

2022 SMALL GAME HUNTER MAIL SURVEY

Prepared by staff in the Wildlife Research Unit

INTRODUCTION

The Minnesota Department of Natural Resources (MNDNR), Division of Fish and Wildlife, Wildlife Research unit annually conducts a mail survey of small game hunters. The small game mail survey was initiated in 1976 as a means to gather small game harvest information, which is used to inform our constituency and guide decisions about hunting regulations and season structure.

METHODS

A postcard survey (Figure 1) was mailed in early March 2023 following the close of the 2022-23 small game hunting season. Hunters who returned it within three weeks were eliminated from a follow-up mailing to non-respondents. The sampling frame consisted of individuals who purchased a small game hunting license (any type) for the 2022-23 small game hunting season (N=228,143). A stratified random sample (n=7,000, 3%), allocated proportionally by license type, was drawn from the MNDNR electronic licensing system (ELS) database. Small game license types included: Resident Senior Citizen, Resident Youth, Resident Adult, Resident Individual Sport, Resident Combination Sport, Resident Lifetime, Resident Lifetime Sport, Nonresident Youth, and Non-resident Adult. For analysis, license types were pooled into "Resident" (N=219,216) and "Non-resident" (N=8,927) (Figure 2). A free youth license was added to the sampling frame for 2010-13 but that license has since been discontinued. Estimates for those years have been recalculated without the youth license so harvest estimates and license sales are comparable among years. Also, beginning in 2017, license holders <18-years old at the time of the survey were excluded from the sampling frame but included in the overall expansion for sampling. This group comprised <3% of license holders and thus estimates should be comparable among years.

Recipients were asked if they hunted small game in 2022-23 and if not, they were instructed to return the survey. Respondents who hunted were asked: (1) total number of days they hunted small game, (2) number bagged by species, (3) number of days hunted by species, and (4) the county in which they hunted most for each species listed. Returned surveys were checked for completeness, consistency, and biological practicability. Dual key-entry and quality control checks were used to minimize transcription errors. Data was tabulated using Viking Data Entry VDE+ software and analyzed using R programming language (R version 4.2.3 (2023-03-15 ucrt); R Core Team 2022).

RESULTS

Survey Response and Overall License Sales Trends

Statewide (resident and non-resident) small game license sales and survey response rate are shown in Figure 2. Of the 7,000 mailed surveys, 173 surveys were returned as undeliverable; 2,197 surveys were completed and returned for an adjusted response rate of 32%, which has slowly declined over time. The percent of respondents who said they hunted or did not hunt is

reported in Table 1. Overall, statewide license sales (228,143 small game licenses) decreased by 2% from the previous year and was 8% below the 10-year average (247,292 licenses; Figure 2, Table 2). Non-resident small game license sales (8,927 licenses) increased 2% in 2022 and was 28% above the 10-year average (6,957 licenses; Table 2).

Estimates by Species

Harvest trends for the four most sought-after small game species (ducks – all species, Canada geese, ruffed grouse, and ring-necked pheasants) in Minnesota since 2002 are shown in Figure 3 and discussed separately below. For all other species, the estimated number of statewide hunters and harvest for 2022-23, the previous year, and the 10-year averages are shown in Tables 4 and 5, respectively. Non-resident estimates over the past decade are shown in Table 3. Table 6 shows the estimated mean harvest per active hunter and Table 7 shows the estimated mean harvest for successful hunters and hunter success rates (%) for all species for 2022-23, the previous year, and the 10-year averages. Tables 4-6 also provide trend information (i.e., the percent change) for annual and 10-year comparisons.

Ducks – all species

In 2022, state duck stamp sales (81,864 stamps) were 3% below last year's sales (84,327 stamps) and 8% below the 10-year average (89,092 stamps; Table 2). An estimated 45,172 hunters pursued ducks in 2022 which was 35% below the 10-year average (69,922 hunters; Table 4). The 2022 harvest estimate (470,309 ducks) was 32% below the 10-year average (693,589 ducks; Table 5). Overall, duck hunters harvested an average of 10.4 ducks/hunter, which was slightly greater than the 10-year average (9.9 ducks/hunter; Table 6). Successful hunters bagged more ducks in 2022 (12.6 ducks) compared to the 10-year average (11.7 ducks) despite fairly similar success rates (83% and 85%, respectively; Table 7).

Canada geese

An estimated 27,207 hunters harvested approximately 127,520 Canada geese in 2022 (Tables 4 and 5). These estimates are 42% and 48% below their respective 10-year averages (46,770 hunters and 245,450 geese; Tables 4 and 5). Overall, Canada goose hunters harvested an average of 4.7 geese/hunter last year, which was slightly less than the 10-year average (5.2 geese/hunter; Table 6). The mean harvest per successful hunter (6.6 geese/hunter) was similar to the 10-year average (6.8 geese/hunter) despite a slightly lower success rate (71% versus 76%, respectively; Table 7).

Ruffed grouse

In 2022, an estimated 64,591 hunters harvested an estimated 237,700 ruffed grouse (Tables 4 and 5). These estimates are 14% and 10% below the 10-year averages, respectively (74,756 hunters and 264,221 grouse; Tables 4 and 5). The mean harvest per active hunter was 3.7 grouse, which was similar to the 10-year average (3.5 grouse/hunter; Table 6). Hunter success (69%) and mean harvest per successful hunter (5.4 grouse/hunter) were also similar to their respective 10-year averages (70% and 5.0 grouse, respectively; Table 7).

Ring-necked pheasants

Pheasant stamp sales in 2022 (77,448 stamps) were 1% below 2021 sales (78,538 stamps) and 1% below the 10-year average (78,040 stamps; Table 2). An estimated 52,337 hunters harvested an estimated 204,052 roosters in 2022 (Tables 4 and 5). These estimates represent 9% fewer hunters compared to the 10-year average (57,539 hunters; Table 4) but a harvest similar to the 10-year average (201,573 roosters; Table 5). The mean harvest per active hunter was 3.9 roosters, which was only slightly greater than the 10-year average (3.5 roosters; Table

6). Success rates in 2022 were the same as the 10-year average (68%) whereas successful hunters bagged slightly more roosters (5.8 versus 5.2 roosters, respectively; Table 7).

ACKNOWLEDGMENTS

This project was funded in part by the Federal Aid in Wildlife Restoration Program. John Giudice analyzed the data, Nicole Davros and Margaret Dexter compiled the report, and John Giudice provided comments on a previous draft of this report.

FIGURES AND TABLES

Dear Small Game Hunter:

You have been selected at random from among Minnesota's small game hunting license buyers to assist us in evaluating the 2022-2023 small game hunting season (March 2022 - February 2023). We need information to estimate the season's harvest and to help set future small game seasons. Answer only for your Minnesota 2022 hunting experience.

YOUR RESPONSE IS NEEDED EVEN IF YOU DID NOT HUNT OR HARVEST SMALL GAME

Please fill out the attached questionnaire and mail as soon as possible. A reminder will be sent to individuals not returning the questionnaire within three weeks. No envelope or stamp is necessary; just tear along the perforation and drop into a mailbox.

THANK YOU FOR YOUR COOPERATION

Wildlife Research Program Manager Division of Fish and Wildlife Department of Natural Resources 2022 Small Game Hunter Report

1.	Did you hunt small game, listed below, in Minnesota this year
	(March 2022 - Feb 2023)? ☐ No ☐ Yes (Please check box)
2.	Indicate the total number of days spent hunting small game of
	all species listed below, in Minnesota.
3.	For the species you hunted indicate your harvest, number of days
	hunted, and county in which you hunted most for each species,
	even if None were bagged. Report only game you personally
	bagged and retrieved in Minnesota. Do not include birds taken on
	shooting preserves or game farms.

		Number You bagged	Days Hunted	County
Ducks (all species)	01			
Coots (mud hens)	50			
Canada geese	40			
Other geese	41	St. 400 - 6410		
Snipe (jacksnipe)	51			
Rails and gallinules	52			
Crows	53			
Woodcock	60			
Mourning Dove	65			
Pheasant	70			
Ruffed grouse (Forest partridge)	71			-
Spruce grouse	72			
Sharp-tailed grouse	73			
Hungarian (Gray) partridge	74			
Fox squirrel	89			
Gray squirrel	90			
Cottontail rabbit	91			
Jackrabbit	92			
Snowshoe hare	93			_
Badger	35			
Coyote (brush wolf)	97			
Gray fox	96			
Raccoon	94			_
Red fox	95			

Figure 1. Sample of Small Game Hunter survey card.

MNDNR Small-Game Mail Survey

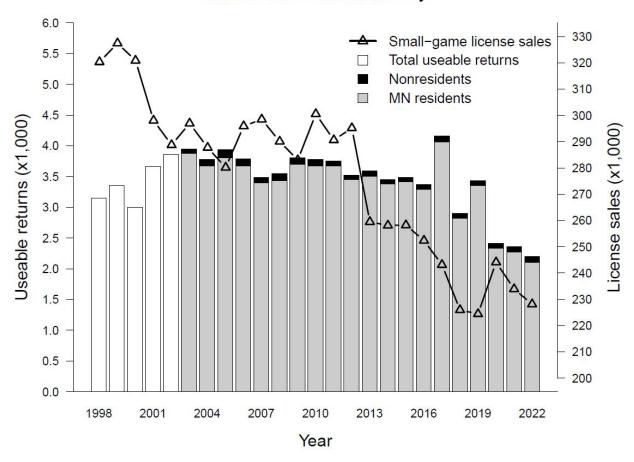


Figure 2. Number of Minnesota small game licenses sold and usable returned surveys, 1998-2022. Includes resident and non-resident licenses and excludes duplicate and free licenses.

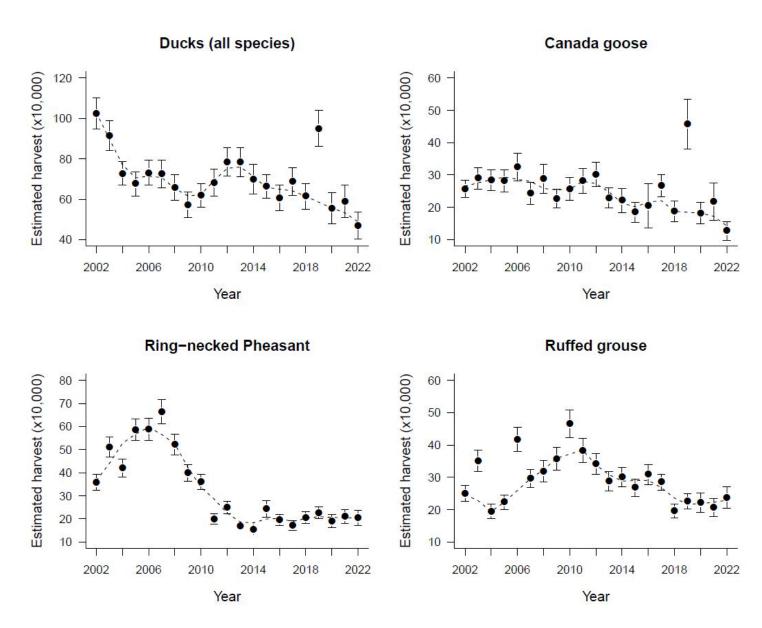


Figure 3. Harvest trends for top four small game species harvested in Minnesota, 2002-2022.

Table 1. Percent of respondents who hunted small game, 2012-13 through 2022-2023a.

		Returns from mail	Projections from
		survey	license sales
2012-13	Hunted	2,669 (76%)	223,808
	Did not hunt	<u>851 (24%)</u>	<u>71,360</u>
		3,520 (100%)	295,168
2013-14	Hunted	2,586 (72%)	186,317
	Did not hunt	<u>1,003 (28%)</u>	<u>72,264</u>
		3,589 (100%)	258,581
2014-15	Hunted	2,476 (72%)	185,186
	Did not hunt	<u>975 (28%)</u>	<u>72,923</u>
		3,451 (100%)	258,109
2015-16	Hunted	2,505 (72%)	185,604
	Did not hunt	<u>980 (28%)</u>	<u>72,612</u>
		3,485 (100%)	258,216
2016-17	Hunted	2,426 (72%)	181,614
	Did not hunt	<u>945 (28%)</u>	<u>70,744</u>
		3,371 (100%)	252,358
2017-18	Hunted	2,768 (66%)	161,658
	Did not hunt	<u>1,395 (34%)</u>	<u>81,472</u>
		4,163 (100%)	243,130
2018-19	Hunted	2,000 (69%)	155,601
	Did not hunt	904 (31%)	<u>70,331</u>
		2,904 (100%)	225,932
2019-20	Hunted	2,524 (73%)	164,896
	Did not hunt	911 (27%)	<u>59,517</u>
		3,435 (100%)	224,413
2020-21	Hunted	1,487 (62%)	150,425
	Did not hunt	926 (38%)	<u>93,675</u>
		2,413 (100%)	244,100
2021-22	Hunted	1,399 (59%)	138,891
	Did not hunt	957 (41%)	95,010
		2,356 (100%)	233,901
2022-23	Hunted	1,383 (63%)	143,615
	Did not hunt	814 (37%)	84,528
		2,197 (100%)	228,143

^a Includes resident and non-resident information. Excludes duplicates and free licenses (youth under 16, active-duty military and disabled veterans).

Table 2. Statewide (resident and non-resident) small game hunting license sales and stamp sales, 2012-13 through 2022-23.

	2012-13 ^a	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Total small game license sales ^b	264,063	258,581	258,109	258,208	252,358	243,130	225,932	224,413	244,100	233,901	228,143
Non-resident license sales ^c	6,456	6,031	6,056	6,755	6,701	6,854	6,718	6,887	8,375	8,730	8,927
State duck stamp sales	90,052	93,412	94,265	92,176	88,905	86,258	82,955	86,568	88,163	84,327	81,864
Pheasant stamp sales	90,541	77,597	74,295	77,750	76,920	71,925	72,192	74,921	81,850	78,538	77,448

^a Estimates from these years were recomputed without license type 99- free youth license to be consistent with other years of data.

Table 3. Mail survey results^a of non-resident small game hunters, 2012-13 through 2022-23.

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Estimated non-residents and (percent) of all licensed non-residents hunting:											
Ducks	2,360 (37)	2,010 (33)	2,340 (39)	1,850 (27)	2,320 (35)	2,350 (34)	1,680 (25)	3,040 (44)	1,230 (15)	3,740 (43)	1,632 (18)
Canada goose	1,360 (21)	1,270 (21)	1,300 (21)	650 (10)	770 (12)	1,730 (25)	1,260 (19)	3,120 (45)	1,560 (19)	1,770 (20)	1,152 (13)
Ring-necked pheasant	1,910 (30)	1,420 (24)	1,380 (23)	1,480 (22)	1,550 (23)	1,520 (22)	2,350 (35)	1,120 (16)	890 (11)	1,460 (17)	4,032 (45)
Ruffed grouse	2,820 (44)	2,010 (33)	2,600 (43)	2,870 (43)	3,520 (53)	2,280 (33)	2,270 (34)	1,760 (26)	3,800 (45)	2,700 (31)	3,648 (41)
Estimated non-resident harvest:											
Ducks	20,380	20,410	13,060	16,863	17,701	15,717	15,792	21,228	5,810	39,395	7,008
Canada goose	2,270	3,650	2,680	1,484	1,462	6,994	2,940	15,060	4,134	30,039	4,224
Ring-necked pheasant	6,820	3,430	3,720	6,581	4,040	7,274	6,048	2,645	5,141	5,924	14,112
Ruffed grouse	10,090	4,990	9,090	13,805	11,772	6,994	2,856	4,325	24,793	11,020	7,104

^a Estimates for non-resident hunters are generally based on small samples sizes; harvest estimates therefore have moderate to high sampling uncertainty.

Table 4. Estimated number of statewide hunters (residents and non-residents) by species for current year (2022-23), previous year (2021-22), and the preceding 10-year (2012-2021) average. Annual and 10-year trends (% change) are also shown.

^b Includes all types of small game licenses. Duplicate and free licenses not included.

^c Excludes duplicate licenses and non-resident shooting preserve licenses.

	2022-23				2021-22		10-yr me (2012-2			ge from 021	Change from 10-yr mean	
	n	Hunters	SE	n	Hunters	SE	Hunters	SE	%	95% CI	%	95% CI
Ducks	435	45,172	1,931	570	56,589	2,054	69,922	618	-20	4	-35	3
Canada geese	262	27,207	1,571	364	36,138	1,734	46,770	535	-25	6	-42	3
Other geese	12	1,247	358	22	2,185	462	2,547	139	-43	20	-51	14
American coot	28	2,908	544	23	2,284	472	3,441	161	27	35	-15	16
Common snipe	9	935	310	7	695	262	1,032	89	35	68	-9	31
Rails & Gallinules	4	416	207	4	398	198	288	46	5	74	44	75
American crow	30	3,116	563	54	5,362	718	7,304	230	-42	13	-57	8
American woodcock	113	11,735	1,071	103	10,226	981	11,453	290	15	15	2	10
Mourning dove	43	4,466	672	63	6,255	774	8,468	248	-29	14	-47	8
Ring-necked pheasant	504	52,337	2,038	493	48,945	1,951	57,539	583	7	6	-9	4
Ruffed grouse	622	64,591	2,183	577	57,284	2,063	74,756	631	13	6	-14	3
Spruce grouse	79	8,204	903	63	6,255	774	8,304	248	31	22	-1	11
Sharp-tailed grouse	40	4,154	648	30	2,979	538	5,123	195	39	33	-19	13
Gray partridge	17	1,766	425	9	894	296	2,126	126	98	81	-17	21
Gray squirrel	133	13,812	1,156	156	15,488	1,193	20,286	377	-11	10	-32	6
Fox squirrel	69	7,166	846	74	7,347	837	11,250	285	-2	16	-36	8
Eastern cottontail	79	8,204	903	85	8,439	895	12,918	305	-3	15	-36	7
White-tailed jackrabbit	8	831	292	10	993	312	1,073	92	-16	39	-23	28
Snowshoe hare	14	1,454	386	17	1,688	406	3,289	156	-14	31	-56	12
Raccoon	36	3,739	616	44	4,369	650	6,517	220	-14	19	-43	10
Red fox	21	2,181	472	27	2,681	511	4,228	177	-19	23	-48	11
Gray fox	5	520	231	5	497	221	1,145	91	5	66	-55	20
Coyote	89	9,243	956	123	12,212	1,067	16,816	344	-24	10	-45	6
Badger	1	104	104	3	298	172	308	48	-65	40	-66	34

Table 5. Estimated hunter harvest (residents and non-residents) by species for current year (2022-23), previous year (2021-22), and the preceding 10-year (2012-2021) average. Annual and 10-year trends (% change) are also shown.

		2022-23			2021-22		10-yr m (2012-			nge from 2021	Change from 10-yr mean	
	n	Harvest	SE	n	Harvest	SE	Harvest	SE	%	95% CI	%	95% CI
Ducks	435	470,309	34,290	570	589,916	40,553	693,589	11,624	-20	8	-32	5
Canada geese	262	127,520	14,697	364	218,218	29,524	245,450	7,594	-42	10	-48	6
Other geese	12	1,767	1,165	22	2,086	832	5,939	849	-15	65	-70	20
American coot	28	5,089	1,718	23	8,342	3,431	14,878	1,363	-39	32	-66	12
Common snipe	9	728	373	7	398	198	1,353	200	83	131	-46	29
Rails & Gallinules	4	104	104	4	498	495	567	149	-79	29	-82	19
American crow	30	10,595	2,374	54	72,884	21,567	58,637	4,567	-85	5	-82	4
American woodcock	113	34,479	6,924	103	35,742	7,115	33,731	1,783	-4	27	2	21
Mourning dove	43	39,883	10,441	63	61,558	12,221	76,770	4,255	-35	21	-48	14
Ring-necked pheasant	504	204,052	16,760	493	210,275	15,872	201,573	4,232	-3	11	1	9
Ruffed grouse	622	237,700	16,446	577	206,699	13,918	264,221	4,496	15	11	-10	6
Spruce grouse	79	13,916	3,363	63	7,248	1,697	11,303	658	92	65	23	31
Sharp-tailed grouse	40	5,401	1,739	30	3,774	1,652	8,556	864	43	78	-37	21
Gray partridge	17	1,766	807	9	398	242	3,213	401	344	337	-45	26
Gray squirrel	133	94,504	14,734	156	92,928	13,170	95,174	3,287	2	21	-1	16
Fox squirrel	69	23,368	4,934	74	29,091	5,592	36,408	1,545	-20	23	-36	14
Eastern cottontail	79	22,951	3,997	85	25,417	5,070	40,075	1,691	-10	24	-43	10
White-tailed jackrabbit	8	624	327	10	795	464	1,375	314	-22	62	-55	26
Snowshoe hare	14	1,247	547	17	2,880	1,139	6,907	704	-57	26	-82	8
Raccoon	36	12,464	2,887	44	37,733	15,986	41,633	3,184	-67	16	-70	7
Red fox	21	2,285	744	27	5,462	2,214	4,829	438	-58	22	-53	16
Gray fox	5	208	207	5	497	408	844	165	-58	54	-75	25
Coyote	89	23,264	4,896	123	53,614	14,533	35,550	2,492	-57	15	-35	15
Badger	1	104		3	100	99	243	49	4		-57	

Table 6. Mean harvest per active hunter (residents and non-residents) for current year (2022-23), previous year (2021-22), and the preceding 10-year (2012-2021) average. Annual and 10-year trends (% change) are also shown.

_	2022-23			2021-22		10-yr me (2012-2		Change from 2021		Change from 10-yr mean		
	n	Mean	SE	n	Mean	SE	Mean	SE	%	95% CI	%	95% CI
Ducks	435	10.4	0.62	570	10.4	0.61	9.9	0.15	0	8	5	6
Canada geese	262	4.7	0.47	364	6.0	0.76	5.2	0.15	-22	13	-10	9
Other geese	12	1.4	0.88	22	1.0	0.33	2.2	0.30	40	99	-36	41
American coot	28	1.8	0.50	23	3.7	1.33	4.3	0.35	-51	22	-58	12
Common snipe	9	0.8	0.32	7	0.6	0.20	1.2	0.15	33	70	-33	28
Rails & Gallinules	4	0.2	0.25	4	1.2	1.24	1.9	0.46	-83	27	-89	13
American crow	30	3.4	0.46	54	13.6	3.62	7.9	0.64	-75	7	-57	7
American woodcock	113	2.9	0.53	103	3.5	0.61	3.0	0.14	-17	21	-3	18
Mourning dove	43	8.9	1.94	63	9.8	1.54	9.0	0.44	-9	24	-1	22
Ring-necked pheasant	504	3.9	0.28	493	4.3	0.28	3.5	0.07	-9	9	11	8
Ruffed grouse	622	3.7	0.22	577	3.6	0.21	3.5	0.05	3	9	6	7
Spruce grouse	79	1.7	0.37	63	1.2	0.23	1.4	0.07	42	41	21	27
Sharp-tailed grouse	40	1.3	0.37	30	1.3	0.51	1.7	0.17	0	49	-24	23
Gray partridge	17	1.0	0.40	9	0.4	0.24	1.5	0.17	150	181	-33	28
Gray squirrel	133	6.8	0.90	156	6.0	0.72	4.7	0.15	13	20	45	20
Fox squirrel	69	3.3	0.58	74	4.0	0.62	3.2	0.12	-18	19	3	18
Eastern cottontail	79	2.8	0.38	85	3.0	0.51	3.1	0.11	-7	20	-10	13
White-tailed jackrabbit	8	0.8	0.31	10	0.8	0.41	1.2	0.23	0	65	-33	29
Snowshoe hare	14	0.9	0.31	17	1.7	0.55	2.0	0.17	-47	25	-55	16
Raccoon	36	3.3	0.55	44	8.6	3.47	6.4	0.51	-62	17	-48	10
Red fox	21	1.0	0.26	27	2.0	0.74	1.1	0.10	-50	23	-9	25
Gray fox	5	0.4	0.40	5	1.0	0.77	0.7	0.12	-60	50	-43	58
Coyote	89	2.5	0.46	123	4.4	1.13	2.2	0.16	-43	18	14	23
Badger	1	1.0		3	0.3	0.33	0.8		233		25	

Table 7. Hunter success rates and mean harvest per successful hunter (residents and non-residents) for current year (2022-23), previous year (2021-22), and the preceding 10-year (2012-2021) average.

		2022-2	3			2021-2	2		10-yr mea	n (2012-20))
	n	% Success	Mean	SE	n	% Success	Mean	SE	% Success	Mean	SE
Ducks	359	83	12.6	0.69	474	83	12.5	0.69	85	11.7	0.15
Canada geese	185	71	6.6	0.61	286	79	7.7	0.95	76	6.8	0.15
Other geese	4	33	4.2	2.13	9	41	2.3	0.55	43	5.1	0.30
American coot	17	61	2.9	0.70	17	74	4.9	1.70	73	5.9	0.35
Common snipe	5	56	1.4	0.40	4	57	1.0	0.00	59	2.0	0.15
Rails & Gallinules	1	25	1.0		1	25	5.0		43	4.1	0.46
American crow	25	83	4.1	0.44	48	89	15.3	4.01	86	9.1	0.64
American woodcock	81	72	4.1	0.70	64	62	5.6	0.89	67	4.4	0.14
Mourning dove	37	86	10.4	2.16	55	87	11.3	1.68	82	11.0	0.44
Ring-necked pheasant	341	68	5.8	0.38	357	72	5.9	0.34	68	5.2	0.07
Ruffed grouse	427	69	5.4	0.29	412	71	5.1	0.26	70	5.0	0.05
Spruce grouse	38	48	3.5	0.65	31	49	2.4	0.36	54	2.5	0.07
Sharp-tailed grouse	16	40	3.2	0.69	13	43	2.9	1.04	46	3.7	0.17
Gray partridge	8	47	2.1	0.66	3	33	1.3	0.33	44	3.3	0.17
Gray squirrel	110	83	8.3	1.04	133	85	7.0	0.81	82	5.7	0.15
Fox squirrel	48	70	4.7	0.74	60	81	4.9	0.71	78	4.2	0.12
Eastern cottontail	60	76	3.7	0.44	63	74	4.1	0.64	76	4.1	0.11
White-tailed jackrabbit	4	50	1.5	0.29	4	40	2.0	0.70	47	2.7	0.23
Snowshoe hare	7	50	1.7	0.42	10	59	2.9	0.73	61	3.3	0.17
Raccoon	30	83	4.0	0.59	40	91	9.5	3.79	91	7.1	0.51
Red fox	14	67	1.6	0.31	17	63	3.2	1.09	54	2.1	0.10
Gray fox	1	20	2.0		2	40	2.5	1.49	34	1.7	0.12
Coyote	61	69	3.7	0.62	85	69	6.4	1.59	54	3.9	0.16
Badger	1	100	1.0		1	33	1.0		72	1.1	0.08