

# Results of the 2021-2022 Virginia Hunter Survey



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## **ABSTRACT**

The 2021-2022 Virginia hunter survey was distributed in June and July of 2022 to measure the actions, preferences, and attitudes of Virginia hunters. A total sample of 13,981 licensed Virginia hunters were invited to complete a survey via mail or email invitation. We adjusted the sample so that a higher number of younger hunters were invited, because in recent hunter surveys older hunters were more likely to respond to survey invitations compared to younger hunters resulting in an age bias. We received 1,981 completed surveys, for a response rate of 14.6%. Some of the harvest and effort estimates have high percentages of standard error due to small sample sizes and high variability in responses.

## **INTRODUCTION**

This study was conducted to measure the actions, preferences, and attitudes of resident hunters in Virginia. The Virginia Department of Wildlife Resources (DWR) manages wildlife resources and populations in the Commonwealth. The information from this biennial survey is utilized to estimate the harvest of game species, gain awareness of hunter opinion, and track those opinions over time. The Virginia Hunter Survey provides hunters the opportunity to provide input and express their opinions on DWR management and practices. The assessment of hunter harvest and effort, along with behavioral and social evaluations of hunters, are crucial for the management of wildlife in Virginia.

A traditional mail-only survey was used prior to 2014, and an online-only survey was used for more recent surveys starting with 2018-2019 Virginia Hunter Survey (Valdez, 2019). The 2021-2022 Virginia Hunter Survey used a dual mode, s that included both mail and email invitations. By using a dual mode, we can cut down on the rising postage costs associated with mailed surveys while still engaging with all licensed Virginia hunters. Although it would have been more cost effective to exclusively use email invitations and an online survey, not all license purchasers have complete contact information (mailing address and valid email address) associated with their license in our database.

## **METHODS**

### *Sampling*

Sampling included two modes, mail and email. Dual modes were used to control costs of survey invitations and provide an opportunity for all hunting license purchasers to receive an invitation. A total of 9,981 email invitations and 4,000 mail invitations were distributed. Stratified random sampling was used to achieve a sufficient number of responses from individuals residing in each DWR management region (Figure 1). Sampling rates were also adjusted so that more invitations were sent to younger hunters.



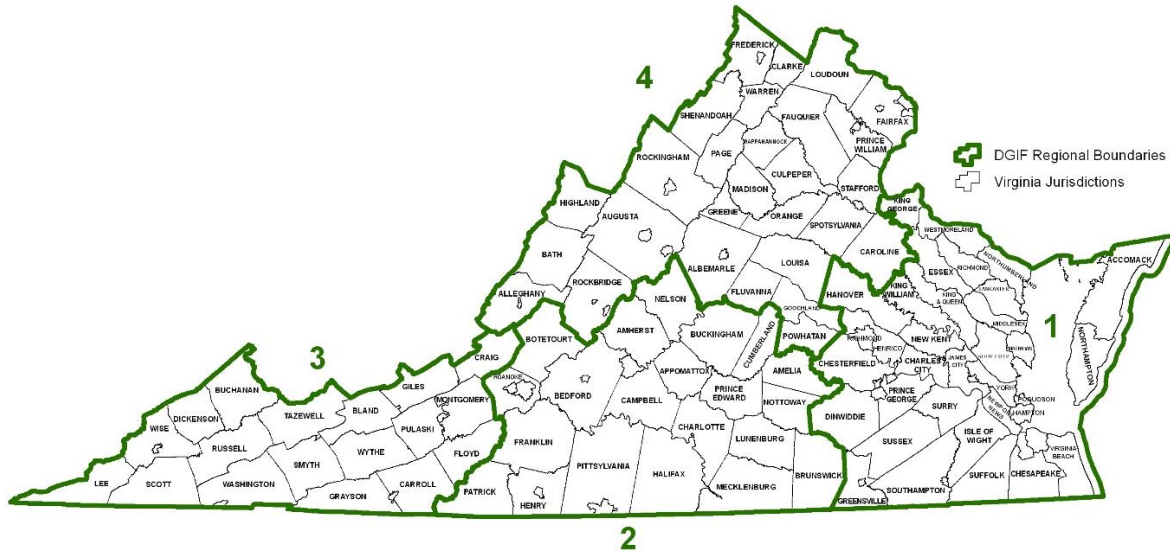


Figure 1. A map of Virginia separated by Virginia Department of Wildlife Resources (formerly DGIF) regional boundaries 1, 2, 3 and 4.

Individuals were eligible to receive a survey invitation if they were 18 years old or older, a Virginia resident, and had purchased a license that conveys hunting privileges (e.g., statewide, Sportsmen) or a deer/turkey license between April 27, 2020 – April 27, 2021. The inclusion of deer/turkey licensees captures individuals who have a lifetime hunting license or multi-year hunting license, and otherwise wouldn't be included in the license purchasing timeframe. The Go Outdoors Virginia (GOV) license database was queried to develop the sample frame. A total of  $N = 180,322$  unique individuals were eligible to receive a survey invitation. Among these individuals, 83.3% ( $n = 150,148$ ) had a valid, unique email address in the database and 16.7% ( $n = 30,174$ ) did not. Individuals with a valid email address were eligible for an email survey and those without a valid email address were eligible to receive a mail survey. The overall sampling rate was 7.7% of the eligible population (13,981 invitations sent).

### *Survey Design and Distribution*

Virginia Hunter Surveys often contain questions repeated from previous years, allowing trends on important topics to be tracked over time. DWR staff collaborate on priorities for the survey and provide input on the survey instrument content. The 2021-2022 survey instrument included questions regarding hunting harvest and effort, species-specific hunting and management opinions, and satisfaction with hunting in Virginia. Some questions were added to evaluate respondents' wildlife-related recreation participation to track the overlap between hunting, fishing, and wildlife viewing (Grooms et al., 2020). Demographic questions included information on race, gender, ethnicity, age, income, and education.

DWR contracted with the Center for Survey Research at the University of Virginia to distribute surveys and manage survey data. Qualtrics software was used to design, distribute, and collect online surveys (Qualtrics, Provo, UT). The survey invitations included a cover letter, explaining the project and the importance of hunter participation (Appendices 1 and 2.1). The

initial invitations were sent in May 2022 and two follow-up reminders were sent out in June 2022. Survey recipients were contacted up to four times, first with an initial survey invitation and then with follow-up reminders. Participants that received a mail survey invitation received two postcard reminders, which included a link to take the survey online and a personalized code (Appendices 3.1 and 3.2). The link to the online survey was hosted on the DWR website ([dwr.virginia.gov/surveys](http://dwr.virginia.gov/surveys)), and only invited participants could access the link with their personalized code. Participants that received an email survey invitation received three email reminders, which included a clickable link to directly access the survey (Appendices 2.2, 2.3, and 2.4). There were 221 undeliverable mail surveys and 148 undeliverable emailed surveys, reducing the effective sample to 13,612. A total of 1,981 usable surveys were submitted, for a response rate of 14.6%. A shortened version of the original survey was sent to 2,000 non-respondents in July 2022, 1,000 sent via the mail and 1,000 sent via email. There were 26 undeliverable mail surveys and 4 undeliverable email surveys from the non-respondent sample.

### *Statistical Analysis*

All statistical analysis were conducted using R software (R, 2022). We conducted non-response bias testing to observe for statistical differences in demographics or hunting opinions between respondents and non-respondents (Appendices 4.1 and 4.2). We then used hunter population data from our license database to compare age, region, and purchase avidity with survey respondents for potential calibration weighting (Appendix 4.3). Purchase avidity is defined as “avid” or “non-avid”, where “avid” indicates a hunting license purchased annually for the previous 3 years and “non-avid” indicates inconsistent purchases. We developed these definitions following research suggesting that the odds of purchasing a license strongly decline following multiple years of not participating in hunting (Hinrichs et al., 2020).

Comparative tests that resulted in a significant p-value ( $p < 0.05$ ) and a measurable effect size (Cliff's  $\Delta > \pm 0.15$ ) were selected for weighting adjustments on non-response testing. The selected items from the comparative tests pertained to the question asking respondents to rate the importance placed on hunting specific species. We found that respondents and non-respondents differed significantly in some responses, with non-respondents indicating higher importance for Fall turkey ( $W = 79233, p < 0.01$ ), rabbit ( $W = 81477, p < 0.01$ ), squirrel ( $W = 82202, p < 0.01$ ), quail ( $W = 85259, p < 0.01$ ), and coyote hunting ( $W = 88676, p < 0.01$ ) (Appendix 4.1). We also evaluated how the species-specific hunting importance rankings correlates with the number of days spent hunting those same species, and found significant positive correlations between those two variables (Appendix 4.4).

Initial testing of weighting procedures returned mixed results. Weighting procedures tend to increase the accuracy of surveys results (moving them closer to true value), but also decrease the precision of survey results (produce higher variance) (Valliant et al., 2013). As expected, weighting procedures increased variance estimates (i.e., standard error) for statewide harvest estimates. To evaluate accuracy, we considered two external sources of harvest estimates: the harvest reporting system DWR uses for big game species (deer, bear, turkey; [dwr.virginia.gov/blog/bear-deer-turkey-harvest-data/](http://dwr.virginia.gov/blog/bear-deer-turkey-harvest-data/)) and federal reporting of migratory waterfowl (Raftovich et al., 2022). These two sources only cover a portion of the harvest

estimates that are produced with hunter survey results, leaving many other species with no other harvest estimate comparison. Weighting procedures resulted in some estimates that were closer to those external sources while others were farther from the external estimates. Without a strong indication that survey weights produced more accurate results, we report the unweighted results for all survey responses.

## **RESULTS**

Tabular results of data are presented in Table 1-50. The survey has three distinct sections. The first section covers hunter effort and harvest estimates, and the results are presented in Tables 1 and 2. The second section includes questions related to game species and game species management, and the results are presented in Table 3 – Table 43. The third section includes questions related to wildlife recreation, demographics, and communication, and the results are presented in Table 44 – Table 50. Any multivariate analysis or cross-tabulations were calculated at the request of staff.

## **DISCUSSION AND MANAGEMENT IMPLICATIONS**

National survey trends have shown a reduction in response rates to surveys over time (US BLS, 2022). We see similar trends in response rates to the Virginia Hunter Survey over time, with the 2021-2022 survey marking the lowest response rate since the survey's inception. Effort should be taken to try and combat reduced response rates and offer guidance for estimates with higher levels of variance.

Harvest estimates and effort calculations are particularly susceptible to statistical issues resulting from reduced sample sizes. The shrinking sample size for small game hunters is likely due to the overall decline in small game hunting (USFWS, 2016). Small samples combined with large variability in reported harvest that occurs with some small game species, can lead to high standard errors, outside of generally accepted levels. When those situations arise, the corresponding estimates become difficult to interpret and should be interpreted with caution.

Table 1. Statewide summary of game harvest.

<b>Species</b>	<b>Total Harvest</b>	<b>Average Daily Kill</b>	<b>Average Seasonal Harvest</b>	<b>Percent Successful Hunters</b>	<b>Total Days</b>	<b>Average Seasonal Days Hunting</b>	<b>Total Hunters</b>	<b>Percent Total License</b>
Dove	383,148	4.181	13.20	79.3	81,814	3.2	25,925	13.9
Wild Quail	9,207	0.328	1.37	35.1	22,355	4.2	5,354	2.9
Pen Raised Quail	118,919	5.6	16.9	91.9	20,853	3.0	6,951	3.7
Total Quail	128,131	2.893	12.1	75.5	43,211	4.2	10,333	5.6
Woodcock	10,990	0.622	2.80	53.7	17,376	4.5	3,851	2.1
Ruffed Grouse	6,390	0.107	0.56	26.3	27,991	5.2	5,354	2.9
Crow	43,119	0.626	5.47	78.5	64,816	8.7	7,421	4.0
Rabbit	177,157	0.929	5.36	68.2	177,251	5.8	30,716	16.5
Gray Squirrel	272,212	1.162	6.01	73.5	194,440	5.2	37,573	20.2
Fox Squirrel	24,046	0.286	1.50	43.9	65,471	5.2	12,493	6.7
Red Squirrel	8,173	0.213	1.14	15.9	31,751	5.4	5,918	3.2
Total Squirrel	304,432	0.870	6.70	74.8	291,661	7.7	37,667	20.2
Groundhog	97,685	0.269	5.00	86.6	274,557	18.6	14,747	7.9
Archery Deer (Buck and Doe)	37,949	0.044	0.47	29.6	809,415	10.6	76,367	41.0
Archery Deer (Buck)	14,278	0.017	0.18	16.1	809,415	10.6	76,367	41.0
Archery Deer (Doe)	23,671	0.027	0.29	18.9	809,415	10.6	76,367	41.0
Muzzleloader Deer (Buck and Doe)	43,115	0.062	0.44	33.4	661,751	7.2	92,523	49.7
Muzzleloader (Buck)	27,147	0.038	0.28	24.8	661,751	7.2	92,523	49.7
Muzzleloader (Doe)	16,157	0.023	0.17	13.5	661,751	7.2	92,523	49.7
Firearms Deer (Buck and Doe)	115,068	0.069	0.77	44.3	1,571,586	11.3	139,302	74.9
Firearms Deer (Buck)	55,514	0.033	0.38	30.1	1,571,586	11.3	139,302	74.9
Firearms Deer (Doe)	59,552	0.035	0.40	25.1	1,571,586	11.3	139,302	74.9
Total Deer	195,754	0.061	1.21	56.8	3,039,641	20.0	152,076	81.7
Total Deer (Buck)	96,938	0.030	0.61	43.0	3,039,641	20.0	152,076	81.7
Total Deer (Doe)	99,380	0.031	0.61	33.6	3,039,641	20.0	152,076	81.7
Spring Turkey 2022	27,334	0.058	0.39	26.9	418,846	6.7	62,747	33.7
Fall Turkey 2021	4,320	0.017	0.08	7.8	135,356	4.7	28,931	15.5
Total Turkey	31,655	0.048	0.37	25.6	554,198	7.6	73,079	39.3
Bear- Early 3 Day	470	0.030	0.06	6.25	15,688	2.1	7,515	4.0
Bear- Archery	1,034	0.006	0.04	4.2	103,046	6.6	15,687	8.4
Bear- Muzzleloader	564	0.005	0.02	2.2	72,983	4.2	17,377	9.3
Bear- Firearms with dogs	2,161	0.019	0.15	15.3	63,966	8.0	7,984	4.3

Table 1 (cont.). Statewide summary of game harvest.

<b>Species</b>	<b>Total Harvest</b>	<b>Average Daily Kill</b>	<b>Average Seasonal Harvest</b>	<b>Percent Successful Hunters</b>	<b>Total Days</b>	<b>Average Seasonal Days Hunting</b>	<b>Total Hunters</b>	<b>Percent Total License</b>
Bear- Firearms without dogs	3,008	0.004	0.02	2.3	109,149	5.3	20,759	11.2
Total Bear Duck (All species)	7,233	0.009	0.10	9.1	364,831	11.0	33,064	17.8
Canada Goose	245,911	1.185	10.85	75.0	189,179	9.2	20,665	11.1
Red Fox	80,028	0.620	4.27	62.6	112,623	6.9	16,344	8.8
Gray Fox	6,388	0.059	0.60	31.3	79,275	10.2	7,796	4.2
Coyote	3,851	0.062	0.55	17.9	56,261	8.9	6,293	3.4
Raccoon	102,761	0.248	4.23	42.4	380,897	17.0	22,356	12.0
Bobcat	21,042	0.141	2.87	54	120,521	20.4	5,918	3.2
Feral Hogs	2,630	0.033	0.31	23.9	60,018	9.5	6,293	3.4
	376	0.065	0.36	18.2	5,822	5.6	1,033	0.6

Table 2. Statewide summary of game harvest estimates with standard errors.

<b>Species</b>	<b>Total Harvest</b>	<b>Standard Error</b>		<b>95% Confidence Interval</b>	
		<b>SE</b>	<b>As % of Total</b>	<b>Lower Limit</b>	<b>Upper Limit</b>
Dove	383,148	32,668	8.5	319,119	447,177
Wild Quail	9,207	2,300	25.0	4,698	13,716
Pen Raised Quail	118,919	20,245	17	79,238	158,600
Total Quail	128,131	22,570	17.6	83,893	172,369
Woodcock	10,990	2,571	23.4	5,953	16,027
Ruffed Grouse	6,390	2,838	44.4	827	11,953
Crow	43,119	7,348	17.0	28,718	57,520
Rabbit	177,157	19,794	11.2	138,362	215,953
Gray Squirrel	272,212	38,159	14	197,421	347,004
Fox Squirrel	24,046	4,293	17.9	15,631	32,459
Red Squirrel	8,173	3,274	40	1,755	14,591
Total Squirrel	304,432	40,906	13.4	224,256	384,608
Groundhog	97,685	17,323	10.9	76,772	118,598
Archery Deer (Buck and Doe)	37,949	2,733	7.2	32,592	43,305
Archery Deer (Buck)	14,278	1,160	8.1	12,004	16,552
Archery Deer (Doe)	23,671	2,208	9.3	19,344	27,998
Muzzleloader Deer (Buck and Doe)	43,115	2,420	5.6	38,372	47,857
Muzzleloader (Buck)	27,147	1,664	6.1	23,886	30,408
Muzzleloader (Doe)	16,157	1,494	9.2	13,228	19,086
Firearms Deer (Buck and Doe)	115,068	5,161	4.5	104,952	125,183
Firearms Deer (Buck)	55,514	2,782	5	50,061	60,966
Firearms Deer (Doe)	59,552	3,756	6.3	52,191	66,913
Total Deer	195,754	7,094	3.6	181,850	203,658
Total Deer (Buck)	96,938	3,568	3.7	89,945	103,932
Total Deer (Doe)	99,380	5,082	5.1	89,419	109,340
Spring Turkey 2022	27,334	2,147	7.9	23,126	31,543
Fall Turkey 2021	4,320	962	22.3	2,435	6,205
Total Turkey	31,655	2,468	7.8	26,819	36,492
Bear- Early 3 Day	470	205	43.5	69	871
Bear- Archery	1,034	432	41.8	187	1,881
Bear- Muzzleloader	564	186	33	199	929
Bear- Firearms with dogs	2,161	761	35.2	669	3,653
Bear- Firearms without dogs	3,008	1,378	45.8	306	5,710
Total Bear	7,233	1,837	25.4	3,632	10,833
Duck (All species)	245,911	37,754	15.4	171,912	319,910
Canada Goose	80,028	13,754	17.2	53,070	106,986

Table 2 (cont.). Statewide summary of game harvest estimates with standard errors.

<b>Species</b>	<b>Total Harvest</b>	<b>Standard Error</b>		<b>95% Confidence Interval</b>	
		<b>SE</b>	<b>As % of Total</b>	<b>Lower Limit</b>	<b>Upper Limit</b>
Red Fox	6,388	2,040	31.9	2,389	10,387
Gray Fox	3,851	1,627	42.3	661	7,041
Coyote	102,761	55,459	54.0	-5,939	211,463
Raccoon	21,042	4,906	23.3	11,425	30,658
Bobcat	2,630	616	23.4	1423	3,837
Feral Hogs	376	252	67.0	-118	870

Table 3. Responses to the question, “Indicate the level of **importance** you place on hunting the following species”. Mean responses are based on a scale from Not at all Important (1) to Extremely Important (7).

	Mean (SE)	Response % (Count)						
		Not at all Important	-	-	Moderately Important	-	-	Extremely Important
Deer	6.1 0.03	2.8 50	1.5 27	1.4 25	9.5 169	9.0 160	14.5 258	61.2 1,087
Fall Turkey	3.4 0.04	26.1 452	11.2 193	11.6 200	29.2 505	6.6 115	4.9 84	10.5 181
Spring Turkey	4.2 0.05	19.5 341	7.0 123	7.4 129	22.6 395	9.3 162	7.6 133	26.5 462
Bear	3.0 0.05	40.8 707	8.5 147	9.0 156	20.2 349	6.2 107	3.8 65	11.6 200
Rabbit	2.9 0.04	40.6 703	10.9 189	10.9 189	19.6 339	5.0 86	3.8 66	9.2 159
Squirrel	2.9 0.04	38.9 670	9.7 167	10.5 181	22.2 383	6.4 111	4.0 69	8.3 143
Quail	2.3 0.04	55.3 945	9.7 166	7.8 133	14.9 254	3.6 61	2.6 45	6.1 104
Raccoon	2.0 0.04	66.6 1,137	8.9 152	6.1 104	9.9 169	1.9 32	1.8 31	4.7 81
Red Fox	2.0 0.04	62.8 1,074	9.8 167	6.8 116	12.8 219	2.5 42	1.3 23	4.0 69
Gray Fox	2.0 0.04	63.8 1,085	9.6 163	6.8 115	12.4 211	2.2 38	1.5 25	3.8 64
Waterfowl	2.7 0.05	53.4 912	6.6 113	6.0 103	13.2 226	4.3 74	3.5 60	12.8 219
Ruffed Grouse	2.2 0.04	60.5 1,032	9.0 154	7.5 128	12.6 215	2.8 48	1.8 30	5.7 98
Woodcock	2.0 0.04	65.7 1,117	8.9 152	6.5 111	10.4 176	2.6 44	1.9 32	3.9 67
Bobcat	2.3 0.04	57.3 977	8.0 136	8.0 136	15.0 255	3.2 55	2.7 46	5.8 99
Coyote	3.8 0.05	33.6 578	4.5 77	6.2 106	16.3 281	6.6 113	6.9 118	26.0 448



Table 4. Responses to the question, “If you hunted on public lands during any of the 2021-2022 seasons, please select all public lands you hunted on”. Respondents could select more than one option.

Response	%	n
Wildlife Management Areas (WMA)	35.9	345
National Forest	44.1	423
State Forest	14.1	135
Other <sup>†</sup>	18.5	178

<sup>†</sup>Other responses (n = 40). Frequent responses: federal land (10), military land (8), state land (4), and county land (6).

Table 5. Responses to the question, “Sunday hunting on public lands was recently approved and DWR wants your opinion on when seasons should end. Select your preference:”

Response	%	n
Seasons end on a Saturday	30.5	526
Seasons end on a Sunday	44.8	772
No opinion	24.6	424

Table 6. Responses to the question, “Overall, how would you rate your satisfaction with the harvest reporting systems offered by DWR?” Mean responses are based on a scale from Very Unsatisfied (1) to Very Satisfied (5), with an option for ‘Never used this System’. Mean and percent responses do not include responses of ‘Never used this system’.

	Mean (SE)	Response % (Count)					
		Very Unsatisfied	-	Neither Satisfied or Unsatisfied	-	Very Satisfied	Never used this System
GoOutdoorsVA Mobile App	4.1 0.03	6.7 90	3.1 41	18.3 245	15.8 212	56.2 754	- 363
Internet Harvest Reporting	4.0 0.03	7.2 82	2.6 30	24.2 277	13.7 157	52.3 598	- 509
Telephone Harvest Reporting	3.9 0.03	7.1 94	5.6 74	26.3 348	16.1 213	44.9 593	- 402
Other <sup>†</sup> :	3.3 0.03	9.4 35	3.5 13	55.5 207	9.7 36	22.0 82	- 435

<sup>†</sup>Other responses (n = 23). Frequent responses: check-in station/ “in person” (16), Virginia Wildlife magazine (2).

Table 7. Responses to the question, “How do you carry your hunting license?” Respondents could select more than one option.

Response	%	n
Physical version (i.e., paper or card)	72.9	1,302
Electronic version	59.0	1,055

Table 8. Responses to the question, “Did you use an electronic call while hunting during any of the 2021-2022 seasons?”

Response	%	n
Yes	9.3	160
No	90.7	1,563

Table 9. Responses to the question, “If yes, indicate how many hunting trips, hours per trip, and total animals harvested by species that were done *while using an electronic call*.”

Response	Mean (SE)	n
<b>Coyote</b>		
Total Hunting trips	7.3 (0.3)	94
Average Hours Per Trip	5.0 (0.3)	86
Total Harvests	9.4 (1.3)	92
<b>Red Fox</b>		
Total Hunting trips	2.7 (0.1)	48
Average Hours Per Trip	2.1 (0.06)	35
Total Harvests	0.7 (0.04)	40
<b>Gray Fox</b>		
Total Hunting trips	2.7 (0.09)	50
Average Hours Per Trip	2.5 (0.06)	37
Total Harvests	0.7 (0.04)	39
<b>Raccoon</b>		
Total Hunting trips	2.1 (0.1)	44
Average Hours Per Trip	1.3 (0.04)	27
Total Harvests	0.6 (0.05)	31
<b>Bobcat</b>		
Total Hunting trips	3.4 (0.2)	48
Average Hours Per Trip	3.3 (0.1)	34
Total Harvests	0.2 (0.01)	37
<b>Crow</b>		
Total Hunting trips	3.6 (0.3)	62
Average Hours Per Trip	2.2 (0.05)	46
Total Harvests	4.7 (0.2)	52

Table 10. Responses to the question, “If you harvested a gray fox within the last 5 years, which of the following statements best describes how you hunted them:”

Response	%	n
I hunted specifically for gray foxes as a primary species of interest using an electronic call	5.3	14
I hunted gray foxes while targeting other species using an electronic call	15.6	41
I hunted specifically for gray foxes as a primary species of interest <u>without</u> using an electronic call	11.0	29
I hunted gray foxes while targeting other species <u>without</u> using an electronic call	68.1	179

Table 11. Responses to the question, “Prior to this survey, were you aware of the presence of sarcoptic mange in bears in northern Virginia over the last several years?”

Response	%	n
Yes	28.1	497
No	71.9	1,272

Table 12. Responses to the question, “How much would you say that you know about the presence of sarcoptic mange in bears in Virginia?”

Response	%	n
Nothing	66.3	1,170
A little bit	25.4	448
A fair amount	7.3	129
A lot	1.1	19

Table 13. Responses to the question, “How concerned are you about each of the following issues related to sarcoptic mange in bears in northern Virginia?” Mean responses are based on a scale from Not Concerned (1) to Extremely Concerned (9).

	Mean (SE)	Response % (Count)								
		Not Concerned	-	-	-	Somewhat Concerned	-	-	-	Extremely Concerned
Transmission from bears to hunters	4.4 0.06	26.5 453	5.0 86	5.8 99	5.4 93	31.0 530	4.9 83	5.7 97	3.8 65	11.9 203
Transmission from bears to hunting dogs	4.2 0.06	31.4 531	5.3 89	5.1 87	4.2 71	27.9 472	5.1 87	4.7 80	4.0 68	12.1 205
The potential for mange to reduce bear populations in Virginia	5.2 0.06	17.8 301	3.4 58	4.6 77	5.1 86	29.4 497	5.9 100	7.6 128	6.2 105	20.0 338
The threat mange poses to the future of bear hunting in Virginia	5.3 0.06	17.3 292	3.4 57	4.7 79	5.2 88	28.0 473	6.6 112	7.2 121	6.7 114	20.9 353
Other <sup>†</sup> :	3.4 0.06	52.2 303	2.8 16	2.9 17	2.8 16	19.7 114	2.9 17	2.4 14	2.6 15	11.7 68

<sup>†</sup>Other responses (n = 21). Frequent responses: don’t hunt bears (6), spread to other areas/other wildlife (4), concern for well-being of infected bear (2), spread to livestock (1).

**Only hunters that reported participating in the 2021-2022 DEER seasons were asked to complete survey questions reported in Tables 14-21.**

Table 14. Responses to the question, “Overall, how would you rate your satisfaction with deer hunting in Virginia?” Mean responses are based on a scale from Very Unsatisfied (1) to Very Satisfied (7).

	Mean (SE)	Response % (Count)						
		Very Unsatisfied	-	-	Neither Satisfied or Unsatisfied	-	-	Very Satisfied
Deer Hunting Satisfaction	5.2 0.04	4.0 63	3.9 60	7.1 110	14.0 218	25.5 397	17.3 270	28.2 439

Table 15. Responses to the question, “How would you rate the size of the DEER HERD in the area you hunted most in the 2021-2022 season?” Mean responses are based on a scale from Low (1) to High (7).

	Mean (SE)	Response % (Count)						
		Low	-	-	Moderate	-	-	High
Size of DEER herd	4.2 0.04	8.3 127	8.1 125	11.1 170	31.5 484	20.6 317	10.7 164	9.8 151

Table 16. Responses to the question, “Overall, how would you rate the quality of the DEER seasons in 2021-2022?” Mean responses are based on a scale from Poor (1) to Excellent (7).

	Mean (SE)	Response % (Count)						
		Poor	-	-	Adequate	-	-	Excellent
Archery	4.2 0.05	7.9 97	6.2 77	10.2 126	38.2 472	15.8 195	10.4 128	11.3 139
Muzzleloader	4.3 0.05	7.4 89	5.6 67	10.1 121	39.0 467	14.9 178	11.9 143	11.1 133
Firearms	4.3 0.04	6.9 98	6.3 89	10.8 154	34.7 493	16.5 234	12.3 175	12.5 177

Table 17. Responses to the question, “When compared to previous years, would you say the number of deer in the area you hunted in 2021-2022:”

Response	%	n
Declined dramatically	6.0	93
Declined	27.3	424
Remained about the same	48.4	751
Increased	11.5	179
Increased dramatically	2.1	33
No opinion	4.6	71

Table 18. Responses to the question, “What advice would you give to DWR regarding how to manage the deer herd?”

Response	%	n
Increase the herd	28.8	438
Stabilize the herd	40.4	613
Decrease the herd	8.3	126
No opinion	22.5	342

Table 19. Responses to the question, “Was there any occasion during the 2021-2022 hunting season when you chose not to shoot a deer, even though you could have (i.e., shot was safe, legal, and clear)?”

Response	%	n
Yes	82.2	1,263
No	17.8	274

Table 20. Responses to the question, “If yes, indicate the number of deer in each category below that you chose not to shoot:”

	Response % ( <i>Count</i> )				
	0	1	2	3	4+
Antlered bucks	22.5 260	14.3 166	35.0 405	0.0 0	0.0 0
Adult does	10.9 131	16.3 195	10.9 131	51.9 623	0.0 0
Fawns	7.3 81	11.0 121	6.5 72	40.8 450	0.0 0
Unknown	5.7 40	8.1 57	3.6 25	25.4 178	0.0 0

Table 21. Responses to the question, “Please check the statement(s) that describe why you chose not to shoot those deer:”

Response	%	n
I already harvested other deer and did not want to kill another	16.8	209
I was concerned about low deer population levels where I hunt	18.4	230
I was unable to harvest the deer due to rules on the property I hunt	11.6	145
I didn’t want to shoot a young deer or a small buck	80.4	1,003
I didn’t want to shoot a doe and fawn, or separate a herd	45.6	569
I was concerned about CWD and unsure about testing	1.0	12
Other <sup>†</sup> :	13.2	165

<sup>†</sup>Other responses (n = 165). Frequent responses: Blank (48), selectively harvesting for size/sex/antlers (37), didn’t want to shoot/process (12), DWR regulations (7), left for someone else (6), time/labor pressure (6), hunter with no intention to harvest (health-related) (5), safety issue (3).

**Only hunters that reported participating in the 2021-2022 TURKEY seasons were asked to complete survey questions reported in Tables 22-28.**

Table 22. Responses to the question, “Overall, how would you rate the quality of your 2021 Fall Turkey season?” Mean responses are based on a scale from Poor (1) to Excellent (7).

	Mean (SE)	Response % (Count)						
		Poor	-	-	Adequate	-	-	Excellent
Fall Turkey Season Quality	3.5 0.06	16.5 103	9.7 61	13.3 83	41.2 258	8.8 55	5.9 37	4.6 29

Table 23. Responses to the question, “Overall, how would you rate the quality of your 2022 Spring Turkey season?” Mean responses are based on a scale from Poor (1) to Excellent (7).

	Mean (SE)	Response % (Count)						
		Poor	-	-	Adequate	-	-	Excellent
Spring Turkey Season Quality	3.9 0.07	15.4 110	9.0 64	13.6 97	29.1 208	12.2 87	11.1 79	9.7 69

Table 24. Responses to the question, “Following guidance from DWR’s Wild Turkey Management Plan, if it is necessary **to increase** turkey populations in certain areas, please indicate how acceptable or unacceptable the following options are.” Mean responses are based on a scale from Unacceptable (1) to Acceptable (7).

	Mean (SE)	Response % (Count)						
		Unacceptable	-	-	Neutral	-	-	Acceptable
Reduce Fall season length	4.3 0.05	16.9 126	3.9 29	4.2 31	38.2 285	6.3 47	4.0 30	26.5 198
Reduce Spring season length	3.2 0.05	35.3 261	8.3 61	5.0 37	31.1 230	4.6 34	2.6 19	13.1 97
Reduce Fall bag limit	4.3 0.05	18.6 138	3.6 27	4.2 31	36.9 273	5.8 43	5.1 38	25.7 190
Reduce Spring bag limit	3.7 0.05	28.3 209	5.4 40	4.5 33	32.7 241	6.4 47	4.1 30	18.7 138
Reduce annual bag limit	3.8 0.05	24.5 179	5.2 38	4.5 33	35.2 257	7.4 54	4.5 33	18.7 137

Table 25. Responses to the question, “Following guidance from DWR’s Wild Turkey Management Plan, if it is necessary **to decrease** turkey populations in certain areas, please indicate how acceptable or unacceptable the following options are:” Mean responses are based on a scale from Unacceptable (1) to Acceptable (7).

	Mean (SE)	Response % (Count)						Acceptable
		Unacceptable	-	-	Neutral	-	-	
Increase Fall season length	4.2 0.05	20.2 148	3.3 24	3.1 23	37.7 277	6.5 48	5.9 43	23.3 171
Increase Spring season length	4.4 0.05	16.0 117	2.6 19	3.4 25	37.0 271	8.0 59	5.7 42	27.3 200
Increase Fall bag limit	4.0 0.05	21.8 159	3.7 27	3.6 26	40.9 299	6.0 44	4.1 30	20.0 146
Increase Spring bag limit	4.0 0.05	21.1 154	3.7 27	5.1 37	38.1 278	6.2 45	4.1 30	21.7 158
Increase annual bag limit	4.1 0.05	19.7 143	4.3 31	3.2 23	37.9 275	7.2 52	5.0 36	22.8 165

Table 26. Responses to the question, “Following guidance from DWR’s Wild Turkey Management Plan, if it is necessary **to increase turkey populations on DWR Wildlife Management Areas (WMAs)**, please indicate how acceptable or unacceptable the following options are:” Mean responses are based on a scale from Unacceptable (1) to Acceptable (7).

	Mean (SE)	Response % (Count)						Acceptable
		Unacceptable	-	-	Neutral	-	-	
Day of the week hunting restrictions	3.8 0.07	24.1 176	3.0 22	3.7 27	44.7 326	3.4 25	3.2 23	17.9 131
Managed quota hunts	4.1 0.07	14.8 107	4.6 33	5.4 39	47.7 346	5.1 37	2.8 20	19.7 143
Reduced bag limits	4.4 0.07	13.7 99	4.2 30	4.7 34	41.3 298	6.4 46	5.3 38	24.5 177

Table 27. Responses to the question, “DWR wants your opinion on the current Fall Turkey season schedule. Select which statement you most strongly agree with:”

Response	%	n
The current Fall Turkey season schedule is fine	35.5	252
I would prefer for Fall Turkey season to start later	2.4	17
I would prefer more overlap between Fall Turkey season and Deer season	43.7	310
I would prefer less overlap between Fall Turkey season and Deer season	18.3	130

Table 28. Responses to the question, “If you did NOT hunt in the Fall 2021 Turkey season, how much do you agree or disagree with each of the following reasons?” Mean responses are based on a scale from Strongly Disagree (1) to Strongly Agree (7).

	Mean (SE)	Response % (Count)						
		Strongly Disagree	-	-	Neither Agree or Disagree	-	-	Strongly Agree
Prefer the experience of Spring Turkey season	5.5 0.04	4.6 28	0.5 3	2.5 15	28.3 173	7.9 48	7.4 45	48.9 299
The Fall turkey season dates are too confusing	4.3 0.04	11.3 69	1.3 8	4.2 26	49.0 300	10.6 65	5.9 36	17.6 108
There is not enough overlap with deer season	4.3 0.04	13.4 82	4.1 25	3.1 19	42.2 258	10.0 61	7.0 43	20.3 124
The turkey population is low in the area I hunt	4.0 0.04	16.4 101	7.5 46	7.5 46	35.7 219	10.4 64	5.7 35	16.8 103
Concern that Fall turkey season harvest is causing population to decline	3.6 0.04	20.1 123	7.5 46	6.7 41	43.1 264	8.6 53	4.1 25	10.0 61
Not interested in Fall turkey hunting	3.8 0.04	21.7 133	5.7 35	6.9 42	37.4 229	7.7 47	4.6 28	16.0 98
Other <sup>†</sup> :	3.9 0.03	13.6 22	0.6 1	2.5 4	72.2 117	0.0 0	0.6 1	10.5 17

<sup>†</sup>Other responses (n = 11). Frequent responses: don't agree with a fall season/season length/bag sizes (4), not enough time (2).

**Only hunters that reported participating in the 2021-2022 BEAR seasons were asked to complete survey questions reported in Tables 29-35.**

Table 29. Responses to the question, “Overall, how would you rate your satisfaction with bear hunting in Virginia?” Mean responses are based on a scale from Very Unsatisfied (1) to Very Satisfied (7).

	Mean (SE)	Response % (Count)						
		Very Unsatisfied	-	-	Neither Satisfied or Unsatisfied	-	-	Very Satisfied
Bear hunting satisfaction	4.2 0.08	7.0 26	7.0 26	8.6 32	40.5 151	21.4 80	5.4 20	10.2 38

Table 30. Responses to the question, “How many **days** in the 2021 Bear Hound Training/Chase season did you participate?”



Response	Mean (SE)	Median	n
Days of participation	2.0 (0.3)	0.0	373

Table 31. Responses to the question, “What advice would you give to DWR regarding how to manage the bear populations?”

Response	%	n
Increase the bear population	19.5	74
Stabilize the bear population	38.3	145
Decrease the bear population	19.8	75
No opinion	22.4	85

Table 32. Responses to the question, “Following guidance from DWR’s Bear Management Plan, if it is necessary to **reduce** bear populations in certain areas, please indicate how acceptable or unacceptable the following options are:” Mean responses are based on a scale from Unacceptable (1) to Acceptable (7).

	Mean (SE)	Response % (Count)						
		Unacceptable	-	-	Neutral	-	-	Acceptable
Add the early 3-day season in new areas	5.0 0.04	8.3 30	1.9 7	1.4 5	37.7 137	5.5 20	6.9 25	38.3 139
Increase the length of the early 3-day season	5.1 0.04	9.4 34	2.5 9	1.4 5	29.9 108	6.9 25	9.1 33	40.7 147
Increase the length of the archery season	5.2 0.04	6.6 24	1.7 6	1.9 7	35.7 129	5.3 19	7.8 28	41.0 148
Increase the length of the muzzleloader season	5.5 0.04	6.3 23	1.6 6	1.4 5	26.6 97	5.8 21	9.9 36	48.5 177
Increase the length of the firearms season	5.6 0.04	5.4 20	0.8 3	1.9 7	21.2 79	9.4 35	9.7 36	51.6 192
Increase the annual bag limit from 1 to 2 bears	5.0 0.05	14.9 55	3.3 12	1.6 6	23.6 87	4.1 15	7.3 27	45.1 166

Table 33. Responses to the question, “Following guidance from DWR’s Bear Management Plan, if it is necessary to **increase** bear populations in certain areas, please indicate how acceptable or unacceptable the following options are:” Mean responses are based on a scale from Unacceptable (1) to Acceptable (7).

	Mean (SE)	Response % (Count)						
		Unacceptable	-	-	Neutral	-	-	Acceptable
Remove the early 3-day season	4.0 0.05	25.8 96	3.0 11	2.7 10	36.3 135	5.4 20	3.0 11	23.9 89
Reduce the length of the early 3-day season	3.9 0.05	26.8 98	3.6 13	2.7 10	38.8 142	3.0 11	3.0 11	22.1 81
Reduce the length of the archery season	3.5 0.05	30.7 112	3.6 13	5.5 20	38.6 141	3.0 11	1.9 7	16.7 61
Reduce the length of the muzzleloader season	3.4 0.05	33.1 122	4.6 17	4.3 16	36.0 133	4.6 17	1.6 6	15.7 58
Reduce the length of the firearms seasons	3.3 0.05	35.8 131	4.6 17	3.6 13	33.6 123	4.6 17	2.7 10	15.0 55

Table 34. Responses to the question, “If you have hunted bear in an area of Virginia where mange is present, which option below best describes how your bear hunting habits in that area have changed?”

Response	%	n
I do not hunt bears in an area where mange is prevalent	61.9	208
I have stopped hunting bears in that area	1.2	4
I have hunted bears less in that area	6.5	22
I have hunted bears about the same in that area	27.7	93
I have hunted bears more in that area	2.7	9

Table 35. Responses to the question, “If mange becomes widespread in the area of Virginia where you hunt bears, which option below best describes how you might change your bear hunting habits in that area?”

Response	%	n
I would stop hunting bears in that area	23.0	80
I would hunt bears less in that area	19.5	68
I would hunt bears about the same in that area	46.0	160
I would hunt bears more in that area	11.5	40

**Only hunters that reported participating in the 2021-2022 SMALL GAME seasons were asked to complete survey questions reported in Tables 36-43.**

Table 36. Responses to the question, “Overall, how would you rate your satisfaction with small game hunting in Virginia?” Mean responses are based on a scale from Very Unsatisfied (1) to Very Satisfied (7).

	Mean (SE)	Response % (Count)						
		Very Unsatisfied	-	-	Neither Satisfied or Unsatisfied	-	-	Very Satisfied
Small game hunting satisfaction	5.0 0.06	3.6 27	3.6 27	6.8 51	25.0 186	22.3 166	16.0 119	22.7 169

Table 37. Responses to the question, “How would you rate your satisfaction with the number of small game harvest opportunities in Virginia?” Mean responses are based on a scale from Very Unsatisfied (1) to Very Satisfied (7).

	Mean (SE)	Response % (Count)						
		Very Unsatisfied	-	-	Neither Satisfied or Unsatisfied	-	-	Very Satisfied
Small game harvest opportunities	4.9 0.06	4.1 31	4.0 30	8.2 61	23.7 177	23.4 175	14.9 111	21.7 162

Table 38. Responses to the question, “What percentage of your small game hunting occurred on Saturday, Sunday, and during the week (Monday through Friday)?”

Response	Mean (SE)	n
Saturday	56.19 (1.2)	707
Sunday	13.28 (0.8)	644
During the week	32.28 (1.2)	703

Table 39. Responses to the question, “Do you think your small game harvest opportunities have been better on public lands, private lands, or about the same?”

Response	%	n
Better on public lands	2.9	21
Better on private lands	52.9	389
About the same	19.0	140
Do not know / Not Sure	25.3	186

Table 40. Responses to the question, “Prior to this survey, had you heard of Rabbit Hemorrhagic Disease Virus (RHDV2)?”

Response	%	n
Yes	28.8	216
No	71.2	535

Table 41. Responses to the question, “Are you aware of the regulations DWR enacted prior to the last rabbit hunting season about carcass disposal and transport?”

Response	%	n
Yes	23.1	173
No	76.9	577

Table 42. Responses to the question, “Have you ever hunted squirrels with a dog?”

Response	%	n
Yes	23.5	142
No	76.5	463

Table 43. Responses to the question, “Did you hunt during the 2021 June squirrel season?”

Response	%	n
Yes	17.9	111
No	82.1	509

Table 44. Responses to the question, “Within the last 12 months, have you participated in any kind of wildlife recreation in Virginia?”

Response	%	n
Yes	86.9	1,485
No	13.1	223

Table 45. Responses to the question, “To what extent do you feel that each of the following describes you?” Mean responses are based on a scale of Very like me (1) to Very unlike me (5).

	Mean (SE)	Response % (Count)				
		Very like me	-	Neither like me or unlike me	-	Very unlike me
Wildlife Viewer	2.5 0.04	26.7 360	33.3 449	16.1 217	7.9 106	16.0 215
Hunter	1.3 0.02	84.4 1,210	9.8 140	2.4 34	0.7 10	2.7 39
Angler	1.7 0.03	67.1 945	17.1 241	6.3 89	3.3 46	6.2 87

Table 46. Responses to the question, “In the past 12 months, about how many days did you spend participating in any of the following wildlife recreation activities in Virginia and outside Virginia?” Respondents were instructed to count multiple activities done in a single day separately. Percent responses are for respondents that reported at least one day of participation.

Response	%	Mean ( <i>SE</i> )	Median	n
<b>In Virginia</b>				
Wildlife Viewing	87.6	76.6 (3.7)	20.0	990
Hunting	90.4	26.9 (1.3)	14.0	1,205
Fishing	39.3	5.2 (0.5)	0.0	499
<b>Outside Virginia</b>				
Wildlife Viewing	99.1	31.4 (1.1)	20.0	1,353
Hunting	55.7	15.1 (2.1)	2.0	449
Fishing	56.0	7.4 (0.9)	2.0	509

Table 47. Responses to the question, “Which of the following non-wildlife focused outdoor activities have you participated in within the past 12 months in Virginia?” Respondents could select more than one answer.

Response	%	n
Archery	36.5	590
Biking	21.9	355
Camping	44.5	720
Hiking or backpacking	42.3	684
Horseback riding	6.4	104
Viewing wildflowers	14.5	234
Motorized boating	40.1	649
Non-motorized boating (such as kayaking or canoeing)	32.8	531
Swimming	39.4	637
Recreational shooting sports	45.7	739
Running, jogging, or walking	43.1	698
Winter sports	11.9	193
I do not participate in any of these activities	9.8	158
Other <sup>†</sup>	4.2	68

<sup>†</sup>Other responses (n = 43). Frequent responses: ATV/off-roading/motorcycles (13), golf (6), foraging (2), and photography (2).

Table 48. Responses to demographic questions.

Demographics		
	<b>Mean</b>	<b>SE</b>
<b>Age (Years)</b>	48.6	0.4
	<b>%</b>	<b>n</b>
<b>Gender</b>		
Woman	5.5	93
Man	93.4	1,581
Transgender	0.0	0
A gender not listed here	0.4	7
Prefer not to answer	0.7	12
<b>Ethnicity</b>		
Hispanic	1.5	24
Non-Hispanic	98.5	1,598
<b>Race</b>		
White	94.0	1,579
Black or African American	3.8	63
American Indian or Alaska Native	1.9	32
Asian	0.5	8
Native Hawaiian or other Pacific Islander	0.2	4
Other <sup>†</sup>	2.2	37
<b>Highest formal education</b>		
Less than high school	3.4	57
High school diploma or equivalent	28.5	482
Some college, no degree	23.1	390
Associate's degree	9.3	158
Bachelor's degree	21.7	367
Master's degree	9.0	152
Professional degree	2.8	48
Doctorate degree	2.1	36
<b>Household Income</b>		
Less than \$24,999	10.1	160
\$25,000 to \$49,999	21.3	336
\$50,000 to \$74,999	24.5	387
\$75,000 to \$99,999	16.3	258
\$100,000 to \$124,999	10.3	163
\$125,000 or more	17.5	277

<sup>†</sup>Other responses (n = 5): Latino (4), mix (1).

Table 49. Responses to the question, “Which of the following best describes where you live now compared to where you lived most of your time growing up?”

	%	n
<b>Early life residency</b>		
Urban	9.6	156
Suburban	31.0	505
Rural	59.5	970
<b>Current residency</b>		
Urban	10.7	177
Suburban	30.3	502
Rural	59.0	977

Table 50. Responses to the question, “In the future, how would you prefer to receive information from DWR?”

	%	n
Family and friends	12.6	201
Local newspaper	14.5	231
Statewide or National newspapers	8.9	142
Radio	11.9	190
TV	15.4	245
DWR Website	62.5	996
Outdoor blogs and websites (non-DWR)	10.0	160
Outdoor magazines (non-DWR)	18.9	301
DWR Public meeting	9.5	151
DWR online social media (i.e., Facebook)	29.4	469
DWR Hunting Regulations booklet	57.5	916
Online social media account (non-DWR)	11.0	176
Information via the mail*	-	-
Information via email*	-	-
DWR Staff	12.2	195

\*Responses removed from analysis due to misprint that resulted in some respondents having surveys with ‘mail’ while others had ‘email’.

## REFERENCES

- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). Internet, phone, mail, and mixed mode surveys: The tailored design method (4th ed.). John Wiley & Sons Inc.
- Grooms, B., Rutter, J., Barnes, J., Peele, A., & Dayer, A. (2020). Supporting wildlife recreationists in Virginia: Survey report to inform the Virginia department of wildlife resources' wildlife viewing plan. Virginia Tech. URL: <http://hdl.handle.net/10919/101046>
- Hinrichs, M.P., Price, N.B., Gruntorad, M.P., Pope, K.L., Fontaine, J.J., & Chizinski, C.J. (2020). Understanding sportsperson retention and reactivation through license purchasing behavior. *Wildlife Society Bulletin*, 44(2), 383-390.
- R Core Team (2022). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>
- Raftovich, R. V., K. K. Fleming, S. C. Chandler, and C. M. Cain. (2022). Migratory Bird Hunting Activity and Harvest during the 2020–21 and 2021–22 Hunting Seasons. U.S. Fish and Wildlife Service, Laurel, Maryland, USA.
- United States Bureau of Labor Statistics (US BLS). (2022). Office of survey methods research – household and establishment survey response rates. URL: <https://www.bls.gov/osmr/response-rates/home.htm>
- U.S. Fish and Wildlife Service (USFWS). (2016). 2016 National survey of fishing, hunting, and wildlife-associated recreation. U.S. Department of the Interior, U.S. Fish and Wildlife Service, & U.S. Department of Commerce. URL: <https://www.census.gov/content/dam/Census/library/publications/2018/demo/fhw16-nat.pdf>
- Valdez, R.X. (2019). Results of the 2018-2019 Virginia hunter survey. Virginia Department of Wildlife Resources. URL: <https://dwr.virginia.gov/surveys/reports/>
- Valliant, R., Dever, J. A., & Kreuter, F. (2013). Practical tools for designing and weighting survey samples (Vol. 1). New York: Springer.



## APPENDICES

### Appendix 1. 2021 – 2022 Hunter Survey

Dear [recipient name],

The Virginia Department of Wildlife Resources (DWR) serves the Commonwealth of Virginia by managing wildlife populations and providing diverse hunting opportunities across the state. To improve our service to the Commonwealth, DWR wants to better understand your hunting effort and preferences, and invites you to participate in the 2021-2022 Virginia Hunter Survey. For this survey, DWR is inviting a select number of hunters that purchased a hunting license in 2021 or 2022. The survey has questions about how often you hunt, the species and locations you prefer, and your views of DWR.

Please take the time to complete this survey, even if you have not recently hunted or hunted very little in the past year. This survey should take 15-20 minutes to complete. The feedback you provide is very important for improving our management and services.

We will do everything necessary to protect your privacy and confidentiality. Your name will never be associated with your responses. Results of this study will be reported in summary and may be shared with DWR staff and other fish and wildlife professionals. Participation in this study is not mandatory. If you have any questions or concerns about this study, please contact the Center for Survey Research at 434-243-5232 or [surveys2@virginia.edu](mailto:surveys2@virginia.edu). Instructions for completing this survey are below. Thank you for your assistance!

Sincerely,  
Gray Anderson, PhD  
Chief of Wildlife



CONSERVE. CONNECT. PROTECT.



Weldon Cooper Center  
for Public Service  
Center for Survey Research

The survey begins on the back of this page. Please take your time and respond to the questions as best you can. When you have answered all of the questions, place all of the survey pages, including this one, into the pre-paid envelope and mail the envelope at your earliest convenience.

Questions 1-8 relate to the number of animals you harvested in Virginia during the 2021-2022 hunting season. In each available space, record the number of animals you personally harvested in 2021-2022. Be as accurate as possible. Do not include animals taken by anyone other than yourself. **If you hunted an animal, but were unsuccessful, place a zero (0) in the space. If you did not hunt that animal, please check the box "I did not hunt this animal..."**.

**1. Big Game Harvest (Deer)**

- |                        |       |  |
|------------------------|-------|--|
| a. Bucks: Archery      | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| b. Bucks: Muzzleloader | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| c. Bucks: Firearms     | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| d. Does: Archery       | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| e. Does: Muzzleloader  | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| f. Does: Firearms      | _____ | <input type="checkbox"/> I did not hunt this animal this way |

**2. Big Game Harvest (Turkey)**

- |                |       |  |
|----------------|-------|--|
| a. Fall 2021   | _____ | <input type="checkbox"/> I did not hunt this animal during this time |
| b. Spring 2022 | _____ | <input type="checkbox"/> I did not hunt this animal during this time |

**3. Waterfowl Harvest**

- |                 |       |   |
|-----------------|-------|---|
| a. Canada Goose | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Duck         | _____ | <input type="checkbox"/> I did not hunt this animal |

**4. Big Game Harvest (Bear)**

- |                         |       |  |
|-------------------------|-------|--|
| a. Early 3-day          | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| b. Archery              | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| c. Muzzleloader         | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| d. Firearms (with dogs) | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| e. Firearms (no dogs)   | _____ | <input type="checkbox"/> I did not hunt this animal this way |

**5. Small Game Harvest (Mammals):**

- |                        |       |   |
|------------------------|-------|---|
| a. Rabbit              | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Gray Squirrel       | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Fox Squirrel        | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Red Squirrel        | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Groundhog/Woodchuck | _____ | <input type="checkbox"/> I did not hunt this animal |

**6. Small Game Harvest (Birds)**

- |                     |       |   |
|---------------------|-------|---|
| a. Wild Quail       | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Pen Raised Quail | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Ruffed Grouse    | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Woodcock         | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Dove             | _____ | <input type="checkbox"/> I did not hunt this animal |

**7. Furbearer Harvest** *(only include animals you hunted, do not include animals you trapped)*

- |             |       |   |
|-------------|-------|---|
| a. Red Fox  | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Gray Fox | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Coyote   | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Raccoon  | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Bobcat   | _____ | <input type="checkbox"/> I did not hunt this animal |

**8. Other Species**

- |               |       |   |
|---------------|-------|---|
| a. Feral Hogs | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Crow       | _____ | <input type="checkbox"/> I did not hunt this animal |

Questions 9-16 relate to the time you spent hunting in Virginia during the 2021-2022 hunting season. Below, please indicate the number of days in which each species was the PRIMARY animal you hunted. Count partial days as 1 day hunted. **If you did not hunt that animal, please check "I did not hunt this animal..."**.

**9. Deer Days Hunted**

- |                 |       |  |
|-----------------|-------|--|
| a. Archery      | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| b. Muzzleloader | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| c. Firearms     | _____ | <input type="checkbox"/> I did not hunt this animal this way |

**10. Turkey Days Hunted**

- |                |       |  |
|----------------|-------|--|
| a. Fall 2021   | _____ | <input type="checkbox"/> I did not hunt this animal during this time |
| b. Spring 2022 | _____ | <input type="checkbox"/> I did not hunt this animal during this time |

**11. Waterfowl Days Hunted**

- |                 |       |   |
|-----------------|-------|---|
| a. Canada Goose | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Duck         | _____ | <input type="checkbox"/> I did not hunt this animal |

**12. Bear Days Hunted**

- |                         |       |  |
|-------------------------|-------|--|
| a. Early 3-day          | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| b. Archery              | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| c. Muzzleloader         | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| d. Firearms (with dogs) | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| e. Firearms (no dogs)   | _____ | <input type="checkbox"/> I did not hunt this animal this way |

**13. Small Game (Mammals) Days Hunted**

- |                        |       |   |
|------------------------|-------|---|
| a. Rabbit              | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Gray Squirrel       | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Fox Squirrel        | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Red Squirrel        | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Groundhog/Woodchuck | _____ | <input type="checkbox"/> I did not hunt this animal |

**14. Small Game (Birds) Days Hunted**

- |                     |       |   |
|---------------------|-------|---|
| a. Wild Quail       | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Pen Raised Quail | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Ruffed Grouse    | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Woodcock         | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Dove             | _____ | <input type="checkbox"/> I did not hunt this animal |

**15. Furbearer Days Hunted** *(only include days you hunted, do not include days you trapped)*

March 1, 2021 – October 31, 2021	a. Red Fox	_____	<input type="checkbox"/> I did not hunt this animal
	b. Gray Fox	_____	<input type="checkbox"/> I did not hunt this animal
	c. Coyote	_____	<input type="checkbox"/> I did not hunt this animal
	d. Raccoon	_____	<input type="checkbox"/> I did not hunt this animal
	e. Bobcat	_____	<input type="checkbox"/> I did not hunt this animal
November 1, 2021 – February 28, 2022	a. Red Fox	_____	<input type="checkbox"/> I did not hunt this animal
	b. Gray Fox	_____	<input type="checkbox"/> I did not hunt this animal
	c. Coyote	_____	<input type="checkbox"/> I did not hunt this animal
	d. Raccoon	_____	<input type="checkbox"/> I did not hunt this animal
	e. Bobcat	_____	<input type="checkbox"/> I did not hunt this animal

**16. Other Species Days Hunted**

- |               |       |   |
|---------------|-------|---|
| a. Feral Hogs | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Crow       | _____ | <input type="checkbox"/> I did not hunt this animal |

For Questions 17-24, indicate which DWR region in Virginia you **MOST OFTEN** hunted each species during the 2021-2022 hunting season. Using the map, select the appropriate region. **If you did not hunt a species, please check "I did not hunt this animal..."**



**17. Deer Region Hunted**

- |                 |       |  |
|-----------------|-------|--|
| a. Archery      | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| b. Muzzleloader | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| c. Firearms     | _____ | <input type="checkbox"/> I did not hunt this animal this way |

**18. Turkey Region Hunted**

- |                |       |  |
|----------------|-------|--|
| a. Fall 2021   | _____ | <input type="checkbox"/> I did not hunt this animal during this time |
| b. Spring 2022 | _____ | <input type="checkbox"/> I did not hunt this animal during this time |

**19. Waterfowl Region Hunted**

- |                 |       |   |
|-----------------|-------|---|
| a. Canada Goose | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Duck         | _____ | <input type="checkbox"/> I did not hunt this animal |

**20. Bear Region Hunted**

- |                         |       |  |
|-------------------------|-------|--|
| a. Early 3-day          | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| b. Archery              | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| c. Muzzleloader         | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| d. Firearms (with dogs) | _____ | <input type="checkbox"/> I did not hunt this animal this way |
| e. Firearms (no dogs)   | _____ | <input type="checkbox"/> I did not hunt this animal this way |

**21. Small Game (Mammals) Region Hunted**

- |                        |       |   |
|------------------------|-------|---|
| a. Rabbit              | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Gray Squirrel       | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Fox Squirrel        | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Red Squirrel        | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Groundhog/Woodchuck | _____ | <input type="checkbox"/> I did not hunt this animal |

**22. Small Game (Birds) Region Hunted**

- |                     |       |   |
|---------------------|-------|---|
| a. Wild Quail       | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Pen Raised Quail | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Ruffed Grouse    | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Woodcock         | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Dove             | _____ | <input type="checkbox"/> I did not hunt this animal |

**23. Furbearer Region Hunted** *(only include animals you hunted, do not include animals you trapped)*

- |             |       |   |
|-------------|-------|---|
| a. Red Fox  | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Gray Fox | _____ | <input type="checkbox"/> I did not hunt this animal |
| c. Coyote   | _____ | <input type="checkbox"/> I did not hunt this animal |
| d. Raccoon  | _____ | <input type="checkbox"/> I did not hunt this animal |
| e. Bobcat   | _____ | <input type="checkbox"/> I did not hunt this animal |

**24. Other Species Region Hunted**

- |               |       |   |
|---------------|-------|---|
| a. Feral Hogs | _____ | <input type="checkbox"/> I did not hunt this animal |
| b. Crow       | _____ | <input type="checkbox"/> I did not hunt this animal |

**25. Indicate the level of importance you place on hunting the following species:**

	Not at all Important			Moderately Important			Extremely Important
a. Deer	1	2	3	4	5	6	7
b. Fall Turkey	1	2	3	4	5	6	7
c. Spring Turkey	1	2	3	4	5	6	7
d. Bear	1	2	3	4	5	6	7
e. Rabbit	1	2	3	4	5	6	7
f. Squirrel	1	2	3	4	5	6	7
g. Quail	1	2	3	4	5	6	7
h. Raccoon	1	2	3	4	5	6	7
i. Red Fox	1	2	3	4	5	6	7
j. Gray Fox	1	2	3	4	5	6	7
k. Waterfowl	1	2	3	4	5	6	7
l. Ruffed Grouse	1	2	3	4	5	6	7
m. Woodcock	1	2	3	4	5	6	7
n. Bobcat	1	2	3	4	5	6	7
o. Coyote	1	2	3	4	5	6	7



The following questions are for all hunters. Please carefully read and answer each question, even if you did not hunt the animal indicated in the question during the 2021-2022 season.

26. If you hunted on **public lands** during any of the 2021-2022 seasons, please select all public lands you hunted on. Please select all that apply

- ☐ Wildlife Management Area (WMA)
- ☐ National Forest
- ☐ State Forest
- ☐ Other: \_\_\_\_\_

27. Sunday hunting on **public lands** was recently approved and DWR wants your opinion on when seasons should end. Select your preference:

- 1 Seasons end on a Saturday
- 2 Seasons end on a Sunday
- 3 No opinion

28. Overall, how would you rate your satisfaction with the harvest reporting systems offered by DWR?

	Very Unsatisfied		Neither Satisfied nor Unsatisfied		Very Satisfied	Never used this System
a. GoOutdoorsVA Mobile App	1	2	3	4	5	9
b. Internet Harvest Reporting	1	2	3	4	5	9
c. Telephone Harvest Reporting	1	2	3	4	5	9
d. Other (Specify): _____	1	2	3	4	5	9

29. How do you carry your hunting license? (Select all that apply)

- ☐ Physical version (i.e. paper or card)
- ☐ Electronic version

30. Did you use an electronic call while hunting during any of the 2021-2022 seasons?

- 1 Yes
- 2 No → Go to Question 32

31. [If 30 = Yes] Indicate how many hunting trips, hours per trip, and total animals harvested by species that were done while using an electronic call:

	Total Hunting Trips	Average Hours Per Trip	Total Harvests
a. Coyote			
b. Red Fox			
c. Gray Fox			
d. Raccoon			
e. Bobcat			
f. Crow			

32. If you harvested a gray fox within the last 5 years, which of the following statements best describes how you hunted them:

- 1 I hunted specifically for gray foxes as a primary species of interest using an electronic call
- 2 I hunted gray foxes while targeting other species using an electronic call
- 3 I hunted specifically for gray foxes as a primary species of interest without using an electronic call
- 4 I hunted gray foxes while targeting other species without using an electronic call

DWR is interested in your awareness and concerns regarding sarcoptic mange in bears. Mange is a highly contagious skin disease caused by mites that affect wild and domestic mammals, as well as humans. Symptoms include missing patches of fur, dry skin, intense itching, and altered behavior in animals.

33. Prior to this survey, were you aware of the presence of sarcoptic mange in bears in northern Virginia over the last several years?

- 1 Yes
- 2 No

34. How much would you say that you know about the presence of sarcoptic mange in bears in Virginia?

- 1 Nothing
- 2 A little bit
- 3 A fair amount
- 4 A lot

35. How concerned are you about each of the following issues related to sarcoptic mange in bears in northern Virginia?

	Not Concerned = 1			Somewhat Concerned = 5			Extremely Concerned = 9		
	1	2	3	4	5	6	7	8	9
a. Transmission from bears to hunters	1	2	3	4	5	6	7	8	9
b. Transmission from bears to hunting dogs	1	2	3	4	5	6	7	8	9
c. The potential for mange to reduce bear populations in Virginia	1	2	3	4	5	6	7	8	9
d. The threat mange poses to the future of bear hunting in Virginia	1	2	3	4	5	6	7	8	9
e. Other:	1	2	3	4	5	6	7	8	9

The following section is related to your participation in the 2021-2022 DEER seasons. If you did not hunt deer in the past 12 months, skip to question 44, page 9.

36. Overall, how would you rate your satisfaction with deer hunting in Virginia? (Please circle one number)

Very Unsatisfied				Neither Satisfied or Unsatisfied			Very Satisfied
1	2	3	4	5	6	7	

Low	Moderate				High
1	2	3	4	5	6

	Poor			Adequate			Excellent
<b>a. Archery</b>	1	2	3	4	5	6	7
<b>b. Muzzleloader</b>	1	2	3	4	5	6	7
<b>c. Firearms</b>	1	2	3	4	5	6	7

- 1 Declined dramatically
- 2 Declined
- 3 Remained about the same
- 4 Increased
- 5 Increased dramatically
- 6 No opinion

- 1 Increase the herd
- 2 Stabilize the herd
- 3 Decrease the herd
- 4 No opinion

1 Yes  
2 No → *Go to Question 44*

	0	1	2	3	4+
<b>Antlered bucks</b>	0	1	2	3	4+
<b>Adult does</b>	0	1	2	3	4+
<b>Fawns</b>	0	1	2	3	4+
<b>Unknown</b>	0	1	2	3	4+

- ☐ I already harvested other deer and did not want to kill another
- ☐ I was concerned about low deer population levels where I hunt
- ☐ I was unable to harvest the deer due to rules on the property I hunt
- ☐ I didn't want to shoot a young deer or a small buck
- ☐ I didn't want to shoot a doe and fawn, or separate a herd
- ☐ I was concerned about CWD and unsure about testing
- ☐ Other:





48. Following guidance from DWR's Wild Turkey Management Plan, if it is necessary to increase turkey populations on DWR Wildlife Management Areas (WMAs), please indicate how acceptable or unacceptable the following options are:

	Unaccept- able			Neutral			Accept- able
a. Day of the week hunting restrictions	1	2	3	4	5	6	7
b. Managed quota hunts	1	2	3	4	5	6	7
c. Reduced bag limit	1	2	3	4	5	6	7

49. DWR wants your opinion on the current Fall Turkey season schedule. Select which statement you most strongly agree with:

- 1 The current Fall Turkey season schedule is fine
- 2 I would prefer for Fall Turkey season to start later
- 3 I would prefer more overlap between Fall Turkey season and Deer season
- 4 I would prefer less overlap between Fall Turkey season and Deer season

50. If you did NOT hunt in the Fall 2021 Turkey season, how much do you agree or disagree with each of the following reasons?

	Strongly Disagree			Neither Agree nor Disagree			Strongly Agree
a. Prefer the experience of Spring turkey season	1	2	3	4	5	6	7
b. The Fall turkey season dates are too confusing	1	2	3	4	5	6	7
c. There is not enough overlap with deer season	1	2	3	4	5	6	7
d. The turkey population is low in the area I hunt	1	2	3	4	5	6	7
e. Concern that Fall turkey season harvest is causing population decline	1	2	3	4	5	6	7
f. Not interested in Fall turkey hunting	1	2	3	4	5	6	7
g. Other:	1	2	3	4	5	6	7

The following section is related to your participation in the 2021-2022 BEAR seasons. **If you did not hunt bear in the past 12 months, skip to question 58, page 12.**

**51. Overall, how would you rate your satisfaction with bear hunting in Virginia?** *(Please circle one number)*

<b>Very Unsatisfied</b>			<b>Neither Satisfied or Unsatisfied</b>			<b>Very Satisfied</b>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>

**52. How many days in the 2021 Bear Hound Training/Chase season did you participate?**  
*Answer with a zero (0) if you did not participate in this season.*

\_\_\_\_\_ Days

**53. What advice would you give to DWR regarding how to manage the bear population?**

- 1 Increase the bear population
- 2 Stabilize the bear population
- 3 Decrease the bear population
- 4 No opinion

**54. Following guidance from DWR's Bear Management Plan, if it is necessary to reduce bear populations in certain areas, please indicate how acceptable or unacceptable the following options are:**

	Unaccept- able			Neutral			Accept- able
<b>a. Add the early 3-day season in new areas</b>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<b>b. Increase the length of the early 3-day season</b>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<b>c. Increase the length of the archery season</b>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<b>d. Increase the length of the muzzleloader season</b>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<b>e. Increase the length of the firearms seasons</b>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<b>f. Increase the annual bag limit from 1 to 2 bears</b>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>

55. Following guidance from DWR's Bear Management Plan, if it is necessary to increase bear populations in certain areas, please indicate how acceptable or unacceptable the following options are:

	Unaccept- able			Neutral			Accept- able
a. Remove the early 3-day season	1	2	3	4	5	6	7
b. Reduce the length of the early 3-day season	1	2	3	4	5	6	7
c. Reduce the length of the archery season	1	2	3	4	5	6	7
d. Reduce the length of the muzzleloader season	1	2	3	4	5	6	7
e. Reduce the length of the firearms seasons	1	2	3	4	5	6	7

56. If you have hunted bear in an area of Virginia where mange is present, which option below best describes how your bear hunting habits in that area have changed?

- 1 I do not hunt bears in an area where mange is prevalent
- 2 I have stopped hunting bears in that area
- 3 I have hunted bears less in that area
- 4 I have hunted bears about the same in that area
- 5 I have hunted bears more in that area

57. If mange becomes widespread in the area of Virginia where you hunt bears, which option below best describes how you might change your bear hunting habits in that area?

- 1 I would stop hunting bears in that area
- 2 I would hunt bears less in that area
- 3 I would hunt bears about the same in that area
- 4 I would hunt bears more in that area

The following section is about **SMALL GAME**. Small game refers to rabbit, squirrel, groundhog / woodchuck, quail, grouse, woodcock, and dove. **If you did not hunt any small game in the past 12 months, skip to question 66, page 14.**

58. Overall, how would you rate your satisfaction with small game hunting in Virginia? *(Please circle one number)*

Very Unsatisfied				Neither Satisfied or Unsatisfied			Very Satisfied
1	2	3	4	5	6	7	

59. How would you rate your satisfaction with the number of small game harvest opportunities in Virginia? *(Please circle one number)*

Very Unsatisfied				Neither Satisfied or Unsatisfied			Very Satisfied
1	2	3	4	5	6	7	

**60. What percentage of your small game hunting occurred on Saturday, Sunday, and during the week (Monday through Friday)? (All three responses should total 100)**

- a. Saturday \_\_\_\_\_ %  
b. Sunday \_\_\_\_\_ %  
c. During the week \_\_\_\_\_ %  
**Total = 100 %**

**61. Do you think your small game harvest opportunities have been better on public lands, private lands, or about the same?**

- 1 Better on public lands  
2 Better on private lands  
3 About the same  
4 Do not know / Not sure

**DWR is interested in your knowledge regarding Rabbit Hemorrhagic Disease Virus (RHDV2).** While RHDV2 has not been detected in Virginia, there have been detections in other states and spread across the U.S. is anticipated. In an effort to prevent RHDV2 from entering Virginia, and to curtail the spread if it does arrive, DWR enacted new carcass disposal and transport regulations.

**62. Prior to this survey, had you heard of Rabbit Hemorrhagic Disease Virus (RHDV2)?**

- 1 Yes  
2 No

**63. Are you aware of the regulations DWR enacted prior to the last rabbit hunting season about carcass disposal and transport?**

- 1 Yes  
2 No

**The following questions are related to squirrel hunting. If you have not ever hunted squirrels in Virginia, skip to question 66, page 14.**

**64. Have you ever hunted squirrels with a dog?**

- 1 Yes  
2 No

**65. Did you hunt during the 2021 June squirrel season?**

- 1 Yes  
2 No



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In this part of the survey we will be asking you about your wildlife recreation activities. By "**wildlife recreation**" we mean activities you do for enjoyment outside of work. The purpose of these activities may include observing, photographing, feeding, collecting data about, or harvesting wildlife.

**Wildlife** refers to all animals, such as birds, fish, insects, mammals, amphibians, and reptiles that are living in natural or wild environments. **Wildlife does not** include animals living in aquariums, zoos, and other artificial surroundings or domestic animals such as farm animals or pets.

**66. Within the last 12 months, have you participated in any kind of wildlife recreation in Virginia?** (*Wildlife recreation includes hunting*)

- 1 Yes  
2 No —→ Go to Question 69

**67. [If 66 = Yes] To what extent do you feel that each of the following describes you?** (*Please respond for each recreation type*)

	Very like me	Somewhat like me	Neither like me nor unlike me	Somewhat unlike me	Very unlike me
<b>Wildlife viewer:</b> someone who intentionally observes, photographs, feeds, or collects data about wildlife or visits parks and natural areas because of wildlife	1	2	3	4	5
<b>Hunter:</b> someone who participates in hunting or trapping, with a license or exempt from a license, using any legal method to harvest wildlife	1	2	3	4	5
<b>Angler:</b> someone who participates in fishing, in either freshwater or saltwater areas, to harvest and/or catch-and-release fish	1	2	3	4	5

**68. [If 66 = Yes] In the past 12 months, about how many days did you spend participating in any of the following wildlife recreation activities in Virginia and outside Virginia? Please count multiple activities done in a single day separately.** (*Please fill in your response as a number between 0 and 365, providing the best estimate you can. If you have not participated in an activity, please check the box next to the statement "Not applicable".*)

	In Virginia	Outside Virginia	
a. Wildlife Viewing	_____ Days	_____ Days	<input type="checkbox"/> Not applicable
b. Hunting	_____ Days	_____ Days	<input type="checkbox"/> Not applicable
c. Fishing	_____ Days	_____ Days	<input type="checkbox"/> Not applicable



69. We are also interested in your participation in other kinds of non-wildlife focused outdoor recreation activities. Which of the following non-wildlife focused outdoor activities have you participated in within the past 12 months in Virginia? *(Please select all that apply)*

- |  |   |
|--|---|
| <input type="checkbox"/> Archery               | <input type="checkbox"/> Non-motorized boating (such as kayaking or canoeing) |
| <input type="checkbox"/> Biking                | <input type="checkbox"/> Swimming   |
| <input type="checkbox"/> Camping               | <input type="checkbox"/> Recreational shooting sports                         |
| <input type="checkbox"/> Hiking or backpacking | <input type="checkbox"/> Running, jogging, or walking                         |
| <input type="checkbox"/> Horseback riding      | <input type="checkbox"/> Winter sports  |
| <input type="checkbox"/> Viewing wildflowers   | <input type="checkbox"/> I do not participate in any of these activities      |
| <input type="checkbox"/> Motorized boating     | <input type="checkbox"/> Other (Please specify): _____                        |

70. In what year were you born?

--	--	--	--

71. What is your gender?

- 1 Woman
- 2 Man
- 3 Transgender
- 4 Prefer not to answer
- 5 A gender not listed here (Please specify): \_\_\_\_\_

72. What is your ethnicity?

- 1 Hispanic
- 2 Non-Hispanic

73. What is your race? *(Select all that apply)*

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Other (Please specify): \_\_\_\_\_

74. What is your highest degree or level of school? *(Select one)*

- 1 Less than high school
- 2 High school diploma or equivalent
- 3 Some college, no degree
- 4 Associate's degree
- 5 Bachelor's degree
- 6 Master's degree
- 7 Professional degree
- 8 Doctorate degree

**75. What was your total individual income during the past 12 months?**

- 1 Less than \$24,999
- 2 \$25,000 - \$49,999
- 3 \$50,000 - \$74,999
- 4 \$75,000 - \$99,999
- 5 \$100,000 - \$124,999
- 6 \$125,000 or more

**76. Which of the following best describes where you live now compared to where you lived most of your time growing up? (Please select one per statement)**

	Urban	Suburban	Rural
<b>a. Where I live now</b>	1	2	3
<b>b. Where I lived growing up</b>	1	2	3

**77. In the future, how would you prefer to receive information from DWR? (Please select all that apply)**

- ☐ Family and friends
- ☐ Local newspaper
- ☐ Statewide or National newspapers
- ☐ Radio
- ☐ TV
- ☐ DWR Website
- ☐ Outdoor blogs and websites (non-DWR)
- ☐ Outdoor magazines (non-DWR)
- ☐ DWR Public meeting
- ☐ DWR online social media (i.e., Facebook)
- ☐ DWR Hunting Regulations booklet
- ☐ Online social media account (non-DWR)
- ☐ Information via the email
- ☐ DWR Staff

**78. If you have any further comments about hunting in Virginia, please share them in the space below.**

***Thank you for your help and taking the time to complete this questionnaire.***

No postage is required to mail back this questionnaire.
Please use the envelope provided.
<b>Lost your envelope?</b>
Please return the questionnaire to us at:
Center for Survey Research
University of Virginia
P.O. Box 400767
Charlottesville, VA 22904-4767
Packet 1 - <<CSRID>>



## Appendix 2.1 2021-2022 Hunter Survey email invitation

Dear [recipient name],

The Virginia Department of Wildlife Resources (formerly DGIF) invites you to participate in the 2021-2022 Hunter Survey. This survey is being conducted to better understand your participation in various hunting seasons, how satisfied you were with your hunting experiences, and to get your feedback on our management plans.

You are among a small group of hunters selected for this survey. Your views are important to us and are used to develop wildlife management plans. We want your feedback even if you did not hunt this past year. To begin the survey please click the link below.

**[CLICK HERE TO BEGIN SURVEY](#)**

This survey should take about 15-20 minutes to complete. This survey is confidential, we will do everything necessary to protect your privacy and confidentiality. Your name will never be associated with your responses. Results of this study will be reported in summary and may be shared with DWR staff and other fish and wildlife professionals. Participation in this study is not mandatory. If you have any questions or concerns about this study, please contact the University of Virginia's Center for Survey Research (surveys2@virginia.edu - 434-243-5232), whom we've asked to help conduct this survey.

Thank you for your help!

Sincerely,  
Gray Anderson, PhD  
Chief of Wildlife

Appendix 2.2 2021-2022 Hunter Survey first email reminder

Dear [recipient name],

Last week, we sent you an invitation to participate in the 2021-2022 Hunter Survey. This is a reminder that the survey is still open, and we want your feedback. You are among a small group of hunters selected for this survey and your views are important to us.

The survey is confidential and should only take 15-20 minutes to complete. To begin the survey click the link below.

**[CLICK HERE TO BEGIN SURVEY](#)**

If you have any questions or concerns about this study, please contact the University of Virginia's Center for Survey Research (surveys2@virginia.edu - 434-243-5232), whom we've asked to help conduct this survey.

Thank you for your help!

Sincerely,  
Gray Anderson, PhD  
Chief of Wildlife

Appendix 2.3 *2021-2022 Hunter Survey second email reminder*

Dear [recipient name],

We have recently sent you two invitations to participate in the 2021-2022 Hunter Survey. You were selected to be part of a small group of hunters that we are asking to complete this survey. It is important that we hear about your experiences and views on hunting, even if you did not hunt during the past year.

The survey is confidential and should only take 15-20 minutes to completes. To begin the survey click the link below.

**[CLICK HERE TO BEGIN SURVEY](#)**

If you have any questions or concerns about this study, please contact the University of Virginia's Center for Survey Research (surveys2@virginia.edu - 434-243-5232), whom we've asked to help conduct this survey.

Thank you for your help!

Sincerely,  
Gray Anderson, PhD  
Chief of Wildlife

Appendix 2.4 *2021-2022 Hunter Survey final email reminder*

Dear [recipient name],

This is the final reminder to participate in the 2021-2022 Virginia Hunter Survey. If you have not already completed this survey, please do so as soon as possible as the survey will be **closing on July 1<sup>st</sup>**. You are among a small group of hunters selected for this survey and your views are important to us.

The survey is confidential and should only take 15-20 minutes to complete. To begin the survey click the link below.

**[CLICK HERE TO BEGIN SURVEY](#)**

If you have any questions or concerns about this study, please contact the University of Virginia's Center for Survey Research (surveys2@virginia.edu - 434-243-5232), whom we've asked to help conduct this survey.

Thank you for your help!

Sincerely,  
Gray Anderson, PhD  
Chief of Wildlife

Appendix 3.1 2021-2022 Hunter Survey postcard invitation

**Dear Virginia Hunter,**

The Virginia Department of Wildlife Resources invites you to participate in the 2021-2022 Hunter Survey. This survey is being conducted to better understand your participation in various hunting seasons, how satisfied you were with your hunting experiences, and to get your feedback on our management plans.

You are among a select group of hunters chosen for this survey. Your views are important to us and are used to develop wildlife management plans. The survey can be accessed online at [www.virginiawildlife.gov/surveys](http://www.virginiawildlife.gov/surveys). Your unique ID# to access the survey is on the opposite side of this postcard, below the address.

Sincerely,

Gray Anderson, Ph.D.  
Chief, Wildlife Resources Division

Virginia Department of Wildlife Resources  
Conserve. Connect. Protect

Phone: 555-555-5555  
E-mail: [someone@example.com](mailto:someone@example.com)

**Return Address for UVA**

Return Address Line 1  
Line 2  
Line 3

PLEASE  
PLACE  
STAMP  
HERE

Mailing Address Line 1  
Mailing Address Line 2  
Mailing Address Line 3  
Mailing Address Line 4  
Mailing Address Line 5

UVA Logo Here



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Appendix 3.2 2021-2022 Hunter Survey final postcard reminder

**Dear Virginia Hunter,**

This is the final reminder to participate in the 2021-2022 Hunter Survey. If you have already completed this survey, thank you for your help. If you have not completed this survey, please do so at your earliest convenience. You are among a select group of hunters chosen for this survey and your views are important to us.

The survey can be accessed online at [www.virginiawildlife.gov/surveys](http://www.virginiawildlife.gov/surveys). Your unique ID# to access the survey is on the opposite side of this postcard, below the address.

Sincerely,

Gray Anderson, Ph.D.  
Chief, Wildlife Resources Division

Virginia Department of Wildlife Resources  
Conserve. Connect. Protect

Phone: 555-555-5555  
E-mail: [someone@example.com](mailto:someone@example.com)

**Return Address for UVA**

Return Address Line 1

Line 2

Line 3

PLEASE  
PLACE  
STAMP  
HERE

Mailing Address Line 1  
Mailing Address Line 2  
Mailing Address Line 3  
Mailing Address Line 4  
Mailing Address Line 5

UVA Logo Here



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Appendix 4.1 *Non-response bias test results between respondents and non-respondents for hunting related activities*

	Response	Non-response	Comparison		
			Stat. test	p value	Effect size
<b>Importance hunting species...</b>					
Deer	6.1	6.1	W = 107307	0.48	Cliff's $\Delta$ = -0.03
Fall Turkey	3.4	4.3	W = 79233	< 0.01	Cliff's $\Delta$ = -0.26
Spring Turkey	4.3	4.6	W = 97299	0.10	Cliff's $\Delta$ = -0.09
Bear	3.0	3.3	W = 96498	0.10	Cliff's $\Delta$ = -0.09
Rabbit	2.9	3.6	W = 81477	< 0.01	Cliff's $\Delta$ = -0.22
Squirrel	2.9	3.7	W = 82202	< 0.01	Cliff's $\Delta$ = -0.21
Quail	2.3	2.9	W = 85259	< 0.01	Cliff's $\Delta$ = -0.15
Raccoon	2.0	2.1	W = 96480	0.21	Cliff's $\Delta$ = -0.06
Red Fox	2.0	2.0	W = 105122	0.60	Cliff's $\Delta$ = 0.02
Gray Fox	2.0	2.0	W = 103492	0.76	Cliff's $\Delta$ = 0.01
Waterfowl	2.7	2.9	W = 96597	0.52	Cliff's $\Delta$ = -0.03
Ruffed Grouse	2.2	2.7	W = 88435	0.01	Cliff's $\Delta$ = -0.13
Woodcock	2.0	2.3	W = 94943	0.19	Cliff's $\Delta$ = -0.06
Bobcat	2.3	2.6	W = 95955	0.21	Cliff's $\Delta$ = -0.06
Coyote	3.8	4.5	W = 88676	< 0.01	Cliff's $\Delta$ = -0.15
<b>Public Land Hunted</b> (% WMA)	38.2	34.1	$\chi^2$ = 0.55	0.46	Cramer's V = 0.02
<b>Season End Date</b> (% Sunday)	44.8	48.8	$\chi^2$ = 0.74	0.39	Cramer's V = 0.02
<b>Harvest Reporting System Satisfaction</b>					
Go Outdoors VA Mobile App	5.2	5.1	W = 101345	0.64	Cliff's $\Delta$ = 0.02
Internet Harvest Reporting	5.5	5.4	W = 99156	0.52	Cliff's $\Delta$ = 0.03
Telephone Harvest Reporting	5.1	5.0	W = 104904	0.84	Cliff's $\Delta$ = -0.01
<b>Carry Hunting License</b> (% Paper)	55.2	68.0	$\chi^2$ = 9.18	< 0.01	Cramer's V = 0.06
<b>Use electronic call</b> (% Yes)	9.3	13.8	$\chi^2$ = 2.72	0.10	Cramer's V = 0.03
<b>Hunted Gray Fox</b> (% primary species with NO e-call)	11.0	10.5		1.0*	OR = 1.1 (95% C.I. 0.23, 9.86)
<b>Aware of Mange</b> (% Yes)	28.1	36.6	$\chi^2$ = 4.06	0.04	Cramer's V = 0.04
<b>Knowledge of Mange</b> (% Nothing)	66.2	56.1	$\chi^2$ = 5.25	0.02	Cramer's V = 0.05
<b>Concern related to mange</b>					
Transmission from bears to hunters	4.4	4.6	W = 97989	0.40	Cliff's $\Delta$ = -0.04
Transmission from bears to hunting dogs	4.2	4.5	W = 93543	0.32	Cliff's $\Delta$ = -0.05
Reduced bear populations	4.2	4.6	W = 97299	0.10	Cliff's $\Delta$ = -0.09
Threat to the future of bear hunting	5.3	5.1	W = 99730	0.51	Cliff's $\Delta$ = 0.04

\*Indicates use of Fisher's Exact Test, FET.

Appendix 4.2 *Non-response bias test results between respondents and non-respondents for demographic information*

	Response	Non-response	Comparison		
			Stat. test	p value	Effect size
<b>Age</b> (Years)	50.5	53.6	W = 69218	0.05	Cliff's $\Delta$ = -0.12
<b>Gender</b> (% Women)	5.5	1.6	$\chi^2$ = 3.43	0.06	Cramer's V = 0.04
<b>Ethnicity</b> (% Hispanic)	1.5	1.8		0.69*	OR = 0.8 (95% C.I. 0.20, 7.43)
<b>Race</b> (% White)	93.7	95.1	$\chi^2$ = 0.40	0.53	Cramer's V = 0.01
<b>Education</b> (% Bachelor's Degree or Higher)	35.6	25.5	$\chi^2$ = 5.02	0.03	Cramer's V = 0.05
<b>Income</b> (% \$75,000 or higher)	44.1	35.2	$\chi^2$ = 3.30	0.07	Cramer's V = 0.04

\*Indicates use of Fisher's Exact Test, FET.

Appendix 4.3 *Comparison of Virginia hunter population and survey respondents for age, region, and purchase avidity*

	Population (180,684)		Survey Respondents (1,981)	
	%	n	%	n
<b>Age</b>				
Q1 (18-32)	26.46	47,804	19.54	387
Q2 (33-46)	24.36	44,022	25.04	496
Q3 (47-59)	25.95	46,893	26.35	522
Q4 (60-85)	23.23	41,965	29.08	576
<b>DWR Region</b>				
1	31.27	56,498	35.34	700
2	19.40	35,045	18.22	361
3	14.17	25,612	12.92	256
4	34.95	63,155	33.52	664
<b>Purchase Avidity</b>				
Avid	53.83	97,270	57.14	1,132
Non-Avid	46.17	83,414	42.86	849

Appendix 4.4 *Kendall's coefficient of rank correlation tau-sub-b (Kendall's  $\tau_b$ ) between number of days hunted and ranking of importance placed on species from Phase I dataset*

Species	r statistic	p value
<b>Deer</b>	.33	< 0.001
<b>Fall Turkey</b>	.30	< 0.001
<b>Spring Turkey</b>	.53	< 0.001
<b>Bear</b>	.41	< 0.001
<b>Rabbit</b>	.53	< 0.001
<b>Squirrel</b>	.41	< 0.001
<b>Quail</b>	.30	< 0.001
<b>Raccoon</b>	.28	< 0.001
<b>Red Fox</b>	.28	< 0.001
<b>Gray Fox</b>	.25	< 0.001
<b>Waterfowl</b>	.50	< 0.001
<b>Ruffed Grouse</b>	.26	< 0.001
<b>Woodcock</b>	.24	< 0.001
<b>Bobcat</b>	.24	< 0.001
<b>Coyote</b>	.25	< 0.001