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EFFECTS OF COVID-19 ON MICHIGAN TURKEY HUNTING IN 2020

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ABSTRACT

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. COVID-19 restrictions (e.g., stay at home requirements, travel restrictions, and keeping physical distance) were enacted to limit its spread in Michigan during 2020, and these restrictions may have impacted turkey hunter behavior. In 2020, licenses were purchased by 105,650 people, an increase of 22,578 license buyers (27% increase) from 2019. About 25% of the license buyers in 2020 were new (i.e., had not purchased a license during the previous 12 years). License buyers were asked to indicate whether COVID-19 caused them to (1) buy a spring turkey hunting license, (2) spend more time hunting, (3) reduce the distance they traveled to hunt, (4) hunt alone more often, or (5) struggle to locate a hunting area. Overall, 39% of license buyers (41,023) agreed that COVID-19 had caused them to take at least one of these five actions. An estimated 15% of all license buyers and 24% of new license buyers agreed that COVID-19 had made them more likely to buy a license. About 20% of license buyers indicated that they increased the amount of time they hunted in 2020 because of COVID-19. About 13% hunted alone more frequently and 10% of license buyers reduced the distance they traveled to hunt. About 7% of license buyers indicated that they found it more difficult to locate a hunting area. Although COVID-19 restrictions appeared to have increased the number of people buying hunting licenses in Michigan (i.e., cited by 15% of the license buyers), hunting regulation changes (e.g., changing the opening day of seasons from Monday to Saturday and increasing the length of most seasons) probably also motivated additional people to purchase licenses in 2020.

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INTRODUCTION

In 2020, the spring turkey (*Meleagris gallopavo*) hunting season occurred from April 18 through June 7 for most of Michigan. Shortly before the season began, restrictions were implemented to limit the spread of the coronavirus disease (COVID-19), a new contagious respiratory disease that can cause serious illness or death in humans. Beginning in mid-March 2020, residents were urged to reduce in-person gatherings and limit non-essential travel (Executive orders 2020-5, 2020-9, 2020-21, and 2020-42). Also, in-person school learning (kindergarten through 12th grade) was suspended for the remainder of the school year (Executive orders 2020-5, 2020-35, and 2020-65), and non-essential workers were ordered to stay at home until June 1 (Executive orders 2020-21, 2020-42, 2020-59, 2020-70, 2020-77, 2020-92, 2020-96, and 2020-110). In addition, turkey hunters were encouraged to hunt as close to home as possible.

The most restrictive COVID-19 rules coincided with the spring turkey hunting season in Michigan. Thus, these COVID-19 regulations may have changed turkey hunting activity. Questions were added to the annual harvest survey (Frawley 2021) to determine how COVID-19 regulations may have changed hunting behavior. Determining how COVID-19 regulations changed hunting behavior may be important because it may affect future hunting seasons and regulations.

METHODS

The Michigan Department of Natural Resources (MDNR) currently sells hunting licenses using a statewide electronic license sales system. This system allowed the MDNR to maintain a central database containing license sales information (e.g., sales transactions and customer profiles). From this database, the sex, birth date, state and county of residence, and license purchasing history of each spring turkey hunting license buyer were determined during 2009-2020.

Following the 2020 spring turkey hunting season, a questionnaire (Appendix A) was sent to 15,442 randomly selected people that had purchased a turkey hunting license (mentored youth [<10 years old], junior resident [10-16], resident turkey [17-64], senior resident turkey [65+], nonresident turkey, apprentice (person >9 years old who did not have a hunter safety certificate), and Pure Michigan hunting licenses). Normally, the annual harvest survey would have been conducted immediately after the season had ended (i.e., June-October); however, the 2020 survey was delayed because of the COVID-19 pandemic. The 2020 survey data were collected during September-December.

All license buyers that received the questionnaire were asked to indicate how important turkey hunting was to them compared to their other recreational activities and to describe their turkey hunting skill level. Also, license buyers were presented with several statements describing the potential impact of COVID-19 on their behavior (e.g., were they more likely to buy a license or to hunt more often?) and were asked to indicate whether COVID-19 had affected their behavior. Responses included “strongly agree,” “agree,” “neither,” “disagree,” “strongly disagree,” and “unsure.” License buyers were asked whether they planned to continue to hunt turkeys in Michigan in the next 2 years. Responses included “very likely,” “somewhat likely,” “not very likely,” “not at all likely,” and “not sure.”

COVID-19 may cause older hunters to change their behavior more than younger ones because younger people may take more risks than older people (Zhou et al. 2020). Female hunters may also change their hunting behavior more than males because males may take more risks than females; therefore, males might ignore the COVID-19 restrictions more often than females (Feingold 1994, Byrnes et al. 1999). Because of these potential differences between ages and gender, estimates were calculated separately for ten different age classes (1-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80+ years old) and each gender.

Hunters living in urban areas (with high human density) may be more affected by the COVID-19 traveling restrictions than hunters living in rural counties; thus, estimates were calculated separately for rural and urban areas. The U.S. Census Bureau classified counties as completely rural, mostly rural, and mostly urban (US Census Bureau 2010). Completely rural counties included counties where 100% of the population in the county lived in areas that have less than 1,000 people per square mile (Antrim, Arenac, Baraga, Benzie, Keweenaw, Lake, Missaukee, Montmorency, Ogemaw, Ontonagon, Osceola, and Oscoda). Mostly rural counties included counties where 50.1% to 99.9% of the population lived in areas with less than 1,000 people per square mile (Alcona, Alger, Allegan, Alpena, Barry, Branch, Cass, Charlevoix, Cheboygan, Clare, Clinton, Crawford, Emmet, Gladwin, Gogebic, Gratiot, Hillsdale, Huron, Ionia, Iosco, Iron, Kalkaska, Lapeer, Leelanau, Lenawee, Luce, Mackinac, Manistee, Mason, Mecosta, Menominee, Montcalm, Newaygo, Oceana, Otsego, Presque Isle, Roscommon, St. Joseph, Sanilac, Schoolcraft, Shiawassee, Tuscola, Van Buren, and Wexford). Mostly urban counties included counties with greater than 50,000 people and greater than 50% of the residents living in areas with more than 1,000 people per square mile (Bay, Berrien, Calhoun, Chippewa, Delta, Dickinson, Eaton, Genesee, Grand Traverse, Houghton, Ingham, Isabella, Jackson, Kalamazoo, Kent, Livingston, Macomb, Marquette, Midland, Monroe, Muskegon, Oakland, Ottawa, Saginaw, St. Clair, Washtenaw, and Wayne).

Estimates were calculated using a stratified random sampling design that included 18 strata (Frawley 2021). Hunters were stratified based on the management unit where their license was valid (13 management units). Hunters who purchased a license that could be used in multiple management units (mentored youth hunters, PMH license holders, and licenses for hunts 234 and 301) were treated as separate strata (strata 14-17). Moreover, people that had voluntarily reported information about their hunting activity via the internet were treated as a separate stratum (eighteenth stratum).

A 95% confidence limit (CL) was calculated for all estimates. This CL could be added to and subtracted from an estimate to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100. Estimates were based on information collected from random samples of hunting license buyers. Thus, these estimates were subject to sampling errors (Cochran 1977). Estimates were not adjusted for possible response or nonresponse biases.

Statistical tests are used routinely to determine the likelihood that differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals were equivalent to stating the difference between the means was larger than would be expected 95 out of 100 times ($P<0.05$), if the study had been repeated (Payton et al. 2003).

RESULTS AND DISCUSSION

Questionnaires were mailed initially during September 2020, and nonrespondents were mailed up to two follow-up questionnaires. Although 15,442 people were sent the questionnaire, 260 surveys were undeliverable resulting in an adjusted sample size of 15,182. Questionnaires were returned by 6,786 people, yielding a 45% adjusted response rate.

In 2020, licenses were purchased by 105,650 people, an increase of 22,578 license buyers (27% increase) from 2019 (Figure 1). About 83% (±1%) of the license buyers hunted turkeys (87,825 ± 975 hunters). A greater number of people purchased a license in 2020 for nearly all ages less than 65 years of age (Figure 2). Most of the people buying a license were males (91%), and the average age of the license buyers was 42 years, compared to an average age of 45 years in 2019 (Frawley 2019b). Nearly 12% (12,230) of the license buyers were younger than 17 years old in 2020, compared to 10% of license buyers in 2019. Mentored youth hunting licenses were purchased by 3,392 youths less than 10 years old in 2020, versus 2,249 licenses purchased in 2019 (51% increase). Apprentice hunting licenses were purchased by 2,648 people in 2020, versus 1,362 licenses purchased in 2019 (94% increase).

License buyers in 2020 were classified into either new license buyers (i.e., people that had not purchased a license during the previous 12 years) or repeat license buyers. About 25% of the 2020 license buyers were first-time buyers in 2020 (i.e., new buyers), and about 13% of the buyers had purchased a license every year since 2009 (Figure 3).

In addition, the frequency of license buying between consecutive years was calculated using two methods: (1) the proportion of buyers in any given year that also purchased a license in the next year and (2) the proportion of license buyers in any single year that had not purchased a license during the previous year. For the first measurement, an average of 62.2% of license buyers in any single year also purchased a license in the next year between 2009 and 2019 (Figure 4). This proportion increased to 64.4% between 2019 and 2020 after the start of the COVID-19 restrictions. For the second measurement, an average of 35.5% of license buyers in any single year had not purchased a license during the previous year between 2010 and 2019. In contrast, 49.4% of the 2020 license buyers had not purchased a license in 2019, which was the highest level observed.

The number of new license buyers in 2020 was greater than in 2019 for most ages (Figure 5), although the largest percentage increases were noted among the youngest license buyers. In addition, a higher proportion of the new license buyers were females than males (Figure 6). About 22% of the male license buyers in 2020 had never purchased a license since 2009, while 41% of the female license buyers in 2020 had never purchased a license.

States adjacent to Michigan also reported an increase in spring turkey hunter numbers in 2020, compared to 2019. Hunter numbers increased 31% in Minnesota (Lyons 2020), 25% in Indiana (National Wild Turkey Federal 2020), and 7% in Ohio (Ohio DNR 2020). Also, Wisconsin hunters obtained 5% more harvest authorizations in 2020 (Wisconsin DNR 2020). Like Michigan, Minnesota and Ohio also reported large increases in participation among youth hunters in 2020. In Minnesota, youth permits increased 132% (Lyons 2020), while Ohio youth permits increased 38% (Ohio DNR 2020).

License buyers were asked to indicate how important turkey hunting was to them compared to their other recreational activities (Tables 1 and 2). Overall, 53% of all license buyers rated turkey hunting as very important (i.e., combined respondents that indicated that turkey hunting was their most important recreational activity or one of their most important activities). Turkey hunting was less important among new buyers than repeat buyers. Also, the importance of hunting declined by age among new buyers (Figure 7), while the importance of turkey hunting did not vary by age among repeat buyers.

Turkey hunters rated turkey hunting as less important than hunting done by deer and waterfowl hunters (Figure 8). Similarly, Frawley (2006) reported that the proportion of repeat hunting license buyers was highest among deer hunters, suggesting that deer hunting was considered the most important type of hunting in Michigan.

License buyers classified themselves into five categories based on their turkey hunting skills: beginner, novice, intermediate, advanced, or expert (Tables 3 and 4). Overall, 28% of all license buyers were rated as beginners (combined beginner and novice ratings). A higher proportion of new buyers and female license buyers considered themselves as beginners than repeat buyers and male buyers. Also, the skill level increased with hunters’ age.

License buyers were asked to indicate whether COVID-19 caused them to (1) buy a spring turkey hunting license, (2) spend more time hunting, (3) reduce the distance they traveled to hunt, (4) hunt alone more often, or (5) struggle to locate a hunting area (Tables 5-14). Overall, 39 ± 1% of license buyers (41,023 ± 1,292) strongly agreed or agreed that COVID-19 had caused them to do at least one of these five actions.

Many people may have had more time to hunt because some businesses and schools shut down and people often worked from home because of COVID-19. About 15% of license buyers (15,708) indicated that they were more likely to purchase a license in 2020 because of COVID-19 (Tables 5 and 6). The first-time buyers in 2020 were more likely to indicate that they purchased a license because of COVID-19 than repeat buyers (24% versus 13%) (Figure 9). Also, females were more likely to buy a license than males (19% versus 14%), and younger hunters were more likely to buy a license because of COVID-19 than older hunters. The proportion of license buyers that agreed that COVID-19 had made them more likely to buy a license did not differ between rural and urban counties.

About 20% of license buyers (21,401) indicated that they increased the amount of time they hunted in 2020 because of COVID-19 (Tables 7 and 8). New buyers were more likely to increase their days hunting because of COVID-19 than repeat buyers (28% versus 18%) (Figure 10). Also, females were more likely to increase their hunting effort than males (30% versus 19%), and younger license buyers were more likely to increase their hunting effort than older buyers, regardless of if they were new or repeat buyers (Figure 10).

Michigan residents were encouraged to do fewer long-distance trips in 2020 because of COVID-19, and about 10% of license buyers (10,154) indicated that they reduced the distance they traveled to hunt in 2020 (Tables 9 and 10). The proportion of hunters that reduced their traveling was similar among all classes of hunters. Similarly, about 10% of Wisconsin turkey hunters in 2020 reported that their travel was affected by COVID-19 travel restrictions mandated in Wisconsin (Lohr and Dhuey 2020).

People were encouraged to keep physical distance between themselves and other people in 2020 because of COVID-19, and about 13% of license buyers (14,014) indicated that they hunted alone more frequently in 2020 because of COVID-19 (Tables 11 and 12). Repeat buyers were slightly more likely to hunt alone because of COVID-19 than new buyers (14% versus 10%). Also, males were slightly more likely to hunt alone than females (14% versus 9%), and older license buyers were more likely to hunt alone than younger buyers. Apprentice (person >9 years old who did not have a hunter safety certificate) and mentored youth (<10 years old) hunters were required to hunt with another hunter, and this requirement would limit their ability to hunt alone.

About 7% of license buyers (6,945) indicated that they found it more difficult to locate a hunting area in 2020 because of COVID-19 (Tables 13 and 14). The proportion of hunters that reported it was more difficult to find a hunting area was similar among all classes of hunters. Similarly, about 9% of Wisconsin turkey hunters in 2020 reported that they found it difficult (somewhat difficult and very difficult responses combined) to find a place to hunt in Wisconsin (Lohr and Dhuey 2020).

About 78% of license buyers (82,601) indicated they were very likely to hunt turkeys during the next two years (Tables 15 and 16). A higher proportion of repeat buyers planned to hunt again than new buyers (82% versus 63%). Also, the younger license buyers (<60 years old) were more likely to hunt again during the next two years than older buyers.

COVID-19 restrictions appeared to have increased the number of people buying hunting licenses in Michigan; however, changes made to hunting regulations also may have affected hunter behavior in 2020. Michigan reported among the highest increase in participation in the Midwest during the spring turkey hunting season in 2020. Michigan implemented significant changes to its regulations in 2020 that may have compounded the increases attributed to COVID-19. The changes made in Michigan included: (1) changing the opening day of all seasons from Monday to Saturday, (2) increasing the season length of Hunt 301 in Unit ZZ from 14 days to 44 days, and (3) reducing the number of quota hunt seasons but increasing the length of most of the remaining quota hunts by 7 to 16 days. Although COVID-19 restrictions likely increased participation in Michigan, many new license buyers may also have been attracted to buy a license because of the new regulations. This may explain why the number of Michigan license buyers in 2020 increased by 27% from 2019, but only 15% of the license buyers reported that they were more likely to purchase a license in 2020 because of COVID-19. Furthermore, few regulation changes were made in Ohio and Wisconsin in 2020, and these states reported more modest increased participation (5-7% increase). This suggests that both regulatory changes and COVID-19 restrictions contributed to the larger gains in participation reported in Michigan. Consequently, a higher proportion of these new hunters may be maintained when COVID-19 restrictions are reduced or eliminated.

Beginning in March 2020, COVID-19 regulations forced many people to work remotely. Among Americans that could work remotely, 71% of these people were working from home all or most of the time (Pew Research Center 2020). These COVID-19 regulations may change how work is done in the future. About 54% of workers that could work remotely would prefer to work from home all or most of the time when the coronavirus outbreak is over. Among workers that shifted to remote working, 49% say they had more flexibility to choose when they worked. This flexibility likely allowed more people to pursue recreational activities such as turkey hunting.

Maintaining the new license buyers may be a challenge because turkey hunting was less important among new buyers than repeat buyers. Also, a lower proportion of new buyers planned to hunt again than repeat buyers. However, more flexible work schedules may allow many of these new buyers to continue to pursue hunting. The Michigan DNR needs to investigate ways to keep these new license buyers engaged when the coronavirus outbreak is over (Brown 2020). For example, providing new learning opportunities and sending license buyers reminders about upcoming seasons may be effective in retaining more of these new license buyers.

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Table 1. The importance of turkey hunting as a recreational activity among license buyers (% of license buyers) in Michigan, 2020.[a]

Group	Very important %	Very important 95% CL	Moderately important %	Moderately important 95% CL	Not important %	Not important 95% CL	No answer %	No answer Total 95% CL
All license buyers	53	1	26	1	18	1	3	<1
Males buyers	53	1	26	1	18	1	3	<1
Female buyers	52	4	26	4	18	3	3	1
Completely rural buyers	51	6	29	6	18	5	2	2
Mostly rural buyers	51	2	28	2	18	2	3	1
Mostly urban buyers	53	2	25	1	19	1	3	1
New buyers[b]	36	3	30	3	31	3	2	1
Repeat buyers	57	1	25	1	15	1	3	<1
Ages 1-9	52	3	24	3	21	3	4	1
Ages 10-19	50	4	29	4	19	3	2	1
Ages 20-29	54	4	24	4	19	3	3	1
Ages 30-39	52	4	24	3	21	3	2	1
Ages 40-49	49	4	28	3	21	3	3	1
Ages 50-59	55	3	27	3	16	2	3	1
Ages 60-69	53	3	27	2	17	2	3	1
Ages 70-79	54	4	25	3	16	3	4	1
Ages 80+	56	9	17	7	18	8	8	5

[a]The very important category included respondents that indicated that turkey hunting was their most important recreational activity or one of their most important activities. The moderately important category included people that indicated that turkey hunting was no more important than other activities. The not important category included respondents that indicated that turkey hunting was less important than other recreational activities or not at all important.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 2. The importance of turkey hunting as a recreational activity among license buyers (number of license buyers) in Michigan, 2020.[a]

Group	Very impor-tant total	Very impor-tant 95% CL	Moder-ately impor-tant total	Moder-ately impor-tant 95% CL	Not impor-tant total	Not impor-tant 95% CL	No answer total	No answer 95% CL
All license buyers	55,844	1,323	27,596	1,168	19,149	1,022	3,061	433
Males buyers	50,364	1,325	24,806	1,130	17,363	987	2,704	408
Female buyers	4,840	543	2,449	386	1,665	317	292	132
Completely rural buyers	1,917	340	1,114	273	682	185	82	71
Mostly rural buyers	20,006	1,041	10,729	799	6,895	656	1,289	282
Mostly urban buyers	31,573	1,213	14,825	927	11,144	824	1,658	324
New buyers[b]	6,888	607	5,791	588	5,995	601	467	156
Repeat buyers	48,315	1,320	21,464	1,077	13,033	883	2,529	400
Ages 1-9	1,487	97	671	78	589	74	105	34
Ages 10-19	5,468	577	3,124	447	2,011	356	246	121
Ages 20-29	4,859	570	2,146	378	1,705	336	247	123
Ages 30-39	6,068	630	2,795	433	2,453	401	266	127
Ages 40-49	6,262	636	3,554	487	2,727	440	366	160
Ages 50-59	11,349	829	5,510	597	3,360	475	534	179
Ages 60-69	12,570	865	6,367	641	3,941	508	628	205
Ages 70-79	6,692	659	3,089	458	2,009	369	512	186
Ages 80+	1,089	266	335	144	349	167	155	104

[a]The very important category included respondents that indicated that turkey hunting was their most important recreational activity or one of their most important activities. The moderately important category included people that indicated that turkey hunting was no more important than other activities. The not important category included respondents that indicated that turkey hunting was less important than other recreational activities or not at all important. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 3. The skill level of turkey hunting license buyers (% of license buyers) in Michigan, 2020.[a]

Group	Beginner %	Beginner 95% CL	Intermediate %	Intermediate 95% CL	Advanced %	Advanced 95% CL	No answer %	No answer 95% CL
All license buyers	28	1	36	1	33	1	4	<1
Males buyers	25	1	36	1	35	1	4	1
Female buyers	53	4	31	4	12	3	5	2
Completely rural buyers	31	6	35	6	32	6	2	2
Mostly rural buyers	26	2	36	2	34	2	5	1
Mostly urban buyers	28	1	37	2	32	2	4	1
New buyers[b]	66	3	21	2	9	2	4	1
Repeat buyers	19	1	39	1	38	1	4	1
Ages 1-9	83	2	7	2	5	1	5	1
Ages 10-19	58	4	28	4	11	2	3	1
Ages 20-29	40	4	34	4	21	4	4	2
Ages 30-39	35	4	36	4	26	3	3	1
Ages 40-49	27	3	37	4	32	3	4	1
Ages 50-59	19	2	38	3	40	3	3	1
Ages 60-69	16	2	38	3	42	3	4	1
Ages 70-79	14	3	39	4	42	4	5	2
Ages 80+	8	5	32	9	47	9	13	7

[a]The beginner category included respondents that indicated that they were beginners or novice turkey hunters. The advanced category included respondents that reported that they were advanced or expert turkey hunters.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 4. The skill level of turkey hunting license buyers (number of license buyers) in Michigan, 2020.[a]

Group	Beginner total	Beginner 95% CL	Intermediate total	Intermediate 95% CL	Advanced total	Advanced 95% CL	No answer total	No answer 95% CL
All license buyers	29,451	1,164	37,606	1,277	34,488	1,246	4,104	512
Males buyers	24,040	1,094	34,405	1,251	33,174	1,234	3,619	481
Female buyers	4,900	523	2,849	432	1,081	269	416	170
Completely rural buyers	1,170	255	1,325	286	1,211	280	88	73
Mostly rural buyers	10,022	758	13,826	904	13,298	885	1,773	345
Mostly urban buyers	16,571	952	21,632	1,079	18,860	1,023	2,138	372
New buyers[b]	12,628	806	4,009	508	1,806	339	698	208
Repeat buyers	16,311	962	33,245	1,240	32,448	1,227	3,337	466
Ages 1-9	2,369	89	203	46	144	39	137	38
Ages 10-19	6,300	609	3,077	448	1,185	280	288	142
Ages 20-29	3,608	490	3,078	451	1,907	365	365	154
Ages 30-39	4,051	508	4,215	532	2,976	447	340	152
Ages 40-49	3,495	486	4,767	565	4,176	526	472	182
Ages 50-59	3,918	520	7,912	706	8,233	709	690	207
Ages 60-69	3,838	501	8,994	749	9,755	776	919	253
Ages 70-79	1,704	353	4,752	557	5,199	584	648	208
Ages 80+	161	99	609	202	912	247	246	139

[a]The beginner category included respondents that indicated that they were beginners or novice turkey hunters. The advanced category included respondents that reported that they were advanced or expert turkey hunters. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 5. The proportion of Michigan spring turkey hunting license buyers that indicated that they were more likely to purchase a hunting license in 2020 because of the COVID-19 pandemic.[a]

Group	Agree %	Agree 95% CL	Neither %	Neither 95% CL	Disagree %	Disagree 95% CL	Unsure %	Unsure 95% CL	No answer %	No answer 95% CL
All license buyers	15	1	31	1	47	1	2	<1	5	1
Males buyers	14	1	31	1	47	1	2	<1	5	1
Female buyers	19	3	31	4	43	4	3	1	5	2
Completely rural buyers	14	5	31	6	46	6	2	2	6	3
Mostly rural buyers	13	1	30	2	48	2	2	1	6	1
Mostly urban buyers	16	1	32	2	46	2	2	<1	5	1
New buyers[b]	24	2	31	3	37	3	3	1	5	1
Repeat buyers	13	1	31	1	49	1	2	<1	5	1
Ages 1-9	16	2	30	3	43	3	4	1	6	2
Ages 10-19	19	3	31	4	43	4	4	2	4	1
Ages 20-29	23	4	30	4	42	4	1	1	4	2
Ages 30-39	19	3	33	4	45	4	1	1	3	1
Ages 40-49	20	3	31	3	44	4	1	1	4	1
Ages 50-59	14	2	29	3	50	3	2	1	4	1
Ages 60-69	8	1	35	3	50	3	2	1	6	1
Ages 70-79	10	2	30	3	46	4	4	2	10	2
Ages 80+	10	6	23	8	46	9	3	3	17	7

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed.
[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 6. The number of Michigan spring turkey hunting license buyers that indicated that they were more likely to purchase a hunting license in 2020 because of the COVID-19 pandemic.[a]

Group	Agree total	Agree 95% CL	Neither total	Neither 95% CL	Disagree total	Disagree 95% CL	Unsure total	Unsure 95% CL	No answer total	No answer 95% CL
All license buyers	15,708	945	32,998	1,234	49,267	1,326	2,233	384	5,444	577
Males buyers	13,701	895	29,797	1,201	44,903	1,314	1,906	359	4,930	552
Female buyers	1,735	329	2,842	415	3,943	490	290	131	436	161
Completely rural buyers	547	189	1,195	279	1,758	311	78	58	217	128
Mostly rural buyers	5,254	571	11,735	837	18,840	1,018	868	242	2,222	371
Mostly urban buyers	9,364	762	18,842	1,021	26,995	1,158	1,179	286	2,820	422
New buyers[b]	4,686	532	5,988	589	6,988	621	487	168	993	246
Repeat buyers	10,750	812	26,650	1,164	41,859	1,302	1,709	344	4,373	521
Ages 1-9	468	67	859	85	1,230	94	121	36	176	43
Ages 10-19	2,022	359	3,334	458	4,646	535	428	168	420	156
Ages 20-29	2,064	377	2,675	416	3,771	507	97	78	350	148
Ages 30-39	2,159	376	3,804	503	5,190	584	74	67	355	152
Ages 40-49	2,602	420	3,970	516	5,730	616	145	96	462	177
Ages 50-59	2,969	453	6,103	630	10,438	792	400	173	844	234
Ages 60-69	1,987	356	8,117	719	11,672	839	408	172	1,322	296
Ages 70-79	1,236	291	3,683	504	5,690	604	505	194	1,188	284
Ages 80+	200	124	449	170	896	247	55	63	328	146

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 7. The proportion of Michigan spring turkey hunting license buyers that indicated that they increased the amount of time they hunted in 2020 because of the COVID-19 pandemic.[a]

Group	Agree %	Agree 95% CL	Neither %	Neither 95% CL	Disagree %	Disagree 95% CL	Unsure %	Unsure 95% CL	No answer %	No answer 95% CL
All license buyers	**20**	**1**	27	1	45	1	2	<1	6	1
Males buyers	19	1	27	1	46	1	2	<1	6	1
Female buyers	30	4	25	4	38	4	3	1	5	2
Completely rural buyers	18	5	29	6	45	6	2	1	7	4
Mostly rural buyers	20	2	25	2	47	2	2	1	6	1
Mostly urban buyers	21	1	27	2	45	2	2	<1	5	1
New buyers[b]	28	3	27	3	36	3	3	1	5	1
Repeat buyers	18	1	26	1	48	1	2	<1	6	1
Ages 1-9	27	3	30	3	31	3	5	1	7	2
Ages 10-19	39	4	23	3	31	4	3	1	4	1
Ages 20-29	34	4	23	4	37	4	2	1	4	2
Ages 30-39	25	3	28	3	43	4	1	1	3	1
Ages 40-49	26	3	24	3	44	4	2	1	4	1
Ages 50-59	18	2	27	3	49	3	1	1	4	1
Ages 60-69	9	2	30	2	53	3	2	1	6	1
Ages 70-79	8	2	26	3	51	4	3	1	12	2
Ages 80+	6	4	19	7	52	9	5	4	18	7

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 8. The number of Michigan spring turkey hunting license buyers that indicated that they increased the amount of time they hunted in 2020 because of the COVID-19 pandemic.[a]

Group	Agree total	Agree 95% CL	Neither total	Neither 95% CL	Disagree total	Disagree 95% CL	Unsure total	Unsure 95% CL	No answer total	No answer 95% CL
All license buyers	21,401	1,061	28,048	1,176	48,065	1,322	2,164	372	5,972	602
Males buyers	18,167	999	25,478	1,141	44,262	1,312	1,885	351	5,445	577
Female buyers	2,770	415	2,277	369	3,504	464	245	121	449	163
Completely rural buyers	687	201	1,085	270	1,705	308	57	51	261	141
Mostly rural buyers	7,613	679	9,877	773	18,161	1,006	820	234	2,448	393
Mostly urban buyers	12,244	854	16,037	956	26,601	1,156	1,210	283	3,108	438
New buyers[b]	5,453	555	5,221	555	6,940	633	523	166	1,005	243
Repeat buyers	15,485	948	22,535	1,097	40,826	1,297	1,607	333	4,888	551
Ages 1-9	769	81	843	84	878	85	156	41	207	47
Ages 10-19	4,281	513	2,523	406	3,309	453	319	139	416	156
Ages 20-29	3,071	459	2,096	374	3,319	469	142	104	329	143
Ages 30-39	2,874	439	3,223	465	5,014	572	84	70	387	158
Ages 40-49	3,341	475	3,145	458	5,720	618	212	116	493	182
Ages 50-59	3,809	501	5,651	609	10,177	789	247	130	870	235
Ages 60-69	2,146	372	7,043	674	12,375	860	504	195	1,439	308
Ages 70-79	1,002	277	3,142	460	6,264	634	405	170	1,490	319
Ages 80+	109	83	372	155	1,009	266	96	84	341	149

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 9. The proportion of Michigan spring turkey hunting license buyers that indicated that they reduced the distance they traveled to hunt in 2020 because of the COVID-19 pandemic.[a]

Group	Agree %	Agree 95% CL	Neither %	Neither 95% CL	Disagree %	Disagree 95% CL	Unsure %	Unsure 95% CL	No answer %	No answer 95% CL
All license buyers	10	1	30	1	53	1	2	<1	6	1
Males buyers	10	1	29	1	53	1	2	<1	6	1
Female buyers	9	2	30	4	54	4	3	1	5	2
Completely rural buyers	13	4	34	6	47	6	1	1	5	3
Mostly rural buyers	8	1	30	2	54	2	2	1	6	1
Mostly urban buyers	10	1	29	2	53	2	2	<1	5	1
New buyers[b]	10	2	33	3	49	3	3	1	5	1
Repeat buyers	9	1	29	1	54	1	2	<1	6	1
Ages 1-9	10	2	31	3	47	3	4	1	8	2
Ages 10-19	8	2	32	4	53	4	3	1	4	1
Ages 20-29	9	2	26	4	59	4	1	1	4	2
Ages 30-39	11	2	29	4	56	4	1	1	3	1
Ages 40-49	10	2	34	4	51	4	1	1	4	1
Ages 50-59	10	2	28	3	55	3	1	1	4	1
Ages 60-69	10	2	31	3	52	3	2	1	6	1
Ages 70-79	9	2	27	3	49	4	3	1	12	2
Ages 80+	9	5	21	8	50	9	2	3	17	7

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 10. The number of Michigan spring turkey hunting license buyers that indicated that they reduced the distance they traveled to hunt in 2020 because of the COVID-19 pandemic.[a]

Group	Agree total	Agree 95% CL	Neither total	Neither 95% CL	Disagree total	Disagree 95% CL	Unsure total	Unsure 95% CL	No answer total	No answer 95% CL
All license buyers	10,154	769	31,272	1,218	56,092	1,325	2,076	373	6,057	608
Males buyers	9,238	738	28,030	1,182	50,646	1,327	1,786	350	5,536	584
Female buyers	800	220	2,775	408	4,955	550	273	128	443	164
Completely rural buyers	484	173	1,290	288	1,791	317	27	35	204	126
Mostly rural buyers	3,014	433	11,526	831	21,056	1,058	869	245	2,454	396
Mostly urban buyers	6,104	611	17,295	991	31,447	1,217	1,110	278	3,244	448
New buyers[b]	1,989	339	6,239	603	9,359	721	541	182	1,013	245
Repeat buyers	8,049	698	24,567	1,136	46,242	1,317	1,517	326	4,966	557
Ages 1-9	293	55	882	85	1,343	95	117	36	219	48
Ages 10-19	839	232	3,453	470	5,785	592	330	146	443	160
Ages 20-29	817	224	2,353	398	5,290	593	128	95	370	153
Ages 30-39	1,237	292	3,348	476	6,467	641	143	106	387	158
Ages 40-49	1,318	301	4,409	547	6,555	653	160	100	468	176
Ages 50-59	2,158	369	5,857	617	11,517	836	310	155	912	246
Ages 60-69	2,239	385	7,271	687	12,134	850	425	175	1,437	307
Ages 70-79	1,084	255	3,286	474	6,028	630	420	175	1,484	320
Ages 80+	169	105	406	165	973	257	43	59	337	151

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 11. The proportion of Michigan spring turkey hunting license buyers that indicated that they hunted alone more frequently in 2020 because of the COVID-19 pandemic.[a]

Group	Agree %	Agree 95% CL	Neither %	Neither 95% CL	Disagree %	Disagree 95% CL	Unsure %	Unsure 95% CL	No answer %	No answer 95% CL
All license buyers	13	1	28	1	51	1	2	<1	6	1
Males buyers	14	1	29	1	50	1	2	<1	6	1
Female buyers	9	2	23	3	59	4	3	1	6	2
Completely rural buyers	13	4	32	6	49	6	1	1	5	3
Mostly rural buyers	12	1	28	2	52	2	2	1	6	1
Mostly urban buyers	14	1	28	2	51	2	2	<1	5	1
New buyers[b]	10	2	31	3	52	3	2	1	5	1
Repeat buyers	14	1	28	1	51	1	2	<1	6	1
Ages 1-9	4	1	29	3	55	3	5	1	8	2
Ages 10-19	8	2	26	3	60	4	3	1	4	1
Ages 20-29	13	3	27	4	55	4	1	1	4	2
Ages 30-39	14	3	30	4	52	4	1	1	3	1
Ages 40-49	12	2	30	3	53	4	1	1	4	1
Ages 50-59	15	2	28	3	52	3	1	1	4	1
Ages 60-69	16	2	30	2	46	3	2	1	6	1
Ages 70-79	13	3	25	3	46	4	4	2	12	2
Ages 80+	14	7	20	7	46	9	2	3	18	7

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed. Apprentice (person >9 years old who did not have a hunter safety certificate) and mentored youth (<10 years old) hunters were required to hunt with another hunter, and this requirement would limit their ability to hunt alone.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 12. The number of Michigan spring turkey hunting license buyers that indicated that they hunted alone more frequently in 2020 because of the COVID-19 pandemic.[a]

Group	Agree total	Agree 95% CL	Neither total	Neither 95% CL	Disagree total	Disagree 95% CL	Unsure total	Unsure 95% CL	No answer total	No answer 95% CL
All license buyers	14,014	909	29,803	1,196	54,018	1,328	1,904	354	5,912	598
Males buyers	13,079	883	27,261	1,165	47,969	1,324	1,608	325	5,320	569
Female buyers	827	235	2,162	361	5,465	569	279	138	514	177
Completely rural buyers	498	178	1,207	273	1,856	327	44	44	190	123
Mostly rural buyers	4,700	555	10,925	810	20,190	1,041	757	225	2,348	382
Mostly urban buyers	8,432	727	16,576	966	29,951	1,199	1,027	266	3,215	447
New buyers[b]	1,863	342	5,853	583	9,972	739	472	166	983	241
Repeat buyers	12,043	856	23,570	1,113	43,462	1,309	1,415	312	4,851	547
Ages 1-9	121	36	820	83	1,557	97	137	38	219	48
Ages 10-19	839	233	2,805	423	6,501	627	291	138	413	153
Ages 20-29	1,120	281	2,429	406	4,966	570	88	78	354	147
Ages 30-39	1,637	335	3,489	480	5,981	623	95	77	380	155
Ages 40-49	1,535	324	3,931	512	6,801	668	163	103	479	180
Ages 50-59	3,037	436	5,806	608	10,801	820	229	130	882	240
Ages 60-69	3,830	508	7,063	673	10,839	809	363	162	1,411	303
Ages 70-79	1,630	334	3,063	456	5,692	608	495	193	1,422	312
Ages 80+	267	141	388	156	879	244	43	59	351	153

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups. Apprentice (person >9 years old who did not have a hunter safety certificate) and mentored youth (<10 years old) hunters were required to hunt with another hunter, and this requirement would limit their ability to hunt alone.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 13. The proportion of Michigan spring turkey hunting license buyers that indicated that found it more difficult to locate a hunting area in 2020 because of the COVID-19 pandemic.[a]

Group	Agree %	Agree 95% CL	Neither %	Neither 95% CL	Disagree %	Disagree 95% CL	Unsure %	Unsure 95% CL	No answer %	No answer 95% CL
All license buyers	7	1	25	1	60	1	2	<1	6	1
Males buyers	7	1	26	1	60	1	2	<1	6	1
Female buyers	7	2	21	3	65	4	3	1	5	2
Completely rural buyers	7	3	28	6	57	6	1	1	6	3
Mostly rural buyers	5	1	25	2	62	2	2	1	6	1
Mostly urban buyers	7	1	26	1	59	2	2	1	5	1
New buyers[b]	8	1	26	2	58	3	3	1	5	1
Repeat buyers	6	1	25	1	61	1	2	<1	6	1
Ages 1-9	6	2	28	3	54	3	5	1	6	2
Ages 10-19	8	2	24	3	62	4	3	1	4	1
Ages 20-29	7	2	22	4	65	4	3	1	4	2
Ages 30-39	6	2	28	3	61	4	1	1	3	1
Ages 40-49	9	2	25	3	60	4	2	1	4	1
Ages 50-59	6	1	27	3	61	3	2	1	4	1
Ages 60-69	5	1	28	2	59	3	2	1	6	1
Ages 70-79	7	2	21	3	56	4	4	2	12	2
Ages 80+	1	1	17	7	62	9	2	3	18	7

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 14. The number of Michigan spring turkey hunting license buyers that indicated that found it more difficult to locate a hunting area in 2020 because of the COVID-19 pandemic.[a]

Group	Agree total	Agree 95% CL	Neither total	Neither 95% CL	Disagree total	Disagree 95% CL	Unsure total	Unsure 95% CL	No answer total	No answer 95% CL
All license buyers	6,945	644	26,845	1,159	63,521	1,299	2,498	408	5,841	600
Males buyers	6,235	614	24,591	1,130	56,907	1,323	2,190	385	5,315	574
Female buyers	632	196	1,905	329	5,970	603	291	136	448	166
Completely rural buyers	283	136	1,057	256	2,170	355	56	49	229	130
Mostly rural buyers	1,927	351	9,676	767	24,003	1,110	905	245	2,408	394
Mostly urban buyers	4,401	517	15,145	937	35,167	1,252	1,433	321	3,053	437
New buyers[b]	1,442	292	4,988	541	11,187	783	576	175	949	241
Repeat buyers	5,426	579	21,508	1,080	51,689	1,324	1,905	369	4,813	550
Ages 1-9	176	43	796	82	1,542	97	156	41	183	44
Ages 10-19	815	225	2,612	410	6,699	636	328	146	396	153
Ages 20-29	587	193	1,929	357	5,839	621	236	128	366	152
Ages 30-39	701	214	3,248	469	7,096	671	158	113	380	155
Ages 40-49	1,170	277	3,261	470	7,787	711	229	128	462	177
Ages 50-59	1,317	295	5,622	602	12,659	871	354	156	802	229
Ages 60-69	1,280	296	6,493	649	13,823	901	499	191	1,410	306
Ages 70-79	886	234	2,549	419	6,873	667	503	196	1,490	321
Ages 80+	14	26	326	146	1,203	287	35	49	350	153

[a]The agree category combined respondents that indicated that they strongly agreed or agreed. The disagree category included respondents that reported that they disagreed or strongly disagreed. Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 15. The likelihood that 2020 spring turkey hunting license buyers will hunt turkeys during the next two years (% of license buyers) in Michigan.

Group	Very likely %	Very likely 95% CL	Somewhat likely %	Somewhat likely 95% CL	Not very likely %	Not very likely 95% CL	Not at all likely %	Not at all likely 95% CL	Not sure %	Not sure 95% CL	No answer %	No answer 95% CL
All license buyers	78	1	15	1	1	<1	1	<1	2	<1	4	<1
Males buyers	78	1	15	1	1	<1	1	<1	2	<1	4	<1
Female buyers	77	3	15	3	2	1	1	1	2	1	3	1
Completely rural buyers	78	5	15	5	1	1	1	1	2	1	2	2
Mostly rural buyers	77	2	15	1	1	<1	1	<1	2	1	4	1
Mostly urban buyers	79	1	14	1	1	<1	1	<1	2	<1	3	1
New buyers[b]	63	3	26	2	3	1	1	1	3	1	4	1
Repeat buyers	82	1	12	1	1	<1	<1	<1	2	<1	3	1
Ages 1-9	71	3	18	2	1	1	1	1	4	1	5	1
Ages 10-19	79	3	15	3	1	1	<1	1	2	1	3	1
Ages 20-29	78	4	15	3	1	1	<1	<1	2	1	4	2
Ages 30-39	83	3	12	2	2	1	<1	<1	1	1	3	1
Ages 40-49	78	3	16	3	1	1	1	1	1	1	3	1
Ages 50-59	82	2	13	2	1	1	1	<1	1	1	2	1
Ages 60-69	77	2	15	2	1	1	1	<1	2	1	4	1
Ages 70-79	72	3	17	3	2	1	1	1	3	1	5	2
Ages 80+	68	9	18	7	2	2	0	0	5	5	8	5

[a]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

Table 16. The likelihood that 2020 spring turkey hunting license buyers will hunt turkeys during the next two years (number of license buyers) in Michigan.[a]

Group	Very likely total	Very likely 95% CL	Somewhat likely total	Somewhat likely 95% CL	Not very likely total	Not very likely 95% CL	Not at all likely total	Not at all likely 95% CL	Not sure total	Not sure 95% CL	No answer total	No answer 95% CL
All license buyers	82,601	1,089	15,414	933	1,310	290	583	191	2,014	359	3,729	486
Males buyers	74,558	1,200	13,848	894	1,166	277	514	180	1,807	347	3,344	464
Female buyers	7,162	654	1,391	290	144	87	65	64	174	84	310	132
Completely rural buyers	2,958	417	572	186	53	50	40	43	78	57	94	89
Mostly rural buyers	29,862	1,193	5,987	611	471	170	202	108	883	244	1,513	313
Mostly urban buyers	47,032	1,314	8,149	704	707	223	325	151	927	247	2,061	363
New buyers[b]	12,042	802	4,887	541	579	192	264	126	628	195	742	213
Repeat buyers	69,678	1,237	10,352	793	730	218	315	144	1,353	300	2,913	434
Ages 1-9	2,014	96	507	69	27	17	31	19	125	37	148	40
Ages 10-19	8,534	716	1,607	308	118	83	36	63	240	124	315	139
Ages 20-29	7,000	675	1,315	294	83	72	27	35	183	112	351	149
Ages 30-39	9,600	774	1,367	305	178	105	28	33	74	63	336	151
Ages 40-49	10,054	794	2,106	384	130	90	70	69	147	95	403	167
Ages 50-59	16,993	986	2,667	419	215	118	129	83	253	133	497	174
Ages 60-69	18,199	1,008	3,454	480	290	153	186	112	470	179	907	254
Ages 70-79	8,899	752	2,048	369	235	118	76	77	418	175	625	212
Ages 80+	1,304	290	342	161	34	46	0	0	101	92	147	100

[a]Subgroup (e.g., gender) totals will not equal the total of all license buyers because some license buyers could not be classified into subgroups.

[b]New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

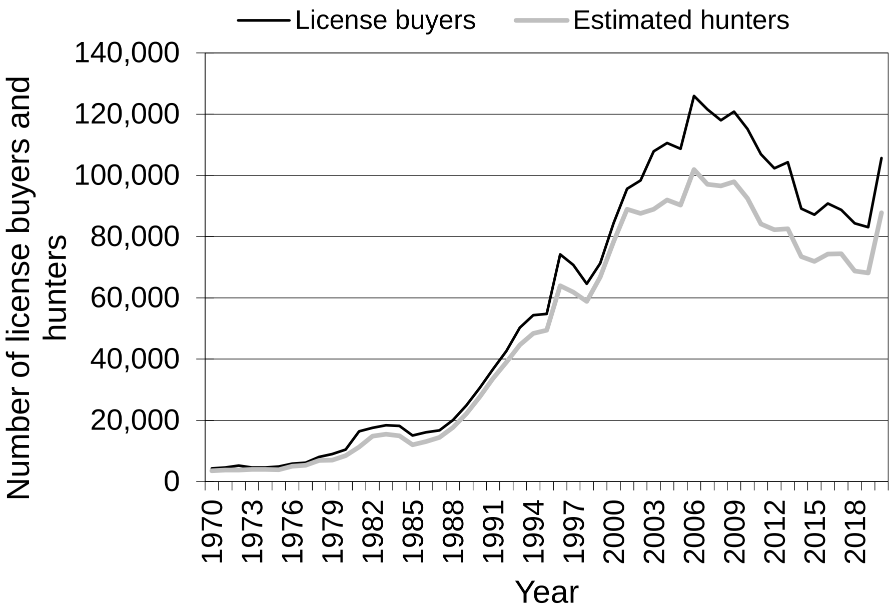


Figure 1. The number of spring turkey hunting license buyers, and the estimated number of buyers that hunted turkeys in Michigan, 1970-2020. Estimates of active hunters were derived from annual harvest survey completed after the hunting seasons had ended (e.g., Frawley 2021).

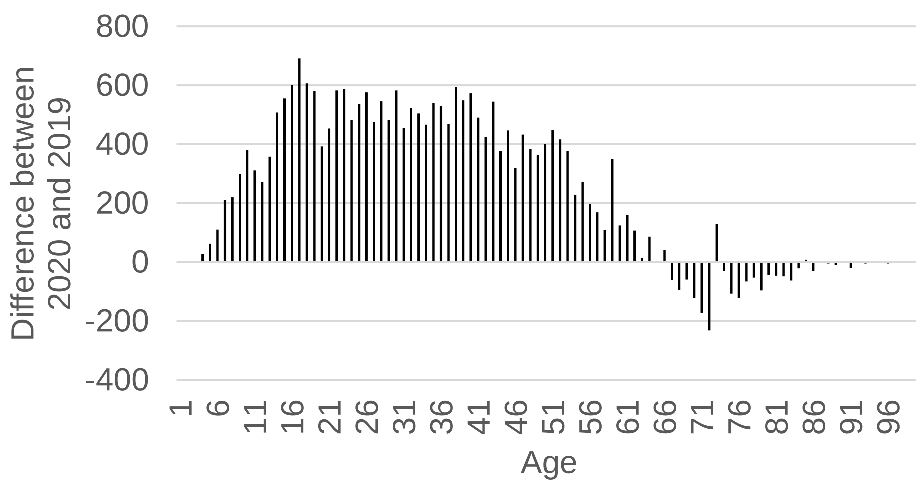


Figure 2. The difference in the number of spring turkey hunting license buyers in 2020 versus 2019, summarized by age.

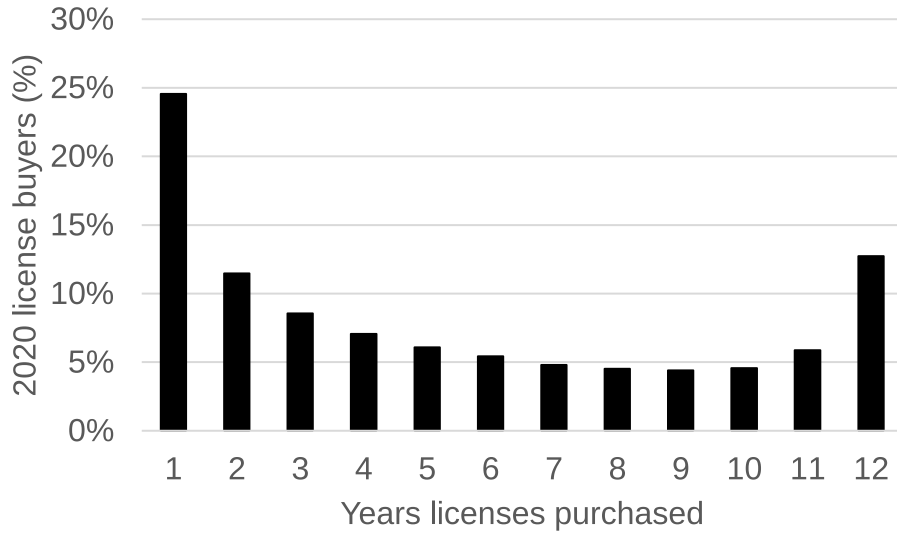


Figure 3. The number of years that 2020 spring turkey hunting license buyers had purchased a license in Michigan, 2009-2020.

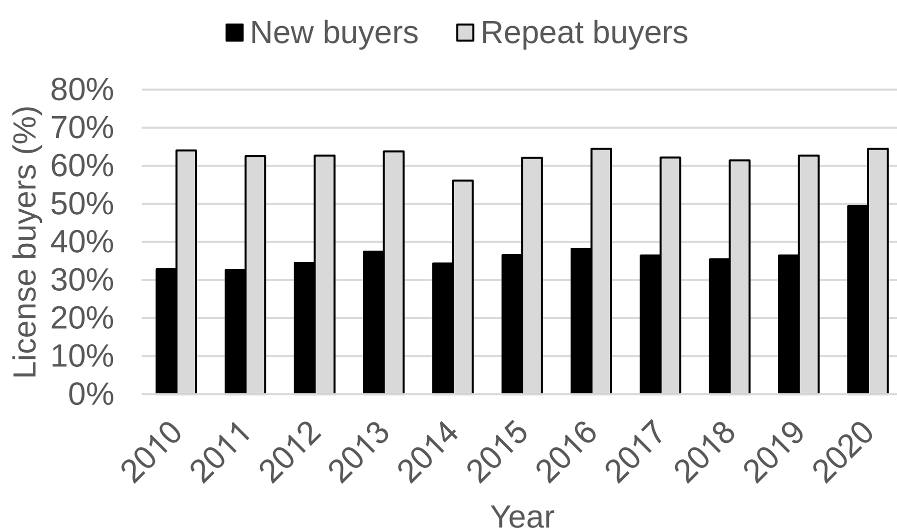


Figure 4. The proportion of new and repeat license buyers in Michigan during 2010-2020. New license buyers were defined as the proportion of buyers in a year that had not purchased a license in the previous year. Repeat license buyers was defined as the proportion of buyers in a year that also purchased a license in the next year.

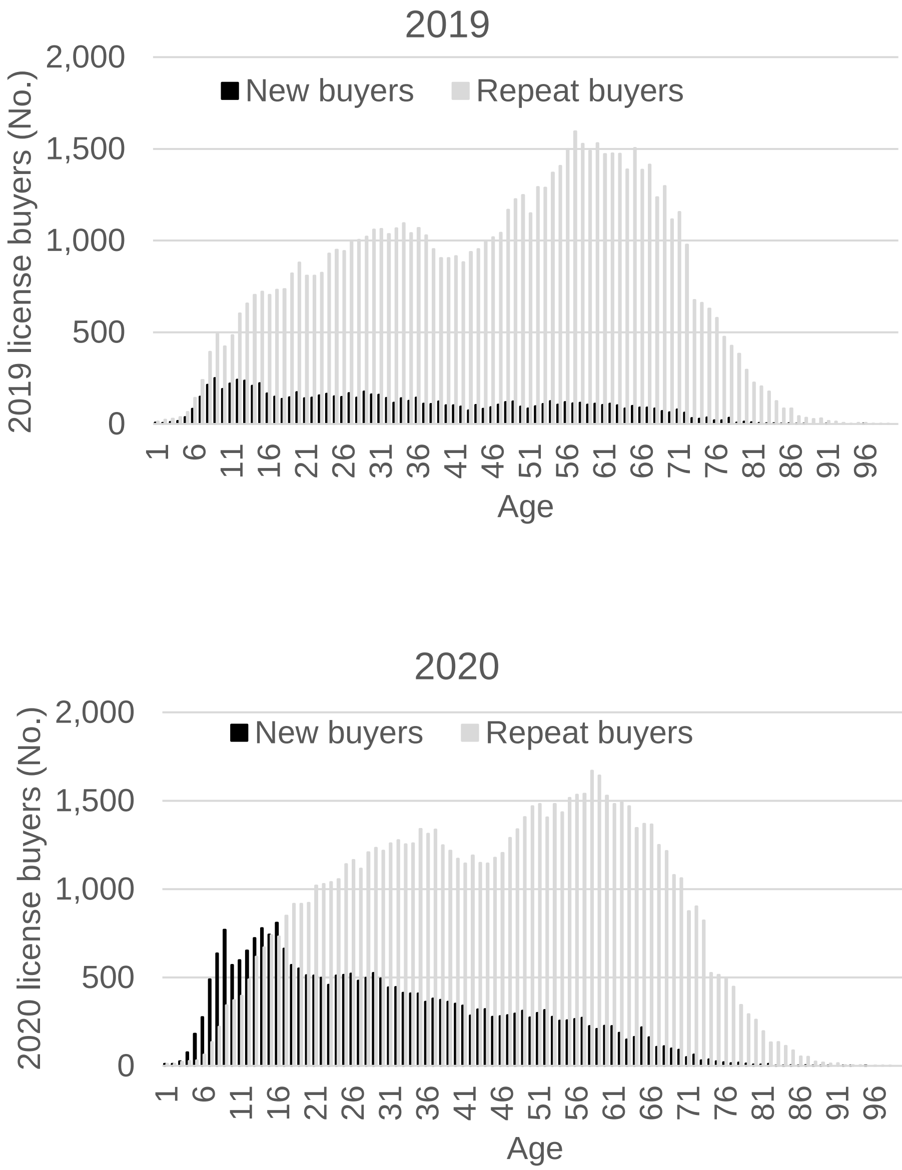
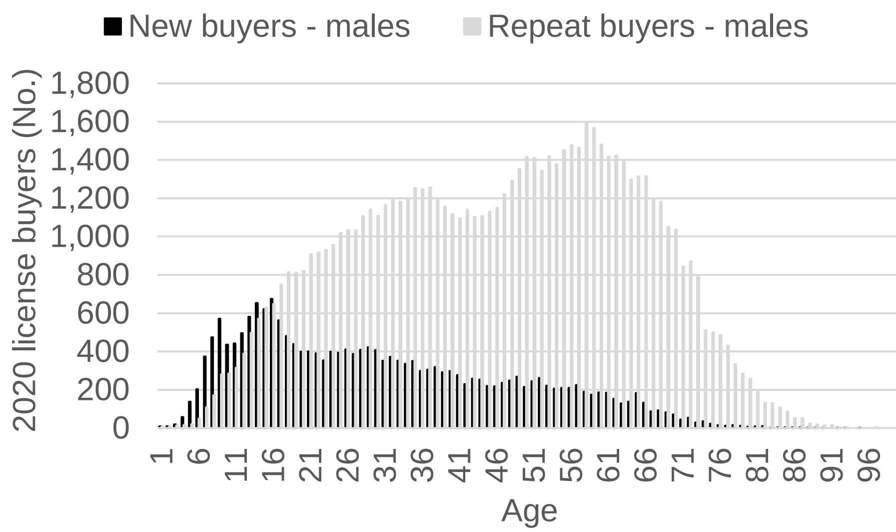


Figure 5. The number of new and repeat license buyers by age in 2019 (top) and 2020 (bottom). New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).



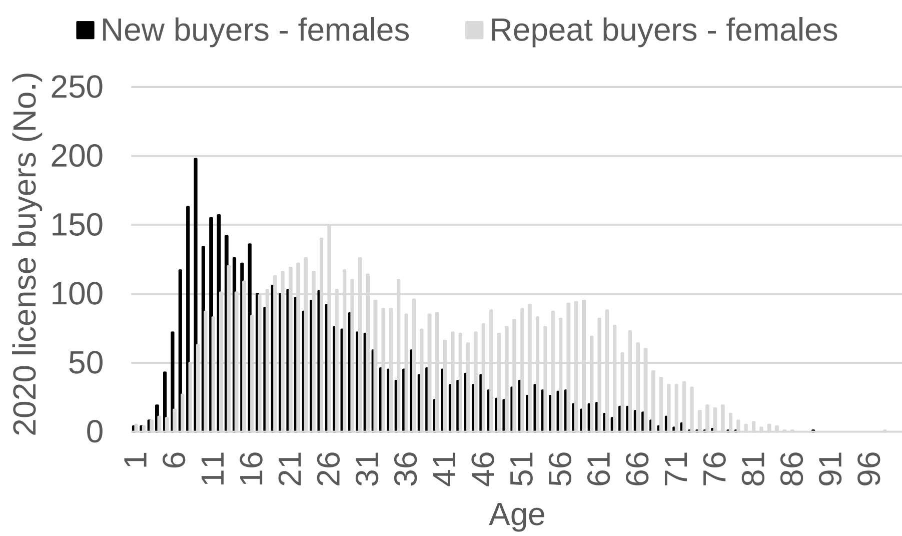


Figure 6. The number of new and repeat license buyers for males (top) and females (bottom) by age in 2020. New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

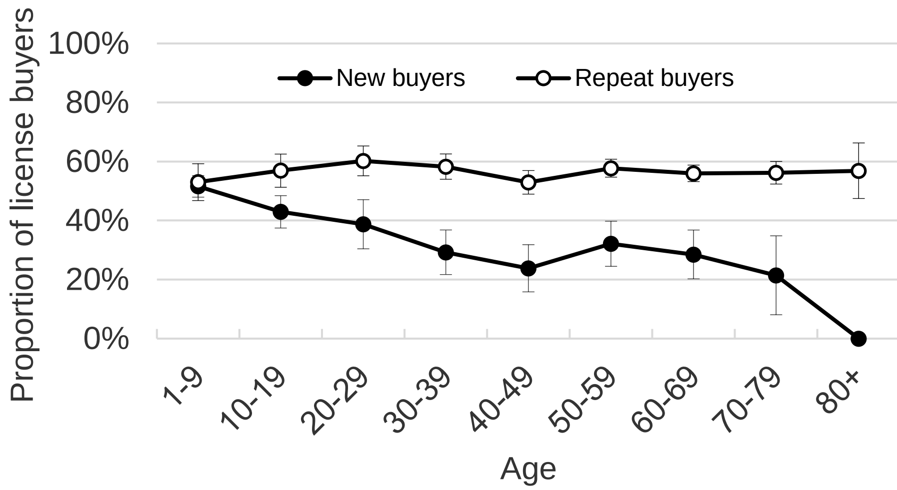


Figure 7. The importance of spring turkey hunting by age of new and repeat license buyers in 2020. New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

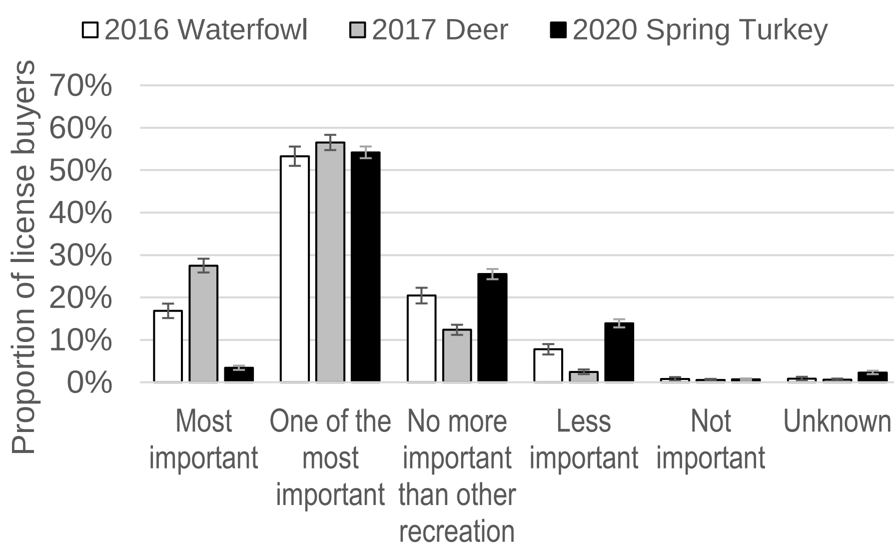


Figure 8. The importance of spring turkey hunting as a recreational activity compared to other types of hunting in Michigan. Estimates were summarized separately for active waterfowl (Frawley 2020), deer (Frawley et. al. 2019a), and spring turkey (current study) hunters.

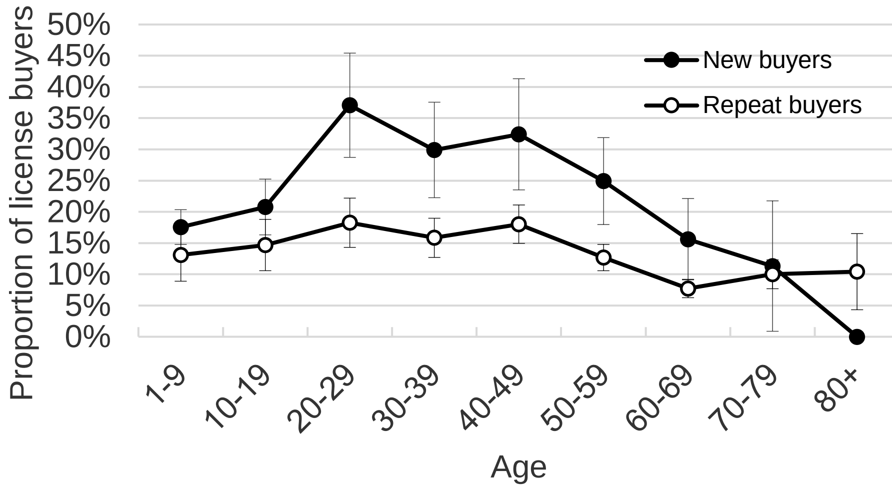


Figure 9. The proportion of 2020 license buyers that agreed that they were more likely to purchase a license because of COVID-19. Estimates provided separately for age and license buyer type (new versus repeat). New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

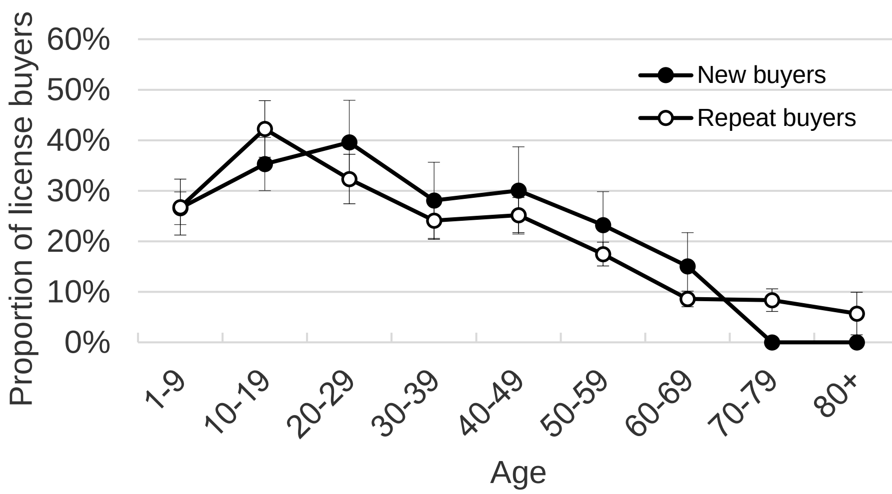


Figure 10. The proportion of 2020 license buyers that agreed that they had hunted more because of COVID-19. Estimates provided separately for age and license buyer type (new versus repeat). New license buyers were defined as people that had not purchased a license during the previous 12 years (since 2009).

APPENDIX A

The questionnaire that was used for the 2020 Spring Turkey Harvest Survey.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES, WILDLIFE DIVISION
PO BOX 30030 LANSING MI 48909-7530

2020 MICHIGAN SPRING TURKEY HUNTER REPORT

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.

It is important that you complete and return this questionnaire even if you did not hunt or harvest a turkey. If you did not hunt, please answer "No" to question 1 and return this report.

1. Did you hunt turkeys during the 2020 spring season? [1] ☐ Yes [2] ☐ No; skip to question 10.

2. Did you hunt with a firearm, crossbow, or bow? (select all that apply)

[1] ☐ Firearm [2] ☐ Crossbow [3] ☐ Bow (recurve, compound, or long bow)

3. If you hunted, please complete the adjacent table: *(If you hunted on both public and private lands in the same county or unit, report your activity on separate lines.* ***If you hunted in Unit ZZ, please <u>report</u> the <u>subunit</u> you hunted.****)*

County hunted (e.g., Kent County)	Unit hunted *(see map on back)*	Land ownership *(please check one)*	Number of days hunted
		[1] ☐ Private [2] ☐ Public	
		[1] ☐ Private [2] ☐ Public	
		[1] ☐ Private [2] ☐ Public	

4. Please circle [O] the days that you hunted. Circle only the days you actually went afield to hunt turkeys.

April						
S	M	T	W	T	F	S
						18
19	20	21	22	23	24	25
26	27	28	29	30		

May						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7						

5. Did you harvest a turkey during the 2020 spring season? Only count turkeys tagged with your kill tag. [1] ☐ Yes [2] ☐ No; skip to question 7.

6. If you placed your harvest tag on a turkey, please mark [X] the date that the turkey was harvested.

April						
S	M	T	W	T	F	S
						18
19	20	21	22	23	24	25
26	27	28	29	30		

May						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7						

A. In what county and unit was the turkey taken *(refer to map on backside)?*

______________________ **Please write in county name**

______________________ **Please write in hunting unit**

B. Which option best describes the bird that you tagged? [1] ☐ Male with a beard less than 6 inches [2] ☐ Male with a beard 6 or more inches [3] ☐ Female with a beard

C. What type of land was the turkey harvested? [1] ☐ Private [2] ☐ Public

D. What type of device was used to harvest your turkey?

[1] ☐ Firearm [2] ☐ Crossbow [3] ☐ Bow (recurve, compound, or long bow)

7. Overall, how would you rate your 2020 spring turkey hunting experience?

[1] ☐ Excellent [2] ☐ Very Good [3] ☐ Good [4] ☐ Fair [5] ☐ Poor

8. How would you describe interference by other hunters during your 2020 spring turkey hunt?

[1] ☐ None [2] ☐ Minor [3] ☐ Some irritation [4] ☐ Major problem

9. Compared to last year, what is the status of turkeys in the county you preferred to hunt in 2020?

[1] ☐ Increasing [2] ☐ Decreasing [3] ☐ Stable [4] ☐ Unknown

10. **As a recreational activity, how important is turkey hunting to you compared to your other recreational activities?** *(Select one choice.)*

- 1 ☐ My most important recreational activity.
- 2 ☐ One of my more important recreational activities.
- 3 ☐ No more important than other recreational activities.
- 4 ☐ Less important than most of my recreational activities.
- 5 ☐ Not at all important as a recreational activity.

11. **How would you describe your turkey hunting skill level?**

1 ☐ Beginner 2 ☐ Novice 3 ☐ Intermediate 4 ☐ Advanced 5 ☐ Expert

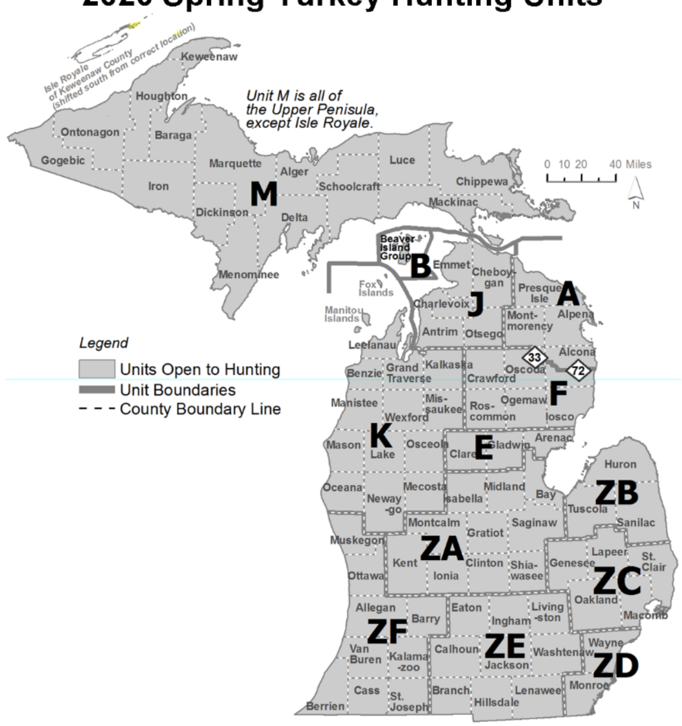
12. **To what extent do you agree or disagree with each of the following statements regarding the impacts of the COVID-19 pandemic on your hunting activity during the 2020 spring turkey hunting season?**
(Select one choice per item.)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Unsure
a. I was <u>more likely</u> to buy a hunting license because of the COVID-19 pandemic.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
b. I <u>increased</u> the amount of time that I spent hunting turkeys because of the COVID-19 pandemic.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
c. I <u>reduced</u> the distance I travelled to hunt turkeys because of the COVID-19 pandemic.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
d. I hunted <u>alone</u> <u>more frequently</u> because of the COVID-19 pandemic.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
e. I found it <u>more difficult</u> to locate a hunting area because of the COVID-19 pandemic.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐

13. **How likely is it that you will continue to hunt turkeys in Michigan in the next 2 years?**

1 ☐ Very likely 2 ☐ Somewhat likely 3 ☐ Not very likely 4 ☐ Not at all likely 5 ☐ Not sure

2020 Spring Turkey Hunting Units



Please note if you hunted Turkey Management Unit ZZ. Turkey Management Unit ZZ consisted of 6 smaller management units (subunits) in southern Michigan. If you hunted in Unit ZZ, please report which of these smaller subunits you hunted (i.e., units ZA, ZB, ZC, ZD, ZE, ZF).