

Results of the 2020-2021 Virginia Angler Survey



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ABSTRACT

The 2020-2021 Virginia angler survey was distributed December 2021 to measure the behaviors, preferences, and opinions of Virginia freshwater anglers. Surveys were sent to licensed Virginia anglers via mail or email, in an effort to connect with as many respondents as possible. We over-sampled younger anglers, due to higher response rates from older respondents in previous surveys and sampled to increase responses in various regions across the state. We received 1,428 completed surveys, for a response rate of 10.6%. We did not weight responses because statistical comparisons between respondents and non-respondents and comparisons between the sample and the population demonstrated minimal differences. The results presented in this report can be read and interpreted as representative of freshwater anglers in Virginia.

INTRODUCTION

The purpose of this study was to connect with Virginia anglers and evaluate their fishing behaviors, perceptions of fisheries management, and satisfaction with various aspects of fishing in Virginia. The Virginia Department of Wildlife Resources (DWR) manages the state's fish and wildlife resources, and the information gathered from this survey are critical to understanding constituent effort and engagement. Biologists and managers are interested in Virginia angler's experiences and this survey provides an avenue for that feedback.

Traditionally, angler information has been collected as part of on-site creel surveys. However, other survey methods are better suited for understanding population-level angler demographics, avidity, participation, management preferences, and angling satisfaction (Ditton & Hunt, 2001). Mail and email surveys can be conducted to meet these objectives (Dillman et al., 2014; York et al., 2022). The dual mode of mailed and emailed surveys allows us to engage with a larger portion of the Virginia freshwater fishing license holders, as we are able to target recipients that may only have one form of communication listed in the Go Outdoors Virginia (GOV) license database.

Statewide angler surveys have been conducted by DWR (formerly DGIF) sporadically over the years, but a consistent biennial schedule was adopted in 2019. A random sample of Virginia freshwater license holders are selected for these surveys, with sampling adjustments to meet project objectives and minimize total survey error (Biemer, 2010). This survey schedule also allows DWR to connect with anglers more frequently, as new issues or proposed regulation changes arise.

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 fishing license purchasers to receive an invitation. Although it would have been more cost effective to only use email invitations and an online survey, not all license

purchasers have an email associated with their license. Stratified random sampling was used to achieve a minimum 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 anglers. In previous DWR survey projects, and studies of anglers elsewhere in the US, survey responses are biased towards older individuals (Wallen et al., 2016; Valdez, 2019). A total of 10,000 email invitations and 4,000 mail invitations were distributed.

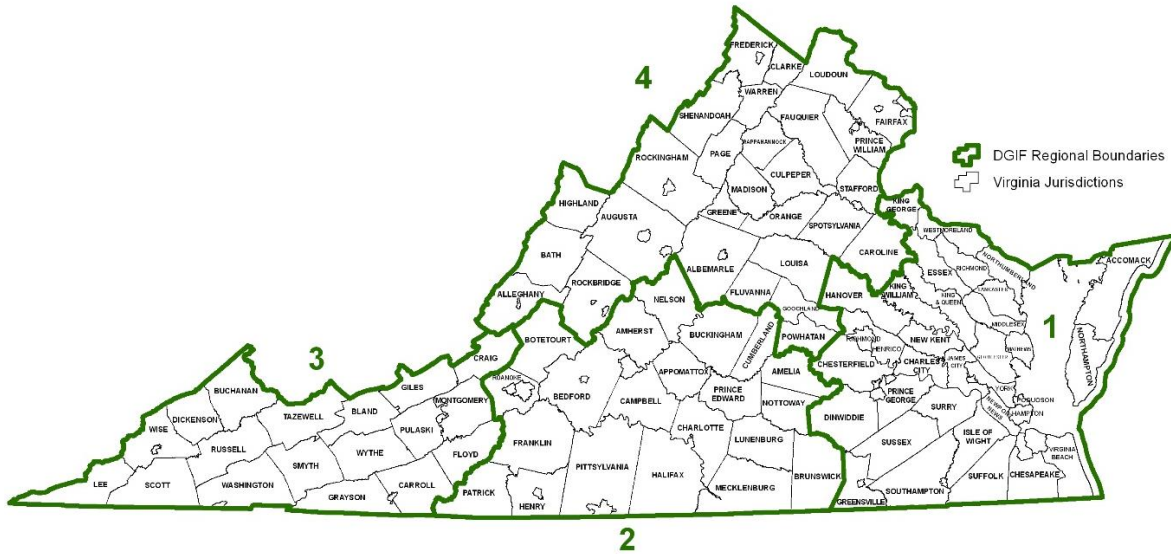


Figure 1. A map of Virginia separated by Virginia Department of Wildlife Resources regional boundaries 1, 2, 3 and 4.

Individuals were eligible to receive a survey invitation if they were 18 years old or older, a Virginia resident, and had purchased a freshwater fishing license between September 1, 2020-2021. There are a number of licenses that confer freshwater fishing privileges in Virginia, the two most commonly purchased are the annual Freshwater license and the Freshwater/Saltwater combo license (VDWR, 2022), but any freshwater license purchase satisfied the license requirement. The GOV license database was queried to develop the sample frame. A total of $N = 339,096$ unique individuals were identified as eligible to receive a survey invitation. The overall sampling rate was 4.1% (14,000 invitations; 339,096 individuals). Among these individuals, 72.8% ($n = 246,708$) had a valid, unique email address in the database and 27.2% ($n = 92,388$) 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 percent split between email and mail invitations was 71.4% ($n = 10,000$) and 28.6% ($n = 4,000$) which was similar to the split of individuals with and without a valid email address.

Survey Design and Distribution

This survey was developed so that results could inform Aquatics Wildlife Resource Division (AWRD) goals and objectives including angler use and preference goals described in the AWRD Strategic Plan. The survey results can also inform agency-wide goals, such as the goals for outdoor

recreationists outlined in the DWR Wildlife Viewing Plan. The survey instrument largely consisted of survey questions previously used in prior angler surveys in Virginia. Survey questions were asked to return information regarding fishing participation and frequency, catch and non-catch fishing preferences, opinions and perceptions of fishing abilities or activities, and engagement with DWR. A series of demographic questions focused on age, gender, race, income and education. We also included questions about participation in wildlife or outdoor related recreation. Recent research on wildlife recreation in Virginia indicates a high percent of overlap between people that fish, hunt, and view wildlife (Grooms et al., 2020).

DWR contracted with the Center for Survey Research at the University of Virginia to distribute surveys and manage survey data. The online survey was designed, distributed, and hosted on Qualtrics Survey Software. Invitations were sent via the mail and email in November and December 2021. Survey recipients were contacted up to three times, with an initial survey invitation and two follow-up reminders. Participants that received a mail survey also received two postcard reminders. The postcards invited recipients to complete the survey online if they preferred that option. The link to the online survey was hosted on the DWR website (dwr.virginia.gov/surveys). There were 375 undeliverable mailed surveys and 199 undeliverable emailed surveys, dropping the effective sample to 13,426. A total of 1,428 usable surveys were returned, making an effective survey response rate of 10.6%. A shortened version of the original survey was then sent to 2,000 non-respondents in February 2022; 1,000 via the mail and 1,000 via email. There were 15 undeliverable surveys and 90 usable returns from the non-respondent survey.

Statistical Analysis

All statistical analysis were conducted using R software (R, 2022). We tested for nonresponse bias using two different methods, comparing survey results to non-response survey results and directly comparing respondents and non-respondents using data available in the license database. The following data in the license database was used to check for nonresponse bias: age, gender, residency in DWR region (1, 2, 3, 4), and license purchase history. The license database includes a combined race/ethnicity variable, however, 19.4% of the sample was listed as “Undisclosed”. Without complete data for this variable, we did not consider this variable appropriate for potential weighting procedures. License purchase history was operationalized into a binary variable, individuals were classified as an “Avid Purchaser” (1) if they purchased a fishing license each year in the three previous years and classified as a “Non-avid Purchaser” (0) if they had not.

Based on the results of these tests, survey results were not weighted. Older respondents were more likely to respond to the survey ($t = 17.07, p < .001$; Cohen’s $d = 0.5$ [medium effect size]) (See Appendix 3.3). The mean age of respondents was 45.8 (SD = 14.7 years) and the mean age of non-respondents was 38.8 (SD = 13.7 years). On their own these results would provide a strong justification to weight results based on age. However, we oversampled younger individuals so they would be more likely to receive survey invitations. Among the broader population of individuals that purchased a freshwater fishing license ($n = 339,096$), the mean age was 43.4 (SD = 14.7 years). We decided not to weight results because of the small difference in age between survey respondents and the population. Individuals that were “Avid Purchasers” were more likely to respond to the survey ($\chi^2 = 92.78, p < 0.001$) but the effect size was negligible (Cramer’s $V = .08$). Response rate did not significantly change based on residency in

DWR region ($\chi^2 = 7.15$, $p = 0.07$). Men were more likely to respond to the survey compared to women ($\chi^2 = 21.80$, $p < 0.001$) but the effect size was negligible (Cramer's $V = .04$). There is a slight difference between the percentage of respondents indicating they are a woman, when the license database is compared to the survey results (16.2% and 15.2%, respectively). This roughly ~1% discrepancy could be due to issues within the license database, the survey, or partial errors in both; however, the difference isn't large enough to warrant weighting.

Results of non-response bias tests between survey responses and non-response survey responses were not significant at the, $\alpha = .05$ level, and did not warrant the construction of non-response weights. Complete results for these tests are available in Appendix 3.1 and 3.2.

RESULTS

Descriptive statistics are reported for all survey questions included on the survey (Tables 1-34). The survey results can be divided into 4 distinct sections: fishing behaviors and actions (Tables 1-22, 27-28), fishing opinions (Tables 23-26), wildlife-related recreation (Tables 29-32), and demographic information (Tables 33-34).

DISCUSSION AND MANAGEMENT IMPLICATIONS

The methodology for this project was implemented to achieve multiple objectives and return accurate statewide results. Unfortunately, the response rate for this survey was lower than expected. Prior surveys administered by DWR have received response rates of over 20% (Valdez, 2019). Due to the relatively recent establishment of a biennial timeframe for the angler survey we don't have historic background knowledge of angler response rates, compared to the decades of hunter survey response rates available. However, the decline in response rates follows a national trend in survey response rates (US BLS, 2022). Additionally, other variables may have influenced the response rate. The timeline of survey distribution was delayed and pushed the survey distribution period into the busy holiday season. Efforts should be made to avoid sending surveys via mail or email from November – early January, as holidays can impact response rate (Saleh and Bista, 2017). This was the first survey contracted with the Center for Survey Research at the University of Virginia. For future projects we will distribute surveys earlier in the year, and discuss potential changes that can be made to enhance survey accessibility and whether to include all partners' logos and associations, as these may alter response rates of people from various communities, regions, and age groups (Edwards et al., 2014; Jans et al., 2015).

Table 1. Responses to the question, “Did you go freshwater fishing in Virginia in the last 12 months?”

Response	%	n
Yes	85.1	1208
No	14.9	211

Table 2. Responses to the question, “In the last 12 months, how many **days** did you fish at freshwater sites in Virginia?”

Response	Mean (<i>SE</i>)	Median	n
Days spent freshwater fishing	27.96 (1.2)	15	1097

Table 3. Responses to the question, “In the last 12 months, how long was your trip (**in minutes**, one way) to get to:”

Response	Mean (<i>SE</i>)	Median	n
Most often fished freshwater site	41.2 (1.7)	25	1061
Furthest trip to a freshwater site	82.7 (2.1)	60	996

Table 4. Responses to the question, “In the last 12 months, how many different freshwater **fishing sites** in Virginia did you fish at?”

Response	Mean (<i>SE</i>)	Median	n
Number of freshwater fishing sites	4.8 (0.1)	3	1088

Table 5. Responses to the question, “In the last 12 months, what percent of your fishing trips were taken on your own, with family, or with friends or social groups?” Only responses totaling 100% considered for analysis.

Response	Mean (<i>SE</i>)	n
On your own	35.1 (1.1)	1068
With family	42.9 (1.2)	1068
With friends or social groups	21.9 (1.0)	1068

Table 6. Responses to the question, “In the last 12 months, what percent of your days did you spend fishing on each of the following types of water in Virginia?” Only responses totaling 100% considered for analysis.

Response	Mean (<i>SE</i>)	n
Public lakes or reservoirs greater than 500 acres	22.7 (1.1)	1038
Public lakes or reservoirs, less than 500 acres	23.5 (1.0)	1038
Non-tidal rivers and streams above the fall line (non-trout streams)	13.9 (0.9)	1038
Tidal rivers below the fall line	11.2 (0.8)	1038
Public coldwater rivers and streams (trout streams) – Stocked by DWR	10.6 (0.7)	1038
Public coldwater rivers and streams (trout streams) – Wild trout streams	5.4 (0.5)	1038
Private lakes and ponds (including home-owner association ponds)	12.8 (0.8)	1038

Table 7. Responses to the question, “In the last 12 months, which of the following methods did you use while freshwater fishing in Virginia?” Respondents could select more than one option.

Response	%	n
Rod and reel	98.8	1072
Jugs, set lines, set poles	4.5	49
Bowfishing	1.0	11
Other [†]	2.8	30

[†]Other responses (n = 30): fly fishing (24), netting (2), gigging (1), live bait (1), and hook/line (2).

Table 8. Responses to the question, “In the last 12 months, what percent of your freshwater fishing activities were done in the following ways?” Only responses totaling 100% considered for analysis.

Response	%	Mean (SE)	n
From a motorized boat	42.9	28.0 (1.2)	1069
From a non-motorized boat (Ex: canoe, kayak)	31.6	14.5 (0.9)	1069
From the shore, pier, or a dock	70.8	45.6 (1.3)	1069
By wading	27.9	11.9 (0.8)	1069

Table 9. Responses to the question, “Did you compete in any freshwater fishing tournaments in Virginia in the last 12 months?”

Response	%	n
Yes	6.4	69
No	93.6	1012

Table 10. Responses to the question, “Please check the fish that you specifically fished for in freshwater in Virginia in the last 12 months.” Respondents could select more than one option.

Response	%	n
Smallmouth bass	58.0	631
Largemouth bass	70.0	761
Striped bass or Hybrid Striped bass	22.9	249
Panfish (bream, sunfish, rock bass)	41.9	455
Shad or herring	6.7	73
White perch	11.6	126
Crappie	40.9	445
Flathead catfish	19.7	214
Blue catfish	29.7	323
Channel catfish	32.7	355
Walleye, Sauger, or Saugeye	6.8	74
Stocked trout (Brook, Rainbow, Brown)	29.3	319
Wild trout (not stocked, Brook, Rainbow, Brown)	16.3	177
Northern pike or Chain pickerel	5.4	59
Muskellunge	4.5	49
Yellow perch	12.4	135
Carp	7.4	81
Suckers	2.2	24
Northern snakehead	4.2	46
Anything that bites	36.1	392
Other [†]	3.3	36

†Other responses (n = 33): Bowfin (7), Blue Gill (3), “small native species” (1), Red Drum (2), Spotted Bass (2), “horny heads” (1), Croaker (1), and Gar (1).

Table 11. Responses to the question, “From the list of fish species on the previous page, please write the letter of the species that you fish for the most often in freshwater in Virginia.”

Response	Species	%	n
1 st most often fished species	Largemouth bass	35.7	375
2 nd most often fished species	Smallmouth bass	16.7	162
3 rd most often fished species	Anything that bites	16.6	107

Table 12. Responses to the question, “Did you fish in freshwater with a guide in the last 12 months?”

Response	%	n
Yes	4.9	53
No	95.1	1030

Table 13. Responses to the question, “What is your freshwater fishing experience level?”

Response	%	n
Beginner	4.5	48
Novice	10.7	114
Intermediate	36.4	387
Advanced	38.5	410
Expert	9.9	105

Table 14. Responses to the question, “In the past 12 months, did you use live bait while freshwater fishing in Virginia?”

Response	%	n
Yes	57.9	627
No	42.1	455

Table 15. Responses to the question, “Three types of live bait are listed in the table below. If you used these types of live bait, indicate whether the bait was purchased from a retail store, captured/trapped, or both. Only consider live bait used in your fishing trips in Virginia in the past 12 months.”

Response	%	n
Purchased		
Bait fish (Examples: minnows, chubs)	76.8	387
Crayfish	3.0	15
Salamanders	2.4	12
Captured/Trapped		
Bait fish (Examples: minnows, chubs)	38.3	193
Crayfish	13.9	70
Salamanders	3.8	19

Table 16. Responses to the question, “Have you consumed any freshwater fish that you caught in Virginia?”

Response	%	n
Yes	44.7	483
No	55.3	597

Table 17. Responses to the question, “Have you shared your freshwater catch for others (friends, family, etc.) to consume?”

Response	%	n
Yes	41.2	445
No	58.8	636

Table 18. Responses to the question, “In the last 12 months, did you participate in any night fishing while freshwater fishing in Virginia?”

Response	%	n
Yes	26.2	281
No	73.8	790

Table 19. Responses to the question, “What percent of your freshwater fishing effort in Virginia is done at night?” Only respondents who answered ‘Yes’ to the night fishing question were asked to respond to this question.

Response	Mean (SE)	Median	n
Night fishing	25.6 (1.4)	20.0	278

Table 20. Responses to the question, “In the last 12 months, did you freshwater fish at any of the following public lands in Virginia?” Respondents could select more than one answer.

Response	%	n
National Forest	22.6	242
Wildlife Management Area (WMA)	25.0	268
State Park	36.7	393
State Forest	8.6	92

Table 21. Responses to the question, “Are you a member of a national fishing organization or fishing club? (Example: BASS)”

Response	%	n
Yes	7.9	85
No	92.1	993

Table 22. Responses to the question, “Are you a member of a statewide or local fishing organization or fishing club? (Example: Virginia Anglers Club)”

Response	%	n
Yes	5.1	55
No	94.9	1023

Table 23. Responses to the question, “How unimportant or important are the following factors when you choose a location to go fishing?” Mean responses are based on a scale from Very Unimportant (1) to Very Important (5).

	Mean (SE)	Response % (Count)				
		Very Unimportant	-	Neutral	-	Very Important
Fishing location close to home	3.6 .03	4.6 49	7.2 77	30.6 328	37.6 402	20.0 214
Knowing that many different fish species are present	3.5 .03	4.9 52	11.4 121	30.2 321	37.4 397	16.0 170
Knowing that my target species is present	4.0 .03	6.1 65	5.9 63	14.2 150	33.7 357	40.0 424
Free fishing access	3.8 .04	5.5 58	8.0 85	20.0 211	30.2 319	36.3 384
Boat ramps available	3.2 .04	14.0 148	18.7 198	22.7 240	24.5 259	20.0 211
Piers available	2.9 .03	13.6 143	20.0 210	35.7 376	21.5 226	9.2 97
Restrooms available	3.0 .04	11.8 124	20.8 218	33.6 353	22.6 237	11.2 118
The area is not crowded	3.9 .03	3.6 38	3.8 40	18.1 192	43.8 466	30.8 327
The area is clean (litter free)	4.2 .03	4.1 43	1.5 16	8.4 89	38.2 404	47.9 507
Fish are stocked regularly	3.3 .03	7.9 84	13.7 146	36.7 390	23.4 249	18.2 193
Parking available	3.9 .03	4.3 46	4.7 50	17.1 182	44.5 472	29.3 311
Fishing access for disabled anglers is available	3.2 .04	11.7 124	12.3 130	38.2 403	22.9 242	14.9 157
Regulations posted on site (signs on trees, at ramp)	3.6 .03	6.7 71	8.1 86	28.6 303	34.7 367	21.8 231
Other [†]	3.4 .07	7.1 17	5.5 13	52.5 125	10.9 26	23.9 57

[†]Other responses (n = 88): law enforcement presence/checks (10), water quality (8), maintained boat ramps (7), and personal safety (4).

Table 24. Responses to the question, “Please indicate the extent that you disagree or agree with the following statements about your freshwater fishing trips.” Mean responses are based on a scale of Strongly disagree (1) to Strongly agree (5).

	Mean (<i>SE</i>)	Response % (<i>Count</i>)				
		Strongly disagree	-	Neutral	-	Strongly agree
A successful fishing trip is one in which I catch many fish	3.0 .03	5.5 59	24.6 262	37.2 395	26.2 279	6.4 68
Catching a big trophy fish is the biggest reward to me	2.8 .03	11.1 118	27.8 295	35.0 372	17.7 188	8.4 89
A fishing trip is successful even if I do not catch any fish	3.8 .03	1.3 14	9.1 97	17.4 185	49.5 526	22.6 240
I usually eat the fish I catch	2.5 .04	30.0 276	27.6 293	20.1 214	18.4 196	7.9 84
I would rather catch 1 or 2 big fish than 10 smaller fish	3.1 .03	5.6 60	23.4 249	37.6 400	24.2 258	9.2 98
I want to keep all the fish I catch	1.8 .03	44.4 471	36.6 388	14.1 150	3.5 37	1.4 15
I’m happiest with the fishing trip if I catch a challenging fish	3.5 .03	4.4 47	9.1 97	30.7 327	43.3 461	12.4 132
When I go fishing, I’m not satisfied unless I catch at least something	2.9 .03	11.4 121	24.9 265	29.6 314	26.7 284	7.3 78
A successful trip is when I reach my catch or creel limit	2.4 .03	21.1 224	32.8 348	32.9 349	10.9 116	2.3 24

Table 25. Responses to the question, “Rate the **performance** of the following functions of the Virginia Department of Wildlife Resources.” Mean responses are based on a scale of Very poor (1) to Very good (5). Mean and percent responses do not include responses of “Don’t know”.

Mean (<i>SE</i>)	Response % (<i>Count</i>)				
	Don’t know	Very Poor	-	Neither good or poor	-

Providing information about fishing regulations	4.0 .02	- 12	0.6 6	3.6 36	12.2 123	58.4 586	25.2 253
Working with private landowners to open access to fishing water	3.3 .04	- 68	5.5 38	13.9 96	40.6 280	29.4 203	10.6 73
Improving habitat for fish	3.7 .03	- 37	4.0 33	7.3 61	21.9 182	48.8 405	17.9 149
Providing information about where to fish	3.7 .03	- 25	3.4 32	7.3 70	19.8 189	49.5 471	20.0 190
Providing information about fish consumption advisories	3.7 .03	- 39	2.7 23	6.0 51	25.3 216	46.0 393	20.0 171
Teaching youth to fish	3.7 .04	- 66	3.8 28	5.6 41	29.5 216	40.0 293	21.1 155
Improving existing angler access for fishing	3.5 .03	- 56	3.3 26	10.4 81	32.8 256	40.6 317	12.9 101
Determining the effects of regulation changes (size and creel limits) on fish species	3.6 .03	- 54	2.3 18	7.8 61	28.5 224	46.6 366	14.8 116
Controlling nonnative, invasive aquatic species	3.5 .04	- 76	4.6 34	9.3 69	35.8 264	35.5 262	14.8 109
Restoring native aquatic vegetation	3.5 .04	- 84	4.5 31	6.9 48	38.2 264	35.0 242	15.3 106
Conserving native fish	3.7 .03	- 60	2.7 21	6.4 50	26.6 208	45.8 358	18.4 144
Stocking warmwater fish (bass, stripers, catfish)	3.5 .04	- 52	5.1 39	10.8 82	29.8 226	38.9 295	15.3 116
Stocking coldwater fish (trout)	3.7 .03	- 50	3.5 28	7.4 59	25.8 205	43.9 348	19.3 153

Table 26. Responses to the question, “Do you agree or disagree that the following reasons limit or prevent you from fishing more often?” Mean responses are based on a scale of Strongly disagree (1) to Strongly agree (5).

Mean (SE)	Response % (Count)				
	Strongly disagree	-	Neither agree or disagree	-	Strongly agree
2.5	13.3	40.4	32.0	11.3	3.0

Fishing regulations are too confusing	.03	136	414	328	116	31
License fees for fishing are too expensive	2.8 .03	10.3 106	34.1 350	29.0 297	18.1 186	8.4 86
I can't catch enough fish to suite me	2.4 .03	16.3 166	40.8 415	31.1 316	9.6 98	2.2 22
I don't have enough fishing opportunities close to home	2.7 .03	12.3 126	37.5 385	24.2 249	20.6 212	5.3 55
I don't know where to fish	2.4 .03	19.0 194	43.1 441	20.9 214	15.0 153	2.0 21
I have too many work commitments	3.2 .04	8.4 86	22.2 226	25.7 262	32.8 334	10.9 111
I have too many family commitments	2.9 .03	8.7 89	27.7 282	33.3 339	24.5 249	5.8 59
Other recreational activities take up my time	2.8 .03	9.9 101	30.2 308	34.7 354	22.5 230	2.7 28
Fishing regulation are too restrictive	2.4 .03	14.7 150	44.7 457	31.4 321	7.3 75	1.9 20
The cost of fishing equipment and supplies is too high	2.8 .03	10.1 103	30.3 310	32.0 327	21.6 221	6.0 61
Fishing facilities and areas are too crowded	2.9 .03	5.9 60	26.7 274	41.2 422	20.9 214	5.3 54
I can't afford to fish more often	2.3 .03	15.3 156	46.5 474	29.0 296	7.3 74	1.9 19
Fishing facilities (ramps, piers, etc.) need improvement	3.0 .03	5.6 57	25.0 255	42.4 432	20.0 204	6.9 70
I don't have anyone to fish with me	2.3 .03	18.2 186	43.5 445	25.6 262	10.9 112	1.8 18
Personal health concerns	2.1 .03	26.8 272	41.4 421	24.9 253	5.5 56	1.4 14
Overall, I am satisfied with the amount of time I spend fishing	3.2 .03	6.1 62	26.0 264	20.8 211	37.0 376	10.1 103
Other [†]	3.4 .09	6.9 10	6.2 9	50.0 72	15.3 22	21.5 31

†Other responses (n = 39): upset by lack of enforcement (6) and poor shore fishing access (4).

Table 27. Responses to the question, “In the last 12 months, how many **days** did you fish at saltwater sites in Virginia?”

Response	Mean (SE)	Median	n
Saltwater fishing in VA	4.3 (0.4)	0.0	1220

Table 28. Responses to the question, “In the last 12 months, how many **days** did you fish at freshwater or saltwater sites outside of Virginia?”

Response	Mean (SE)	Median	n
All fishing outside VA	4.3 (0.4)	0.0	1222

Table 29. Responses to the question, “Within the last 12 months, have you participated in any kind of wildlife recreation in Virginia?”

Response	%	n
Yes	82.1	1013
No	17.9	221

Table 30. 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 .04	26.2 252	33.3 320	15.8 152	11.3 109	13.3 128
Hunter	2.7 .06	42.0 405	12.3 119	9.0 87	7.7 74	28.9 279
Angler	1.4 .03	71.8 702	20.0 195	3.6 35	1.9 19	2.7 26

Table 31. 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.

Response	%	Mean (SE)	n
In Virginia			
Wildlife Viewing	78.4	60.7 (3.7)	833
Hunting	51.6	17.0 (1.2)	848
Outside Virginia			
Wildlife Viewing	46.6	8.7 (1.1)	648
Hunting	14.8	2.4 (0.7)	627

Table 32. 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	28.5	330
Biking	27.9	323
Camping	44.6	517
Hiking or backpacking	45.6	528
Horseback riding	5.9	68
Motorized boating	34.3	398
Non-motorized boating (such as kayaking or canoeing)	39.0	452
Swimming	37.5	435
Recreational shooting sports	30.4	352
Running, jogging, or walking	43.6	505
Winter sports	8.4	97
Viewing wildflowers	18.5	215
I do not participate in any of these activities	9.7	112
Other [†]	6.5	75

[†]Other responses (n = 71): foraging (8), off roading/ATV/motorcycles (9), disc golf (3), golf (6), metal detecting (2), picnicking (2), and litter clean ups (2).

Table 33. Responses to demographic questions.

Demographics	Mean	SE
Age (Years)	48.2	0.44
	%	n
Gender		
Woman	15.2	180
Man	83.2	989
Transgender	0.1	1
A gender not listed here	0.8	9
Prefer not to answer	0.8	9
Ethnicity		
Hispanic	3.6	41
Non-Hispanic	96.4	1084
Race		
White	88.0	1038
Black or African American	5.9	70
American Indian or Alaska Native	0.4	5
Asian	2.0	24
Native Hawaiian or other Pacific Islander	0.2	2

Other	2.3	27
Multiple Selected	1.2	14
Highest formal education		
Less than high school	3.5	42
High school diploma or equivalent	28.4	337
Some college, no degree	24.2	287
Associate's degree	8.3	99
Bachelor's degree	21.1	251
Master's degree	9.4	112
Professional degree	2.4	29
Doctorate degree	2.6	31
Household Income		
Less than \$24,999	15.6	175
\$25,000 to \$49,999	22.3	250
\$50,000 to \$74,999	23.2	260
\$75,000 to \$99,999	14.4	162
\$100,000 to \$124,999	9.1	102
\$125,000 or more	15.5	174

Table 34. 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
Early life residency		
Urban	13.0	151
Suburban	37.7	438
Rural	49.3	573
Current residency		
Urban	12.1	142
Suburban	41.2	484
Rural	46.7	548

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APPENDICES

Appendix 1. 2020-2021 Angler Survey

Dear Virginia Angler,

The Virginia Department of Wildlife Resources (DWR) serves the Commonwealth of Virginia by managing freshwater fish populations and providing diverse fishing opportunities across the state. To improve our service to the Commonwealth, DWR wants to better understand your fishing effort and preferences, and invites you to participate in the 2020-2021 Virginia Angler Survey. For this survey, DWR is inviting a small number of anglers that purchased a fishing license in 2020 or 2021. The survey has questions about how often you fish, the types of fish and water bodies you prefer, and your views of DWR.

Please take the time to complete this survey, even if you have not recently fished or fished 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 we can to protect your privacy and confidentiality. Your name will never be associated with your responses. Results of this study will be reported in aggregate 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. Instructions for completing this survey are below. Thank you for your assistance!

Sincerely,

Mike Bednarski
Chief of Fisheries



CONSERVE. CONNECT. PROTECT.



UNIVERSITY
of VIRGINIA

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.

1. Did you go freshwater fishing in Virginia in the last 12 months?

Yes

No (If No, skip to Question 27, Page 10)

2. In the last 12 months, how many **days** did you fish at freshwater sites in Virginia? _____ **Days**

3. In the last 12 months, how long was your trip (**in minutes**, one way) to get to:

a. The freshwater site in Virginia you most often fished: _____ **Minutes**

b. The freshwater site in Virginia that was your furthest trip: _____ **Minutes**

4. In the last 12 months, how many different freshwater **fishing sites** in Virginia did you fish at?

_____ **Sites**

5. In the last 12 months, what percent of your fishing trips were taken on your own, with family, or with friends or social groups? (*Answers should add to 100%*)

On your own _____ %

With family _____ %

With friends or social groups _____ %

Total = _____ **100** %

6. In the last 12 months, what percent of your days did you spend fishing on each of the following types of water in Virginia? (*Answers should add to 100%*)

Public lakes or reservoirs, greater than 500 acres (Examples: Smith Mountain, Kerr, Chesdin, Moomaw, Briery Creek) _____ %

Public lakes or reservoirs, less than 500 acres _____ %

Non-tidal rivers and streams above the fall line (non-trout streams) _____ %

Tidal rivers below the fall line _____ %

Public coldwater rivers and streams (trout streams) – Stocked by DWR _____ %

Public coldwater rivers and streams (trout streams) – Wild trout streams _____ %

Private lakes and ponds (including home-owner association ponds) _____ %

Total = _____ **100** %

7. In the last 12 months, which of the following methods did you use while freshwater fishing in Virginia? (Check all that apply)

- Rod and reel
- Jugs, set lines, set poles, etc.
- Bowfishing
- Other (Please specify): _____

8. In the last 12 months, what percent of your freshwater fishing activities were done in the following ways? (Answers should add to 100%)

From a motorized boat	_____ %
From a non-motorized boat (Ex: canoe, kayak)	_____ %
From the shore, pier, or a dock	_____ %
By wading	_____ %
Total =	<u>100</u> %

9. Did you compete in any freshwater fishing tournaments in Virginia in the last 12 months?

- Yes
- No

10. Please check the fish that you specifically fished for in freshwater in Virginia in the last 12 months. (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> A: Smallmouth bass | <input type="checkbox"/> K: Walleye, Sauger, or Saugeye |
| <input type="checkbox"/> B: Largemouth bass | <input type="checkbox"/> L: Stocked trout (Brook, Rainbow, Brown) |
| <input type="checkbox"/> C: Striped bass or Hybrid Striped bass | <input type="checkbox"/> M: Wild trout (not stocked, Brook, Rainbow, Brown) |
| <input type="checkbox"/> D: Panfish (bream, sunfish, rock bass) | <input type="checkbox"/> N: Northern pike or Chain pickerel |
| <input type="checkbox"/> E: Shad or herring | <input type="checkbox"/> O: Muskellunge |
| <input type="checkbox"/> F: White perch | <input type="checkbox"/> P: Yellow perch |
| <input type="checkbox"/> G: Crappie | <input type="checkbox"/> Q: Carp |
| <input type="checkbox"/> H: Flathead catfish | <input type="checkbox"/> R: Suckers |
| <input type="checkbox"/> I: Blue catfish | <input type="checkbox"/> S: Northern snakehead |
| <input type="checkbox"/> J: Channel catfish | <input type="checkbox"/> T: Anything that bites |
| | <input type="checkbox"/> U: Other (please specify): _____ |

11. From the list of fish species on the previous page, please write the letter of the species that you fish for the most often in freshwater in Virginia (example: write B for Largemouth Bass; write G for Crappie).

1st most often fished species _____

2nd most often fished species _____

3rd most often fished species _____

12. Did you fish in freshwater with a guide in the last 12 months?

- Yes
- No

13. What is your freshwater fishing experience level?

- Beginner** – Very limited experience holding a rod and casting
- Novice** – Some experience with rod and casting techniques and beginning to experiment with different types of tackle
- Intermediate** – Comfortable with the rod, casting, and tackle selection in some settings
- Advanced** – Lots of experience with equipment and techniques in many settings
- Expert** – Very experienced with equipment and techniques in all settings

14. In the past 12 months, did you use live bait while freshwater fishing in Virginia?

- Yes
- No (If No, skip to Question 16)

15. Three types of live bait are listed in the table below. If you used these types of live bait, indicate whether the bait was purchased from a retail store, captured/trapped, or both. Only consider live bait used in your fishing trips in Virginia in the past 12 months. (*Check all that apply*)

Type of bait	Purchased	Captured/Trapped
Bait fish (Examples: minnows, chubs)	<input type="checkbox"/>	<input type="checkbox"/>
Crayfish	<input type="checkbox"/>	<input type="checkbox"/>
Salamanders	<input type="checkbox"/>	<input type="checkbox"/>

Questions 16 and 17 are about fish consumption. Only consider the freshwater fish harvested in Virginia in the past 12 months.

16. Have you consumed any freshwater fish that you caught in Virginia?

- Yes
- No

17. Have you shared your freshwater catch for others (friends, family, etc.) to consume?

- Yes
- No

18. In the last 12 months, did you participate in any night fishing while freshwater fishing in Virginia?

- Yes
- No (If No, skip to Question 20)

19. What percent of your freshwater fishing effort in Virginia is done at night?

_____ % Fishing Done at Night

20. In the last 12 months, did you freshwater fish at any of the following public lands in Virginia? (*Check all that apply*)

- National Forest
- DWR Wildlife Management Area (WMA)
- State park
- State forest

21. Are you a member of a national fishing organization or fishing club? (Example: BASS)

- Yes
- No

22. Are you a member of a statewide or local fishing organization or fishing club? (Example: Virginia Anglers Club)

- Yes
- No

23. How unimportant or important are the following factors when you choose a location to go fishing?
 (Check one answer for each statement)

	Very Unimportant	Unimportant	Neutral	Important	Very Important
Fishing location close to home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knowing that many different fish species are present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knowing that my target species is present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Free fishing access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boat ramps available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piers available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrooms available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The area is not crowded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The area is clean (litter free)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish are stocked regularly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing access for disabled anglers is available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regulations posted on site (signs on trees, at ramp)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other: _____

24. Please indicate the extent that you disagree or agree with the following statements about your freshwater fishing trips. (Check one answer for each statement)

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
A successful fishing trip is one in which I catch many fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Catching a trophy fish is the biggest reward to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A fishing trip is successful even if I do not catch any fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I usually eat the fish I catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would rather catch 1 or 2 big fish than 10 smaller fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I want to keep all the fish I catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'm happiest with the fishing trip if I catch a challenging fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I go fishing, I'm not satisfied unless I catch at least something	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A successful trip is when I reach my catch or creel limit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. Rate the **performance** of the following functions of the Virginia Department of Wildlife Resources.
(Check one answer for each statement)

	Don't know	Very poor	Poor	Neither good or poor	Good	Very good
Providing information about fishing regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working with private landowners to open access to fishing water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improving habitat for fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Providing information about where to fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Providing information about fish consumption advisories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching youth to fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improving existing angler access for fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Determining the effects of regulation changes (size and creel limits) on fish species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controlling nonnative, invasive aquatic species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restoring native aquatic vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conserving native fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stocking warmwater fish (bass, stripers, catfish)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stocking coldwater fish (trout)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

26. Do you agree or disagree that the following reasons limit or prevent you from fishing more often?
 (Check one answer for each statement)

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Fishing regulations are too confusing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
License fees for fishing are too expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can't catch enough fish to suit me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't have enough fishing opportunities close to home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't know where to fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have too many work commitments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have too many family commitments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other recreational activities take up my time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing regulation are too restrictive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The cost of fishing equipment and supplies is too high	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing facilities and areas are too crowded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can't afford to fish more often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing facilities (ramps, piers, etc.) need improvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't have anyone to fish with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal health concerns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall, I am satisfied with the amount of time I spend fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other: _____

27. In the last 12 months, how many **days** did you fish at saltwater sites in Virginia?

_____ **Days**

28. In the last 12 months, how many **days** did you fish at freshwater or saltwater sites outside of Virginia?

_____ **Days**

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.

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

- Yes
- No (If No, Skip to Question 32, Next Page)

30. 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 or unlike me	Somewhat unlike me	Very unlike me
Wildlife viewer: someone who intentionally observes, photographs, feeds, or collects data about wildlife or visits parks and natural areas because of wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hunter: someone who participates in hunting or trapping, with a license or exempt from a license, using any legal method to harvest wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Angler: someone who participates in fishing, in either freshwater or saltwater areas, to harvest and/or catch-and-release fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. 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 leave the space blank.)*

	In Virginia	Outside Virginia
Wildlife Viewing	_____ Days	_____ Days
Hunting	_____ Days	_____ Days

32. 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 check 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"/> Motorized boating	<input type="checkbox"/> Viewing wildflowers
<input type="checkbox"/> I do not participate in any of these activities	<input type="checkbox"/> Other (please specify): _____

33. In what year were you born? _____

34. What is your gender?

- Woman
- Man
- Transgender
- A gender not listed here (Please specify:) _____
- Prefer not to answer

35. What is your ethnicity?

- Hispanic
- Non-Hispanic

36. What is your race?

- | | |
|---|--|
| <input type="checkbox"/> White | <input type="checkbox"/> Asian |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> Native Hawaiian or Pacific Islander |
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Other (Please specify): _____ |

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

- | | | |
|--|---|--|
| <input type="checkbox"/> Less than high school | <input type="checkbox"/> Associate's degree | <input type="checkbox"/> Professional degree |
| <input type="checkbox"/> High school diploma or equivalent | <input type="checkbox"/> Bachelor's degree | <input type="checkbox"/> Doctorate degree |
| <input type="checkbox"/> Some college, no degree | <input type="checkbox"/> Master's degree | |

38. What was your total individual income during the past 12 months? (*Select one*)

- | | | |
|--|--|--|
| <input type="checkbox"/> Less than \$24,999 | <input type="checkbox"/> \$50,000 - \$74,999 | <input type="checkbox"/> \$100,000 - \$124,999 |
| <input type="checkbox"/> \$25,000 - \$49,999 | <input type="checkbox"/> \$75,000 - \$99,999 | <input type="checkbox"/> \$125,000 or more |

39. 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
Where I live now	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Where I lived growing up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you have any further comments about freshwater fishing in Virginia, please share them in the space below.

Thank you for taking the time to complete this survey. Please place the completed survey in the pre-paid envelope that arrived with this survey. If you have any questions regarding this study, please contact the Center for Survey Research at 434-243-5232 or surveys2@virginia.edu.

Appendix 2.1 2020-2021 Angler Survey first postcard reminder

Dear Virginia Angler,

Recently, you should have received an invitation to participate in an angler survey sponsored by the Virginia Department of Wildlife Resources. 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 small group of anglers selected for this survey and we want to hear back from you.

Please mail your completed survey to us using the pre-paid envelope that was sent with the survey. For a replacement survey or envelope, please call the number below. If you prefer, the survey can be completed online at www.virginiawildlife.gov/surveys. If you complete the survey online, you will be asked to provide an ID#. Your ID# is on the opposite side of this postcard, below the address.

Sincerely,

Mike Bednarski
Chief of Fisheries

Virginia Department of Wildlife Resources
Conserve. Connect. Protect

Phone: 555-555-5555
E-mail: someone@example.com

Return Address for UVA

Return Address Line 1
Line 2
Line 3

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 2.2 2020-2021 Angler Survey final postcard reminder

Dear Virginia Angler,

This is the final reminder to please participate in the Virginia Angler 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 small group of anglers selected for this survey and your views are important to us.

Please mail your completed survey to us using the pre-paid envelope that was sent with the survey. For a replacement survey or envelope, please call the number below. If you prefer, the survey can be completed online at www.virginiawildlife.gov/surveys. If you complete the survey online, you will be asked to provide an ID#. Your ID# is on the opposite side of this postcard, below the address.

Sincerely,

Mike Bednarski
Chief of Fisheries

Virginia Department of Wildlife Resources
Conserve. Connect. Protect

Phone: 555-555-5555
E-mail: 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 3.1 *Non-response bias test results between respondents and non-respondents for fishing related activities*

	Response	Non-response	Comparison		
			Stat. test	<i>p</i> value	Effect size
Days freshwater fished	28.0	33.7	W = 38441	0.34	Cliff's Δ = -0.07
Days saltwater fished	4.29	9.04	W = 48337	0.05	Cliff's Δ = -0.10
Days fished outside VA	4.31	4.16	W = 49879	0.27	Cliff's Δ = -0.06
Travel to favorite spot (minutes)	41.2	42.7	W = 39832	0.54	Cliff's Δ = 0.04
Travel to furthest spot (minutes)	82.7	83.3	W = 31461	0.86	Cliff's Δ = -0.02
Number of fishing locations	4.82	5.74	W = 36521	0.18	Cliff's Δ = -0.09
Fishing locations (% fished from)					
Motorized boat	42.9	36.0	$\chi^2 = 1.38$	0.24	Cramer's V = 0.03
Non-motorized boat	31.6	45.3	$\chi^2 = 8.58$	0.003	Cramer's V = 0.08
Shore, pier, dock	70.8	88.0	$\chi^2 = 10.3$	0.001	Cramer's V = 0.09
Wading	27.9	41.3	$\chi^2 = 6.19$	0.01	Cramer's V = 0.07
Fish consumption (% Yes)	44.7	46.7	$\chi^2 = 0.12$	0.73	Cramer's V = 0.01

Appendix 3.2 *Non-response bias test results between respondents and non-respondents for demographic information*

	Response	Non-response	Comparison		
			Stat. test	<i>p</i> value	Effect size
Age (Years)	48.2	45.3	W = 52229	0.07	Cliff's Δ = 0.12
Gender (% Women)	15.1	21.3	$\chi^2 = 2.52$	0.11	Cramer's V = 0.04
Ethnicity (% Hispanic)	3.6	2.6	$\chi^2 = 0.21$	0.64	Cramer's V = 0.004
Race (% White)	88.0	82.9	$\chi^2 = 1.90$	0.17	Cramer's V = 0.03
Education (% Bachelor's Degree or Higher)	35.5	43.6	$\chi^2 = 2.29$	0.13	Cramer's V = 0.04
Income (% \$75,000 or higher)	39.0	52.4	$\chi^2 = 5.83$	0.02	Cramer's V = 0.07
Early life residency (%)			$\chi^2 = 2.36$	0.31	Cramer's V = 0.04
Urban	13.0	7.2			
Suburban	37.7	41.0			
Rural	49.3	51.8			
Current residency (%)			$\chi^2 = 1.12$	0.57	Cramer's V = 0.03
Urban	12.1	10.6			
Suburban	41.2	47.1			
Rural	46.7	42.3			

Appendix 3.3 *Response rates per age quartile of survey respondent*

Age Quartiles for Sample	Response Rate (%)	n
1 (18-28 years)	5.8	212
2 (29-38 years)	7.5	263
3 (39-50 years)	10.3	362
4 (51-85 years)	17.9	590