they consider themselves to be “of Hispanic origin.” They are then asked to identify what category of race “best describes you,” using a list that does not include Hispanic/Latino as a race. This follows the definition in the U.S. Census, which considers Hispanic to be an ethnic category; Hispanics can be of any race. The breakdown by Hispanic/Latino ethnicity uses responses to the Hispanic/Latino question.
- Region. Respondents were assigned to one of four geographic regions of the state used for past iterations of this study. See Figure II-1 for a map and table of the planning districts that make up these regions.
- Homeownership status. We also compared homeowners with renters.
- Gender. Respondents were asked their

gender.

- Race. Respondents were asked what race they considered themselves to be. For the race variable used in the demographic breakouts, responses to the race question were changed to be “Hispanic/Latino” for those who said they were Hispanic or Latino in the question about Hispanic identity. The remaining responses to the race question were then interpreted as indicating non-Hispanic Whites, non-Hispanic Blacks, etc.
- Household income. Four categories of annual household incomes were compared: Less than \$50,000; \$50,000 - \$99,999; \$100,000 - \$149,999; and more than \$150,000.

The following categories are new for the 2017 analysis:

- Urban-rural: Certain planning districts were grouped into a non-rural category and the rest were grouped into a rural category. See Figure II-2 for a map of the planning districts that make up the urban and rural areas.
- Probability sample vs. Crowd-sourced survey: A web-only “crowd-sourced” version of the survey was available in 2017. DCR staff distributed notifications about the crowd-sourced survey by email to various affinity and interest groups.
- Households with children: Households with and without children were compared.

See Table H-4 in Appendix H for a comparison of unweighted and weighted survey data to statewide estimates for several demographic variables.

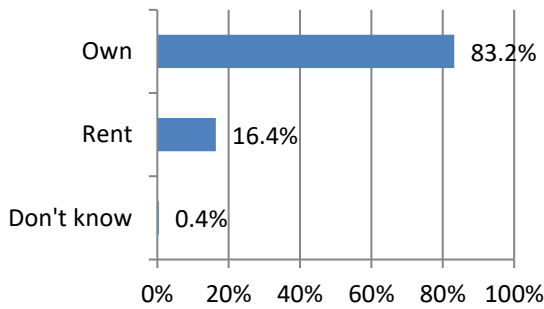
Overview of Respondents

Home Ownership

As indicated in Figure III-1, approximately five out of six (83.2%) of respondents to the survey are homeowners, while just over one in six (16.4%) are renters. The unweighted percentage of homeowners among the survey respondents is greater than the statewide estimate (66.2%) obtained from the American Community Survey (ACS). The disparity is probably due in some part to the tendency for homeowners to respond to surveys in greater proportion than renters, and to

overrepresenting rural areas (where fewer rental units are available) in the sampling plan. After applying the survey weighting, the percentage of homeowners in the 2017 VODS is 77 percent, closer to the statewide estimate obtained from the ACS. See Table H-4 in Appendix H for more detail.

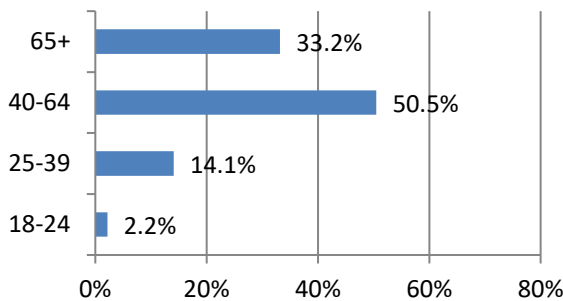
Figure III-1: Home Ownership (unweighted)



Age

As seen in Figure III-2, approximately one third (33.2%) of respondents to the survey are over 65 years of age, more than half (50.5%) are between 40 and 64, 14.1 percent are between 25 and 39, and 2.2 percent are between 18 and 24 years old. This overrepresents respondents over age 40, but survey weighting brings these percentages much more closely in line with statewide estimates from the ACS. See Table H-4 in Appendix H for more detail.

Figure III-2: Age (unweighted)

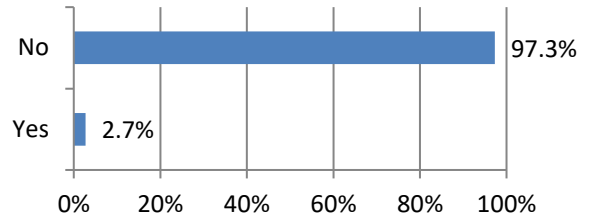


Hispanic Origin

The vast majority of respondents were not Hispanic in origin (97.3%), while 2.7 percent of respondents (n=82) identified as Hispanic (see Figure III-3 below). The statewide estimate from the ACS is 7.6 percent. Hispanic respondents are usually underrepresented in surveys, and the

sampling plan oversampled areas of the state where Hispanics do not tend to live. After weighting the survey, Hispanic respondents are 5.6 percent of the survey cases. See Table H-4 in Appendix H for more detail.

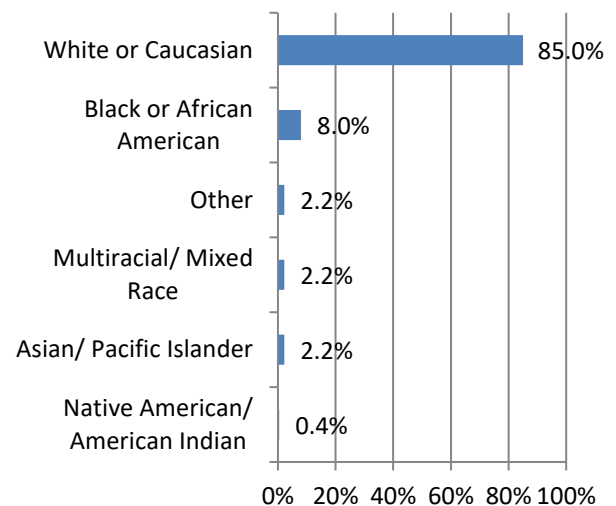
Figure III-3: Hispanic Origin (unweighted)



Race

Race was asked separately from Hispanic/Latino ethnicity. Over four-fifths (85.0%) of the respondents identified themselves as White or Caucasian. Eight percent identified as Black or African American. Seven percent identified themselves as any other racial category, whether Asian/Pacific Islander (2.2%), Native American/American Indian (0.4%), “Other” (2.2%) or multiracial (2.2%). See Figure III-4 below. These percentages underrepresent minorities. After weighting the survey data, the percentages are much more in line with statewide estimates from the ACS. See Table H-4 in Appendix H for more detail.

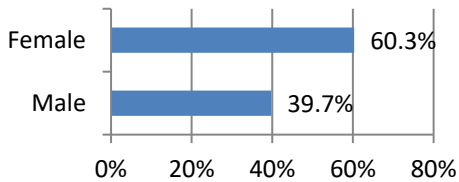
Figure III-4: Race (unweighted)



Gender

Almost two-thirds of respondents (60.3%) were female; the remaining respondents (39.7%) were male. See Figure III-5. This overrepresents females, as is usually the case in survey research. After weighting the survey data, the percentages of male and female respondents are essentially identical to statewide estimates from the ACS. See Table H-4 in Appendix H for more detail.

Figure III-5: Gender (unweighted)



Income

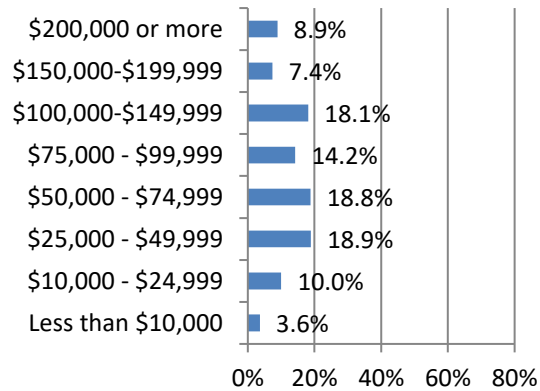
As shown in Figure III-6, a plurality of respondents reported household incomes between \$25,000 and \$74,999 (37.7%) while 7.4 percent reported household income of \$150,000-\$199,999, 8.9 percent reported household income more than \$200,000 and 3.6 percent reported household incomes less than \$10,000.

Unlike many surveys, the unweighted income data in the survey were actually closely in line with statewide estimates from the ACS. Oversampling in Southside and southwest Virginia probably offset the usual bias towards the inclusion of higher-income households in general population surveys. After weighting the survey data, the income distribution was more closely in line with statewide estimates. See Table H-4 in Appendix H for more detail.

Poverty level depends on the interplay of family size and household income. For a person living alone, federal poverty level in 2017 is \$12,060 and for a family of four it is \$24,600. In 2015, 11.2 percent of Virginia’s people lived in poverty⁹.

⁹ For poverty definitions see <http://www.vdh.virginia.gov/content/uploads/sites/10/2017/04/FY-2017FPL.pdf> and for poverty statistics in Virginia see <http://vaperforms.virginia.gov/indicators/economy/pove-rtty.php>.

Figure III-6: Income (unweighted)



For additional information on the demographic distribution of respondents, please see Appendix D (unweighted data) and Appendix C (weighted data). Appendix H compares unweighted and weighted demographics.

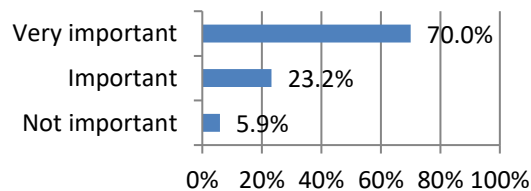
Note that demographic variables are often correlated with one another. Appendix H also contains a series of crosstabulation tables showing how the demographic variables relate to one another.

Access to Outdoor Recreation

Importance of Access

As indicated in Figure III-7, over two-thirds of respondents (70.0%) considered it “very important” to have access to outdoor recreation opportunities. About 6% considered it “not important.”

Figure III-7: Importance of Access to Outdoor Recreation Opportunities [A1]



These figures are more supportive than those from the 2011 Virginia Outdoors Demand Survey (56% “very important,” 36% “important” and 8% “not important”).

Respondents over the age of 65 were less likely to consider access to outdoor recreation opportunities

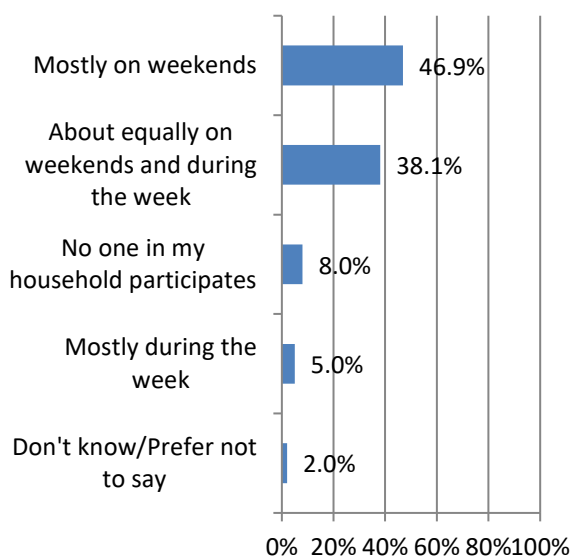
important than were younger respondents. (See Appendix E.)

Among the four main regions of the state used for geographic analysis (see Figure II-1), there were no large differences in the percentage saying access to outdoors recreation was “very important.” Men, Hispanics, respondents with higher household incomes and those with children in the household were more likely to say that access to outdoor recreation activities is very important. (See Appendices E, F and G.)

Participation by Time of Week

As indicated in Figure III-8 below, slightly less than half of respondents (46.9%) participated in outdoor recreation activities “mostly on weekends,” slightly over one third of respondents (38.1%) participated “about equally on weekends and during the week” and one in twenty respondents (5.0%) participated “mostly during the week.”

Figure III-8: Participation by Time of Week [A2]



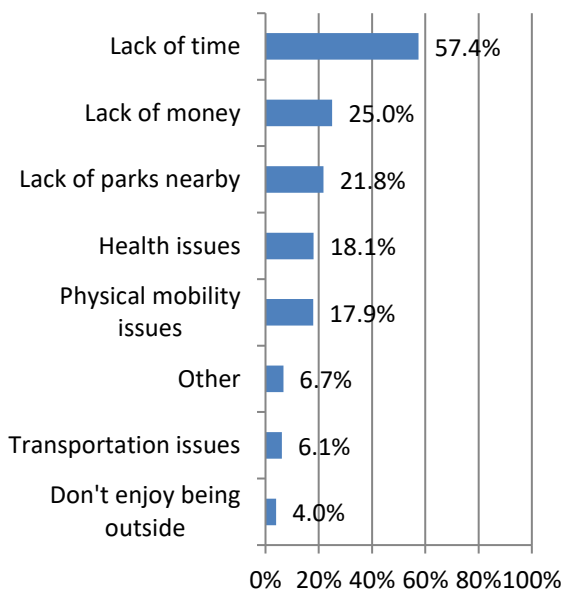
Younger respondents were more likely to participate “mostly on weekends” than were older respondents. Among those aged 18-24 years, 63 percent participate mostly on weekends, compared to 55 percent of those aged 25-39, 52 percent of those aged 40-64 and 24 percent of those aged 65 and over. Hispanics were also more likely to

participate mostly on weekends. (See Appendix E.)

Reasons for Not Visiting Parks

Figure III-9 reveals that the most common reason people do not visit parks is lack of time (57.4%). One quarter of respondents (25.0%) lack money for park visits and about one-fifth of respondents (21.8%) cite lack of parks nearby. Only a very small proportion of respondents fail to visit parks due to transportation issues (6.1%) or because they do not enjoy being outside (4.0%). Many of the “other” responses to this item had to do with physical limitations due to health conditions or age.

Figure III-9: Reasons for Not Visiting Parks [A3]

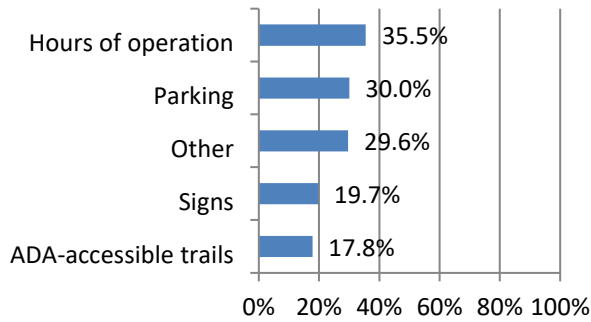


The oldest respondents were more likely than others to select “health issues” and “physical mobility issues” as reasons for not visiting parks, and less likely to select “lack of time” and “lack of parks nearby.” Respondents in the Chesapeake region were more likely to name “lack of parks nearby.” (See Appendix E.) Renters were more likely to name “lack of money to travel or pay entry fees at parks” and “transportation issues.” (See Appendix F.)

Improvements That Would Enable More Park Usage

Park users indicated the following physical improvements would increase the ability to visit and use parks.

Figure III-10: Improve Ability to Visit Parks [A4]



Thirty percent of responses cited the category "other" and wrote in responses not related to physical access, but addressed reasons parks were not visited. These "other" reasons for not visiting parks were categorized into several broad groups. The groups are listed below, ordered from most to least frequently mentioned:

- Lack of time
- Distance, transportation, traffic, no parks nearby, lack of access
- Request for specific park amenities or events
- Cost, money
- Need for more advertising and increased awareness
- Poor health, age
- Lack of interest in visiting parks
- Environmental factors (bugs, weather, dislike of nature)
- Overcrowding

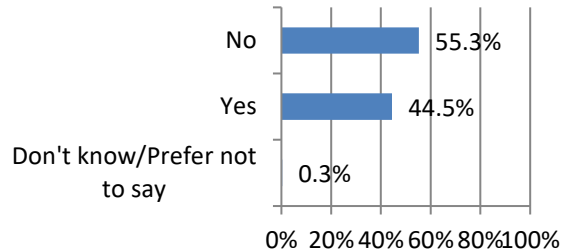
Specific amenities that would improve park use (found in the "Request for specific park amenities or events" group above) included:

- Easy to walk, paved trails
- Restrooms
- Benches
- Access for mobility chairs
- Access to parks from neighborhood trails
- Special programming for persons with disabilities
- Senior discount and low cost access

Participation Affected by Crowds

Figure III-11 shows that 45 percent of respondents have avoided parks and trails in the past because they were too crowded.

Figure III-11: Have you ever avoided visiting a park or trail because it was too crowded? [A5]



Main Reasons for Participation in Outdoor Recreation

Figure III-12 shows that about two-thirds of respondents say that physical activity/exercise is the reason they participate in outdoor recreation. Just under 60 percent say that they participate in outdoor recreation to experience nature and 58.0 percent cite taking a break from their routine and reducing stress/improving their mental health. Almost half (48%) mention the social aspect as being a motivating factor and slightly less than a quarter (23%) name experiencing excitement or adventure. Just over one in five (20.4%) participate to experience solitude and just over one in ten participate for personal development. Doing competitive events registers amongst the lowest reasons for participating in outdoor recreation with only 5.6 percent of respondents choosing it as an answer. Respondents could select three responses, so percentages add to more than 100 percent.

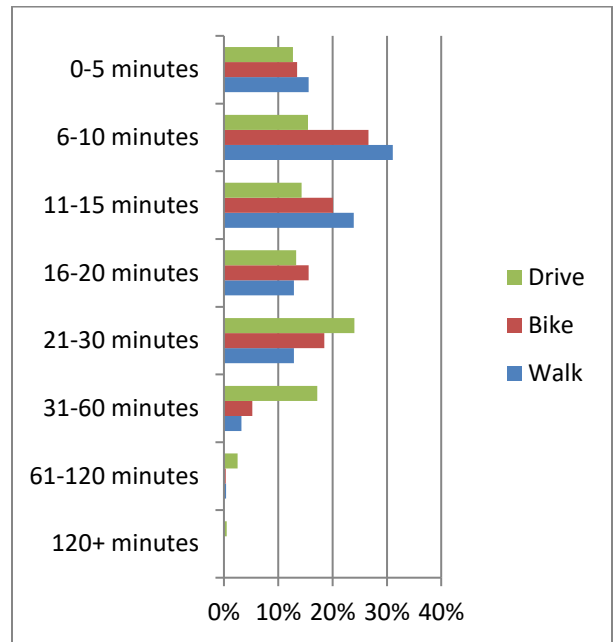
Figure III-12: Main Reasons for Participation in Outdoor Recreation [A7]



Defining a Close-to-Home Park

Figure III-13 shows that, in order for a park to be considered “close to home,” over half of the respondents indicated that that park should be within a 15-minute walk (71%, the sum of the blue bars in the categories labeled “0-5 minutes,” “6-10 minutes” and “11-15 minutes”) or a 15-minute bike ride (63%). When it comes to driving distance, over half of the respondents indicated that a close-to-home park should be within a 20-minute drive.

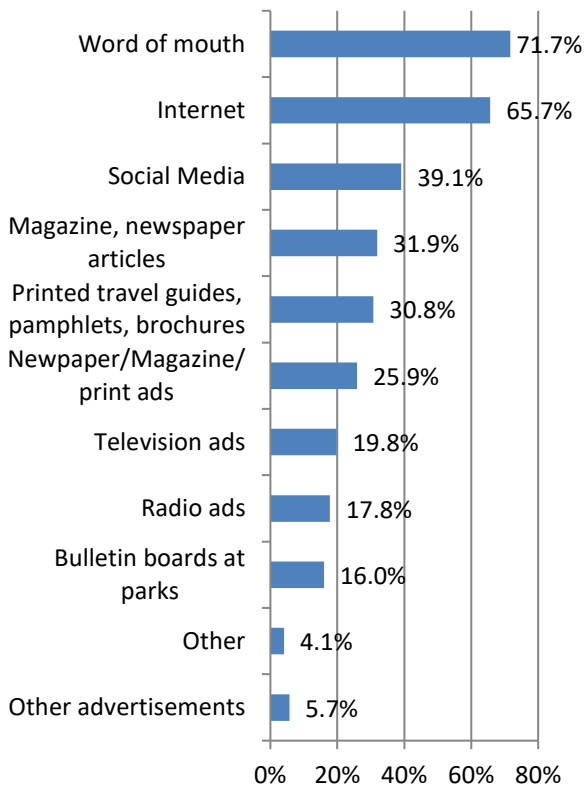
Figure III-13: What do you consider to be a close-to-home park? [A6]



Sources of Information about Recreation Opportunities

As indicated in Figure III-14, almost three-quarters of respondents (71.7%) heard about recreation information and opportunities through word of mouth. About two-thirds of respondents (65.7%) used the Internet as a source of information. About two in five (39.1%) received information from social media; almost one-third (31.9%) received information from magazine or printed articles. About a third utilized travel guides, pamphlets or brochures (30.8%), about a quarter of respondents received information from printed advertisements (25.9%), fewer than one in five received information from television advertisements (19.8%) and a handful (4.1%) reported an “other” source of information.

Figure III-14: Sources of Outdoor Recreation Information and Opportunities [A7a]



Older respondents were far more likely to obtain information from printed sources and advertising rather than from the Internet and social media. Hispanic residents were less likely to use printed media. Residents in the Chesapeake and Mountain regions were a little more likely to use printed media. The larger regional differences in information sources in the 2011 survey leveled off substantially in 2017. (See Appendix E.)

As in the 2011 survey, those who own their homes were a little more likely to use printed media, African-Americans were more likely to use advertising and printed media to find information about recreational opportunities, and Internet usage went up with household income while use of advertising went down with household income. (See Appendix F.)

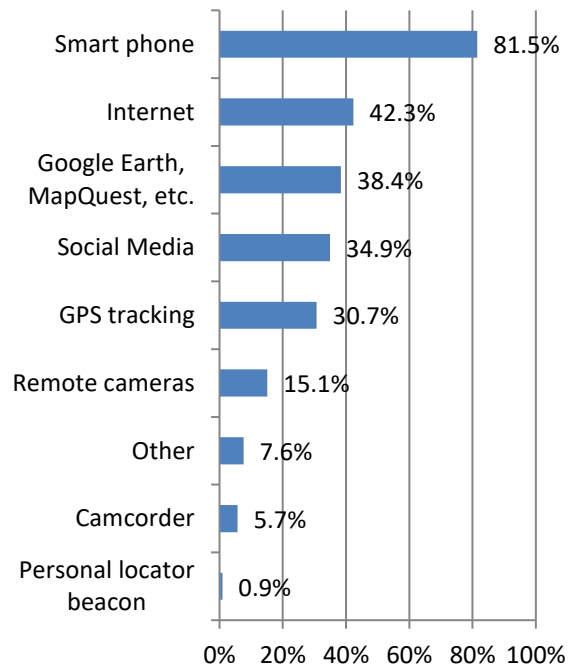
Urban respondents were more likely to utilize the Internet compared to rural respondents. Households with children were more likely to use the Internet and social media compared to households without children. Respondents in the crowd-sourced survey were more likely to use the Internet and social media as well. (See Appendix G.)

For additional data on the demographic correlates of sources of information about recreation opportunities, please see Appendix E, Appendix F and Appendix G.

Technology and Recreation

As seen in Figure III-15, over three quarters of respondents (81.5%) used their smart phone during their outdoor recreation activities which is much higher than the 27.3 percent from the 2011 survey. Less than half (42.3%) used Internet in connection with their outdoor recreation activities. About a third used some form of digital mapping (38.4%), social media (34.9%), or GPS (30.7%). A little over one in seven (15.1%) respondents used remote cameras. Fewer than one in ten used some “other” form of technology (7.6%) or a camcorder (5.7%) in connection with their outdoor activities.

Figure III-15: Technology and Recreation [A7c]



Respondents under 40 years of age were more likely to use the Internet and social media in connection with outdoor activities. Respondents under 65 years of age were more likely to use smart phones. The association between youth and the use of other technologies in connection with outdoor recreational activities is generally less clear. Hispanic respondents were more likely to use the Internet, social media and GPS tracking. Technology use was also slightly more frequent in

the Urban Corridor region, although certain technologies were mentioned more frequently in other regions (GPS tracking in the Chesapeake region and remote cameras in the Mountain and Piedmont regions). (See Appendix E.)

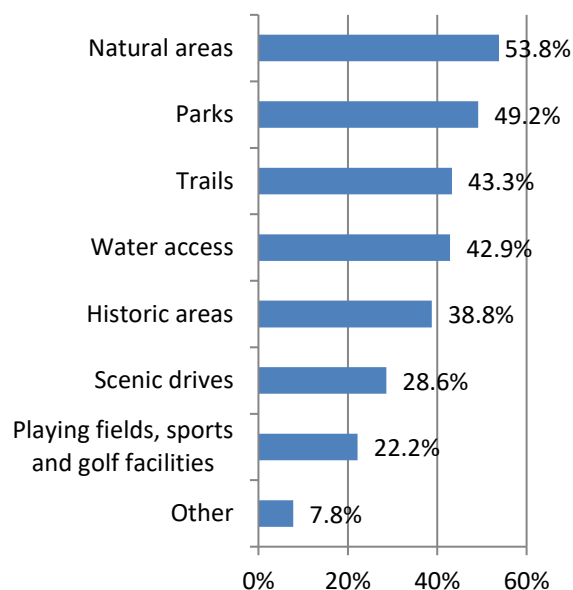
Renters were more likely to use the Internet and social media during their outdoor recreation. Females were more likely to use social media. Whites were less likely to use the Internet and social media compared to African-Americans, Hispanics and others. The use of the Internet, smart phones and Google Earth/MapQuest and the like went up with household income. (See Appendix F.)

Urban respondents were generally more likely to use technologies during outdoor recreation compare to rural respondents, as were households with children. (See Appendix G.)

Most Needed Recreation Opportunities

When asked what they thought were the most needed recreation opportunities in Virginia, over half (53.8%) named access to natural areas. A little less than half (49.2%) answered access to parks, hiking and walking trails (43.3%) and water access (42.9%). Also perceived as needed by over a third of the respondents was access to historic areas (38.8%). About a quarter of respondents indicated needing access to scenic drives (28.6%) and playing fields, or sports and golf facilities (22.2%). See Figure III-16.

Figure III-16: Most Needed Outdoor Recreation Opportunities [A8]



Respondents 65 years of age and older were more likely to cite a need for access to historic areas and scenic drives compared to younger respondents. Hispanic respondents favored parks. Although region did not play a major role in perceptions of most needed opportunities, respondents from the Mountain region were more likely to indicate access to scenic drives and respondents from the Urban Corridor region were the least likely to see a need for water access (See Appendix E for details.)

African-American respondents were more likely to mention access to playing fields, sports and golf facilities and less likely to mention trails and natural areas. Respondents with household incomes below \$100,000 were more likely to mention playing fields, sports and golf facilities, as well as scenic drives. (See Appendix F.)

Households with children saw the need for parks and playing fields while those without children cited historic areas and natural areas. Respondents to the crowd-sourced survey were much more likely to mention natural areas, trails and water access. Those in the probability survey were much more likely to mention parks, playing fields and scenic drives. (See Appendix G.)

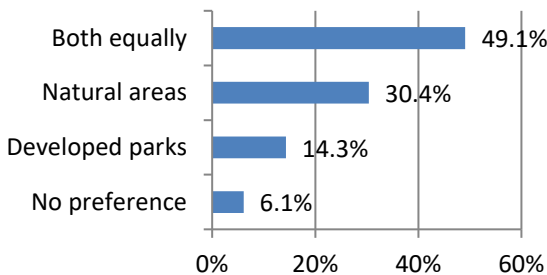
For a breakdown of respondents by planning district, see Table III-3. This table gives frequencies of outdoor recreation opportunities respondents believe are most needed in Virginia

with the respondents broken down by what planning district they are from.

Preference for Developed Parks or Natural Areas

As shown in Figure III-17, when asked whether they preferred developed parks with recreational facilities or natural areas with more limited facilities, almost half of respondents (49.1%) reported that they preferred both equally. About one third (30.4%) of respondents preferred natural areas, while only 14.3 percent expressed a preference for developed parks.

Figure III-17: Developed Parks vs. Natural Areas [A9]



Compared to older respondents, the youngest respondents reported a greater preference for “natural areas” over developed parks: 49.1 percent of those aged 18-24 reported this preference compared to no more than 31.7 percent in any other age category. Hispanic respondents preferred both equally. Residents in the Chesapeake region were more likely to prefer natural areas. (See Appendix E.)

African-Americans were more likely to prefer developed parks. (See Appendix F.)

Crowd-sourced respondents were more likely to prefer natural areas. (See Appendix G.)

Historic Sites

Just over one-third of respondents to the 2017 survey (35.2%) reported that members of their households had visited “historic areas” in the past year, as compared to 63.5 percent who had visited “historic sites” in 2011. Appendix B contains detailed information on the duration, site type and location of these visits for both years.

Natural Areas, Preserves and Refuges

Just under three-quarters of respondents to the 2017 survey (71.0%) reported that members of their households had visited a natural area, in the last 12 months, as compared to 50.3 percent who had done so in 2011. Appendix B contains detailed information on the duration, site type and location of these visits for both years.

Parks with No Wi-Fi or Internet

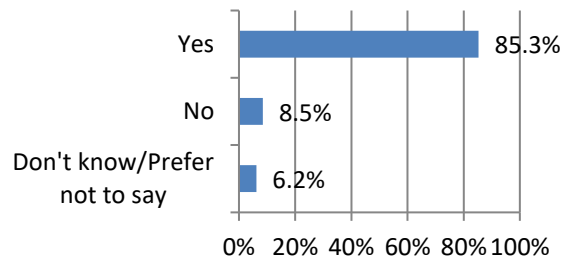
Two new additions to this year’s survey asked respondents whether or not they would use parks with no access to Wi-Fi/Internet or cell service. These questions are more applicable now than six years ago as shown by the large increase in smart phone usage during outdoor recreation activities in Figure III-15. As shown in Figure III-18, 85.3 percent of respondents would use a park with no access of Wi-Fi or access to the Internet. Less than one in 10 (8.5%) said no and 6.2 percent of respondents answered don’t know or prefer not to say.

Older respondents were less likely to say “yes” to this question. (See Appendix E.)

African-Americans were less likely to say “yes” to this question compared to other groups. (See Appendix F.)

Crowd-sourced respondents were more willing to say “yes” to this question. (See Appendix G.)

Figure III-18: Would Use Parks with No Wi-Fi or Internet Access [A10]

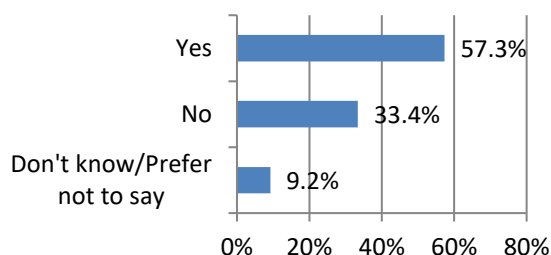


Parks with No Cell Service

Figure III-19 depicts the responses to whether or not respondents would use a park with no cell phone service. Over half (57.3%) said yes while about one third (33.4%) said no. Many more people responded no to using a park with no cell service than a park with no Wi-Fi or access to Internet. This may be because more people use

their cell phones when they are outside as opposed to their computers and they do not need Wi-Fi to access the Internet as long as they have cell service. In the focus groups, some participants viewed having cell service as a personal safety issue in case of attack or accidental injury.

Figure III-19: Would Use Parks with No Cell Service [A11]



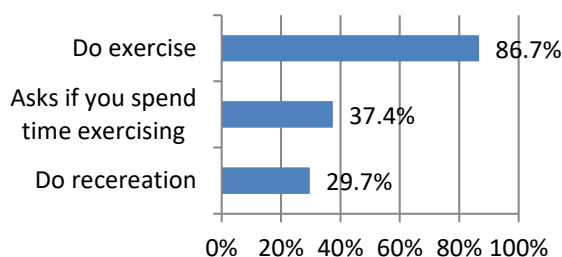
Males were much more likely to say they would use a park with no cell service than were females (69% to 48%). Whites and Hispanics were also more likely to say “yes” to this question. (See Appendix F.)

Crowd-sourced respondents were more willing to say “yes” to this question. (See Appendix G.)

Healthcare Provider Recommendations

Figure III-20 depicts the replies to whether or not healthcare providers recommend that respondents do recreation activities, recommend exercise, or ask if respondents spend time exercising. Most of the respondents’ healthcare providers (86.7%) recommend they do exercise, while about one-third asks if they spend time exercising (37.4%) or recommend that they do recreational activities (29.7%).

Figure III-20: Healthcare Provider Recommendations [A12]



Respondents aged 18-24 were much less likely to report that their healthcare provider recommended

doing exercise or asked about exercise. Hispanics were more likely to say their healthcare provider recommended doing recreation. (See Appendix E.)

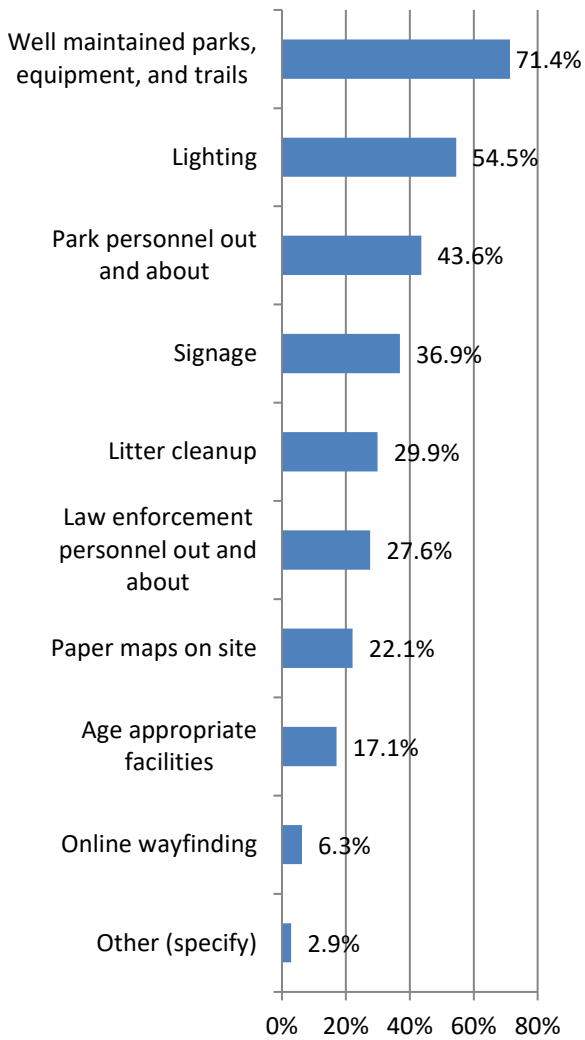
Males were more likely to say their healthcare provider recommended doing recreation. (See Appendix F.)

Crowd-sourced respondents were more likely to say their healthcare provider asked about exercise, and less likely to say their healthcare provider recommended doing exercise (See Appendix G.)

Improvements for Safety

Figure III-21 shows replies about what improvements are most important to ensure safety in parks and outdoor recreation settings. Almost three quarters (71.4%) of respondents named well-maintained parks and equipment. Over half (54.5%) named lighting. Another 43.6 percent said that having park personnel out and about would be a good improvement for safety. About a third responded that signage (36.9%) and litter cleanup (29.9%) would help improve safety. Meanwhile, about a quarter of respondents believe that having law enforcement personnel out and about (27.6%) or paper maps on site (22.1%) are possible improvements. Less than one in five (17.1%) believe that having age-appropriate facilities would improve safety and only 6.3 percent thought that online wayfinding would improve safety. Respondents could name up to three improvements so percentages add to more than 100 percent.

Figure III-21: Improvements for Safety [A13]



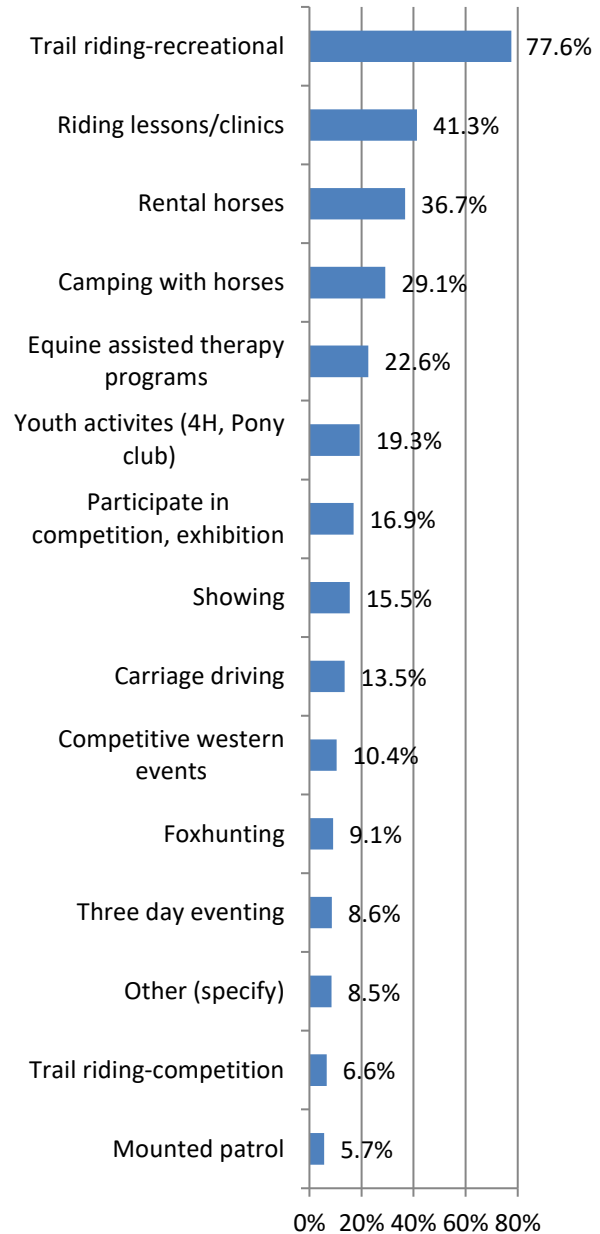
Outdoor Recreation Activities

Equestrian Related Activities

Overall, 7 percent of respondents said they or someone in their household took part in equestrian or horse-related activities in the last 12 months. Of those participants, Figure III-22 shows what equestrian-related activities they would like to do on public land. This was another new item for the 2017 survey. Over three-quarters of respondents (77.6%) would like to be able to recreationally ride on trails. Over a third want riding lessons/clinics (41.3%) or rental horses (36.7%). Meanwhile, a little less than a third (29.1%) named camping with horses. About one in five would like equine-assisted therapy programs (22.6%) and youth activities such as 4H or Pony Club (19.3%). Over one in seven indicated

wanting to participate in a competition, exhibition, or race (16.9%) or showing (15.5%). Meanwhile, about one in ten responded carriage driving (13.5%), competitive Western events (10.4%), foxhunting (9.1%) and three-day eventing (8.6%). Ranked least were trail riding competition at 6.6 percent and mounted patrol at 5.7 percent.

Figure III-22: Equestrian Related Activities [B3]

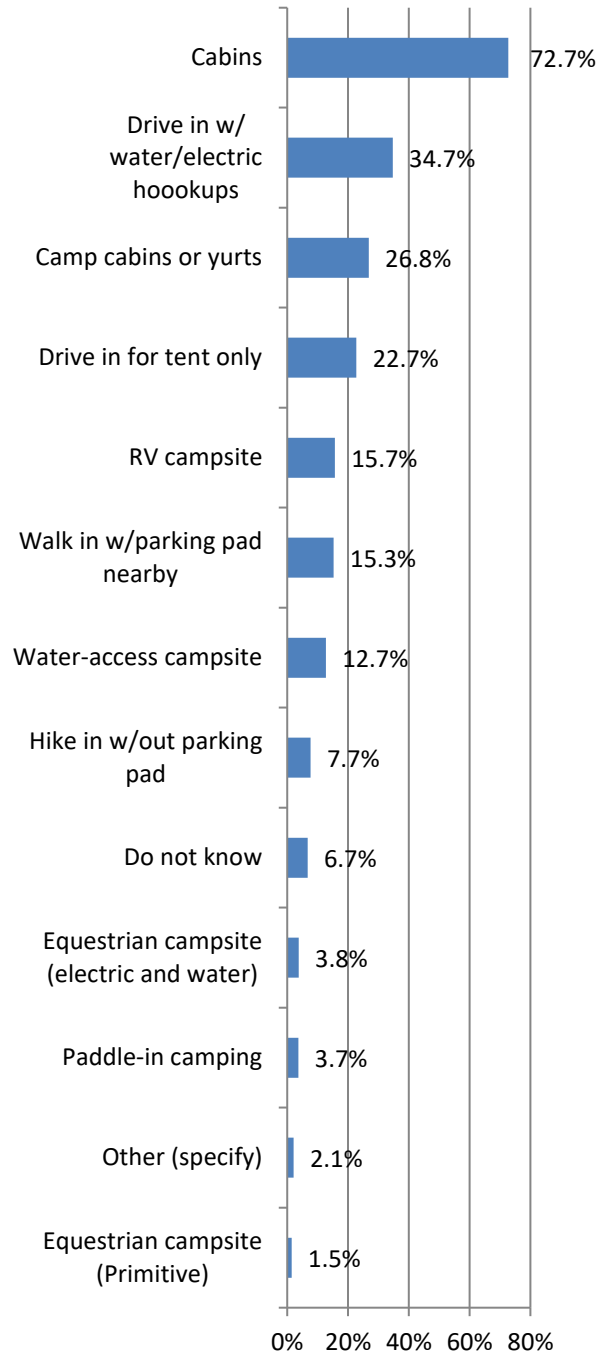


Virginia’s State Parks

Preferred Campsite Types in State Parks

All respondents were asked “If you were to camp in a state park, what type of campsite would you prefer?” Figure III-23 depicts the popularity of campsite types, with those having cabins being the most preferred (72.7%). Having water and electricity is the second most preferred (34.7%). About a quarter prefer camp cabins or yurts (26.8%) or tent-only campsites (22.7%). Still fewer respondents preferred campsites with access to water (12.7%), hike-in campsites (7.7%), and equestrian campsites with electric and water (3.8%).

Figure III-23: Preferred Campsite Type

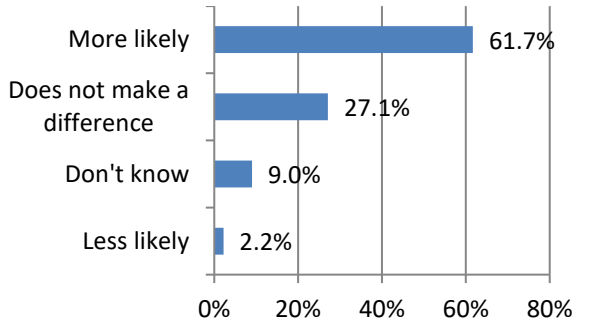


Importance of Having Cabins

All respondents were asked “If a state park has cabins are you more likely to stay overnight, less likely to stay overnight or does having cabins not make a difference?” Figure III-24 shows the responses to this question. Almost two-thirds of respondents (61.7%) said they would be more

likely to stay overnight if the state park has cabins. A little over a quarter (27.1%) said that having cabins does not make a difference and 2.2 percent of respondents said they would be less likely to stay overnight if the state park has cabins.

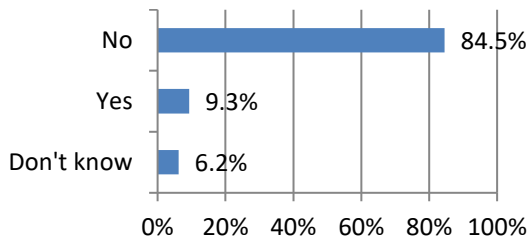
Figure III-24: Effect of Having Cabins on Staying Overnight



Effect of Crowdedness

All respondents were asked if they or anyone in their household had gone to a state park and been turned away or left because it was too crowded in the past year. Figure III-25 depicts the responses to this question. Over four in five (84.5%) responded “no” that they had not been turned away or left a state park in the past year because the park was too crowded while just shy of one in ten (9.3%) responded “yes” they had been turned away or left a state park.

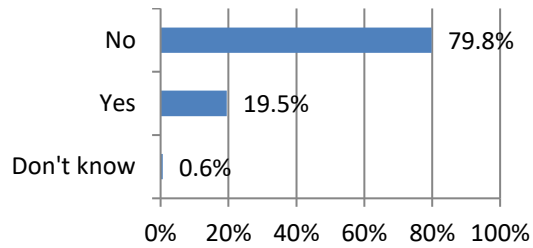
Figure III-25: Ever Left or Been Turned Away from a State Park Because of Crowding?



Camping in a Virginia State Park

All respondents were asked if they or anyone in their household had gone camping in a Virginia state park in the past year. Figure III-26 shows that over three-quarters (79.8%) of respondents or someone in their household have not gone camping in a Virginia State Park in the past year. About one in five (19.5%) responded having gone camping in a Virginia State Park in the last 12 months.

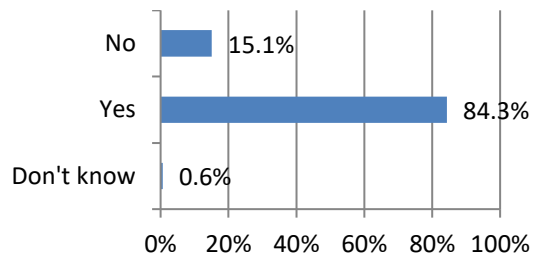
Figure III-26: Camping in a Virginia State Park



Camping at a Drive-In Campground

Respondents who said they had camped at a Virginia state park in the last year (19.5% overall) were asked if they or anyone in their household had gone camping at a drive-in campground in the past year. Of those who camped in a state park in the last year, 84 percent used drive-in campsites in the last year. See Figure III-27.

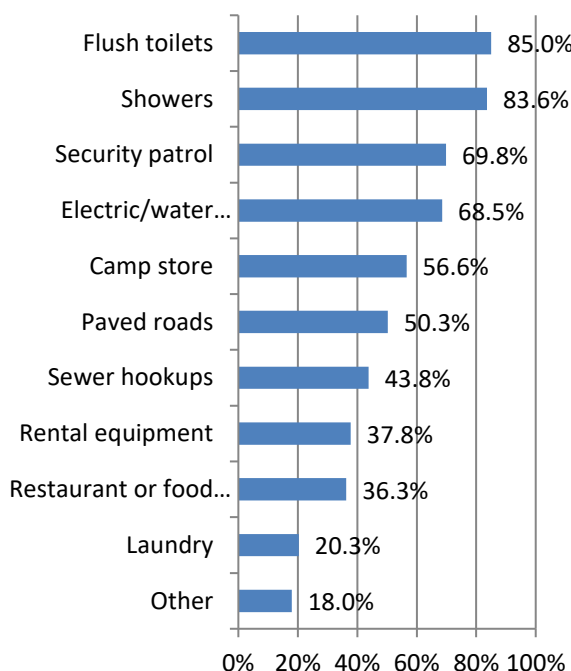
Figure III-27: Did Drive-In Camping in the Last 12 Months? (Among respondents who camped in a Virginia State Park in the past 12 months)



Drive-In Camping Amenities

As indicated in Figure III-28, having flush toilets is the most important amenity for drive-in camping. Other popular amenities are showers (83.6%), security patrol (69.8%), electric/water hookups (68.5%), and having a camp store (56.6%) Having paved roads was only cited as important by 6.7% of respondents and only about one in twenty respondents thought that sewer hookups (5.9%), rental equipment (4.9%) or food service (4.7%) were important drive-in camping amenities. Only about one in 40 respondents (2.7%) thought that laundry was an important or very important drive-in amenity. See Appendix C.

Figure III-28: Importance of Drive-In Camping Amenities [Percentage Rating Amenity as “very important” or “important”]

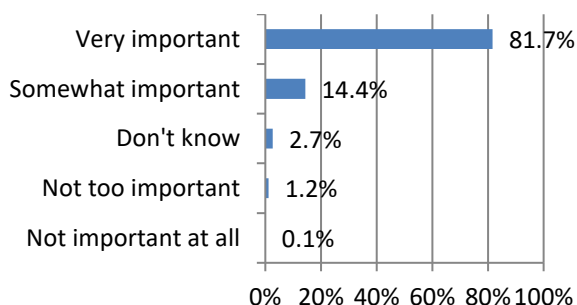


Protection of Virginia’s Natural Areas and Open Space Resources

Importance of Protecting Natural and Open Space Resources

As indicated in Figure III-29, over three-quarters (81.7%) of respondents rate the protection of natural areas as “very important,” and slightly over one in seven respondents (14.4%) rate it as “somewhat important.” Very few respondents (1.3%) consider natural area protection to be “not too important” or “not important at all.”

Figure III-29: Importance of Protecting Natural Areas



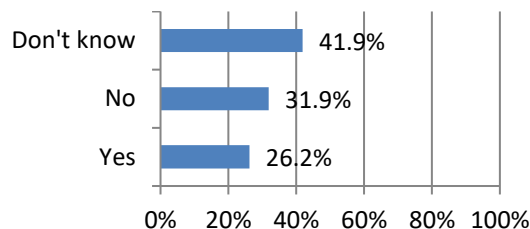
Hispanics were more likely to say that protecting Virginia’s natural and open space resources is very important. (See Appendix E).

Crowd-sourced respondents were also more likely to say that protecting Virginia’s natural and open space resources is very important. (See Appendix G).

Are Natural and Open Space Resources Adequately Protected?

As indicated in Figure III-30, of those surveyed, 41.9 percent are unsure whether natural and open spaces are adequately protected. Slightly under a third of respondents (31.9%) feel that natural resources are not adequately protected and slightly over a quarter of respondents (26.2%) feel that they are.

Figure III-30: Are Resources Adequately Protected?

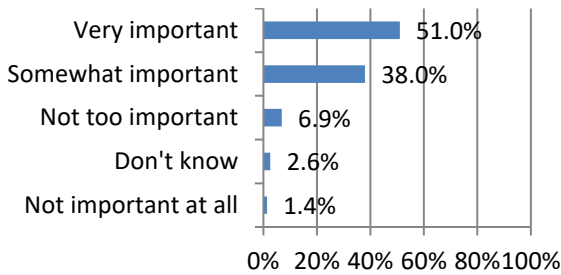


There were no clear demographic differences for this response.

Importance of Scenery/Scenic Views When Making Travel Plans

As indicated in Figure III-31, of those surveyed, a little over half (51%) think that scenery is very important when making travel plans and over a third (38%) believe scenery is somewhat important. Only 8.3 percent of respondents said that scenery is not too important or not important at all.

Figure III-31: Importance of Scenery/Scenic Views

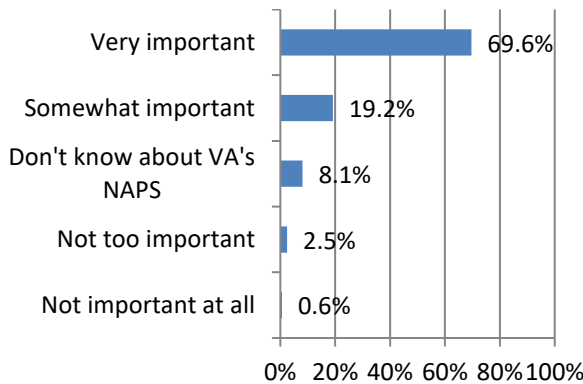


Crowd-sourced respondents were more likely to say this is very important. (See Appendix G.)

Importance of Natural Area Preserve System

As indicated in Figure III-32, more than two-thirds of respondents (69.6%) consider Virginia’s natural area preserve system “very important” and about one in four (28.2%) rate it as “somewhat important.” Very few respondents (0.6%) saw the system as “not important at all.”

Figure III-32: Importance of Virginia’s Natural Area Preserve System



Hispanic respondents were more likely to consider the preserve system “very important” than were non-Hispanic respondents. (See Appendix E.)

Crowd-sourced respondents were also more likely to consider the preserve system “very important” than were respondents from the probability sample. (See Appendix G.)

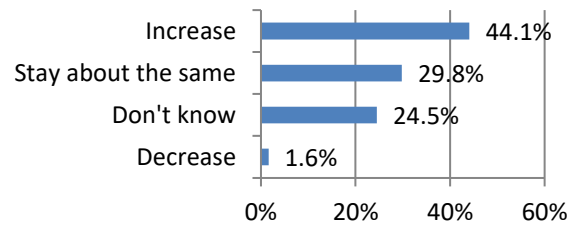
State Funding for Outdoor Recreation

State Spending for Outdoor Recreation

Respondents to the survey were asked if the state should increase, decrease or keep the current level

of state spending for outdoor recreation. Figure III-33 shows that almost half (44.1%) of respondents believe that state spending on outdoor recreation should increase. Meanwhile, 29.8 percent believe that state spending should stay about the same and slightly under one quarter (24.5%) do not know how or if state spending on outdoor recreation should change. Only 1.6 percent of respondents believe that state spending on outdoor recreation should decrease.

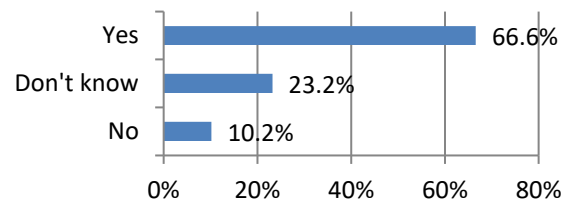
Figure III-33: State Spending for Outdoor Recreation



Spending Public Funds to Preserve Natural Areas and Open Spaces

Respondents to the survey were asked “Should the state spend public funds to acquire land to prevent the loss of natural areas and open spaces?” There is strong public support for such spending, as indicated in Figure III-34. Two thirds (66.6%) of those surveyed support public spending to prevent the loss of natural areas and open spaces. Among the remaining respondents, over twice as many people had no opinion on such spending (23.2%) than actually opposed it (10.2%).

Figure III-34: Spending to Preserve Natural Areas



Younger respondents and Hispanics tended to favor increased spending. (See Appendix E.)

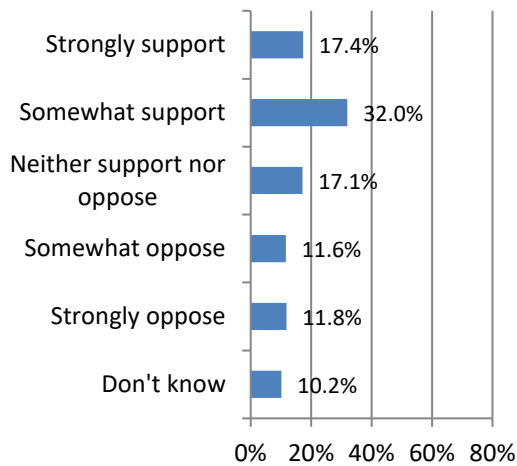
In addition, crowd-sourced respondents were much more favorable to increasing state spending for outdoor recreation compared to probability

sample respondents (73% to 44%). (See Appendix G.)

State Tax Increase to Fund Outdoor Recreation

Respondents to the survey were asked if they would support an increased state tax to fund outdoor recreation in Virginia. There is some public support for such spending, as indicated in Figure III-35. Almost half (49.2%) of respondents said they would somewhat or strongly support an increased state tax to fund outdoor recreation in Virginia. 17.1 percent said they would neither support nor oppose it and 10.2 percent said they did not know. Less than a quarter (23.4%) of respondents indicated they would somewhat or strongly oppose increased state tax to fund outdoor recreation.

Figure III-35: Support for a State Tax Increase to Fund Outdoor Recreation



Hispanics were more likely to say they “strongly support” a state tax increase to fund outdoor recreation. (See Appendix E.)

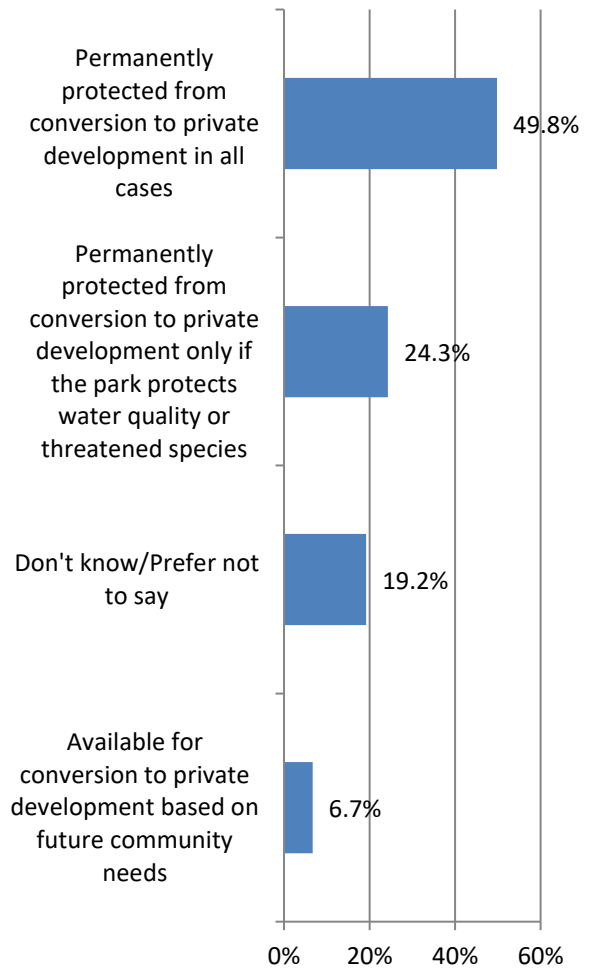
Households with incomes over \$100,000 were a little more likely to support a tax increase. (See Appendix F.)

In addition, crowd-sourced respondents were much more likely to say they “strongly support” a state tax increase to fund outdoor recreation compared to probability sample respondents (42% to 17%). (See Appendix G.)

Opinions about Developing Publicly Owned Park Land

Respondents to the survey were asked about their opinions regarding the development of publicly owned park land. According to Figure III-36 almost half (49.8%) said that they believe publicly owned park land should be permanently protected from conversion to private development in all cases. Slightly under a quarter (24.3%) of people said that publicly owned park land should be permanently protected from conversion to private development only if the park protects water quality or threatened species. Only 6.7 percent of respondents replied that publicly owned park land should be available for conversion to private development based on future community needs.

Figure III-36: Publicly Owned Park Land and Development



Crowd-sourced respondents were much more likely to say that publicly owned park land should

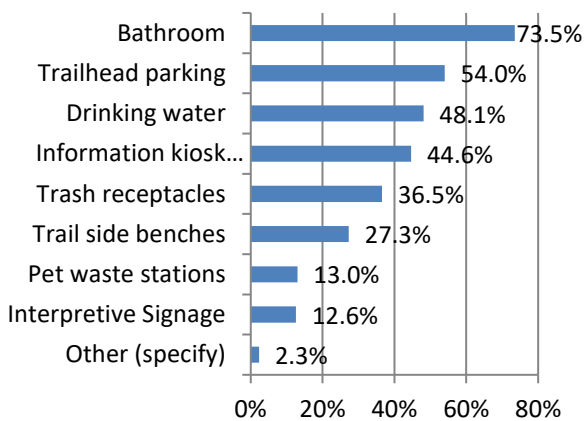
be permanently protected in all cases than were probability sample respondents (73% to 50%). (See Appendix G.)

Opinions about Trails

Recreational Trail Amenities

As indicated in Figure III-37, respondents overwhelmingly believe that bathrooms are the most important amenity when using trails, with almost three-quarters of respondents (73.5%) saying so. Almost half of the respondents said that trailhead parking (54%) and drinking water (48.1%) are the most important amenities and 44.6 percent of those surveyed think that information kiosks are the most important amenity. A little over a third (36.5%) responded trash receptacles and 27.3 percent said trail side benches. A little over one in 10 named pet waste stations (13%) or interpretive signage (12.6%). Respondents could name multiple amenities so percentages add to more than 100 percent.

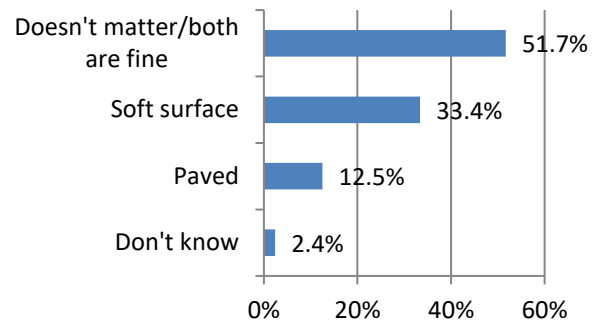
Figure III-37: Recreational Trail Amenities



Trail Surfaces

The survey also asked respondents about their preference for trail surfaces. As seen in Figure III-38, over half of survey responders (51.7%) said they had no preference between paved and soft surface trails. One-third (33.4%) of respondents said they prefer soft surface trails and one in eight (12.5%) said that they prefer paved trails over soft surface trails.

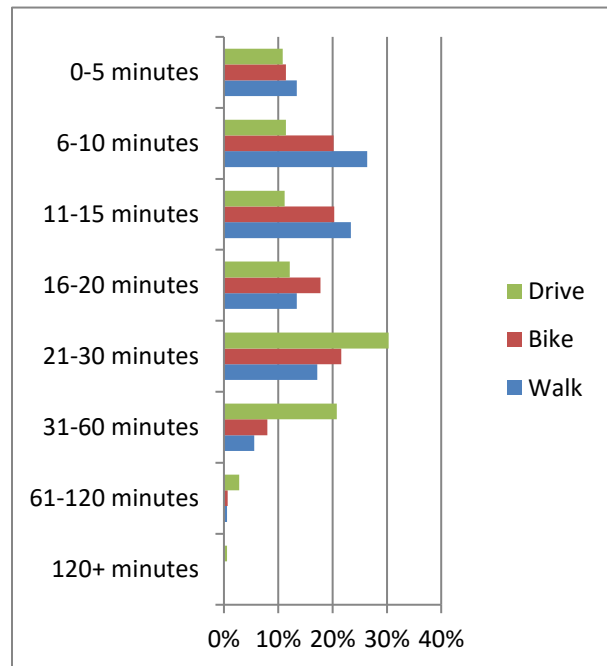
Figure III-38: Trail Surface Preferences



Close-to-Home Trail

The survey also asked respondents about how close a trail must be to be considered “close-to-home.” As seen in Figure III-39, over half of the respondents indicated that a trail should be within a 15-minute walk (63%, the sum of the blue bars in the first three categories, “0-5 minutes,” “6-10 minutes,” and “11-15 minutes”) or a 15-minute bike ride (53%). When it comes to driving distance, half (50%) of the respondents indicated that a close-to-home trail should be within a 20-minute drive, while another 48% indicated that the trail should be within a 21- to 60-minute drive.

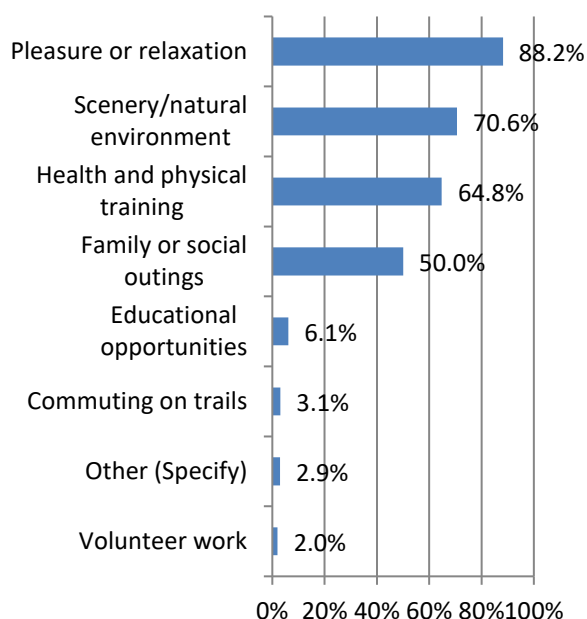
Figure III-39: What do you consider to be a close-to-home trail?



Trail Usage

Finally, respondents were asked why they use trails. As indicated in Figure III-40, almost nine in ten (88.2%) use trails for pleasure or relaxation. A little under three-quarters (70.6%) use trails to view scenery or natural environment while 64.8 percent of respondents said they use trails for health and physical training. Half (50%) said they use trails for family or social outings. Only 6.1 percent responded using trails for educational opportunities. Ranking lowest were commuting on trails (3.1%) and volunteer work (2.0%). Respondents could name multiple reasons so percentages add to more than 100 percent.

Figure III-40: Reasons for Using Trails



Participation in Activities

Table III-1 lists the percentage of households participating in all 101 activities asked about in the survey.¹⁰ “Visiting natural areas” (71% of households participating) was the activity with the greatest participation, followed by “driving for pleasure” (67%), “walking for pleasure” (67%) and “visiting parks” (56%). Note that the 2011 survey questionnaire did not ask about “driving for pleasure.”

¹⁰ We initially follow the 2006 convention of examining all activities together. We then briefly discuss activities by type (e.g., organized sports, water, etc.).

Also note that there are several activities that respondents could see as overlapping. For example, some respondents might consider walking for pleasure (67%), nature-based tours/trails (26%) and hiking/backpacking day trips (21%) to be essentially the same thing. Overall, 72 percent of respondents participated in any of these three walking activities.

The list of activities was organized into seven subsets, each with a theme – snow/ice-dependent activities, water-dependent activities, activities on courts and golf, destination activities, other miscellaneous activities, activities on trails, and activities on sports fields. See Appendix A for the survey questionnaire.

Detailed information on the frequency, duration and proximity of these activities is found in Appendix B. Demographic comparisons of participation rates are found at the end of Appendices E, F and G.

Table III-2 contains a detailed percentage breakdown of the participation in activities for each Planning District. It can be seen that “driving for pleasure” and “visiting natural areas” are the activities with the most participation across the board varying from 56% participation to 80% participation. The table shows that planning districts are pretty consistent in terms of participation in activities though some small differences do exist. For instance, for kickball, most planning districts yield a participation rate of 1 percent or 2 percent but planning district 19 (Crater) has a 9 percent participation rate in kickball. Another difference is in equestrian events, most planning districts yield a 5 percent to 6 percent participate rate while planning district 9 (Rappahannock – Rapidan) has an 11 percent participation rate.

One more example is water skiing or being towed on water. While respondents in most planning districts responded that someone in their household participated in the activity 6 percent of the time, the respondents from planning district 4 (New River Valley) had a participation rate of 16 percent. Looking at this frequency breakdown is useful in determining which activities are most popular in each planning district and which activities respondents in every planning district prefer. Since there is a column detailing the percentage of participation of the sample as a whole, it serves as a good comparison point for the

percentages given by the respondents in each planning district.

The statewide percentages are based on an estimated population of more than 8 million people (close to 4 million households). Therefore, even a statewide activity participation statistic of one percent equates to perhaps 35,000 to 40,000 households.

Table III-1: Percentage of Households Participating in Activities

Activities	Percent
Visiting natural areas	71%
Driving for pleasure	67%
Walking for pleasure	67%
Visiting parks (local, state & national)	56%
Swimming/outdoor pool	48%
Sunbathing/relaxing on a beach	47%
Viewing the water	38%
Swimming/beach/lake river (open water)	37%
Visiting historic areas	35%
Fresh water fishing	34%
Outdoor-festivals	34%
Visiting working farms, petting zoos, corn mazes, etc.	31%
Music festivals	28%
Picnicking away from home	27%
Viewing scenery	27%
Gardening	27%
Nature based tours/trails	26%
Canoeing/kayaking	25%
Visiting gardens/arborescences	25%
Jogging/running	24%
Sporting events or tournaments	23%
Visiting playgrounds	23%
Hiking/backpacking day trips	21%
Culinary tours/trails	19%
Walks/runs/challenge-based events	19%
Hunting	16%
Snow sledding/tubing	15%
Salt water fishing	15%
Basketball	15%
Power boating	14%
18-hole golf	14%
Miniature golf	14%
Shooting range	14%
Tent camping	14%
Tubing on water	12%
Staying in cabins	11%
Stargazing/Dark skies/Astronomy	11%
Paved or gravel bicycle trails	11%
Soccer	11%
Tennis	10%
Driving range	10%
Dog parks	10%
Visiting private farms and forests	10%
Downhill skiing	9%
Bicycle touring on roads	9%
Fitness trails (not jogging)	9%
Jet ski/personal watercraft	8%
Equestrian	7%
Ice skating (outdoor)	7%
Art based tours/trails (artisan, music)	7%
Baseball	7%
Football	7%
Snowboarding	6%

Water skiing or towed on water	6%
Paddle boarding	6%
Nature study/Nature programs	6%
Bird watching away from home	6%
RV camping	6%
Mountain biking	6%
Driving 4-wheel off road (Jeep, truck)	6%
ATV or UTV off-road	6%
Disc golf	5%
Archery	5%
Equestrian events (races, dressage shows, exhibitions, auctions, etc.)	5%
Zip line	5%
Softball	5%
Splash pads	4%
Par-3 golf	4%
Horseback riding	4%
Volleyball	4%
Other snow/ice dependent activities	3%
Sailing	3%
Whitewater rafting (guided or solo)	3%
Geocaching	3%
Kickball	3%
Track and field	3%
Downhill skiing	3%
Cross country skiing, snowshoeing	2%
Surfing	2%
Other water depending activities	2%
Other activities on courts & golf	2%
Other destination activities	2%
Other activities	2%
Driving motorcycle off road/ dirt bike	2%
T-ball	2%
Lacrosse	2%
Sail boarding	1%
Crew rowing	1%
Pickle ball	1%
Shuffleboard	1%
Racquetball	1%
Paddle-in camping	1%
Segway on sidewalks and paths	1%
Orienteering	1%
Other activities on trails	1%
Field hockey	1%
Cheerleading	1%
Kite boarding	<1%
Squash	<1%
Electric-assist bicycle on road or trails	<1%
Rugby	<1%

Table III-2: Percentage of Households in Planning Districts Participating in Activities

	1, 2	3	4	5	6	7	8	9	10	11	12	13, 14	15	16	17, 18, 22	19	23	Total
1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 22 Accomack, 19 Crater, 23 Hampton Roads																		
Visiting natural areas	74	68	76	71	80	71	79	72	83	68	60	56	68	73	62	60	65	71
Driving for pleasure	79	76	74	73	83	65	60	78	73	61	70	61	61	69	65	60	63	67
Walking for pleasure	61	62	76	67	69	68	76	69	67	59	58	54	73	66	64	57	65	67
Visiting parks (local, state & national)	56	48	61	49	59	61	65	55	61	49	41	43	66	57	45	41	57	56
Swimming/outdoor pool	47	36	46	46	43	50	54	53	49	46	39	32	52	44	40	39	48	48
Sunbathing/relaxing on a beach	37	36	54	48	44	34	47	52	56	37	33	32	54	56	44	35	47	47
Viewing the water	28	33	37	36	34	27	42	31	40	29	31	21	45	38	48	28	43	38
Swimming/beach/lake river (open water)	26	29	47	35	39	28	36	40	44	28	35	26	39	41	42	25	35	37
Visiting historic areas	18	20	33	29	41	31	45	44	38	31	25	24	38	45	38	30	41	35
Fresh water fishing	58	44	51	29	34	38	26	39	32	35	38	58	26	36	33	46	22	34
Outdoor-festivals (music festivals, outdoor-themed festivals, extreme sports festivals, etc.)	27	34	43	47	26	27	29	24	34	33	31	20	40	36	26	23	40	34
Visiting working farms, petting zoos, corn mazes, etc.	38	25	27	32	30	34	36	40	32	25	17	21	31	42	19	25	32	31
Music festivals	21	36	31	34	29	24	27	26	26	22	24	28	34	28	21	23	35	28
Picnicking away from home	35	29	28	26	26	26	31	31	35	25	24	28	22	31	22	15	23	27
Viewing scenery	23	34	27	28	35	29	25	32	35	30	22	12	32	25	17	18	29	27
Gardening	23	25	27	31	37	41	21	30	29	26	23	31	29	24	37	28	30	27
Nature based tours/trails	19	26	30	25	33	23	34	28	35	22	19	15	29	27	16	18	24	26
Canoeing/kayaking	14	24	34	19	25	24	29	30	35	21	28	19	21	23	32	12	18	25
Visiting gardens/arboretums	3	13	29	21	30	33	33	20	30	15	11	20	38	17	19	17	27	25
Jogging/running	9	12	33	20	19	14	36	23	15	23	9	10	27	27	11	10	31	24
Sporting events or tournaments	31	26	29	24	13	24	29	18	21	17	16	10	22	33	20	25	27	23
Visiting playgrounds	17	16	18	20	25	32	25	25	25	18	14	21	23	26	17	14	23	23
Hiking/backpacking day trips	13	19	26	26	31	21	27	24	27	17	9	6	22	23	15	10	16	21
Culinary tours/trails (brewery/winery/food)	7	10	14	19	23	14	27	22	36	20	12	11	20	22	14	8	16	19
Walks/runs/challenge-based events (charity walks,marathon, triathlon, extreme sports)	7	17	19	14	9	11	28	12	24	19	17	11	23	21	9	11	22	19
Hunting	39	28	20	18	23	17	7	16	20	24	24	31	8	11	20	23	9	16
Snow sledding/tubing	25	17	29	17	26	12	14	18	20	13	14	10	12	14	10	10	8	15
Salt water fishing	17	6	9	13	15	7	12	8	13	12	6	16	19	14	42	20	25	15
Basketball	24	8	13	12	15	8	19	12	12	9	10	13	14	17	9	11	18	15
Power boating	17	14	20	14	12	11	14	14	16	13	18	14	14	15	26	10	10	14
18-hole golf	6	13	15	14	10	9	19	21	17	10	9	6	17	12	12	21	18	14
Miniature golf	12	7	23	9	9	7	24	15	13	18	7	9	11	14	7	8	14	14
Shooting range	23	13	18	16	12	16	16	11	11	12	13	9	10	15	16	15	17	14
Tent camping	10	15	24	16	7	10	15	13	14	9	8	7	13	18	10	7	12	14
Tubing on water	7	16	31	10	9	12	12	21	17	8	10	8	8	13	7	5	7	12
Staying in cabins	12	10	15	12	10	13	8	9	16	13	6	4	11	13	7	4	8	11
Stargazing/Dark skies/Astronomy	6	13	10	12	13	7	9	14	17	16	11	7	9	13	13	8	11	11
Paved or gravel bicycle trails	4	10	15	15	8	9	20	6	7	13	4	9	12	7	4	4	14	11
Soccer	2	7	12	10	5	8	21	12	10	5	3	3	14	11	8	7	8	11
Tennis	14	6	3	6	8	7	19	6	12	6	8	8	15	7	1	4	11	10
Driving range	4	5	10	9	6	7	22	12	11	4	5	3	14	9	8	8	12	10
Dog parks	2	8	9	9	6	11	18	4	13	6	3	4	10	12	7	3	10	10
Visiting private farms and forests	5	4	12	10	9	8	9	13	15	19	7	7	8	15	11	14	8	10
Downhill skiing	1	8	6	5	12	8	17	7	16	3	2	3	10	9	5	10	8	9
Bicycle touring on roads	1	5	7	8	7	5	14	2	7	3	2	13	12	11	7	4	12	9
Fitness trail (not jogging)	3	13	4	11	14	6	12	8	9	6	3	11	8	10	1	4	12	9
Jet ski/personal watercraft	17	7	10	10	5	3	7	9	13	4	8	7	5	9	9	8	4	8
Equestrian	7	10	5	6	5	7	10	18	9	5	7	10	9	7	3	0	6	7
Ice skating (outdoor)	3	3	5	3	7	15	16	7	6	3	6	2	3	5	4	4	5	7
Art tours/trails (artisan, music)	4	4	9	6	9	3	8	8	9	4	5	2	6	4	5	4	14	7

1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 22 Accomack, 19 Crater, 23 Hampton Roads																			1, 2	3	4	5	6	7	8	9	10	11	12	13, 14	15	16	17, 18, 22	19	23	Total
Baseball	25	10	4	3	3	4	7	3	6	5	4	7	5	9	5	6	6	7																		
Football	19	15	7	5	5	4	8	5	4	2	7	5	6	6	5	12	6	7																		
Snowboarding	3	4	8	5	11	4	10	6	7	1	1	2	4	5	8	8	4	6																		
Water skiing or towed on water	2	3	16	4	3	5	6	7	9	7	6	7	4	5	6	2	4	6																		
Paddle boarding	2	4	5	6	1	5	7	5	8	4	4	3	6	8	5	0	8	6																		
Nature study/Nature programs	3	5	10	6	7	4	7	7	6	5	3	6	6	6	9	5	7	6																		
Bird watching away from home	2	4	6	4	6	6	6	5	5	4	5	3	5	6	9	3	4	6																		
RV camping	11	13	5	9	12	8	4	5	4	8	6	7	4	5	6	4	4	6																		
Mountain biking	1	10	3	9	3	2	7	6	5	6	2	2	7	7	5	0	4	6																		
Driving 4-wheel off road (Jeep, truck)	13	5	11	7	3	4	2	7	8	6	4	6	4	7	5	9	2	6																		
ATV or UTV off-road	13	7	10	8	5	10	1	14	10	5	13	5	3	8	5	6	1	6																		
Disc golf	1	6	14	4	3	1	5	2	4	4	4	4	6	7	2	2	4	5																		
Archery	17	4	4	5	7	4	2	5	6	9	4	4	5	5	9	4	2	5																		
Equestrian events (races, dressage, shows, exhibitions, auctions, etc.)	5	6	2	5	5	7	6	11	6	4	6	5	6	4	3	2	3	5																		
Zip line	2	6	4	3	4	4	6	6	4	3	3	3	8	2	8	0	7	5																		
Softball	5	5	7	5	3	4	6	6	1	4	4	6	4	6	3	7	6	5																		
Splash pads	5	3	3	1	2	15	6	1	2	2	0	1	3	4	0	1	4	4																		
Par-3 golf	0	0	6	7	2	14	7	5	2	4	1	2	6	3	4	1	4	4																		
Horseback riding	5	5	3	3	2	4	5	11	5	3	3	5	4	4	4	0	2	4																		
Volleyball	6	4	2	4	3	1	4	5	4	1	4	3	5	2	5	8	5	4																		
Other snow/ice dependent activities	1	7	9	3	4	3	2	1	3	1	4	1	5	3	6	10	1	3																		
Sailing	1	2	4	6	1	4	5	4	5	2	4	2	2	3	7	1	4	3																		
Whitewater rafting (guided or solo)	4	5	5	2	1	2	4	6	2	6	4	4	2	1	1	3	2	3																		
Geocaching	1	5	1	2	7	1	3	6	2	5	0	1	3	2	1	1	3	3																		
Kickball	1	2	0	1	2	1	2	1	0	2	1	2	6	0	3	9	4	3																		
Track and field	4	4	0	1	2	1	3	4	3	1	3	2	2	3	2	4	3	3																		
Other activities on sports fields	1	0	4	2	1	1	3	7	1	0	1	1	4	4	5	0	2	3																		
Cross country skiing, snowshoeing	1	3	0	2	3	2	4	2	4	1	3	1	2	2	4	1	1	2																		
Surfing	1	1	1	2	1	2	2	1	2	0	0	2	2	0	2	1	6	2																		
Other water dependent activities	3	2	1	2	3	1	2	4	3	2	1	1	1	0	6	1	3	2																		
Other activities on courts & golf	1	1	2	3	2	2	2	2	2	0	1	2	2	2	0	0	1	2																		
Other destination activities	0	0	2	1	2	1	2	2	1	1	2	1	3	1	2	2	0	2																		
Other activities	12	5	3	4	1	1	2	3	2	1	2	0	1	3	0	3	1	2																		
Driving motorcycle off road/dirt bike	2	3	3	3	2	1	1	0	2	2	6	2	1	3	2	2	2	2																		
T-ball	0	5	0	0	5	2	2	2	0	2	1	3	1	4	2	2	2	2																		
Lacrosse	1	1	0	2	0	1	4	2	1	1	1	0	2	2	1	0	1	2																		
Sail boarding	1	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	1	1																		
Crew rowing	0	0	0	0	0	0	1	0	3	0	0	1	1	0	1	0	1	1																		
Pickle ball	1	0	2	1	1	1	3	0	1	1	2	1	2	1	0	2	1	1																		
Shuffleboard	2	0	0	0	0	1	1	3	2	2	1	2	1	0	1	0	0	1																		
Racquetball	1	1	1	4	2	12	2	1	2	0	1	0	2	0	0	0	2	1																		
Paddle-in camping	0	4	0	0	1	0	1	1	2	0	0	1	1	1	1	0	0	1																		
Segway on sidewalks and paths	0	0	3	1	0	1	2	0	0	0	0	7	3	2	1	0	1	1																		
Orienteering	0	0	1	0	1	0	1	0	1	2	0	0	0	1	1	2	0	1																		
Other activities on trails	3	3	0	1	0	0	1	0	0	0	0	0	0	0	1	2	0	1																		
Field hockey	0	1	0	0	0	0	1	1	1	1	1	0	1	1	0	0	1	1																		
Cheerleading	3	1	1	1	1	1	1	1	1	2	2	1	2	1	1	2	0	1																		
Kite boarding	1	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0																		
Squash	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0																		
Electric-assist bicycle on road or trail	0	2	0	0	1	0	1	1	0	0	0	1	1	0	0	0	0	0																		
Rugby	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0																		

Figure III-41 gives insight on the top ten activities in 2011 and 2017 determined by participation rate. There was a decrease in participation for some activities from 2011 to 2017 such as “walking for pleasure” and “visiting historic areas,” while participation in other activities such as “visiting natural areas” increased.

The survey does not directly illuminate why these changes exist. The comparison is limited to those activities that appeared in both questionnaires, but note that some activities, such as walking for pleasure and visiting historic areas, appeared in different places in the two questionnaires, which could have some impact on patterns of response. And as noted earlier, multiple items in the questionnaire (walking for pleasure, nature-based tours/ trails and hiking/backpacking day trips) could all be considered “walking for pleasure.” Surveys are also subject to sampling error and other sources of imprecision.

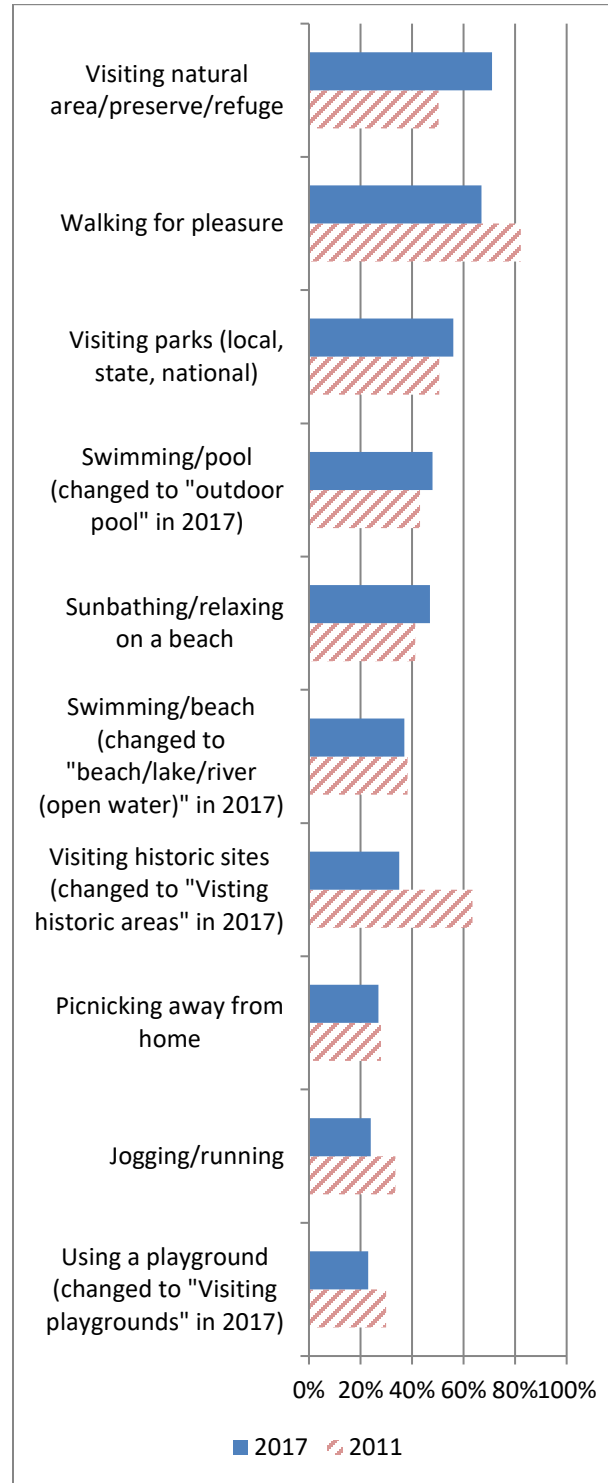
But the differences could signal real changes. We know that a person’s age plays a significant role in their outdoor activities. Advancing age is often associated with health and mobility issues that limit participation in outdoor activities. As the population ages overall, participation rates in some activities will probably decline. This is an effect of age as a stage of life.

There can also be generational differences in participation in outdoor activities. Perhaps people in older generations in general would have a different relationship to nature than people in younger generations in general. Those differences may persist across stages of life.

The changes in participation rates from 2011 to 2017 may be due to any of these causes, or others not considered here.

We recommend focusing on the 2017 results rather than looking for deep meaning in comparisons to 2011.

Figure III-41: Participation in the Top Ten Activities by Year (Only for activities that could be compared across years)



Most Needed Recreation Opportunities by Planning District

Table III-3 displays the most needed outdoor recreation opportunities broken down by the

planning district. As with participation in activities, many of the responses for the most needed recreation opportunities are relatively similar across planning districts. However, there are some differences. For instance, most planning districts have around 40 percent of respondents saying that historic areas are the most needed recreation opportunity but it is 49 percent in

planning district 11 (Region 2000 Partnership). Similarly, most planning districts have close to 30 percent of respondents saying scenic drives are among the most needed recreation opportunities but it is 43 percent in planning districts 1 and 2 combined (LENOWISCO and Cumberland Plateau).

Table III-3: Most Needed Recreation Opportunities by Planning District

1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 22 Accomack, 19 Crater, 23 Hampton Roads																		
	1, 2	3	4	5	6	7	8	9	10	11	12	13, 14	15	16	17, 18, 22	19	23	Total
Historic areas	37	42	43	37	47	31	34	40	30	49	43	46	42	43	33	43	42	39
Natural areas	49	50	62	58	65	61	53	50	64	59	46	55	55	54	47	40	47	54
Parks	52	47	51	40	38	43	51	44	50	50	46	58	52	41	48	45	56	49
Playing fields, sports and golf facilities	15	19	22	17	11	13	28	21	17	19	21	26	25	22	27	31	21	22
Scenic drives (driving for pleasure)	43	34	25	31	32	29	19	23	22	32	34	29	28	27	25	27	28	29
Trails	45	36	46	49	38	47	46	43	45	41	31	37	42	52	40	30	42	43
Water access	55	46	53	45	35	34	39	43	45	43	45	38	40	33	47	46	43	43

Crowd-Sourced Data

As described earlier, the 2017 VODS included a “crowd-sourced” version of the questionnaire available by web only. DCR promoted the crowd-sourced survey through social media and email lists (See Appendix I). There were 2,389 usable responses to the crowd-sourced survey which constitute a valuable description of households that are more closely connected with outdoor recreation. But because it is based on a sample of convenience, the crowd-sourced data cannot support statistical inferences to the general population of Virginia.

With convenience samples, we anticipate that there will be unknown biases in responses compared to what a probability sample would yield. In many studies there would only be the convenience sample, and its biases would be unknown. In the case of the 2017 VODS, though, we can compare the results from the convenience sample to those from the probability sample.

This section of the report compares demographic variables in the crowd-sourced data and the probability sample data, and then compares some substantive responses. The exact breakdown of demographics for each variable can be found in

Table III-4. Full comparisons substantive responses from the crowd-sourced and probability surveys are found in Appendix G.

The comparison shows why it is so important to dedicate the resources to a good probability sample if the goal is to represent the full population of Virginia and estimate participation in, and demand for, various outdoor activities across all households in the state.

Demographics

Comparison of frequencies of the demographic variables between the weighted probability data and crowd-sourced data reveals some similar values. In both cases, most people own the homes they live in (83.2 percent for the weighted probability data and 82.8 percent for the crowd-sourced data),

There is a small difference when it comes to gender: 39.7 percent of the respondents in the unweighted probability sample were male compared to 44.3 percent in the crowd-sourced data. Similarly, 60.3 percent of respondents were female for the unweighted probability data compared to 55.4 percent in the crowd-sourced data.

The number of respondents who consider themselves to be of Hispanic/Latino origin is quite similar for the two different data samples: 2.5 percent of respondents in the unweighted probability data considered themselves to be of Hispanic/Latino origin vs 1.7 percent in the crowd sourced data.

The overall race breakdown is different between the datasets for White/Caucasians, Black/African Americans and Asian/Pacific Islanders. Eighty-five percent of the unweighted probability data respondents considered themselves to be White/Caucasian compared to 93 percent of the crowd-sourced respondents. Meanwhile, African Americans made up 8 percent of the unweighted probability data but only about 2 percent of the crowd-sourced data.

Finally, the income of respondents in the unweighted probability sample is lower than in the crowd-sourced data. The cumulative percentage of respondents with an income less than \$25,000 was about 14 percent for the unweighted probability sample but only 4 percent for the crowd-sourced data. The cumulative percent of respondents with an income less than \$50,000 was 33 percent for the unweighted probability sample but only 17 percent for the crowd-sourced data. The cumulative percent of respondents with an income less than \$75,000 was 51 percent for the unweighted probability sample but only 37 percent for the crowd-sourced data. So, while a total household income of \$75,000 or greater makes up about 63 percent of the crowd-sourced data, it only makes up about 49 percent of the unweighted probability sample.

Table III-4: Demographics of Unweighted Probability Sample and Crowd Sourced Data

		Probability Data (unwtd.)	Crowd Sourced Data
Home Ownership	Own	83.2%	82.8%
	Rent	16.4%	14.4%
Gender	Male	39.7%	44.3%
	Female	60.3%	55.4%
Hispanic/Latino Origin	Yes	2.7%	1.7%
	No	97.3%	98.3%
Race	White/Caucasian	85.0%	93.2%
	Black/African American	8.0%	1.6%
	American Indian	0.4%	0.6%
	Asian/Pac. Islander	2.2%	0.8%
	Multiracial/Mixed race	2.2%	1.9%
	Other	2.2%	1.9%
Household Income	Less than \$10,000	3.6%	0.9%
	\$10,000 to \$24,999	10.0%	3.3%
	\$25,000 to \$49,999	18.9%	12.3%
	\$50,000 to \$74,999	18.8%	20.8%
	\$75,000 to \$99,999	14.2%	17.1%
	\$100,000 to \$149,999	18.1%	27.4%
	\$150,000 to \$199,999	7.4%	11.8%
	\$200,000 or more	8.9%	6.4%

Table III-5 shows the percentages of respondents in each planning district in the unweighted probability data and the crowd-sourced data. One of the key features of the probability sample is the assurance that each planning district in the state will have enough representation in the data to be described with reasonable precision. A convenience sample does not offer this assurance.

Table III-5: Planning Districts of Unweighted Probability Sample and Crowd-Sourced Data

Planning District(s)	Probability Sample (unwtd.)	Crowd Sourced Data
1, 2	3.3%	1.6%
3	3.8%	1.5%
4	4.3%	2.6%
5	5.5%	5.8%
6	5.9%	5.9%
7	4.5%	2.6%
8	13.3%	13.0%
9	4.3%	3.2%
10	5.5%	4.3%
11	5.0%	2.1%
12	5.3%	1.4%
13, 14	3.2%	1.3%
15	11.2%	17.0%
16	6.0%	2.5%
17, 18, 22	4.8%	6.0%
19	3.6%	1.3%
23	10.4%	9.6%

In general, there is a similar percentage of respondents from each planning district across the probability sample and the crowd-sourced data, but key differences exist in PDs 12, 13/14, 16 and 19. The largest difference exists in planning district 15 (Richmond Regional PDC), where 11.2 percent of respondents in the probability sample live while 17 percent of respondents in the crowd-sourced data live there. This reflects the slight undersampling of high-population PDs in the probability survey, but perhaps more than that it may reflect DCR's promotion efforts for the crowd-sourced survey reaching more people in the Richmond PD, where DCR's main offices are located. As a result, PD 15 (Richmond Regional PDC) contains the most respondents for the crowd-sourced data while PD 8 (Northern Virginia Regional Commission) has the largest share of respondents in the probability sample.

More importantly, planning districts 1/2, 3, 12, 13/14, and 19 have too few cases in the crowd-sourced data for adequate analysis at the planning district level.

Comparisons on Substantive Data

Another comparison between crowd-sourced data and the probability sample was based on substantive items in the questionnaires. Respondents from the crowd sourced data are more likely to say that it is important to have outdoor recreation opportunities (90%) compared to the probability sample (70%).

Furthermore, respondents from the crowd-sourced survey are more likely to participate in outdoor recreation equally on the weekends and during the week (53.9%) compared to the probability sample respondents (38.1%). Overall, only 0.7 percent of the responders in the crowd-sourced data said that no one in their household participates in outdoor recreation activities compared to 8 percent of respondents in the probability sample.

There were also differences between the issues that respondents or their household members face which prevent them from visiting parks. Respondents in the probability sample were more likely to say that health issues prevent them from partaking in outdoor recreation activities (18.1%) compared to the crowd-sourced respondents (10.9%). Meanwhile, 69.9 percent of respondents from the crowd-sourced survey said that lack of time is what prevents them from doing outdoor recreation compared to 57.4 percent of the probability sample.

In addition, the probability sample had a higher percentage of respondents say they lacked the funds to visit parks (25%) compared to the crowd-sourced survey (16.7%). This result is consistent with the earlier finding that the household incomes in the crowd-sourced data are higher than in the probability sample.

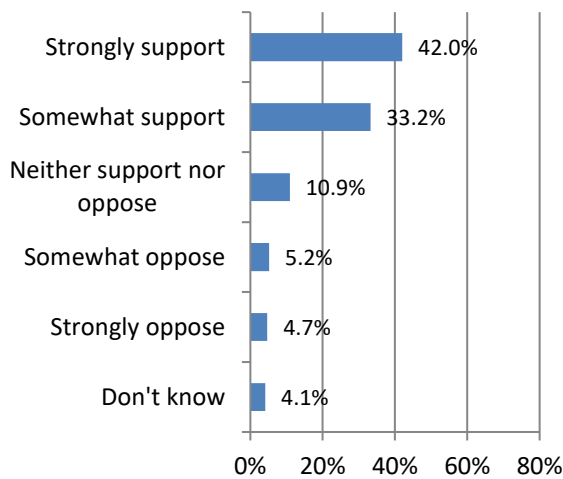
When asked why the respondents participate in outdoor recreation activities, only 0.4 percent of respondents from the crowd-sourced survey said that they do not participate in outdoor recreation which is much lower than the 7.5 percent who gave that answer in the probability sample. The respondents from the probability sample were also more likely to participate in outdoor recreation because of the social aspect (48%) compared to

the crowd-sourced survey (29.5%). The respondents in the crowd-sourced survey were much more likely to participate in outdoor recreation to experience nature than were the respondents in the probability sample (78.4% to 59.3%, respectively).

Respondents were asked if they would support an increased state tax to fund outdoor recreation in Virginia. There is strong support in the crowd-sourced survey for such spending, as indicated in Figure III-42. About three-quarters (75.2%) of respondents said they would somewhat or strongly support an increased state tax to fund outdoor recreation in Virginia, while 11 percent said they would neither support nor oppose it and four percent said they did not know. Only one in ten respondents (9.9%) indicated they would somewhat or strongly oppose an increased state tax to fund outdoor recreation.

This support is much higher than in the probability sample (see Appendix G.)

Figure III-42: Support for a State Tax Increase to Fund Outdoor Recreation



Another key difference between the two data sets is in the sources of information about recreation opportunities that respondents reported using. The crowd-sourced respondents were more likely to get their information from the Internet (83.7%) compared to the probability sample respondents (65.7%). Probability sample respondents were more likely to get their information from television ads than the crowd-source respondents (19.8% to 6.4%).

In terms of natural areas, respondents from the crowd-sourced survey preferred natural areas more than the respondents in the probability sample (54.3% to 30.4%). Those from the crowd-sourced data are more likely to go to parks without Wi-Fi or cell phone service, perhaps because they are more interested in experiencing nature than are respondents in the probability sample, generally speaking. Similarly, the respondents from the crowd sourced data were more likely to say that protecting Virginia’s natural and open space resources is “very important” than are the respondents from the probability sample (94.8% to 81.7%), although both groups show strong support here.

The crowd-sourced approach is attractive due to its lower cost, its appeal to highly motivated respondents and its rich store of data pertaining to residents who are more connected to outdoor recreation, but it cannot provide results that are unbiased and generalizable to Virginia’s population, nor can it provide results that are useable at the planning district level for all planning districts in the state.

Urban versus Rural Areas

Table III-6 contains a side by side comparison of participation frequency in activities in urban and rural areas. In most cases, the respondents in urban and rural areas participate in the activities listed in this survey in comparable frequencies. Some differences do exist though. Interestingly, people in urban areas are more likely to participate in organized sports/events such as soccer (15% versus 8%), charity walks/5K/10K/marathon/etc. (25% versus 14%) or playing basketball (17% versus 12%). Respondents from urban areas are also more likely to sunbathe (52% versus 43%), visit gardens/arboretums (31% versus 20%), or jog/run (32% versus 17%). Meanwhile, respondents from rural areas are more likely than urban respondents to participate in fresh water fishing (40% versus 27%), hunt (22% versus 8%) or garden (30% versus 25%). Table III-6 has a frequency breakdown for all 101 activities asked about in the survey.

Table III-6: Percentage of Households in Urban and Rural Areas Participating in Activities

1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 19 Crater, 22 Accomack, 23 Hampton Roads			
	URBAN (8,15,16,23)	RURAL (1,2,3,4,5,6,7,9,10, 11,12,13,14,17,18, 19,22)	Total
Visiting natural areas	72	70	71
Driving for pleasure	62	71	67
Walking for pleasure	71	65	67
Visiting parks (local, state & national)	60	52	56
Swimming/outdoor pool	50	45	48
Sunbathing/relaxing on a beach	52	43	47
Viewing the water	42	35	38
Swimming/beach/lake river (open water)	38	36	37
Visiting historic areas	41	31	35
Fresh water fishing	27	40	34
Outdoor-festivals (music festivals, outdoor-themed festivals, extreme sports festivals)	36	32	34
Visit petting zoos, working farms, corn mazes, etc.	35	28	31
Music festivals	31	26	28
Picnicking away from home	27	27	27
Viewing scenery	27	27	27
Gardening	25	30	27
Nature tours/trails	29	24	26
Canoeing/kayaking	25	25	25
Visiting gardens or arboretums	31	20	25
Jogging/running	32	17	24
Sporting events or tournaments	26	21	23
Visiting playgrounds	24	22	23
Hiking/backpacking day trips	23	20	21
Culinary tours/trails (brewery/winery)	22	17	19
Walks/runs/challenge events (charity walks, extreme sports, marathon)	25	14	19
Hunting	8	22	16

1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 19 Crater, 22 Accomack, 23 Hampton Roads			
	URBAN (8,15,16,23)	RURAL (1,2,3,4,5,6,7,9,10, 11,12,13,14,17,18, 19,22)	Total
Snow sledding/tubing	12	17	15
Salt water fishing	17	14	15
Basketball	17	12	15
Power boating	13	15	14
18-hole golf	16	12	14
Miniature golf	17	12	14
Shooting range	14	14	14
Tent camping	15	13	14
Tubing on water	11	13	12
Staying in cabins	10	11	11
Stargazing/Dark skies/Astronomy	10	11	11
Paved or gravel bicycle trails	15	8	11
Soccer	15	8	11
Tennis	14	7	10
Driving range	15	7	10
Dog parks	13	7	10
Visiting private farms and forests	10	11	10
Downhill skiing	12	7	9
Bicycle touring on roads	13	5	9
Fitness trail (not jogging)	11	7	9
Jet ski/personal watercraft	7	8	8
Equestrian	8	7	7
Ice skating (outdoor)	9	5	7
Art tours/trails (artisan, music)	8	6	7
Baseball	7	6	7
Football	7	7	7
Snowboarding	7	6	6
Water skiing or towed on water	5	6	6
Paddle boarding	8	4	6
Nature study/programs	7	6	6
Bird watching away from home	6	5	6
RV camping	4	7	6
Mountain biking	7	5	6
Driving 4-wheel off road (Jeep, truck)	4	7	6
ATV or UTV off-road	3	9	6
Disc golf	5	5	5
Archery	3	6	5

1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 19 Crater, 22 Accomack, 23 Hampton Roads			
	URBAN (8,15,16,23)	RURAL (1,2,3,4,5,6,7,9,10, 11,12,13,14,17,18, 19,22)	Total
Equestrian events (races, dressage, shows, exhibitions, auctions, etc.)	5	5	5
Zip line	5	4	5
Softball	5	5	5
Splash pads	4	3	4
Par-3 golf	5	3	4
Horseback riding	4	4	4
Volleyball	4	4	4
Other snow/ice activities	2	4	3
Sailing	4	3	3
Whitewater rafting (guided or solo)	3	3	3
Geocaching	3	3	3
Kickball	3	2	3
Track and field	3	2	3
Downhill skiing	3	2	3
Cross country skiing, snowshoeing	3	2	2
Surfing	3	1	2
Other water activities	2	2	2
Other activities on courts & golf	2	1	2
Other destination activities	2	1	2
Other activities	2	2	2
Driving motorcycle off road/dirt bike	1	2	2
T-ball	2	2	2
Lacrosse	3	1	2
Sail boarding	1	1	1
Crew rowing	1	0	1
Pickle ball	2	1	1
Shuffleboard	1	1	1
Racquetball	2	1	1
Paddle-in camping	1	1	1
Segway on sidewalks & paths	2	1	1
Orienteering	1	0	1
Other activities on trails	0	1	1
Field hockey	1	0	1
Cheerleading	1	1	1
Kite boarding	0	0	0
Squash	1	0	0
Electric-assist bicycle on road or trail	1	0	0
Rugby	1	0	0

Most Needed Recreation Opportunities in Rural and Urban Areas

Table III-7 displays the most needed recreation opportunities in rural and urban areas.

Table III-7: Most Needed Recreation Opportunities in Rural and Urban Areas

1 Lenowisco, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 19 Crater, 22 Accomack, 23 Hampton Roads			
	URBAN (8,15,16,23)	RURAL (1,2,3,4,5,6,7,9,10, 11,12,13,14,17,18, 19,22)	Total
Natural areas	53	55	54
Parks	51	48	49
Trails	46	42	43
Water access	39	46	43
Historic areas	38	40	39
Scenic drives (driving for pleasure)	26	31	29
Playing fields, sports and golf facilities	25	19	22
Other (specify)	7	8	8

Just as with household rates of participation in activities, not much difference exists between the responses of respondents from urban areas and those from rural areas. People in rural areas and urban areas are seeking similar recreation opportunities. The respondents from both groups believe that natural areas are the most needed recreation opportunity in Virginia. The largest difference is in the water access category, where 39 percent of respondents from urban areas believe that the most needed recreation opportunity is water access compared to 46 percent of rural respondents. This difference is only 7 percent. All in all, respondents from rural and urban areas are pretty similar in their opinions about what recreation opportunities they believe are needed in Virginia.

Inventory of Outdoors Recreation Resources

As part of the SCORP process, DCR updated its database of outdoors recreation resources by contacting counties, independent cities and towns in Virginia and requesting data about existing

resources such as parks, trails, water acreage and the like.

Not surprisingly, there are distinct regional differences among the types of recreational resources and facilities available. The data were broken down into three categories representing: (1) recreational facilities, (2) land-based wilderness activities, and (3) water-based activities.

Figure III-43 through Figure III-45 show the three inventory variables that are representative of these components: (a) the total number of recreational facilities, (b) recreational open space land acreage,

and (c) recreational open space boating acreage. Recreational facilities (see Figure III-43) are most commonly found in more densely populated urban and metropolitan regions such as Northern Virginia, the City of Richmond and its environs, and the Hampton Roads region (see Figure III-44). Land acreage is most plentiful in the Shenandoah Valley and Blue Ridge Mountains. Boating acreage is comparatively larger in the Northern Neck, Middle Peninsula and Eastern Shore (see Figure III-45).

Figure III-43: Number of Recreation Facilities by Locality

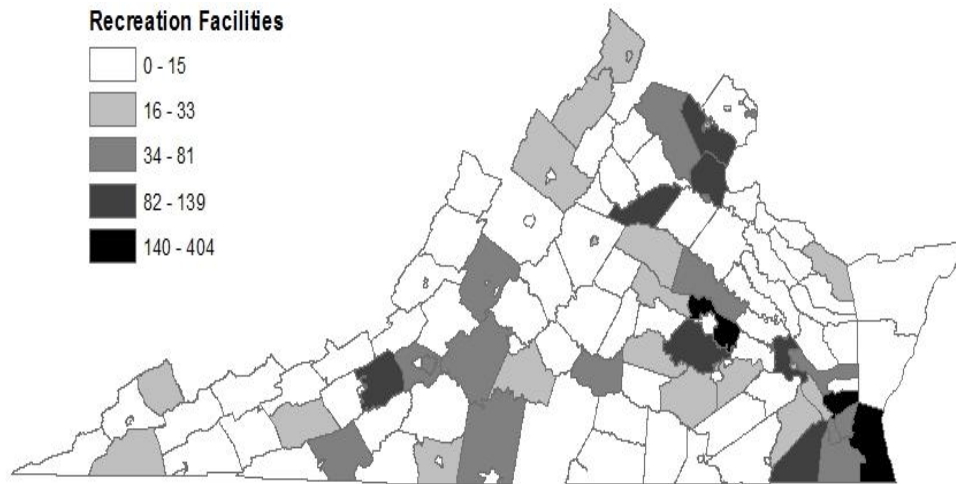


Figure III-44: Recreational Open Space Land Acreage by Locality

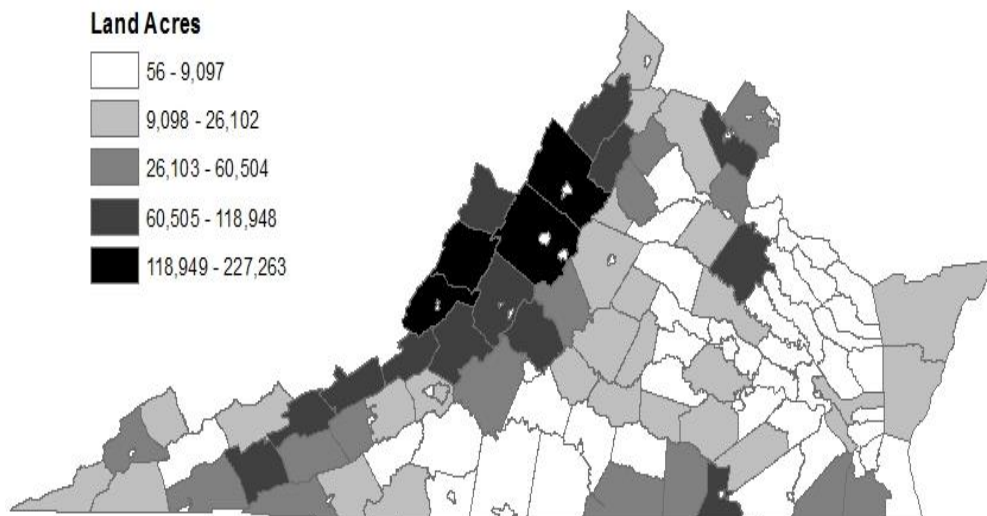
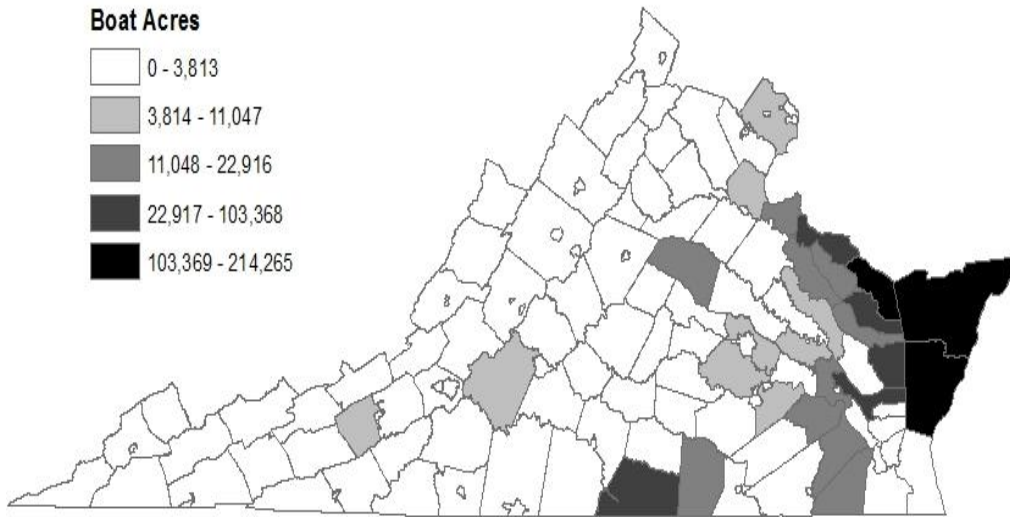


Figure III-45: Recreational Boating Water Acreage by Locality



Public and Private Ownership

Private open space may be either a complement or substitute to public open space. In the DCR recreational inventory data, about 75 percent of recreational open space land and water acreage is publicly owned (see Figure III-46). For some types of recreational resources, however, the private sector is an important provider (see Figure III-47). All of the ski facilities in the resource inventory

are privately owned and operated. In addition, most marina slips, camping sites, golf courses, outdoor pools, and hunting-related facilities (e.g. rifle shooting, skeet shooting, and archery) are privately owned. In contrast, almost all water-related open spaces and almost all athletic facilities (e.g., football, basketball, soccer, softball, and baseball fields) are publicly owned.

Figure III-46: Total Recreational Open Space Acreage by Ownership

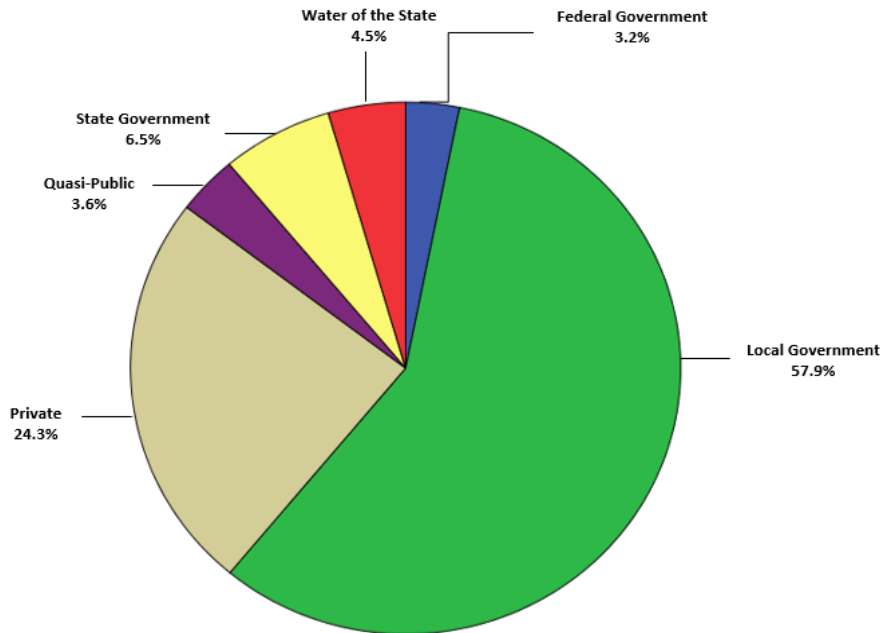
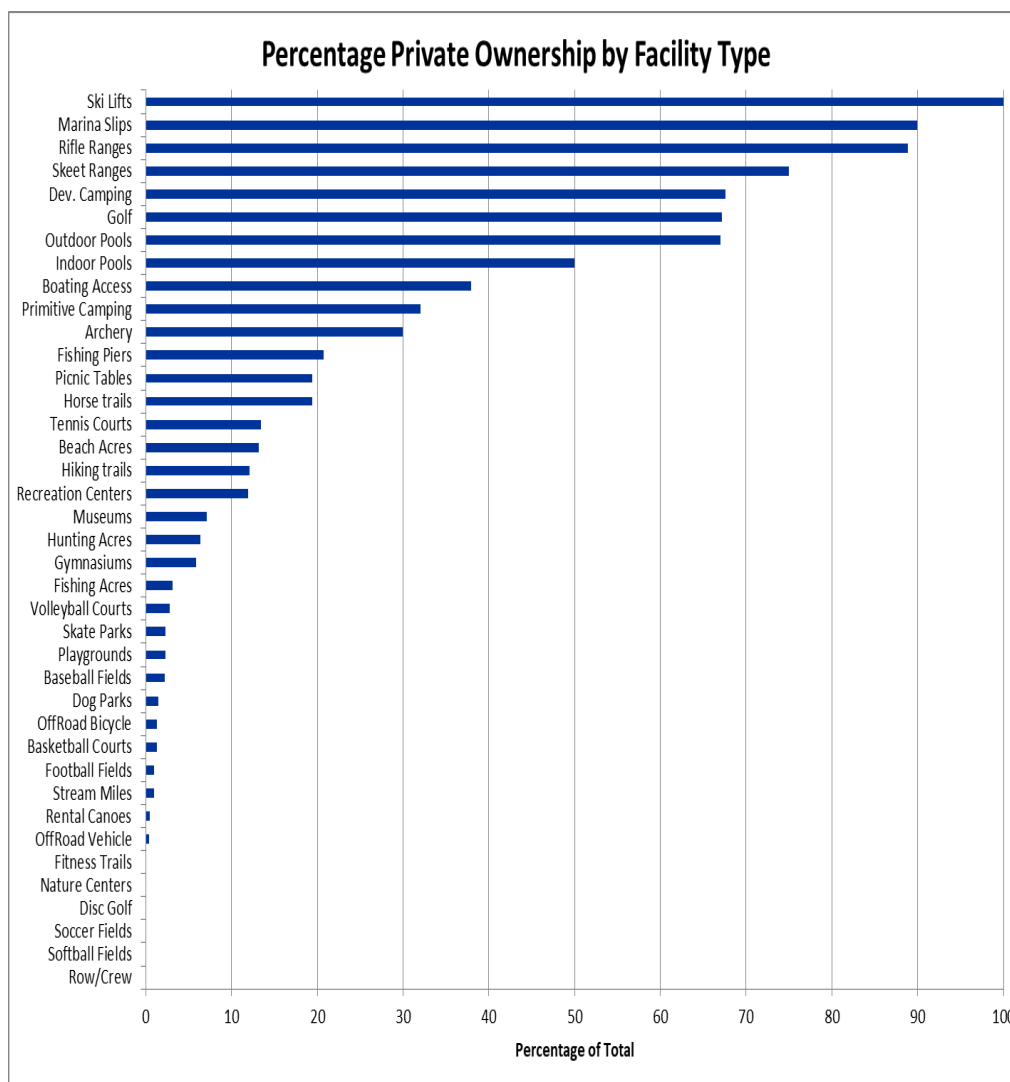


Figure III-47: Percentage of Private Ownership by Facility Type

Demand Analysis

This section describes the method used to estimate and project the demand for various recreation opportunities as well as the results from the method. This is another way to gauge the level of participation in the 101 activities covered in the survey; it is derived in part from the participation rates already discussed in this report.

Although this analysis does not explicitly relate demand to available facilities, these results will help planning districts and the state of Virginia as a whole better anticipate what recreation opportunities would be most beneficial to the residents of Virginia. The method used is modeled after the method used in the 2007 Virginia Outdoors Plan (VOP) (Virginia Department of Conservation and Recreation 2007). This 2007

approach estimates the average resident activity levels for each activity by region.

These resident activity levels were determined for each activity by first calculating the per capita person-days of each activity in each reporting household. This was defined as the number of days in the last 12 months that anyone in the household did the activity multiplied by the number of people typically involved in the activity divided by the number of people living in the household.

Then within each planning district, the median per capita person-days and the percentage of households engaging in each activity were calculated. The estimated demand was defined as the proportion of households participating in the activity multiplied by the median per capita

person-days for each activity multiplied by the total population (all ages) of the planning district. Regional and statewide aggregate activity levels were obtained by aggregating the planning district-level results.

The data were cleaned prior to these calculations by ensuring that the number of people reported to typically do the activity did not exceed the number of people reported to live in the household. Also, extreme outlier values were reduced to more plausible values for the number of days in the last 12 months on which the activities were done, and the total calculated per-capita days per household. Plausible values were determined by judgment using the overall distribution of reported values as a guide. Usually the highest 1 to 10 percent of the values were recoded downward. Finally, the calculated demand statistics were rounded to the nearest thousand days.

Because the reported data are subject to errors of recall and data processing, the estimated demand statistics are subject to error. The results should be treated as approximations.

Regional and statewide activity level estimates and projections can be found in Table III-8 (see Figure II-1 for a map of the four regions). Urban-rural and statewide activity level estimates and projections can be found in Table III-9 (see Figure II-2 for a map of the urban-rural designations). Estimates by planning district were too voluminous to include in this written report. They were provided separately to DCR.

Table III-8: Estimated Demand (person-days) for the Activity in the Last 12 Months by Region

	CHESAPEAKE (15)	MOUNTAIN (1,2,3,4,5,6)	PIEDMONT (8,9,10,11,12)	URBAN CORRIDOR (7,13,14,16,17)	Total
1 LENOWISCO, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 22 Accomack, 19 Crater, 23 Hampton Roads					
Driving for pleasure	956,000	9,604,000	4,327,000	19,758,000	34,644,000
Visiting natural areas	469,000	6,684,000	2,975,000	18,833,000	28,961,000
Equestrian	870,000	236,000	549,000	1,298,000	2,953,000
Downhill skiing	17,000	424,000	330,000	1,713,000	2,484,000
Snowboarding	26,000	999,000	121,000	771,000	1,917,000
Cross country skiing, snowshoeing	5,000	61,000	46,000	198,000	310,000
Snow sledding/tubing	31,000	572,000	271,000	1,298,000	2,171,000
Ice skating (outdoor)	7,000	83,000	138,000	798,000	1,025,000
Other snow/ice dependent activities	9,000	918,000	170,000	481,000	1,579,000
Fresh water fishing	152,000	3,342,000	2,034,000	7,022,000	12,549,000
Salt water fishing	385,000	457,000	323,000	4,248,000	5,412,000
Sunbathing/relaxing on a beach	544,000	4,089,000	2,729,000	19,416,000	26,779,000
Jet ski/personal watercraft	20,000	579,000	226,000	884,000	1,710,000
Power boating	391,000	942,000	1,100,000	4,226,000	6,659,000
Sailing	40,000	82,000	78,000	569,000	769,000
Sail boarding	0	31,000	7,000	90,000	128,000
Canoeing/kayaking	132,000	1,363,000	996,000	3,382,000	5,873,000
Water skiing or towed on water	221,000	470,000	287,000	1,163,000	2,141,000
Whitewater rafting (guided or solo)	1,000	104,000	206,000	238,000	550,000
Tubing on water	20,000	699,000	262,000	811,000	1,792,000
Swimming/outdoor pool	380,000	6,308,000	3,429,000	19,794,000	29,912,000
Swimming/beach/lake river (open water)	393,000	3,685,000	2,483,000	13,589,000	20,149,000
Crew rowing	0	0	494,000	212,000	707,000
Surfing	11,000	70,000	59,000	1,131,000	1,271,000
Paddle boarding	4,000	197,000	237,000	612,000	1,050,000
Kite boarding	0	36,000	1,000	5,000	42,000
Splash pads	0	242,000	89,000	851,000	1,182,000
Viewing the water	1,360,000	3,946,000	2,902,000	17,516,000	25,724,000
Other water dependent activities	136,000	293,000	76,000	598,000	1,103,000
Tennis	6,000	375,000	616,000	5,231,000	6,228,000
Basketball	67,000	1,686,000	892,000	10,012,000	12,656,000
Pickle ball	0	28,000	207,000	396,000	632,000
Shuffleboard	2,000	4,000	43,000	45,000	94,000
18-hole golf	89,000	1,057,000	995,000	4,640,000	6,782,000
Par-3 golf	5,000	166,000	115,000	720,000	1,006,000
Driving range	13,000	319,000	307,000	3,498,000	4,137,000
Disc golf	13,000	368,000	281,000	911,000	1,573,000
Racquetball	9,000	229,000	41,000	3,136,000	3,416,000
Squash	0	0	5,000	74,000	78,000
Miniature golf	10,000	226,000	212,000	1,723,000	2,171,000
Archery	132,000	628,000	284,000	1,230,000	2,274,000
Shooting range	144,000	699,000	378,000	2,045,000	3,266,000
Other activities on courts & golf	11,000	518,000	221,000	434,000	1,185,000
Visiting working farms, petting zoos, corn mazes, etc.	56,000	818,000	509,000	3,910,000	5,294,000
Music festivals	47,000	985,000	381,000	3,389,000	4,802,000
Equestrian events (races, dressage, shows, exhibitions, auctions, etc.)	7,000	196,000	227,000	752,000	1,182,000
Outdoor-festivals (music festivals, outdoor-themed festivals, extreme sports festivals, etc.)	119,000	1,177,000	618,000	3,984,000	5,897,000
Culinary tours/trails (brewery/winery/food)	42,000	721,000	806,000	3,745,000	5,314,000

1 LENOWISCO, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 22 Accomack, 19 Crater, 23 Hampton Roads					
	CHESAPEAKE (15)	MOUNTAIN (1,2,3,4,5,6)	PIEDMONT (8,9,10,11,12)	URBAN CORRIDOR (7,13,14,16,17)	Total
Nature based tours/trails	122,000	1,372,000	888,000	6,452,000	8,835,000
Art based tours/trails (artisan, music)	7,000	160,000	100,000	1,093,000	1,360,000
Sporting events or tournaments	125,000	2,223,000	783,000	6,221,000	9,352,000
Walks/runs/challenge-based events (charity walks, 5K, 10K, marathon, triathlon, extreme sports)	14,000	316,000	409,000	2,578,000	3,317,000
Other destination activities	9,000	32,000	137,000	259,000	437,000
Hunting	178,000	3,249,000	2,422,000	2,762,000	8,611,000
Picnicking away from home	100,000	1,261,000	866,000	4,315,000	6,541,000
Nature study/Nature programs	27,000	195,000	210,000	1,091,000	1,523,000
Visiting gardens/arboretums	58,000	638,000	456,000	3,611,000	4,762,000
Bird watching away from home	45,000	775,000	177,000	1,205,000	2,202,000
Visiting parks (local, state & national)	339,000	4,656,000	2,391,000	18,805,000	26,190,000
Visiting historic areas	225,000	1,624,000	880,000	6,347,000	9,075,000
Geocaching	5,000	162,000	114,000	670,000	951,000
Viewing scenery	208,000	3,161,000	2,275,000	10,716,000	16,361,000
Dog parks	17,000	1,135,000	671,000	3,366,000	5,188,000
Zip line	11,000	103,000	50,000	393,000	557,000
RV camping	50,000	889,000	487,000	1,105,000	2,531,000
Tent camping	46,000	990,000	338,000	2,784,000	4,158,000
Staying in cabins	56,000	888,000	267,000	1,320,000	2,531,000
Paddle-in camping	4,000	106,000	27,000	83,000	220,000
Visiting private farms and forests	34,000	1,616,000	852,000	1,722,000	4,224,000
Gardening	1,116,000	9,314,000	7,436,000	24,098,000	41,965,000
Visiting playgrounds	108,000	3,650,000	1,315,000	18,154,000	23,228,000
Bicycle touring on roads	49,000	636,000	409,000	4,992,000	6,086,000
Segway on sidewalks and paths	22,000	331,000	3,000	598,000	953,000
Electric-assist bicycle on road or trail	0	223,000	22,000	522,000	768,000
Orienteering	1,000	4,000	27,000	173,000	205,000
Stargazing/Dark skies/Astronomy	384,000	1,884,000	788,000	1,243,000	4,299,000
Other activities	9,000	638,000	275,000	1,931,000	2,854,000
Walking for pleasure	1,145,000	15,311,000	9,968,000	77,498,000	103,923,000
Jogging/running	820,000	7,391,000	2,627,000	61,053,000	71,891,000
Hiking/backpacking day trips	185,000	2,078,000	813,000	6,696,000	9,773,000
Fitness trail (not jogging)	11,000	1,296,000	560,000	4,813,000	6,681,000
Horseback riding	15,000	311,000	824,000	644,000	1,794,000
Mountain biking	40,000	564,000	469,000	3,271,000	4,344,000
Paved or gravel bicycle trails	59,000	1,236,000	579,000	6,101,000	7,975,000
Driving 4-wheel off road (Jeep, truck)	57,000	707,000	309,000	750,000	1,824,000
Driving motorcycle off road/dirt bike	48,000	581,000	133,000	229,000	991,000
ATV or UTV off-road	56,000	1,170,000	956,000	1,252,000	3,435,000
Other activities on trails	5,000	1,177,000	42,000	521,000	1,744,000
Softball	163,000	1,091,000	238,000	5,492,000	6,984,000
Baseball	15,000	2,585,000	659,000	4,365,000	7,625,000
T-ball	38,000	1,492,000	74,000	868,000	2,472,000
Soccer	49,000	3,520,000	1,760,000	10,337,000	15,666,000
Rugby	0	19,000	5,000	281,000	304,000
Football	13,000	1,797,000	1,158,000	2,154,000	5,122,000
Volleyball	80,000	491,000	553,000	1,890,000	3,014,000
Lacrosse	196,000	343,000	448,000	2,414,000	3,401,000
Field hockey	0	213,000	37,000	1,001,000	1,251,000
Kickball	7,000	163,000	581,000	2,469,000	3,220,000
Cheerleading	6,000	1,999,000	154,000	2,017,000	4,176,000
Track and field	0	1,244,000	108,000	6,946,000	8,298,000
Other activities on sports fields	556,000	341,000	389,000	4,961,000	6,246,000

Table III-9: Estimated Demand (person-days) for the Activity in the Last 12 Months by Urban-Rural

1 LENOWISCO, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 19 Crater, 22 Accomack, 23 Hampton Roads			
	URBAN (8,15,16,23)	RURAL (1,2,3,4,5,6,7,9,10,11,12,13,14,17, 18,19,22)	Total
Driving for pleasure	19,266,000	15,379,000	34,644,000
Visiting natural areas	18,482,000	10,480,000	28,961,000
Equestrian	1,298,000	1,656,000	2,953,000
Downhill skiing	1,709,000	775,000	2,484,000
Snowboarding	767,000	1,149,000	1,917,000
Cross country skiing, snowshoeing	198,000	112,000	310,000
Snow sledding/tubing	1,268,000	903,000	2,171,000
Ice skating (outdoor)	794,000	231,000	1,025,000
Other snow/ice dependent activities	231,000	1,347,000	1,579,000
Fresh water fishing	6,257,000	6,292,000	12,549,000
Salt water fishing	4,061,000	1,352,000	5,412,000
Sunbathing/relaxing on a beach	19,197,000	7,582,000	26,779,000
Jet ski/personal watercraft	851,000	858,000	1,710,000
Power boating	4,117,000	2,542,000	6,659,000
Sailing	554,000	215,000	769,000
Sail boarding	90,000	38,000	128,000
Canoeing/kayaking	3,314,000	2,559,000	5,873,000
Water skiing or towed on water	1,129,000	1,011,000	2,141,000
Whitewater rafting (guided or solo)	238,000	311,000	550,000
Tubing on water	807,000	985,000	1,792,000
Swimming/outdoor pool	19,484,000	10,428,000	29,912,000
Swimming/beach/lake river (open water)	13,366,000	6,784,000	20,149,000
Crew rowing	212,000	494,000	707,000
Surfing	1,123,000	148,000	1,271,000
Paddle boarding	612,000	438,000	1,050,000
Kite boarding	5,000	37,000	42,000
Splash pads	838,000	344,000	1,182,000
Viewing the water	17,275,000	8,449,000	25,724,000
Other water dependent activities	590,000	513,000	1,103,000
Tennis	5,164,000	1,064,000	6,228,000
Basketball	9,871,000	2,785,000	12,656,000
Pickle ball	339,000	293,000	632,000
Shuffleboard	45,000	49,000	94,000
18-hole golf	4,496,000	2,286,000	6,782,000
Par-3 golf	711,000	295,000	1,006,000
Driving range	3,458,000	679,000	4,137,000
Disc golf	901,000	672,000	1,573,000
Racquetball	3,136,000	279,000	3,416,000
Squash	74,000	5,000	78,000
Miniature golf	1,700,000	470,000	2,171,000
Archery	992,000	1,282,000	2,274,000
Shooting range	1,978,000	1,288,000	3,266,000
Other activities on courts & golf	434,000	751,000	1,185,000
Visiting working farms, petting zoos, corn mazes, etc.	3,873,000	1,420,000	5,294,000
Music festivals	3,326,000	1,476,000	4,802,000
Equestrian events (races, dressage, shows, exhibitions, auctions, etc.)	748,000	434,000	1,182,000
Outdoor-festivals (music festivals, outdoor-themed festivals, extreme sports festivals, etc.)	3,909,000	1,988,000	5,897,000
Culinary tours/trails (brewery/winery/food)	3,719,000	1,595,000	5,314,000
Nature based tours/trails	6,405,000	2,430,000	8,835,000
Art based tours/trails (artisan, music)	1,079,000	282,000	1,360,000
Sporting events or tournaments	5,833,000	3,519,000	9,352,000

1 LENOWISCO, 2 Cumberland Plateau, 3 Mount Rogers, 4 New River Valley, 5 Roanoke Valley-Alleghany, 6 Central Shenandoah, 7 Northern Shenandoah Valley, 8 Northern Virginia, 9 Rappahannock - Rapidan, 10 Thomas Jefferson, 11 Region 2000 Partnership, 12 West Piedmont, 13 Southside, 14 Commonwealth Council, 15 Richmond, 16 George Washington, 17 Northern Neck, 18 Middle Peninsula, 19 Crater, 22 Accomack, 23 Hampton Roads			
	URBAN (8,15,16,23)	RURAL (1,2,3,4,5,6,7,9,10,11,12,13,14,17, 18,19,22)	Total
Walks/runs/challenge-based events (charity walks, 5K, 10K, marathon, triathlon, extreme sports)	2,542,000	775,000	3,317,000
Other destination activities	227,000	210,000	437,000
Hunting	2,108,000	6,504,000	8,611,000
Picnicking away from home	4,270,000	2,271,000	6,541,000
Nature study/Nature programs	1,086,000	437,000	1,523,000
Visiting gardens/arboretums	3,570,000	1,192,000	4,762,000
Bird watching away from home	1,107,000	1,095,000	2,202,000
Visiting parks (local, state & national)	18,561,000	7,630,000	26,190,000
Visiting historic areas	6,201,000	2,874,000	9,075,000
Geocaching	635,000	316,000	951,000
Viewing scenery	10,522,000	5,839,000	16,361,000
Dog parks	3,342,000	1,847,000	5,188,000
Zip line	393,000	164,000	557,000
RV camping	977,000	1,554,000	2,531,000
Tent camping	2,761,000	1,397,000	4,158,000
Staying in cabins	1,294,000	1,237,000	2,531,000
Paddle-in camping	83,000	137,000	220,000
Visiting private farms and forests	1,200,000	3,025,000	4,224,000
Gardening	22,767,000	19,198,000	41,965,000
Visiting playgrounds	18,031,000	5,198,000	23,228,000
Bicycle touring on roads	4,977,000	1,109,000	6,086,000
Segway on sidewalks and paths	598,000	356,000	953,000
Electric-assist bicycle on road or trail	522,000	245,000	768,000
Orienteering	167,000	38,000	205,000
Stargazing/Dark skies/Astronomy	1,094,000	3,205,000	4,299,000
Other activities	1,885,000	969,000	2,854,000
Walking for pleasure	76,467,000	27,456,000	103,923,000
Jogging/running	60,553,000	11,338,000	71,891,000
Hiking/backpacking day trips	6,628,000	3,145,000	9,773,000
Fitness trail (not jogging)	4,797,000	1,883,000	6,681,000
Horseback riding	644,000	1,150,000	1,794,000
Mountain biking	3,220,000	1,124,000	4,344,000
Paved or gravel bicycle trails	6,080,000	1,895,000	7,975,000
Driving 4-wheel off road (Jeep, truck)	632,000	1,192,000	1,824,000
Driving motorcycle off road/dirt bike	213,000	778,000	991,000
ATV or UTV off-road	1,132,000	2,303,000	3,435,000
Other activities on trails	499,000	1,245,000	1,744,000
Softball	5,440,000	1,545,000	6,984,000
Baseball	4,226,000	3,399,000	7,625,000
T-ball	861,000	1,611,000	2,472,000
Soccer	9,952,000	5,715,000	15,666,000
Rugby	281,000	24,000	304,000
Football	2,125,000	2,997,000	5,122,000
Volleyball	1,855,000	1,158,000	3,014,000
Lacrosse	2,414,000	987,000	3,401,000
Field hockey	1,001,000	249,000	1,251,000
Kickball	2,387,000	833,000	3,220,000
Cheerleading	1,959,000	2,217,000	4,176,000
Track and field	6,761,000	1,537,000	8,298,000
Downhill skiing	4,961,000	1,286,000	6,246,000

Summary

The 2017 VODS provides a useful basis to support strategic planning for Virginia's outdoors recreational needs statewide and by planning district, region and urban/rural designations. The results of the survey are similar to those obtained in 2011, although self-reported participation in some outdoor activities is a little lower in 2017. Because of significant changes to the lineup of outdoor activities in the 2017 survey, comparisons to 2011 should be made with caution.

Public support is very strong for public access to open spaces and outdoor recreational opportunities, as well as for public expenditures to make those opportunities available. Public support is also strong for natural areas and conserved lands, and there is moderate support for increased taxes to fund outdoor recreation.

Inventory and Demand Analysis

The demand for activities, measured in annual person-days, is estimated by four regions of the state and for the first time also by urban and rural regions. The analysis of the statewide outdoor recreation inventory data shows that almost 60 percent of recreational open space acreage is owned and managed by local governments. Regional and statewide estimates of household participation in activities are summarized statewide as well as by planning district, region and urban-rural areas.

Crowd-Sourced Survey

The crowd-sourced survey provides additional data from outdoor recreation users and land conservation advocates. Respondents in the crowd-sourced survey reported higher household incomes and were less racially and ethnically diverse than respondents in the probability survey. While the crowd-sourced survey provides useful information about Virginia residents who heard about the survey effort and may be more frequent outdoor recreation and land conservation supporters, the differences observed between those respondents and the probability survey respondents demonstrate why the additional expense and effort of a probability survey are needed to provide a more unbiased estimate of the full population. The crowd-sourced data should not be generalized to the full population of

Virginia. It does a good job of representing people who are more strongly connected to outdoor recreation in Virginia.

Participation in Outdoor Recreation Activities

The four activities most frequently mentioned by respondents as something they or a household member did in the last 12 months were visiting natural areas, driving for pleasure, walking for pleasure, and visiting parks (local, state, national). These activities were similar (but not identical) to the top choices in 2011 and 2006.

Respondents in the younger age groups, particularly those aged 18 to 24, tended to be more active and to have less desire for cabins in state parks.

Participation in some activities was related to the region of the state in which the respondent lived. For example, hunting was less popular in the Urban Corridor region than in the others. And as in 2011, salt water fishing and power boating were more popular in the Chesapeake region.

Methods

The methods experiments conducted in the 2017 VODS indicate that a hybrid method should be considered in 2022. This hybrid method would use a web-based invitation with two follow-up contacts to obtain completed surveys by Internet. Then a full postal survey protocol would be used to fill out the data collection and maximize response rates. This approach might save \$7,600 compared to a postal-only method.

The surprisingly low responses to the Spanish-language versions of both the probability and crowd-sourced surveys must call into question the use of scarce funds to support this outreach next time around.

Conclusion

The information from the 2017 VODS is only a portion of the information used by DCR staff in their extensive review and update of the 2018 Virginia Outdoors Plan. CSR is pleased to contribute to this important effort on behalf of Virginia's citizens.