2018-2019 Virginia Trapper Harvest Survey

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ABSTRACT

A mail survey was conducted following the 2018-2019 season to quantify trapper harvest and effort for furbearer species. Surveys were mailed to 1,500 randomly selected trappers who held annual or multi-year trapping licenses valid during the 2018-2019 season (*N*=1,924). Of the 1,500 surveys mailed, 548 (36.5%) were returned and all contained some usable data. Of the trappers who responded, 294 (53.6%) reported that they trapped during the 2018-2019 season (active trappers) and 254 (46.4%) reported that they did not trap (non-active trappers). The number of active trappers that provided usable information for county/effort analyses was 284 (96.6%). On average, active trappers set 11.6 (SE ± 0.8) traps for 33.3 (SE ± 2.3) days during the 2018-2019 season. Response data was used to estimate trapping experiences of non-respondents and calculate total harvest, number of trappers, trapping effort, and catch per unit effort for each furbearer species statewide and by region. Trappers harvested an estimated statewide total of 34,349 ± 112.1 furbearers. Raccoons and opossum were the most-harvested species with estimated totals of 9,534 ± 35.3 and 5,529 ± 19.9, respectfully. Observations of fishers, spotted skunks, and least weasels were also reported by trappers.

GOAL & OBJECTIVE

To quantify 2018-2019 statewide trapper effort and furbearer harvest and obtain additional occurrence information for rare furbearer species (i.e., fisher, spotted skunk, and least weasel).

METHODS

A total of 1,924 persons possessed Virginia trapping licenses valid during the 2018-2019 trapping season. From that total, a random sample of 1,500 persons was selected using information from the Virginia Department of Game & Inland Fisheries license database. The sample represented 78.0% of all license holders who held a valid license for some portion the 2018-2019 season including statewide resident (includes senior, junior and regular, N=892), county/city license holders (N=562), multi-year

license holders (N=26), and nonresident license holders (N=20). On 13 May 2019, each trapper was mailed a one-page (front and back) questionnaire (Appendix A), cover letter (Appendix B), and a postage-paid return envelope. A reminder postcard (Appendix C) was sent to non-respondents on 14 June 2019 (N=1,191). A third and final mailing identical to the first was sent on 3 August 2019 to survey recipients who did not respond to the previous two mailings (N=1,123). No surveys were reported as undeliverable so the effective sampling total was 1,500. Trapping season date information is provided in Appendix D. Survey response data (i.e., harvest data) were entered into an Access database where they were checked for quality and cleaned prior to statistical analyses.

Data Analysis.—Descriptive and inferential statistical analyses were conducted in RStudio (R Core Team 2018) with the assistance of R library packages "dplyr" (Wickham et al. 2018) and "survey" (Lumley 2017). Raw harvest data (county, species, number harvested, days trapped, number traps) were imported from the Access database as .csv files, transposed from column to row format, and used to create and append additional variables to the matrix, including trap region, number of trap days, and whether the data record represented target or non-target efforts and if trap efforts were successful. Successful harvest data were considered non-target harvest, or "bycatch", if the respondent reported take but zero trap days (i.e., number of days x number of traps), or if the species was marked as "non-target" in the response. These variables were used to subset and analyze data by target versus non-target efforts, successful versus non-successful efforts, and by region.

Input data for inferential statistical analyses conducted with R package "survey" were prepared by summarizing (subset) harvest data by individual trappers (rows) and species (columns) for the parameter of interest. Using these new input matrices, statewide and regional statistics (Tables 9–12) were estimated using the "svydesign()" function in R which allows for the incorporation of a finite population correction factor (FPC). For example, to estimate the total number of successful target

trappers (Table 10), the function is multiplying the proportion of successful target trappers among all survey responses (313/557 = 0.562) by the total number of trapping licenses (0.562 * 1,924 = 918). Whereas standard deviations (SD) are presented to describe the variability of survey response data (e.g., *average* days trapped; descriptive statistics) and provide ranges for estimates, standard errors (SE) are presented to provide a measure of precision around estimated parameters (e.g., *estimated* total number of furbearer species harvested) and were calculated by dividing the standard deviation (SD) by the square root of the appropriate sample size.

In addition, as is recommended when sampling is conducted without replacement from more than 5% of a finite population, a finite population correction factor (FPC) was used to calculate SE (i.e., more than 5% of the population of 2018-2019 trappers were sampled; 548 samples; finite population = 1,924 trapping licenses) (Lumley 2010; Thompson 2012). As survey responses were not normally distributed, 95% confidence intervals were calculated by using a logarithmic transformation of the estimate and delta-method approximation of variance (Seber 1982; Fletcher 2008). Hence, 95% CIs will not be symmetrical around parameter estimates.

RESULTS

A total of 548 (36.5% effective response rate) license holders responded to the survey (Table 1). Of the 548 surveys returned, all were considered usable responses for some aspect of the analysis. Of these, 10 were considered unusable (contained incomplete or unreliable data) for county/effort analysis. Of the 548 total returned surveys, 294 (53.6%) reported trapping activity during the 2018-2019 season (active trappers) and 254 (46.4%) reported no trapping activity (non-active trappers). Statewide, an estimated 1,031 (53.6% * 1,924) trappers set, on average, 11.6 (SE ± 0.8) traps for 33.3 (SE ± 2.3) days and harvested an estimated total of 34,349 ± 112.2 furbearers (Tables11 and 12). By species, total statewide trapper harvest was estimated to be 9,534 raccoons, 5,529 opossums, 4,388 coyotes, 4,216

muskrats, 3,998 red foxes, 3,490 beavers, 1,023 gray foxes, 840 striped skunks, 579 otters, 569 bobcats, 161 mink, 21 nutria, and 0 long-tailed weasels (Table 11). Average harvest per season for trappers targeting certain species was highest for muskrat, followed by raccoon, opossum, beaver, red fox, coyote, striped skunk, otter, gray fox, mink, bobcat, and nutria (Table 12). Trapper responses by license type and reported numbers of trappers, effort, and harvest from response data are presented in Tables 1–8. Extrapolated statewide and regional trapping effort and harvest estimates for all furbearer species are presented in Tables 9–12. Rare furbearer observations are reported in Table 13.

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TABLES & FIGURES

Table 1. Summary of trapping licenses sold in Virginia (2018-2019), license types represented in the survey sample, and license types represented by those who responded (active and non-active trappers) to the 2018-2019 Virginia Trapper Harvest Survey.

License Type	No. licensed trappers	% of licensed trappers	No. in survey sample	% in survey sample	No. of respondents	% of respondents[1]	No. active trappers	% of respondents[2]	No. non-active trappers	% of respondents[2]
Annual	1,862	96.8	1,454	96.9	524	36.0	279	53.2	245	46.8
Multi-year	34	1.8	26	1.7	13	50.0	9	69.2	4	30.8
Non-resident	27	1.4	20	1.3	11	55.0	6	54.5	5	45.5
Total	1,924		1,500	78.0	548	36.5	294	53.6	254	46.4

[1] Derived by dividing the number of respondents by the total number in the survey sample for each license type

[2] Derived by dividing the number of active/non-active trappers by the total number of respondents for each license type

Table 2. Number of Virginia trappers by number of counties trapped and physiographic region.

Grouped by	Category	No. trappers	% of total active trapper responses (*n*=294)
By Counties/Cities			
	Usable Responses		
	1	216	73.5
	2	39	13.3
	3	6	2.0
	No county specified	23	7.8
	Total no. unique trappers with **usable** response data	284	96.6
	Unusable Response Data		
	1	2	0.7
	2	1	0.3
	3	2	0.7
	Other[1]	5	1.7
	Total no. unique trappers with **unusable** response data	10	3.4
By Region[2]			
	Usable Responses		
	Northern Mountain	48	16.3
	Northern Piedmont	60	20.4
	Southern Mountain	64	21.8
	Southern Piedmont	61	20.8
	Tidewater	79	26.9
	No region specified	23	7.8
	Unusable Response Data		
	Northern Mountain	3	1.0
	Northern Piedmont	2	0.7
	Southern Mountain	1	0.3
	Southern Piedmont	1	0.3
	Tidewater	0	0.0
	Other[1]	5	1.7

[1] Insufficient information provided to distinguish trapping counties or trapper

[2] An individual trapper may trap in multiple regions; hence, the summation of these values will not equal totals by county/city

Table 3. Targeted furbearer trapping efforts reported by respondents to the 2018-2019 Virginia Trapper Harvest Survey (*N*=273 active trappers)[1].

Target species	No. trappers that targeted species	% of total active trappers	Total no. days trapped	Average no. days trapped	Average no. traps set per day per trapper	Total no. of trap days
Beaver	111	39.1	1,985	17.9	7.4	19,311
Bobcat	96	33.8	3,031	31.6	10.3	34,793
Coyote	179	63.0	7,051	39.4	14.5	111,969
Gray Fox	112	39.4	4,357	38.9	14.7	64,345
Red Fox	151	53.2	5,430	36.0	14.0	77,927
Mink	31	10.9	649	20.9	10.4	5,601
Muskrat	58	20.4	1,041	17.9	15.3	16,138
Nutria	1	0.4	21	21.0	15.0	315
Opossum	47	16.6	2,118	45.1	15.1	27,179
Otter	48	16.9	1,229	25.6	10.0	12,526
Raccoon	153	53.9	5,670	37.1	12.9	68,464
Striped skunk	18	6.3	703	39.1	12.2	9,801
Long-tailed Weasel	0	0.0	0	0	0	0
All species	273		33,285	33.1	12.7	448,369

1 A total of 11 trappers filled out reports but entered “0” for number of traps set, or days trapped, etc. effectively making them non-trappers. These entries were removed from trapping related tables.

Table 4. Reported number of successful trappers by species for target and non-target trapping efforts in Virginia, 2018-2019.

	# Successful trappers					
	Target		Non-target		Total	
Species	No. [1]	%	No. [2]	%	No. [3]	%
Beaver	101	91.0	2	1.2	103	37.1
Bobcat	59	61.5	11	5.9	69	24.8
Coyote	131	73.2	8	7.6	139	50.0
Gray Fox	79	70.5	9	5.2	88	31.7
Red Fox	121	80.1	15	11.3	135	48.6
Mink	17	54.8	2	0.8	19	6.8
Muskrat	52	89.7	8	3.5	60	21.6
Nutria	0	0.0	1	0.4	1	0.4
Opossum	44	93.6	127	53.6	170	61.2
Otter	40	83.3	11	4.7	51	18.3
Raccoon	148	96.7	52	39.7	198	71.2
Striped Skunk	16	88.9	56	21.1	72	25.9
Long-tailed Weasel	0	0.0	0	0.0	0	0.0

[1] of trappers who targeted species

[2] of trappers who did not target species (i.e., incidental harvest)

[3] of total active trappers (*N*=284)

Table 5. Reported harvest by species for target and non-target trapping efforts in Virginia, 2018-2019.

Species	Target harvest	% of total	Non-target harvest	% of total	Total harvest
Beaver	961	98.5	15	1.5	976
Bobcat	128	80.5	31	19.5	159
Coyote	1,101	89.7	126	10.3	1,227
Gray Fox	271	94.8	15	5.2	286
Red Fox	1,022	91.4	96	8.6	1,118
Mink	43	95.6	2	4.4	45
Muskrat	1,161	98.5	18	1.5	1,179
Nutria	0	0.0	6	100.0	6
Opossum	399	25.8	1,147	74.2	1,546
Otter	124	76.5	38	23.5	162
Raccoon	2,214	83.0	452	17.0	2,666
Striped Skunk	68	28.9	167	71.1	235
Long-tailed Weasel	0	0.0	0	0.0	0
Total	7,492	78.0	2,113	22.0	9,605

Table 6. Frequency distribution of trappers by total number of each species harvested in 2018-2019 (*N*=284 active trappers). Note, when interpreting this table, the number of trappers that harvested "0" individuals includes trappers that actively targeted the species and those who did not target the species.

	Total no. of trappers in each harvest category												
Total number harvested during season	Beaver	Bobcat	Coyote	Gray Fox	Red Fox	Mink	Muskrat	Nutria	Otter	Opossum	Raccoon	Skunk	Long-tailed Weasel
0	10	37	47	33	14	5	1	3	8	5	30	2	0
1–5	57	64	77	75	18	28	0	80	42	80	86	60	0
6–10	20	5	29	9	0	15	1	36	6	40	25	10	0
11–15	14	0	16	2	0	6	0	27	3	22	9	2	0
16–20	2	0	5	1	1	0	0	9	0	19	6	0	0
21–25	3	0	0	1	0	3	0	8	0	5	3	0	0
26–50	4	0	9	0	0	4	0	9	0	26	4	0	0
51–75	1	0	3	0	0	0	0	1	0	4	0	0	0
76–100	1	0	0	0	0	0	0	0	0	1	1	0	0
>100	1	0	0	0	0	4	0	0	0	1	1	0	0

Table 7. Reported harvest of furbearer species and percent of statewide harvest by region in Virginia, 2018-2019 (N=284 active trappers).

		Region											
	State total	Northern Mountain		Northern Piedmont		Southern Mountain		Southern Piedmont		Tidewater		Unknown	
Species	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Beaver	976	54	5.5	342	35.0	76	7.8	81	8.3	371	38.0	52	5.3
Bobcat	159	11	6.9	8	5.0	68	42.8	32	20.1	27	17.0	13	8.2
Coyote	1,227	149	12.1	167	13.6	512	41.7	187	15.2	114	9.3	98	8.0
Gray Fox	286	23	8.0	34	11.9	51	17.8	52	18.2	111	38.8	15	5.2
Red Fox	1,118	267	23.9	410	36.7	158	14.1	120	10.7	110	9.8	53	4.7
Mink	45	7	15.6	8	17.8	12	26.7	3	6.7	14	31.1	1	2.2
Muskrat	1,179	58	4.9	117	9.9	138	11.7	31	2.6	829	70.3	6	0.5
Nutria	6	0	0.0	0	0.0	0	0.0	0	0.0	6	100.0		0.0
Opossum	1,546	212	13.7	243	15.7	396	25.6	280	18.1	272	17.6	143	9.2
Otter	162	14	8.6	13	8.0	28	17.3	27	16.7	71	43.8	9	5.6
Raccoon	2,666	488	18.3	471	17.7	679	25.5	353	13.2	442	16.6	233	8.7
Striped Skunk	235	61	26.0	26	11.1	48	20.4	60	25.5	17	7.2	23	9.8
Long-tailed Weasel	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	52	5.3
All species	9,605	1,344		1,839		2,166		1,226		2,384		646	

Table 8. Reported harvest of furbearer species by county in Virginia, 2018-2019.

	Species												
County	Beaver	Bobcat	Coyote	Gray Fox	Red Fox	Mink	Muskrat	Nutria	Opossum	Otter	Raccoon	Striped Skunk	Long-tailed Weasel
Accomack	0	0	0	0	3	0	153	0	14	0	14	0	0
Albemarle	0	0	5	0	6	0	0	0	0	0	2	0	0
Alleghany	0	0	1	0	0	0	0	0	0	0	2	0	0
Amelia	0	0	3	0	7	0	0	0	7	0	2	0	0
Amherst	0	0	1	2	8	0	3	0	1	0	5	0	0
Augusta	6	0	5	0	15	4	0	0	7	4	53	1	0
Bath	11	1	1	0	0	0	0	0	2	4	10	0	0
Bedford	0	1	6	2	6	1	8	0	12	0	38	9	0
Bland	0	9	18	4	11	1	34	0	43	4	34	0	0
Botetourt	5	0	64	12	22	0	38	0	62	4	62	3	0
Brunswick	3	2	2	0	2	0	0	0	14	0	4	2	0
Buchanan	1	4	12	2	2	0	0	0	7	0	12	2	0
Buckingham	0	3	5	4	3	0	0	0	15	0	8	1	0
Campbell	0	1	21	4	14	0	1	0	27	2	61	3	0
Caroline	134	1	13	18	24	1	23	0	46	1	59	9	0
Carroll	7	11	82	10	34	3	3	0	46	5	123	10	0
Charles City	12	4	24	4	3	0	0	0	48	0	35	0	0
Charlotte	0	0	0	0	0	0	0	0	2	0	4	1	0
Charlottesville	0	0	7	1	6	0	0	0	0	0	9	0	0
Chesapeake	15	0	24	20	12	0	5	0	4	5	20	0	0
Chesterfield	15	0	7	6	5	0	33	0	9	1	8	0	0
Clarke	2	0	52	0	97	0	0	0	43	0	128	0	0
Covington	0	2	5	0	7	1	0	0	21	0	22	1	0
Craig	0	0	1	0	0	0	0	0	0	0	0	0	0
Cumberland	0	1	1	0	1	0	0	0	15	0	10	2	0
Dickenson	2	8	15	0	1	0	0	0	37	0	10	0	0
Dinwiddie	2	6	23	0	6	0	0	0	6	1	19	3	0
Essex	15	0	0	0	0	0	0	0	1	1	3	0	0

Table 8 (continued). Reported harvest of furbearer species by county in Virginia, 2018-2019

	Species												
County	Beaver	Bobcat	Coyote	Gray Fox	Red Fox	Mink	Muskrat	Nutria	Opossum	Otter	Raccoon	Striped Skunk	Long-tailed Weasel
Fairfax	0	0	0	0	28	0	0	0	0	0	32	0	0
Fairfax (City)	0	0	0	0	6	0	0	0	0	0	0	0	0
Fauquier	22	1	4	0	20	0	5	0	3	6	24	0	0
Floyd	4	2	4	4	20	1	0	0	14	2	37	2	0
Fluvanna	3	2	3	0	16	2	3	0	11	2	12	4	0
Franklin	1	0	12	5	12	0	3	0	27	1	38	2	0
Frederick	0	0	2	1	2	0	0	0	8	0	20	0	0
Giles	0	0	2	0	0	0	0	0	39	0	45	1	0
Gloucester	14	0	0	0	0	0	6	0	6	0	7	0	0
Goochland	10	0	12	0	0	0	0	0	10	0	6	1	0
Grayson	3	0	8	1	6	0	0	0	10	1	16	8	0
Greensville	39	3	0	2	0	0	0	0	5	13	17	0	0
Halifax	37	7	20	12	15	0	3	0	39	12	72	24	0
Hanover	0	0	0	0	2	0	0	0	4	0	10	1	0
Henrico	21	0	0	1	3	5	39	0	0	1	25	0	0
Highland	0	0	0	0	0	0	0	0	15	0	8	4	0
Isle of Wight	13	5	12	15	2	0	0	6	18	7	52	5	0
James City	0	0	1	0	0	0	125	0	11	0	9	2	0
King & Queen	36	4	2	1	11	0	0	0	25	0	33	2	0
King George	3	0	0	0	0	0	15	0	0	0	0	0	0
King William	69	2	0	0	10	0	414	0	7	7	29	0	0
Loudoun	18	1	35	4	210	0	2	0	79	2	160	2	0
Louisa	80	2	53	1	21	0	1	0	29	0	45	2	0
Lunenburg	1	2	15	0	5	0	0	0	2	0	4	0	0
Mecklenburg	7	1	0	0	2	0	0	0	3	0	4	0	0
Middlesex	4	0	3	0	5	12	32	0	8	0	20	0	0
Montgomery	3	0	3	4	2	0	4	0	0	0	8	0	0

Table 8 (continued). Reported harvest of furbearer species by county in Virginia, 2018-2019.

	Species												
County	Beaver	Bobcat	Coyote	Gray Fox	Red Fox	Mink	Muskrat	Nutria	Opossum	Otter	Raccoon	Striped Skunk	Long-tailed Weasel
Nelson	0	0	9	3	4	0	0	0	18	0	8	0	0
New Kent	11	1	2	2	1	0	0	0	20	6	8	0	0
Newport News	0	0	0	0	0	0	0	0	0	0	3	0	0
Northumberland	0	0	0	0	1	0	0	0	0	0	2	0	0
Orange	1	0	5	0	6	0	0	0	3	0	10	0	0
Page	0	0	0	3	10	0	0	0	5	0	4	2	0
Patrick	2	2	6	6	5	0	0	0	11	4	20	5	0
Petersburg	14	0	0	0	5	0	7	0	0	0	0	0	0
Pittsylvania	28	6	61	14	27	2	13	0	77	7	53	8	0
Powhatan	4	0	0	0	0	0	0	0	1	0	0	0	0
Prince Edward	0	0	2	0	3	0	0	0	4	0	3	0	0
Prince George	24	0	0	2	0	0	0	0	0	0	0	0	0
Prince William	13	0	14	1	21	0	2	0	7	0	18	0	0
Pulaski	0	0	4	1	0	0	0	0	7	0	5	1	0
Rappahannock	0	1	0	0	0	0	0	0	8	0	5	0	0
Richmond	16	0	7	2	13	0	22	0	24	2	39	0	0
Richmond City	0	0	2	2	8	0	0	0	29	0	29	7	0
Roanoke	0	0	4	0	0	0	0	0	31	0	13	0	0
Rockbridge	25	5	28	4	52	0	0	0	45	4	44	20	0
Rockingham	0	0	5	6	53	1	50	0	31	0	82	22	0
Russell	1	2	7	2	6	0	0	0	0	1	5	1	0
Scott	2	1	16	0	0	0	10	0	5	0	34	0	0
Shenandoah	10	3	50	8	26	1	8	0	18	2	39	8	0
Smyth	3	5	21	4	24	0	16	0	21	1	41	5	0
Southampton	27	2	11	20	26	0	0	0	37	13	45	1	0
Spotsylvania	5	0	6	0	13	0	2	0	0	0	4	0	0
Stafford	2	0	1	0	10	0	0	0	4	0	13	0	0
Suffolk	36	1	3	8	12	0	0	0	6	7	8	0	0

Table 8 (continued). Reported harvest of furbearer species by county in Virginia, 2018-2019.

	Species												
County	Beaver	Bobcat	Coyote	Gray Fox	Red Fox	Mink	Muskrat	Nutria	Opossum	Otter	Raccoon	Striped Skunk	Long-tailed Weasel
Surry	0	2	6	4	0	0	0	0	22	0	6	4	0
Sussex	28	2	2	3	0	2	7	0	0	2	3	2	0
Tazewell	0	5	33	2	0	0	0	0	10	0	30	0	0
Virginia Beach	3	1	5	27	5	0	50	0	0	2	29	0	0
Warren	0	0	0	1	5	0	0	0	17	0	76	3	0
Washington	3	2	70	3	15	0	0	0	27	2	61	2	0
Westmoreland	6	0	4	0	2	0	0	0	0	0	0	0	0
Wise	38	16	127	1	12	0	3	0	16	2	46	0	0
Wythe	4	3	21	1	3	7	30	0	21	6	97	13	0
York	0	0	8	1	4	0	0	0	16	6	60	1	0
UNKNOWN	52	13	98	15	53	1	6	0	143	9	233	23	0
State total	976	159	1,227	286	1,118	45	1,179	6	1,546	162	2,666	235	0

Table 9. Expanded statewide estimates of the total number of trappers by targeted furbearer species in Virginia, 2018-2019.

Species	Est. no. trappers	SE	95% confidence interval Lower	Upper
Beaver	397	1.2	345	457
Bobcat	343	1.2	294	401
Coyote	640	1.4	578	709
Gray Fox	401	1.2	348	461
Red Fox	540	1.4	481	606
Mink	111	0.7	83	148
Muskrat	207	0.9	169	255
Nutria	4	0.1	1	19
Opossum	168	0.9	133	212
Otter	172	0.9	136	216
Raccoon	547	1.4	488	613
Striped Skunk	64	0.6	44	95
Long-tailed Weasel	0	0.0	0	0

Table 9a. Expanded statewide estimates of the total number of trappers by targeted furbearer species in the Northern Mountain region of Virginia, 2018-2019.

Species	Est. no. trappers	SE	95% confidence interval Lower	Upper
Beaver	43	0.5	27	69
Bobcat	43	0.5	27	69
Coyote	100	0.7	74	136
Gray Fox	61	0.5	41	91
Red Fox	93	0.7	68	128
Mink	25	0.3	13	47
Muskrat	18	0.3	9	38
Nutria	0	0	0	0
Opossum	29	0.4	16	51
Otter	29	0.4	16	51
Raccoon	104	0.7	77	140
Striped Skunk	7	0.2	2	23
Long-tailed Weasel	0	0.0	0	0

Table 9b. Expanded statewide estimates of the total number of trappers by targeted furbearer species in the Southern Mountain region of Virginia, 2018-2019.

Species	Est. no. trappers	SE	95% confidence interval Lower	Upper
Beaver	54	0.5	35	82
Bobcat	97	0.7	71	132
Coyote	150	0.8	117	192
Gray Fox	107	0.7	80	144
Red Fox	122	0.7	92	160
Mink	46	0.5	29	73
Muskrat	64	0.6	44	95
Nutria	25	0.3	13	47
Opossum	43	0.5	27	69
Otter	114	0.7	86	152
Raccoon	11	0.2	4	28
Striped Skunk	54	0.5	35	82
Long-tailed Weasel	0	0.0	0	0

Table 9c. Expanded statewide estimates of the total number of trappers by targeted furbearer species in the Northern Piedmont region of Virginia, 2018-2019.

Species	Est. no. trappers.	SE	95% confidence interval Lower	Upper
Beaver	97	0.7	71	132
Bobcat	43	0.5	27	69
Coyote	107	0.7	80	144
Gray Fox	43	0.5	27	69
Red Fox	93	0.7	68	128
Mink	14	0.3	6	33
Muskrat	46	0.5	29	73
Nutria	0	0	0	0
Opossum	32	0.4	19	56
Otter	21	0.3	11	42
Raccoon	107	0.7	80	144
Striped Skunk	7	0.2	2	23
Long-tailed Weasel	0	0.0	0	0

Table 9d. Expanded statewide estimates of the total number of trappers by targeted furbearer species in the Southern Piedmont region of Virginia, 2018-2019.

Species	Est. no. trappers	SE	95% confidence interval Lower	Upper
Beaver	57	0.5	38	86
Bobcat	82	0.6	59	116
Coyote	154	0.8	120	196
Gray Fox	100	0.7	74	136
Red Fox	122	0.7	92	160
Mink	11	0.2	4	28
Muskrat	25	0.3	13	47
Nutria	0	0.0	0	0
Opossum	39	0.4	24	65
Otter	18	0.3	9	38
Raccoon	104	0.7	77	140
Striped Skunk	21	0.3	11	42
Long-tailed Weasel	0	0.0	0	0

Table 9e. Expanded statewide estimates of the total number of trappers by targeted furbearer species in the Tidewater region of Virginia, 2018-2019.

Species	Est. no. trappers.	SE	95% confidence interval Lower	Upper
Beaver	125	0.8	95	164
Bobcat	64	0.6	44	95
Coyote	97	0.7	71	132
Gray Fox	79	0.6	56	111
Red Fox	93	0.7	68	128
Mink	11	0.2	4	28
Muskrat	50	0.5	32	78
Nutria	4	0.1	1	19
Opossum	25	0.3	13	47
Otter	46	0.5	29	73
Raccoon	93	0.7	68	128
Striped Skunk	18	0.3	9	38
Long-tailed Weasel	0	0.0	0	0

Table 10. Expanded statewide estimates of the total number of successful target and non-target trappers by furbearer species in Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper
Beaver	361	1.2	311	420	7	0.2	2	23	368	1.2	318	427
Bobcat	211	1.0	172	259	39	0.4	24	65	247	1.0	205	298
Coyote	468	1.3	413	532	29	0.4	16	51	497	1.3	440	562
Gray Fox	283	1.1	238	336	32	0.4	19	56	315	1.1	267	370
Red Fox	433	1.3	379	495	54	0.5	35	82	483	1.3	426	547
Mink	61	0.5	41	91	7	0.2	2	23	68	0.6	47	99
Muskrat	186	0.9	149	232	29	0.4	16	51	215	1.0	175	263
Nutria	0	0.0	0	0	4	0.1	1	19	4	0.1	1	19
Opossum	157	0.8	124	200	454	1.3	399	517	608	1.4	547	676
Otter	143	0.8	111	184	39	0.4	24	65	182	0.9	146	228
Raccoon	529	1.4	471	595	186	0.9	149	232	708	1.5	644	778
Striped Skunk	57	0.5	38	86	200	0.9	162	247	257	1.0	214	309
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All Species	926	1.5	860	998	590	1.4	530	657	994	1.5	927	1,066

Table 10a. Expanded statewide estimates of the total number of successful target and non-target trappers by furbearer species in the Northern Mountain region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper
Beaver	36	0.4	21	60	0	0	0	0	36	0.4	21	60
Bobcat	18	0.3	9	38	4	0.1	1	19	21	0.3	11	42
Coyote	57	0.5	38	86	0	0	0	0	57	0.5	38	86
Gray Fox	29	0.4	16	51	4	0.1	1	19	32	0.4	19	56
Red Fox	72	0.6	50	103	4	0.1	1	19	75	0.6	53	107
Mink	11	0.2	4	28	4	0.1	1	19	14	0.3	6	33
Muskrat	18	0.3	9	38	4	0.1	1	19	21	0.3	11	42
Nutria	0	0	0	0	0	0	0	0	0	0	0	0
Opossum	21	0.3	11	42	61	0.5	41	91	82	0.6	59	116
Otter	21	0.3	11	42	0	0	0	0	21	0.3	11	42
Raccoon	100	0.7	74	136	18	0.3	9	38	114	0.7	86	152
Striped Skunk	7	0.2	2	23	43	0.5	27	69	50	0.5	32	78
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All species	136	0.8	105	176	89	0.6	65	124	147	0.8	114	188

Table 10b. Expanded statewide estimates of the total number of successful target and non-target trappers by furbearer species in the Southern Mountain region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper
Beaver	54	0.5	35	82	4	0.1	1	19	57	0.5	38	86
Bobcat	64	0.6	44	95	18	0.3	9	38	82	0.6	59	116
Coyote	136	0.8	105	176	14	0.3	6	33	150	0.8	117	192
Gray Fox	68	0.6	47	99	11	0.2	4	28	79	0.6	56	111
Red Fox	86	0.6	62	120	14	0.3	6	33	100	0.7	74	136
Mink	29	0.4	16	51	0	0	0	0	29	0.4	16	51
Muskrat	54	0.5	35	82	4	0.1	1	19	57	0.5	38	86
Nutria	0	0	0	0	0	0	0	0	0	0	0	0
Opossum	25	0.3	13	47	118	0.7	89	156	143	0.8	111	184
Otter	36	0.4	21	60	4	0.1	1	19	39	0.4	24	65
Raccoon	111	0.7	83	148	61	0.5	41	91	172	0.9	136	216
Striped Skunk	11	0.2	4	28	54	0.5	35	82	64	0.6	44	95
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
Total	190	0.9	152	236	132	0.8	102	172	207	0.9	169	255

Table 10c. Expanded statewide estimates of the total number of successful target and non-target trappers by furbearer species in the Northern Piedmont region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper
Beaver	82	0.6	59	116	0	0	0	0	82	0.6	59	116
Bobcat	21	0.3	11	42	0	0	0	0	21	0.3	11	42
Coyote	72	0.6	50	103	4	0.1	1	19	75	0.6	53	107
Gray Fox	29	0.4	16	51	7	0.2	2	23	36	0.4	21	60
Red Fox	86	0.6	62	120	14	0.3	6	33	97	0.7	71	132
Mink	11	0.2	4	28	0	0	0	0	11	0.2	4	28
Muskrat	43	0.5	27	69	4	0.1	1	19	46	0.5	29	73
Nutria	0	0	0	0	0	0	0	0	0	0	0	0
Opossum	32	0.4	19	56	68	0.6	47	99	100	0.7	74	136
Otter	18	0.3	9	38	4	0.1	1	19	21	0.3	11	42
Raccoon	100	0.7	74	136	29	0.4	16	51	129	0.8	98	168
Striped Skunk	7	0.2	2	23	18	0.3	9	38	25	0.3	13	47
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All species	168	0.9	133	212	75	0.6	53	107	182	0.9	146	228

Table 10d. Expanded statewide estimates of the total number of successful target and non-target trappers by furbearer species in the Southern Piedmont region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper
Beaver	54	0.5	35	82	0	0.0	0	0	54	0.5	35	82
Bobcat	46	0.5	29	73	7	0.2	2	23	54	0.5	35	82
Coyote	93	0.7	68	128	4	0.1	1	19	97	0.7	71	132
Gray Fox	82	0.6	59	116	0	0.0	0	0	82	0.6	59	116
Red Fox	97	0.7	71	132	14	0.3	6	33	111	0.7	83	148
Mink	4	0.1	1	19	4	0.1	1	19	7	0.2	2	23
Muskrat	21	0.3	11	42	4	0.1	1	19	25	0.3	13	47
Nutria	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
Opossum	36	0.4	21	60	111	0.7	83	148	147	0.8	114	188
Otter	18	0.3	9	38	0	0.0	0	0	18	0.3	9	38
Raccoon	100	0.7	74	136	43	0.5	27	69	143	0.8	111	184
Striped Skunk	21	0.3	11	42	43	0.5	27	69	64	0.6	44	95
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All species	190	0.9	152	236	143	0.8	111	184	197	0.9	159	243

Table 10e. Expanded statewide estimates of the total number of successful target and non-target trappers by furbearer species in the Tidewater region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper	Est. no. trappers	SE	Lower	Upper
Beaver	114	0.7	86	152	4	0.1	1	19	118	0.7	89	156
Bobcat	46	0.5	29	73	4	0.1	1	19	46	0.5	29	73
Coyote	75	0.6	53	107	4	0.1	1	19	79	0.6	56	111
Gray Fox	61	0.5	41	91	4	0.1	1	19	64	0.6	44	95
Red Fox	75	0.6	53	107	4	0.1	1	19	79	0.6	56	111
Mink	7	0.2	2	23	0	0.0	0	0	7	0.2	2	23
Muskrat	46	0.5	29	73	11	0.2	4	28	57	0.5	38	86
Nutria	0	0.0	0	0	4	0.1	1	19	4	0.1	1	19
Opossum	25	0.3	13	47	72	0.6	50	103	93	0.7	68	128
Otter	36	0.4	21	60	21	0.3	11	42	57	0.5	38	86
Raccoon	89	0.6	65	124	36	0.4	21	60	122	0.7	92	160
Striped Skunk	11	0.2	4	28	14	0.3	6	33	25	0.3	13	47
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All species	197	0.9	159	243	111	0.7	83	148	207	0.9	169	255

Table 11. Expanded statewide estimates of the total number of target and non-target furbearer species harvested in Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper
Beaver	3,437	23.7	2,510	4,705	54	1.6	14	212	3,490	23.7	2,561	4,758
Bobcat	458	2.7	349	601	111	1.5	60	203	569	3.1	444	728
Coyote	3,937	19.8	3,133	4,948	451	9.3	175	1,158	4,388	21.6	3,505	5,494
Gray Fox	969	5.8	738	1,273	54	0.7	30	95	1,023	5.8	789	1,326
Red Fox	3,655	28.7	2,557	5,225	343	6.5	145	814	3,998	29.3	2,864	5,582
Mink	154	2.4	75	315	7	0.2	2	23	161	2.4	81	320
Muskrat	4,152	48.1	2,450	7,037	64	0.9	34	122	4,216	48.1	2,508	7,088
Nutria	0	0.0	0	0	21	0.8	4	114	21	0.8	4	114
Opossum	1,427	10.5	1,022	1,992	4,102	17.7	3,368	4,996	5,529	19.9	4,692	6,515
Otter	443	3.4	313	628	136	2.2	66	281	579	4	423	793
Raccoon	7,918	34.1	6,509	9,632	1,616	11.9	1,155	2,263	9,534	35.3	8,054	11,287
Striped Skunk	243	2.6	149	398	597	3.9	444	803	840	4.6	655	1,079
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All Species	26,793	98.4	22,664	31,674	7,557	34.0	6,155	9,277	34,349	112.1	29,602	39,858

Table 11a. Expanded statewide estimates of the total number of target and non-target furbearer species harvested in the Northern Mountain region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper
Beaver	193	3.1	92	405	0	0.0	0	0	193	3.1	92	405
Bobcat	36	0.6	16	78	4	0.1	1	19	39	0.6	19	81
Coyote	533	9.2	243	1,168	0	0.0	0	0	533	9.2	243	1,168
Gray Fox	75	1.0	40	141	7	0.3	1	38	82	1.1	46	148
Red Fox	912	13.7	460	1,810	43	1.6	8	227	955	13.8	494	1,845
Mink	21	0.6	7	70	4	0.1	1	19	25	0.6	9	71
Muskrat	200	4.0	81	496	7	0.3	1	38	207	4.0	86	499
Nutria	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
Opossum	272	5.5	109	680	486	5.6	289	818	758	7.8	476	1,208
Otter	50	0.8	25	102	0	0.0	0	0	50	0.8	25	102
Raccoon	1,609	19.2	934	2,773	136	3.9	37	495	1,745	19.8	1,041	2,924
Striped Skunk	36	0.9	11	119	182	2.8	92	363	218	2.9	119	401
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All Species	3,937	43.9	2,370	6,541	869	10.1	511	1,479	4,806	47.8	3,054	7,564

Table 11b. Expanded statewide estimates of the total number of target and non-target furbearer species harvested in the Southern Mountain region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper
Beaver	229	3.7	110	478	43	1.6	8	227	272	4.0	139	533
Bobcat	179	2.1	105	304	64	1.3	26	161	243	2.4	154	384
Coyote	1,473	13.8	963	2,255	358	9.1	112	1,140	1,831	16.4	1,217	2,755
Gray Fox	165	1.7	104	260	18	0.4	7	49	182	1.7	119	279
Red Fox	43	0.6	22	85	0	0.0	0	0	43	0.6	22	85
Mink	483	5.1	299	780	11	0.4	2	57	494	5.1	308	790
Muskrat	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
Nutria	286	5.8	114	718	1,130	9.4	775	1,647	1,416	10.9	997	2,012
Opossum	93	1.2	53	163	7	0.3	1	38	100	1.2	59	171
Otter	1,820	15.1	1,249	2,653	608	7.1	357	1,035	2,428	16.5	1,782	3,308
Raccoon	515	5.2	325	816	50	1.1	18	139	565	5.3	368	868
Striped Skunk	39	1.1	11	138	132	1.5	79	221	172	1.8	105	280
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0		0.0	0
All Species	5,325	36.4	3,899	7,273	2,421	22.4	1,587	3,693	7,746	48.6	5,822	10,306

Table 11c. Expanded statewide estimates of the total number of target and non-target furbearer species harvested in the Northern Piedmont region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper
Beaver	1,223	19.9	584	2,562	0	0.0	0	0	1,223	19.9	584	2,562
Bobcat	29	0.5	14	59	0	0.0	0	0	29	0.5	14	59
Coyote	590	8.6	304	1,147	7	0.3	1	38	597	8.6	310	1,152
Gray Fox	111	1.8	52	234	11	0.3	3	37	122	1.8	61	243
Red Fox	1,287	23.9	553	2,997	179	4.8	53	602	1,466	24.3	689	3,122
Mink	29	0.7	9	89	0	0.0	0	0	29	0.7	9	89
Muskrat	411	6.5	201	844	7	0.3	1	38	418	6.5	206	848
Nutria	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
Opossum	336	5.1	168	672	533	7.5	282	1,008	869	9.0	542	1,392
Otter	43	0.9	17	110	4	0.1	1	19	46	0.9	19	112
Raccoon	1,502	15.7	934	2,416	182	4.1	65	513	1,684	16.2	1,088	2,608
Striped Skunk	39	1.2	10	159	54	1.1	21	137	93	1.6	42	207
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All Species	5,600	54.1	3,607	8,694	976	13.8	513	1,857	6,577	61.2	4,305	10,047

Table 11d. Expanded statewide estimates of the total number of target and non-target furbearer species harvested in the Southern Piedmont region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper
Beaver	290	4.5	143	587	0	0.0	0	0	290	4.5	143	587
Bobcat	97	1.2	55	171	18	0.5	5	59	114	1.3	68	192
Coyote	626	5.7	413	948	43	1.6	8	227	669	5.9	447	1,000
Gray Fox	186	1.7	123	282	0	0.0	0	0	186	1.7	123	282
Red Fox	397	3.6	262	601	32	0.7	11	90	429	3.7	291	634
Mink	7	0.3	1	38	4	0.1	1	19	11	0.3	3	37
Muskrat	100	2.1	39	256	11	0.4	2	57	111	2.1	47	263
Nutria	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
Opossum	215	2.9	116	398	787	7.0	524	1,181	1,001	7.5	711	1,411
Otter	97	2.0	37	252	0	0.0	0	0	97	2.0	37	252
Raccoon	1,073	11.8	650	1,771	190	2.4	107	335	1,262	12.0	819	1,946
Striped Skunk	97	1.7	43	217	118	1.7	62	224	215	2.4	130	355
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All Species	3,183	26.3	2,185	4,637	1,202	9.9	826	1,748	4,384	33.9	3,082	6,238

Table 11e. Expanded statewide estimates of the total number of target and non-target furbearer species harvested in the Tidewater region of Virginia, 2018-2019.

	Target				Non-target				Total			
			95% CI				95% CI				95% CI	
Species	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper	Est. No.	SE	Lower	Upper
Beaver	1,316	11.7	879	1,970	11	0.4	2	57	1,327	11.7	889	1,979
Bobcat	89	1.1	52	155	7	0.3	1	38	97	1.2	56	168
Coyote	404	4.7	238	687	4	0.1	1	19	408	4.7	241	690
Gray Fox	393	5.0	221	700	4	0.1	1	19	397	5.0	224	702
Red Fox	390	4.6	228	667	4	0.1	1	19	393	4.6	231	670
Mink	50	1.6	12	213	0	0.0	0	0	50	1.6	12	213
Muskrat	2,940	47.2	1,414	6,112	25	0.6	8	74	2,965	47.2	1,435	6,126
Nutria	0	0.0	0	0	21	0.8	4	114	21	0.8	4	114
Opossum	190	3.1	90	400	783	9.5	450	1,362	973	10.1	607	1,559
Otter	147	2.2	73	293	107	2.1	44	262	254	3.1	147	439
Raccoon	1,187	12.0	749	1,883	393	6.7	181	857	1,581	13.7	1,065	2,346
Striped Skunk	32	0.8	11	93	29	0.6	11	76	61	1.0	29	125
Long-tailed Weasel	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
All Species	7,138	60.8	4,841	10,525	1,388	15.7	829	2,322	8,526	66.5	5,975	12,165

Table 12. Statewide estimates and summary statistics for each furbearer species targeted.

Species	Est. # trappers that targeted species	% of total licenses[1]	Avg. # days trapped per trapper	SE	Est. total # days trapped	SE	Avg. # traps set per day per trapper	SE	Avg. season harvest per trapper	SE	Avg. harvest per 100 trap days per trapper	SE	Est. total number of trap days	SE
Beaver	361	18.8	18.0	1.7	6,702	31.7	7.3	1.0	9.1	1.6	14.4	2.4	64,697	832.3
Bobcat	211	11.0	29.8	4.1	6,920	45.9	9.0	1.2	1.4	0.3	2.5	0.8	74,242	779.7
Coyote	468	24.3	39.4	3.2	22,662	86.9	14.2	1.2	6.5	0.9	2.4	0.5	359,294	1,950.3
Gray Fox	283	14.7	45.3	5.1	8,908	55.5	14.3	2.0	2.5	0.6	1.3	0.4	135,578	1,179.4
Red Fox	433	22.5	36.9	3.3	12,939	61.0	14.1	1.7	7.9	2.3	4.7	1.4	189,518	1,437.0
Mink	61	3.2	22.9	3.8	1,885	18.2	7.3	1.9	1.5	1.0	2.1	1.0	14,845	188.0
Muskrat	186	9.7	18.8	2.9	2,890	22.3	14.7	2.7	24.8	7.9	19.7	4.6	45,733	460.0
Nutria	0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Opossum	157	8.2	72.2	29.4	2,840	52.6	8.3	2.0	10.7	3.9	11.4	7.5	22,037	368.3
Otter	143	7.4	25.7	3.8	2,850	23.9	11.0	2.6	2.8	0.5	2.9	0.8	31,957	584.2
Raccoon	529	27.5	38.7	4.7	14,544	79.2	10.6	1.0	16.7	1.9	11.8	2.4	149,121	840.1
Striped Skunk	57	3.0	14.8	5.3	265	5.6	6.0	2.1	3.6	0.8	22.4	20.3	1,409	31.5
Long-tailed Weasel	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0
All species	926	48.1	33.3	2.3	83,404	311.9	11.6	0.8	8.7	1.2	8.2	1.2	1,088,430	5,421.5

[1] the total number of licenses is 1,924

Table 12a. Northern Mountain region estimates and summary statistics for each furbearer species targeted.

Species	Est. # trappers that targeted species	% of total licenses[1]	Avg. # days trapped per trapper	SE	Est. total # days trapped	SE	Avg. # traps set per day per trapper	SE	Avg. season harvest per trapper	SE	Avg. harvest per 100 trap days per trapper	SE	Est. total number of trap days	SE
Beaver	36	1.9	16.2	4.7	637	9.7	7.6	1.4	4.9	1.7	6.4	1.7	5,278	101.1
Bobcat	18	0.9	20.4	6.4	647	10.7	7.6	2.4	0.9	0.7	3.4	4.7	3,390	55.9
Coyote	57	3.0	36.0	5.8	2,972	28.2	21.4	5.5	7.0	3.5	0.7	0.2	74,067	1,087.7
Gray Fox	29	1.5	50.6	10.0	2,221	28.1	16.2	3.7	1.2	0.6	0.1	0.1	38,895	579.8
Red Fox	72	3.7	39.9	6.8	3,884	35.6	17.8	4.6	10.0	4.2	6.8	4.7	70,305	1,000.1
Mink	11	0.6	15.8	3.5	283	5.1	4.4	1.4	1.0	1.1	1.2	1.2	1,191	23.8
Muskrat	18	0.9	31.8	9.5	526	10.8	21.3	11.3	13.8	3.3	9.1	5.5	6,705	146.8
Nutria	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Opossum	21	1.1	64.7	16.9	744	17.0	14.7	4.4	6.7	9.4	11.9	33.7	13,075	332.9
Otter	21	1.1	15.0	5.8	268	5.8	6.8	1.9	2.0	0.6	3.3	1.7	1,466	27.9
Raccoon	100	5.2	35.1	7.5	2,453	27.5	12.1	1.9	19.6	6.2	12.4	4.5	31,589	419.7
Striped Skunk	7	0.4	12.0	6.4	136	3.9	9.5	3.9	5.0	0.7	6.7	6.6	737	20.9
Long-tailed Weasel	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
All species	136	7.1	35.9	4.7	14,770	121.7	14.5	2.8	8.2	2.8	6.4	2.6	246,698	2,881.2

[1] the total number of licenses is 1,924

Table 12b. Southern Mountain region estimates and summary statistics for each furbearer species targeted.

Species	Est. # trappers that targeted species	% of total licenses1	Avg. # days trapped per trapper	SE	Est. total # days trapped	SE	Avg. # traps set per day per trapper	SE	Avg. season harvest per trapper	SE	Avg. harvest per 100 trap days per trapper	SE	Est. total number of trap days	SE
Beaver	54	2.8	11.4	4.3	726	10.8	3.7	0.5	4.3	1.5	24.1	9.1	3,101	48.8
Bobcat	64	3.3	32.2	5.1	2,264	22.5	10.6	2.0	2.3	0.8	3.2	1.7	22,609	247.8
Coyote	136	7.1	42.4	4.5	6,058	41.3	14.4	2.4	10.4	2.3	4.2	1.5	100,617	1,067.8
Gray Fox	68	3.5	39.1	6.3	2,317	24.9	14.9	4.7	1.9	0.6	0.9	0.5	39,428	806.0
Red Fox	86	4.5	37.6	5.4	2,986	27.9	14.3	3.6	4.4	1.2	1.9	1.1	46,559	815.6
Mink	29	1.5	26.3	7.0	848	13.1	6.1	1.6	0.6	0.2	2.9	1.9	5,615	103.4
Muskrat	54	2.8	18.8	4.8	873	11.9	8.2	0.9	7.8	1.7	15.8	5.5	6,759	87.9
Nutria	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Opossum	25	1.3	46.0	31.1	329	11.8	5.5	2.5	20.0	12.7	27.3	16.0	2,911	106.0
Otter	36	1.9	24.0	6.2	908	13.2	13.9	6.5	2.2	0.5	3.0	2.1	5,579	86.3
Raccoon	111	5.8	40.6	6.5	3,354	31.8	9.3	1.1	17.0	3.1	11.1	9.4	29,361	297.8
Striped Skunk	11	0.6	2.5	0.0	18	0.7	2.0	0.0	2.0	0.0	62.5	0.0	18	0.7
Long-tailed Weasel	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
All species	190	9.9	35.3	3.7	20,681	143.6	11.2	1.8	7.0	1.5	9.3	3.3	262,554	2,917.9

[1] the total number of licenses is 1,924

Table 12c. Northern Piedmont region estimates and summary statistics for each furbearer species targeted.

Species	Est. # trappers that targeted species	% of total licenses1	Avg. # days trapped per trapper	SE	Est. total # days trapped	SE	Avg. # traps set per day per trapper	SE	Avg. season harvest per trapper	SE	Avg. harvest per 100 trap days per trapper	SE	Est. total number of trap days	SE
Beaver	82	4.3	18.4	4.2	1,942	19.6	9.8	3.8	13.6	5.8	11.4	3.2	34,725	811.2
Bobcat	21	1.1	16.4	4.9	490	8.1	5.7	0.8	0.4	0.5	0.4	0.4	2,339	38.9
Coyote	72	3.7	41.4	13.4	4,320	54.8	11.6	2.9	5.3	2.6	2.3	1.4	58,042	906.7
Gray Fox	29	1.5	33.5	7.0	479	9.5	17.5	9.4	1.3	1.2	0.2	0.2	11,658	356.7
Red Fox	86	4.5	26.8	3.7	1,438	15.3	9.3	3.0	18.5	11.4	8.1	2.4	16,712	363.6
Mink	11	0.6	18.7	2.0	200	4.3	18.3	9.0	2.3	1.5	0.8	0.7	4,134	118.9
Muskrat	43	2.2	30.7	8.6	769	13.2	12.4	3.3	15.3	4.1	10.2	4.5	14,004	302.5
Nutria	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Opossum	32	1.7	205.0	113.1	1,466	48.1	4.0	1.4	16.5	6.0	3.2	0.2	3,576	101.8
Otter	18	0.9	42.0	1.4	300	7.8	5.0	2.1	2.0	0.0	1.4	0.6	1,459	43.4
Raccoon	100	5.2	54.9	19.5	3,397	52.7	9.2	2.1	17.7	4.9	5.7	1.2	26,528	346.9
Striped Skunk	7	0.4	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Long-tailed Weasel	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
All species	168	8.7	38.3	8.7	14,802	166.9	10.3	2.1	11.2	3.7	6.5	1.6	173,178	2,145.4

[1] the total number of licenses is 1,924

Table 12d. Southern Piedmont region estimates and summary statistics for each furbearer species targeted.

Species	Est. # trappers that targeted species	% of total licenses1	Avg. # days trapped per trapper	SE	Est. total # days trapped	SE	Avg. # traps set per day per trapper	SE	Avg. season harvest per trapper	SE	Avg. harvest per 100 trap days per trapper	SE	Est. total number of trap days	SE
Beaver	54	2.8	17.0	5.5	923	13.5	4.4	0.5	5.6	2.0	24.1	4.0	3,079	36.6
Bobcat	46	2.4	34.6	13.5	2,493	36.2	8.6	2.3	0.9	0.5	3.2	0.7	24,844	473.1
Coyote	93	4.8	34.0	6.3	5,790	46.7	12.2	1.5	3.8	1.0	4.2	0.4	70,326	646.8
Gray Fox	82	4.3	53.3	16.0	2,800	38.6	11.0	2.8	1.5	0.3	0.9	0.4	30,537	496.1
Red Fox	97	5.0	38.6	12.5	2,979	38.1	11.2	2.3	2.8	0.8	1.9	1.0	30,484	479.7
Mink	4	0.2	30.7	13.7	329	8.8	5.0	0.8	0.7	0.9	2.9	0.5	1,953	52.6
Muskrat	21	1.1	6.4	2.9	204	3.9	6.1	1.8	4.0	1.8	15.8	20.4	1,506	33.5
Nutria	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Opossum	36	1.9	20.0	0.0	72	2.6	8.0	0.0	12.0	0.0	27.3	0.0	572	20.9
Otter	18	0.9	33.0	10.1	579	11.8	13.8	3.7	6.5	2.1	3.0	0.7	5,236	105.6
Raccoon	100	5.2	41.2	14.2	3,219	42.4	11.5	2.4	13.3	3.9	11.1	1.6	33,316	462.9
Striped Skunk	21	1.1	15.5	10.3	111	3.9	4.5	1.1	3.0	1.4	62.5	10.8	654	23.6
Long-tailed Weasel	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
All species	190	9.9	32.5	6.3	19,497	201.3	10.1	1.2	7.2	1.2	10.3	2.1	202,506	2,429.1

[1] the total number of licenses is 1,924

Table 12e. Tidewater region estimates and summary statistics for each furbearer species targeted.

Species	Est. # trappers that targeted species	% of total licenses1	Avg. # days trapped per trapper	SE	Est. total # days trapped	SE	Avg. # traps set per day per trapper	SE	Avg. season harvest per trapper	SE	Avg. harvest per 100 trap days per trapper	SE	Est. total number of trap days	SE
Beaver	114	5.9	17.0	2.2	2,031	15.8	8.0	1.3	10.7	2.0	16.4	4.5	15,188	147.0
Bobcat	46	2.4	34.6	2.3	590	7.3	7.7	2.2	1.4	0.5	3.5	1.5	5,139	92.4
Coyote	75	3.9	34.0	4.2	2,178	20.7	9.7	1.4	4.6	1.3	2.7	0.8	20,821	225.6
Gray Fox	61	3.2	38.6	5.7	794	11.8	13.3	2.9	5.1	2.8	6.3	1.4	9,781	145.0
Red Fox	75	3.9	53.3	3.8	848	10.9	13.7	5.0	6.5	2.1	2.7	2.7	10,890	163.9
Mink	7	0.4	30.7	6.4	150	4.2	9.0	4.9	7.0	3.5	5.4	2.1	1,802	62.9
Muskrat	46	2.4	6.4	2.9	458	6.5	26.5	7.9	70.1	24.8	30.8	8.7	16,143	300.1
Nutria	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Opossum	25	1.3	20.0	0.0	72	2.6	2.0	0.0	4.0	0.0	10.0	0.0	143	5.2
Otter	36	1.9	33.0	3.7	304	5.4	7.0	1.8	3.3	1.3	4.2	1.9	2,089	44.6
Raccoon	89	4.6	41.2	2.9	1,302	12.9	6.4	1.1	13.5	2.7	20.9	4.4	8,747	100.4
Striped Skunk	11	0.6	15.5	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Long-tailed Weasel	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
All species	197	10.2	17.9	2.0	8,726	53.3	10.4	1.7	12.8	4.2	13.3	2.8	90,743	677.9

[1] the total number of licenses is 1,924

Table 13. Rare furbearer observations based upon responses to the 2018-2019 Trapper Harvest Survey

Species	No. observed	No. trapped	List of counties observed[1]	List of counties where trapped
Fisher	9	0	Shenandoah, Frederick, Fauquier, Stafford, Virginia Beach, Washington, Bath, indeterminable	None
Spotted Skunk	10	1	Alleghany, Rockbridge, Nottoway, Augusta	indeterminable
Least Weasel	3	0	Bath, Washington, Carroll, Caroline	None

[1] county locations are provided where possible and are based on descriptions provided by respondents. Some reports did not specify county, or did not provide sufficient information to determine county.

Appendix A: Survey Instrument

VIRGINIA DGIF	*2018-19 Virginia Trapper Harvest Survey*	

This is your 2018-2019 Virginia Trapper Harvest Survey. Please complete the survey and return it in the enclosed business reply envelope. Your response is completely confidential and very important. Please send in your response, even if you did not trap this season. If you have any questions or concerns, please contact Furbearer Project Leader Mike Fies at (540) 248-9390 or mike.fies@dgif.virginia.gov.

First, did you trap in Virginia between November 15, 2018 and February 28, 2019?

☐ Yes ☐ No

If ***NO***, stop here and return the survey in the postage-paid envelope.

If ***YES***, please follow the instructions below and complete the remainder of the survey on the other side of this page.

Instructions for Completing the Trapping Table:

1. Please only report information for furbearers trapped during the general trapping season **(Nov. 15, 2018 to Feb. 28, 2019)**. Do **not** report information for animals trapped under authorization of a Commercial Nuisance Animal Permit or other nuisance animals trapped outside the general season. Also, please do not include live foxes trapped for transport to foxhound training preserves.

2. **For Primary and Secondary Target Species (animals you were targeting when you set the traps):**

   - The **primary target** species is the animal you were most interested in catching in a particular trap set. If you were targeting multiple species with the same trap set (i.e. a dirt hole set for coyotes and foxes), please choose **one** species as your primary target and list the others as **secondary targets**.
   - For each **primary target** species, please circle "P" in the first column and indicate total # of animals trapped, total # of days trapped, and average # of traps set per day in each county. ***See beaver example for how to report primary target species trapping***.
   - For each **secondary target** species, please circle "S" in the first column and list the same information as for target species, including the # of animals trapped, total # of days trapped, and average # of traps set per day in each county. ***See red fox/gray fox/raccoon example for reporting a trap line with primary and secondary targets.***
   - If you were unsuccessful at catching a targeted species, place a "0" for the total # of animals trapped, but still report the total # of days trapped and the average # of traps set per day for that species. ***See bobcat example for how to report unsuccessful target species trapping*.**

3. **For Non-Target/Incidental Species (animals you were not intending to capture as either a primary or secondary target):**

   - If you captured non-target/incidental animals, please report the total # of animals trapped, but place a "0" for the total # of days trapped and a "0" for the average # of traps set per day, since these animals were not the target of your traps. ***See opossum and striped skunk examples for how to report incidentally trapped animals*.**

4. **For fisher, spotted skunk, and least weasel:**

   - Please indicate if you observed or trapped these species during the past trapping season. If YES, please provide a detailed location where each animal was observed or trapped OR you may contact DGIF Furbearer Project Leader Mike Fies at 540-248-9390 or mike.fies@dgif.virginia.gov to provide specific details.

PLEASE READ THE INSTRUCTIONS ON THE OPPOSITE SIDE OF THIS PAGE BEFORE COMPLETING THIS SURVEY.

	Write in the name of each county or city in which you trapped															
	Example				County/City #1				County/City #2				County/City #3			
	Buckingham															
For each species, record whether it was a primary, secondary, or non-target species, total # of animals trapped, total # days trapped, and average # traps set per day (please see instructions on opposite side of page) →	**Primary (P), Secondary (S), or Non-Target (N)**	**# Animals Trapped**	**# Days Trapped**	**Average # Traps Set Per Day**	**Primary (P), Secondary (S), or Non-Target (N)**	**# Animals Trapped**	**# Days Trapped**	**Average # Traps Set Per Day**	**Primary (P), Secondary (S), or Non-Target (N)**	**# Animals Trapped**	**# Days Trapped**	**Average # Traps Set Per Day**	**Primary (P), Secondary (S), or Non-Target (N)**	**# Animals Trapped**	**# Days Trapped**	**Average # Traps Set Per Day**
Beaver	(P) S N	17	15	10	P S N				P S N				P S N			
Bobcat	(P) S N	0	7	5	P S N				P S N				P S N			
Coyote	P S N				P S N				P S N				P S N			
Gray Fox	P (S) N	2	12	8	P S N				P S N				P S N			
Red Fox	(P) S N	10	12	8	P S N				P S N				P S N			
Mink	P S N				P S N				P S N				P S N			
Muskrat	(P) S N	55	30	15	P S N				P S N				P S N			
Nutria	P S N				P S N				P S N				P S N			
Opossum	P S (N)	25	0	0	P S N				P S N				P S N			
Otter	P S N				P S N				P S N				P S N			
Raccoon	P (S) N	9	12	8	P S N				P S N				P S N			
Striped Skunk	P S (N)	12	0	0	P S N				P S N				P S N			
Long-tailed Weasel	P S N				P S N				P S N				P S N			

Please indicate if you observed or trapped any of the following species during this past trapping season. If YES, please provide a detailed location where the observation occurred. You may also provide details to DGIF Furbearer Project Leader Mike Fies at 540-248-9390 or mike.fies@dgif.virginia.gov

Fisher

Did you observe a fisher during the past trapping season?

□ **Yes** □ **No**

Did you trap a fisher during the past trapping season?

□ **Yes** □ **No**

Detailed location: _____

Spotted Skunk

Did you observe a spotted skunk during the past trapping season?

□ **Yes** □ **No**

Did you trap a spotted skunk during the past trapping season?

□ **Yes** □ **No**

Detailed location: _____

Least Weasel

Did you observe a least weasel during the past trapping season?

□ **Yes** □ **No**

Did you trap a least weasel during the past trapping season?

□ **Yes** □ **No**

Detailed location: _____

Appendix B: Cover Letter (1st Mailing)

Matthew J. Strickler
Secretary of Natural Resources

COMMONWEALTH of VIRGINIA
Department of Game and Inland Fisheries

Gary F. Martel
Acting Executive Director

April 23, 2019

Dear Trapper,

Enclosed you will find the 2018-19 Virginia Trapper Harvest Survey from the Virginia Department of Game and Inland Fisheries. We would appreciate your cooperation in this voluntary survey designed to provide us with the necessary information to estimate the statewide harvest of furbearers during the 2018-19 trapping season.

This survey is being sent to a random sample of Virginia licensed trappers. It is important that every recipient send in a response. All information on this survey is **completely confidential**. No personally identifiable information is being collected on the survey so that responses cannot be tied to an individual. A postage-paid envelope (addressed to our survey administrators at Virginia Tech) is enclosed for your convenience in returning the completed questionnaire.

If you have questions or comments about this survey, please feel free to contact Mike Fies, Furbearer Project Leader, via email at **mike.fies@dgif.virginia.gov**, phone at (540) 248-9390, or by mail at Virginia Department of Game and Inland Fisheries, P.O. Box 996, Verona, VA 24482.

Your assistance in providing trapping harvest information is greatly appreciated and important for effectively managing Virginia's furbearers in the future. Please try to complete and return the questionnaire **within the next 10 days**. Thanks in advance for your cooperation.

Sincerely,

Michael L. Fies
Furbearer Project Leader
Virginia Dept. of Game and Inland Fisheries

Appendix C: Postcard Reminder

2018-2019 Virginia Trapper Survey Reminder

We haven't heard from you yet! This is a friendly reminder to fill out and return the 2018-2019 Virginia Trapper Survey that was recently mailed to you. If you have already completed this **confidential** survey and returned it, please accept our sincere thanks and disregard this reminder notice. If you haven't returned the survey yet, please do so at your earliest convenience. Your response is important to us and will help generate meaningful estimates of statewide furbearer harvests to effectively manage populations for future trappers. If you did not receive a questionnaire, it was misplaced, or you have questions about the survey, please feel free to contact me at 540-248-9390 or mike.fies@dgif.virginia.gov

Thank you,

Mike Fies
Furbearer Project Leader
Virginia Department of Game & Inland Fisheries

Appendix D: 2018–2019

Virginia Trapping Season Dates

There is a continuous open season to trap beaver, muskrat, opossum, and raccoon within the incorporated limits of any city or town in the Commonwealth, and in the counties of Arlington, Chesterfield, Fairfax, Henrico, James City, Loudoun, Prince William, Spotsylvania, Stafford, Roanoke, and York.

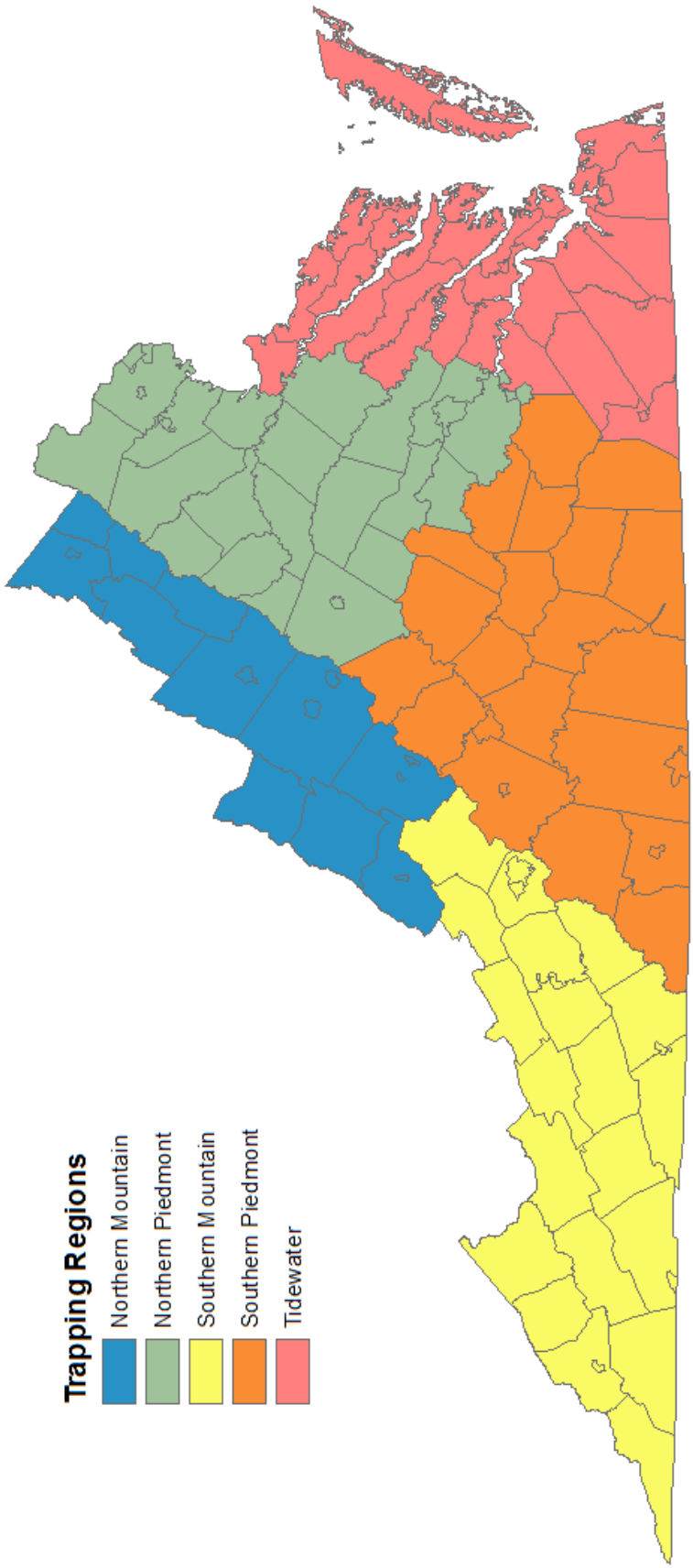
When beavers are damaging crops or lands, the owner of the premises, his agent, or tenant, may kill the animals or have them killed. This includes shooting, except in areas where the discharge of firearms is prohibited.

Species	Start of Season	End of Season
Beaver	December 1st	February 28th
Bobcat	November 15th	February 28th
Coyote	Continuous open season	
Fisher	Continuous **closed** season	
Fox[1]	November 15th	February 28th
Mink	December 1st	February 28th
Muskrat	December 1st	February 28th
Nutria	Continuous open season	
Opossum	November 15th	February 28th
Otter	December 1st	February 28th
Raccoon	November 15th	February 28th
Striped Skunk	Continuous open season	
Spotted Skunk	Continuous **closed** season[2]	
Weasel	December 1st	February 28th

[1] Fox trapping is prohibited in Clarke (except on G. Richard Thompson WMA), Fauquier (except on Chester F. Phelps WMA and G. Richard Thompson WMA), Loudoun, and Rappahannock counties.

[2] Spotted skunk and the pelts of spotted skunk may not be sold.

Appendix E: Map of Trapping Regions in Virginia


Trapping Regions
Northern Mountain
Northern Piedmont
Southern Mountain
Southern Piedmont
Tidewater