



## 2021 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 2022 following the close of the 2021-22 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 2021-22 small game hunting season (N=233,901). 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, Non-resident Youth, and Non-resident Adult. For analysis, license types were pooled into "Resident" (N=225,171) and "Non-resident" (N=8,730) (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 2021-22 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 were tabulated using Viking Data Entry VDE+ software and analyzed using R programming language (R version 4.1.3 [2022-03-10]; 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, 172 surveys were returned as undeliverable; 2,356 surveys were completed and returned for an adjusted response rate of 34%. The percent of respondents who said they hunted or did not hunt is reported in Table 1. Overall, statewide

license sales (233,901 small game licenses) decreased by 4% from the previous year and was 7% below the 10-year average (251,074 licenses; Figure 2, Table 2). Non-resident small game license sales (8,730 licenses) increased 4% in 2021 and was 30% above the 10-year average (6,715 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 2021-22, 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 2021-22, 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*

The number of state duck stamps sold in 2021 (84,327 stamps) was 4% below 2020 (88,163 stamps) and 6% below the 10-year average (89,627 stamps; Table 2). An estimated 56,589 hunters pursued ducks in 2021 which was 21% below the 10-year average (71,872 hunters; Table 4). The 2021 harvest estimate (589,916 ducks) was 16% below the 10-year average (702,753 ducks; Table 5). Duck hunters harvested an average of 10.4 ducks/hunter, slightly greater than the 10-year average (Table 6). The 2021 duck hunter success rate (83%) and mean harvest per successful hunter (12.5 ducks) were similar to the 10-year averages (85% and 11.5 ducks, respectively; Table 7).

#### *Canada geese*

An estimated 36,138 hunters harvested approximately 218,218 Canada geese in 2021, averaging 6.0 geese/active hunter (Tables 4, 5, and 6, respectively). The number of hunters in 2021 was 26% below the 10-year average (48,878 hunters; Table 4) whereas the 2021 harvest was 13% below the 10-year average (251,791 geese; Table 5). The hunter success rate (79%) and mean harvest per successful hunter (7.7 geese) were only slightly above their respective 10-year averages (76%, 6.7 geese; Table 7).

#### *Ruffed grouse*

In 2021, an estimated 57,284 hunters pursued and harvested an estimated 206,699 ruffed grouse (Tables 4 and 5). These estimates are 26% below and 27% below the 10-year averages, respectively (77,889 hunters and 281,866 grouse; Tables 4 and 5). The mean harvest per active hunter was 3.6 grouse, which was similar to the 10-year average (Table 6). Hunter success (71%) and mean harvest per successful hunter (5.1 grouse) were also similar to their 10-year averages (70% and 5.1 grouse, respectively; Table 7).

#### *Ring-necked pheasants*

Pheasant stamp sales in 2021 (78,538 stamps) were also 4% below the previous year's sales (81,850 stamps) but similar to the 10-year average (78,873 stamps; Table 2). Approximately 48,945 hunters harvested an estimated 210,275 roosters in 2021 for an average of 4.3 roosters/active hunter (Tables 4, 5, and 6, respectively). The estimated number of hunters was 18% below the 10-year average whereas the estimated harvest was slightly above the 10-year average (59,929 hunters and 200,396 roosters; Tables 4 and 5, respectively). Hunter success (72%) was greater than the 10-year average (67%) but mean harvest per successful hunter (5.9 roosters) was only slightly above the 10-year average (5.0 roosters; Table 7).

## ACKNOWLEDGMENTS

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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 2021-2022 small game hunting season (**March 2021 - February 2022**). We need information to estimate the season's harvest and to help set future small game seasons. Answer only for your Minnesota 2021 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. 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

**2021 Small Game Hunter Report**

1. Did you hunt small game, listed below, in Minnesota this year (March 2021 - Feb 2022)? ☐ 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		
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.

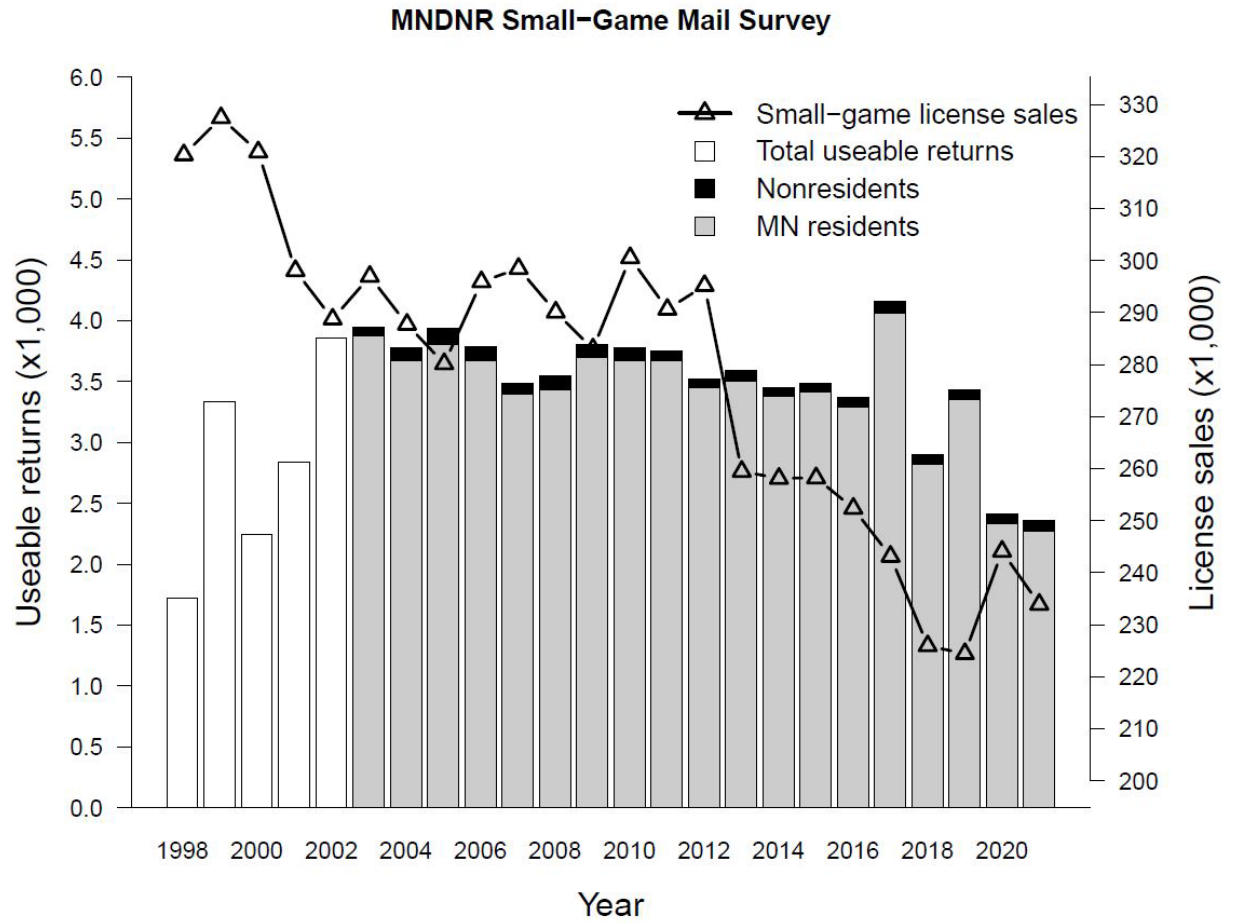


Figure 2. Number of Minnesota small game licenses sold and usable returned surveys, 1998-2021. Includes resident and non-resident licenses, and excludes duplicate and free licenses.

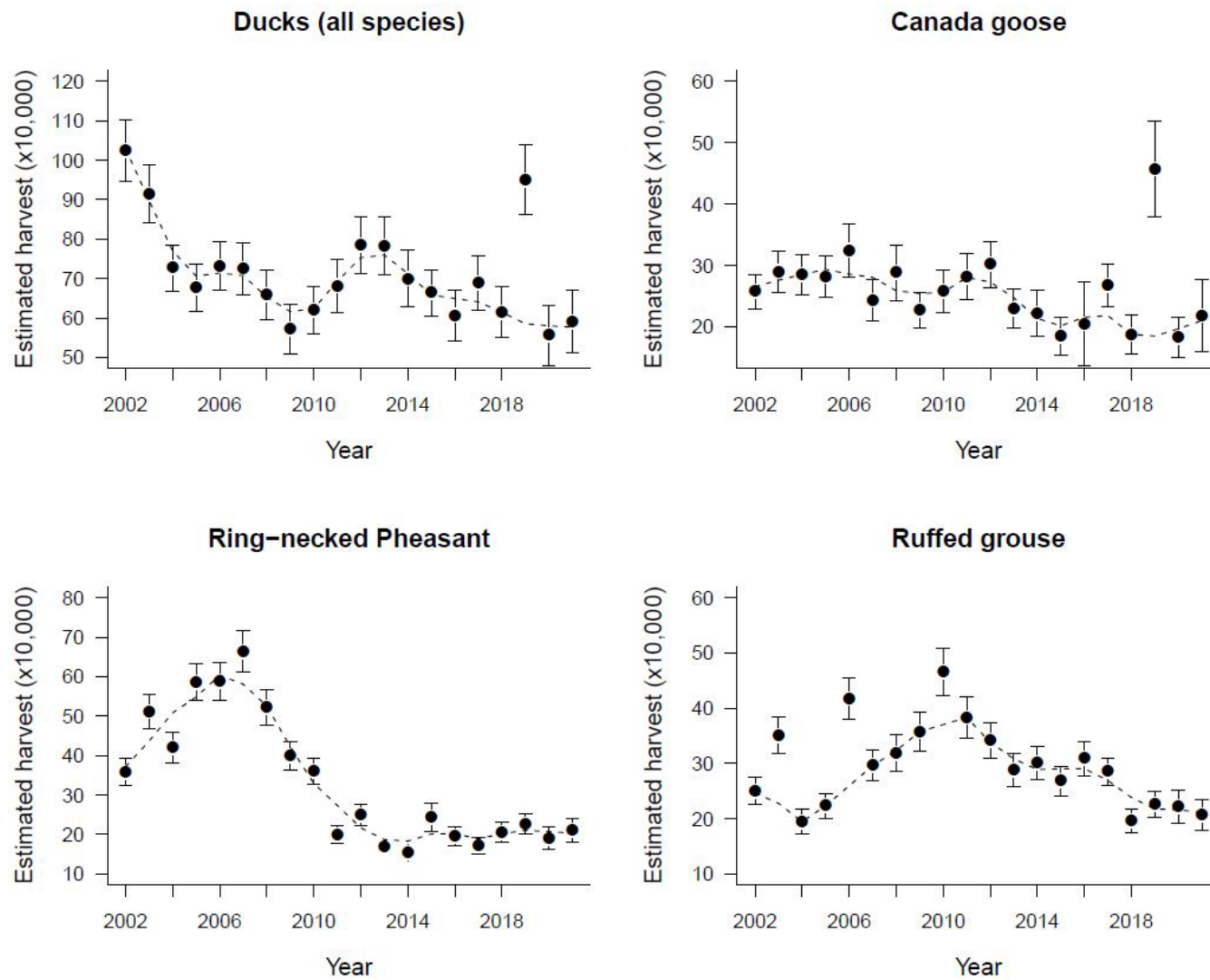


Figure 3. Harvest trends for top four small game species harvested in Minnesota, 2002-2021.

Table 1. Percent of respondents who hunted small game, 2011-12 through 2021-2022<sup>a</sup>.

		Returns from mail survey	Projections from license sales
2011-12	Hunted Did not hunt	2,761 (74%) <u>987 (26%)</u> 3,748 (100.0%)	214,137 <u>76,549</u> 290,686
2012-13	Hunted Did not hunt	2,669 (76%) <u>851 (24%)</u> 3,520 (100%)	223,808 <u>71,360</u> 295,168
2013-14	Hunted Did not hunt	2,586 (72%) <u>1,003 (28%)</u> 3,589 (100%)	186,317 <u>72,264</u> 258,581
2014-15	Hunted Did not hunt	2,476 (72%) <u>975 (28%)</u> 3,451 (100%)	185,186 <u>72,923</u> 258,109
2015-16	Hunted Did not hunt	2,505 (72%) <u>980 (28%)</u> 3,485 (100%)	185,604 <u>72,612</u> 258,216
2016-17	Hunted Did not hunt	2,426 (72%) <u>945 (28%)</u> 3,371 (100%)	181,614 <u>70,744</u> 252,358
2017-18	Hunted Did not hunt	2,768 (66%) <u>1,395 (34%)</u> 4,163 (100%)	161,658 <u>81,472</u> 243,130
2018-19	Hunted Did not hunt	2,000 (69%) <u>904 (31%)</u> 2,904 (100%)	155,601 <u>70,331</u> 225,932
2019-20	Hunted Did not hunt	2,524 (73%) <u>911 (27%)</u> 3,435 (100%)	164,896 <u>59,517</u> 224,413
2020-21	Hunted Did not hunt	1,487 (62%) <u>926 (38%)</u> 2,413 (100%)	150,425 <u>93,675</u> 244,100
2021-22	Hunted Did not hunt	1,399 (59%) <u>957 (41%)</u> 2,356	138,891 <u>95,010</u> 233,901

<sup>a</sup> 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 estimated hunter harvest, 2011-12 through 2021-22.

	2011-12 <sup>a</sup>	2012-13 <sup>a</sup>	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Total small game license sales <sup>b</sup>	271,768	264,063	258,581	258,109	258,208	252,358	243,130	225,932	224,413	244,100	233,901
Non-resident license sales <sup>c</sup>	6,312	6,456	6,031	6,056	6,755	6,701	6,854	6,718	6,887	8,375	8,730
State duck stamp sales	89,681	90,052	93,412	94,265	92,176	88,905	86,258	82,955	86,568	88,163	84,327
Pheasant stamp sales	86,868	90,541	77,597	74,295	77,750	76,920	71,925	72,192	74,921	81,850	78,538

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

<sup>b</sup> Includes all types of small game licenses. Duplicate and free licenses not included.

<sup>c</sup> Excludes duplicate licenses and non-resident shooting preserve licenses.

Table 3. Mail survey results of non-resident small game hunters, 2011-12 through 2021-22.

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Estimated non-residents and (percent) of all licensed non-residents hunting:											
Ducks	2,430 (39)	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)
Canada goose	1,620 (26)	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)
Ring-necked pheasant	1,780 (28)	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)
Ruffed grouse	1,460 (23)	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)
Estimated non-resident harvest <sup>a</sup> :											
Ducks	13,840	20,380	20,410	13,060	16,863	17,701	15,717	15,792	21,228	5,810	39,395
Canada goose	4,050	2,270	3,650	2,680	1,484	1,462	6,994	2,940	15,060	4,134	30,039
Ring-necked pheasant	4,860	6,820	3,430	3,720	6,581	4,040	7,274	6,048	2,645	5,141	5,924
Ruffed grouse	8,980	10,090	4,990	9,090	13,805	11,772	6,994	2,856	4,325	24,793	11,020

<sup>a</sup> Estimates for non-resident hunters in 2021-22 are based on small samples sizes (range: 14-36 hunters); 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 (2021-22), previous year (2020-21), and the preceding 10-year (2011-2020) average. Annual and 10-year trends (% change) are also shown.

	2021-22			2020-21			10-yr mean (2011-20)		Change from 2020		Change from 10-yr mean	
	n	Hunters	SE	n	Hunters	SE	Hunters	SE	%	95% CI	%	95% CI
Ducks	570	56,589	2,054	557	56,347	2,084	71,872	617	0	5	-21	3
Canada geese	364	36,138	1,734	370	37,430	1,782	48,878	539	-3	7	-26	4
Other geese	22	2,185	462	21	2,125	460	2,599	139	3	31	-16	18
American coot	23	2,284	472	32	3,238	566	3,561	162	-29	19	-36	14
Common snipe	7	695	262	13	1,316	363	1,079	90	-47	25	-36	25
Rails & Gallinules	4	398	198	3	304	175	269	43	31	100	48	77
American crow	54	5,362	718	39	3,946	624	7,804	236	36	28	-31	9
American woodcock	103	10,226	981	105	10,622	1,009	11,373	285	-4	13	-10	9
Mourning dove	63	6,255	774	60	6,070	771	8,740	250	3	18	-28	9
Ring-necked pheasant	493	48,945	1,951	519	52,503	2,033	59,929	585	-7	5	-18	3
Ruffed grouse	577	57,284	2,063	627	63,428	2,169	77,889	633	-10	4	-26	3
Spruce grouse	63	6,255	774	80	8,093	886	8,699	251	-23	13	-28	9
Sharp-tailed grouse	30	2,979	538	43	4,350	655	5,444	200	-32	16	-45	10
Gray partridge	9	894	296	19	1,923	438	2,276	130	-54	19	-61	13
Gray squirrel	156	15,488	1,193	164	16,591	1,245	21,066	380	-7	10	-26	6
Fox squirrel	74	7,347	837	72	7,284	842	11,721	288	1	16	-37	7
Eastern cottontail	85	8,439	895	106	10,724	1,014	13,304	307	-21	11	-37	7
White-tailed jackrabbit	10	993	312	13	1,316	363	1,206	96	-25	32	-18	27
Snowshoe hare	17	1,688	406	21	2,125	460	3,445	159	-21	26	-51	12
Raccoon	44	4,369	650	66	6,677	807	6,884	224	-35	13	-37	10
Red fox	27	2,681	511	27	2,732	521	4,563	182	-2	26	-41	11
Gray fox	5	497	221	6	607	247	1,234	94	-18	49	-60	18
Coyote	123	12,212	1,067	123	12,443	1,088	17,389	346	-2	12	-30	6
Badger	3	298	172	2	203	143	310	48	47	134	-4	57



Table 5. Estimated hunter harvest (residents and non-residents) by species for current year (2021-22), previous year (2020-21), and the preceding 10-year (2011-2020) average. Annual and 10-year trends (% change) are also shown.

	2021-22			2020-21			10-yr mean (2011-20)		Change from 2020		Change from 10-yr mean	
	n	Harvest	SE	n	Harvest	SE	Harvest	SE	%	95% CI	%	95% CI
Ducks	570	589,916	40,553	557	555,985	39,044	702,753	11,409	6	10	-16	6
Canada geese	364	218,218	29,524	370	182,194	16,934	251,791	7,264	20	20	-13	12
Other geese	22	2,086	832	21	2,024	1,112	6,210	864	3	70	-66	14
American coot	23	8,342	3,431	32	7,792	2,036	15,096	1,343	7	52	-45	23
Common snipe	7	398	198	13	1,620	740	1,452	205	-75	17	-73	14
Rails & Gallinules	4	498	495	3	507	364	552	145	-2	120	-10	93
American crow	54	72,884	21,567	39	21,248	6,809	59,498	4,535	243	150	22	37
American woodcock	103	35,742	7,115	105	33,182	5,859	32,655	1,685	8	29	9	23
Mourning dove	63	61,558	12,221	60	41,883	11,939	78,014	4,269	47	51	-21	16
Ring-necked pheasant	493	210,275	15,872	519	190,185	14,414	200,396	4,090	11	12	5	8
Ruffed grouse	577	206,699	13,918	627	221,746	15,161	281,866	4,670	-7	9	-27	5
Spruce grouse	63	7,248	1,697	80	14,467	2,937	12,442	690	-50	16	-42	14
Sharp-tailed grouse	30	3,774	1,652	43	15,883	6,234	9,338	879	-76	14	-60	18
Gray partridge	9	398	242	19	1,822	805	3,568	419	-78	16	-89	7
Gray squirrel	156	92,928	13,170	164	87,002	14,590	97,466	3,228	7	23	-5	14
Fox squirrel	74	29,091	5,592	72	18,413	3,457	38,309	1,604	58	42	-24	15
Eastern cottontail	85	25,417	5,070	106	27,923	4,167	40,998	1,704	-9	23	-38	13
White-tailed jackrabbit	10	795	464	13	4,657	2,482	1,813	353	-83	13	-56	27
Snowshoe hare	17	2,880	1,139	21	5,060	1,865	7,462	748	-43	31	-61	16
Raccoon	44	37,733	15,986	66	38,140	9,126	42,267	2,919	-1	48	-11	38
Red fox	27	5,462	2,214	27	3,947	1,114	4,995	437	38	68	9	45
Gray fox	5	497	408	6	304	175	910	170	63	164	-45	46
Coyote	123	53,614	14,533	123	29,540	9,590	33,529	2,187	81	77	60	45
Badger	3	100	99	2	203	143	256	51	-51	60	-61	39

Table 6. Mean harvest per active hunter (residents and non-residents) for current year (2021-22), previous year (2020-21), and the preceding 10-year (2011-2020) average. Annual and 10-year trends (% change) are also shown.

	2021-22			2020-21			10-yr mean (2011-20)		Change from 2020		Change from 10-yr mean	
	n	Mean	SE	n	Mean	SE	Mean	SE	%	95% CI	%	95% CI
Ducks	570	10.4	0.61	557	9.9	0.59	9.8	0.14	5	9	6	6
Canada geese	364	6.0	0.76	370	4.9	0.39	5.1	0.14	22	18	18	15
Other geese	22	1.0	0.33	21	1.0	0.49	2.3	0.30	0	59	-57	15
American coot	23	3.7	1.33	32	2.4	0.47	4.2	0.33	54	63	-12	32
Common snipe	7	0.6	0.20	13	1.2	0.47	1.3	0.15	-50	26	-54	16
Rails & Gallinules	4	1.2	1.24	3	1.7	0.88	2.0	0.47	-29	82	-40	64
American crow	54	13.6	3.62	39	5.4	1.52	7.3	0.56	152	98	86	52
American woodcock	103	3.5	0.61	105	3.1	0.47	2.9	0.13	13	26	21	22
Mourning dove	63	9.8	1.54	60	6.9	1.78	8.8	0.43	42	43	11	18
Ring-necked pheasant	493	4.3	0.28	519	3.6	0.24	3.4	0.06	19	11	26	8
Ruffed grouse	577	3.6	0.21	627	3.5	0.21	3.6	0.05	3	8	0	6
Spruce grouse	63	1.2	0.23	80	1.8	0.31	1.4	0.07	-33	17	-14	17
Sharp-tailed grouse	30	1.3	0.51	43	3.7	1.34	1.8	0.17	-65	19	-28	29
Gray partridge	9	0.4	0.24	19	0.9	0.37	1.6	0.17	-56	32	-75	15
Gray squirrel	156	6.0	0.72	164	5.2	0.79	4.6	0.13	15	22	30	16
Fox squirrel	74	4.0	0.62	72	2.5	0.38	3.2	0.11	60	34	25	20
Eastern cottontail	85	3.0	0.51	106	2.6	0.30	3.1	0.10	15	24	-3	17
White-tailed jackrabbit	10	0.8	0.41	13	3.5	1.68	1.3	0.23	-77	16	-38	34
Snowshoe hare	17	1.7	0.55	21	2.4	0.73	2.1	0.18	-29	31	-19	27
Raccoon	44	8.6	3.47	66	5.7	1.19	6.1	0.39	51	68	41	58
Red fox	27	2.0	0.74	27	1.4	0.31	1.1	0.08	43	62	82	69
Gray fox	5	1.0	0.77	6	0.5	0.22	0.6	0.10	100	178	67	131
Coyote	123	4.4	1.13	123	2.4	0.75	1.9	0.12	83	74	132	61
Badger	3	0.3	0.33	2	1.0	0.00	0.8	0.08	-70	33	-62	42

Table 7. Hunter success rates and mean harvest per successful hunter (residents and non-residents) for current year (2021-22), previous year (2020-21), and the preceding 10-year (2011-2020) average.

	2021-22				2020-21				10-yr mean (2011-20)		
	n	% Success	Mean	SE	n	% Success	Mean	SE	% Success	Mean	SE
Ducks	474	83	12.5	0.69	456	82	12.1	0.68	85	11.5	0.14
Canada geese	286	79	7.7	0.95	275	74	6.5	0.48	76	6.7	0.14
Other geese	9	41	2.3	0.55	7	33	2.9	1.24	44	5.2	0.30
American coot	17	74	4.9	1.70	22	69	3.5	0.55	72	5.8	0.33
Common snipe	4	57	1.0	0.00	7	54	2.3	0.64	60	2.1	0.15
Rails & Gallinules	1	25	5.0	---	2	67	2.5	0.50	44	4.1	0.47
American crow	48	89	15.3	4.01	32	82	6.6	1.79	86	8.5	0.56
American woodcock	64	62	5.6	0.89	74	70	4.4	0.60	68	4.2	0.13
Mourning dove	55	87	11.3	1.68	49	82	8.4	2.12	81	10.9	0.43
Ring-necked pheasant	357	72	5.9	0.34	356	69	5.3	0.31	67	5.0	0.06
Ruffed grouse	412	71	5.1	0.26	422	67	5.2	0.27	70	5.1	0.05
Spruce grouse	31	49	2.4	0.36	45	56	3.2	0.45	55	2.6	0.07
Sharp-tailed grouse	13	43	2.9	1.04	20	47	7.8	2.61	48	3.7	0.17
Gray partridge	3	33	1.3	0.33	6	32	3.0	0.57	46	3.5	0.17
Gray squirrel	133	85	7.0	0.81	136	83	6.3	0.92	82	5.7	0.13
Fox squirrel	60	81	4.9	0.71	55	76	3.3	0.44	77	4.2	0.11
Eastern cottontail	63	74	4.1	0.64	81	76	3.4	0.35	75	4.1	0.10
White-tailed jackrabbit	4	40	2.0	0.70	7	54	6.6	2.68	49	2.8	0.23
Snowshoe hare	10	59	2.9	0.73	15	71	3.3	0.91	62	3.4	0.18
Raccoon	40	91	9.5	3.79	63	95	6.0	1.23	91	6.7	0.39
Red fox	17	63	3.2	1.09	18	67	2.2	0.35	52	2.0	0.08
Gray fox	2	40	2.5	1.49	3	50	1.0	0.00	33	1.7	0.10
Coyote	85	69	6.4	1.59	67	54	4.4	1.32	52	3.7	0.12
Badger	1	33	1.0	---	2	100	1.0	0.00	74	1.1	0.08