

A REPORT ON THE 2013 WATERFOWL HUNTER SURVEY

MIKE ERVIN, Olentangy Wildlife Research Station, Ohio Division of Wildlife, 8589 Horseshoe Road, Ashley, OH 43003, USA

Abstract

Waterfowl hunter opinions vary greatly and wildlife agencies should reasonably consider those opinions towards regulations when setting season dates to hunt waterfowl within the context of Adaptive Harvest Management. For this reason Ohio waterfowl hunters were surveyed via an open internet based survey from 21 January 2013 through 15 February 2013. A total of 1818 valid surveys were submitted. The majority (59.2%) of respondents primarily hunted in the North Zone, followed by the South Zone (19.3%), and the Lake Erie Marsh Zone (LEMZ) (17.5%). The survey revealed waterfowl hunting season date preferences for the LEMZ and the South Zone; however North Zone respondents failed to reveal any strong date preferences. Respondents indicated split ducks seasons were preferred overall (72.3%), and in each zone. Respondents indicated marginal preference to a goose hunting regulations package consisting of a 92 day season with a 2 bird bag limit overall (55.8%), and in the LEMZ (60.6%) and North Zone (56.0%), while South Zone hunters showed no preference for either a 78 day season with a 3 bird bag limit (50.6%) or a 92 day season with a 2 bird bag limit (49.4%).

Introduction

Need for survey

The timing of waterfowl migration through Ohio depends on a multitude of factors including the biology of the 20+ species of waterfowl, climate, weather, day length, habitat, geography, and others. These factors must be considered when setting waterfowl hunting season dates to correspond with fall migration, if waterfowl hunting opportunity is to be optimal.

In addition to the ecological and biological factors the opinions of Ohio's 20,000+ waterfowl hunters must be considered. Internet surveys are a cost effective means of surveying people (Balch 2010) when compared to other survey methods. However, with the cost effectiveness of a 'convenience sample' provided by open internet survey methodologies, such as this survey, one must consider what the data actually represent. With this survey method a random sample is not drawn and therefore the results are prone to bias. Laborde et al. (2012) showed that an open online survey of Louisiana waterfowl hunters was biased towards more avid hunters than a random mail based survey conducted in the same year, but that responses were similar to value or policy oriented questions. Similarly in simultaneous surveys of Ohio waterfowl hunters conducted in 2009 by the Ohio Division of Wildlife (ODOW) (open online) and Ohio State University (random mail based) (Bruskotter 2010) responses to the online survey tended to be from more avid hunters and hunters who utilized private lands more frequently, however responses to questions about regulations generated similar results (ODNR DOW 1,

unpublished data, 2010). Additionally, one could reasonably expect internet based surveys to be biased toward younger more internet savvy hunters as suggested by Graefe et al. (2011). Although these biases may be present in the data open internet based surveys are an efficient way to gather public opinion on policy and regulations oriented questions as long as the data are interpreted with these potential biases in mind.

Purpose of survey

The human dimensions aspect of managing waterfowl and waterfowl hunting is more important now than ever. Mid-continental waterfowl populations are at all-time highs (USFWS 2012), while both federal and in-state numbers of waterfowl hunters are at historic lows (Virtiska et al. 2013, ODNR DOW 2, unpublished data). Funding for habitat conservation is driven by the sale of hunting license and waterfowl stamps, and that funding source is waning yearly as fewer and fewer waterfowl hunters buy stamps. Therefore waterfowl hunting season regulations should reasonably consider the opinions of waterfowl hunters, to perhaps provide a sense of inclusiveness to hunters regarding regulations as a means of hunter retention. The purpose of this survey is to gather data on hunter opinions which will be considered when setting waterfowl hunting season regulations within the constraints of [Adaptive Harvest Management](#).

Dates available to hunt ducks are among the most controversial issues among waterfowl hunters. Opinions vary greatly based on species hunted and geographic location. Under the liberal regulations package for ducks the U. S. Fish and Wildlife Service allows states to open duck hunting season for 60 days with a 6 bird bag limit. States with three waterfowl zones, as in Ohio, are allowed to split (close) the season and reopen it only once. In past surveys Ohio waterfowl hunters have indicated they prefer a split season. The general structure of the season in recent years has therefore been designed to open an early portion of the duck season (the first split) designed to take advantage of early migrating (i.e. green winged teal, widgeon, and pintails) and locally hatched ducks (i.e. mallards and wood ducks); and a later segment of the season (second split) to take advantage of late migrating waterfowl. All duck hunting seasons must be closed by January 27th. In 2012 the USFWS and the Mississippi Flyway Council liberalized Canada goose hunting season packages from a 74 day season with a 2 bird bag limit to allowing states to choose either a 92 day season with a 2 bird bag limit (hereafter 92-2) or a 78 day season with a 3 bird bag limit (hereafter 78-3). A portion of this survey is designed to gather public opinion from Ohio's waterfowl hunters to consider while setting waterfowl hunting season dates for Ohio.

Hunting methods for waterfowl vary depending on which species guilds waterfowl hunters are pursuing, and which habitats those species are utilizing. For example dabbling duck species likely utilize shallow wetlands, pond, or riverine habitats where food resources are only shallowly inundated, while diving duck species may utilize open lakes and deeper water habitats, and some waterfowl including Canada geese and some dabbling duck species may utilize waste grain left over in agricultural fields. We ask an identical question from a survey of waterfowl hunters in 1983 (Miller and Bart 1987) to assess if the use of various hunting methods by Ohio waterfowl hunters has changed over the past 30 years.

Waterfowl hunter recruitment and retention are paramount issues among state and federal wildlife agencies (Case 2004). Waterfowl hunter retention and 'churn' rates (i.e. a hunter hunts one year, but not in subsequent years) is thought to be high, however has not been quantified for Ohio waterfowl hunters. We ask hunters their intention to hunt in 2013-14 to compare with results from an identical question in a random mail based survey of Ohio waterfowl hunters in 1983 (Miller and Bart 1987). If retention rates are to be increased, and 'churn' minimized, factors which may influence the decision to hunt in a subsequent year must be identified. We asked hunters who selected *maybe* or *no* to select among a list of reasons why they may not intend to hunt in the 2013-14 season. In addition, we compare data sets of Ohio Wetland Habitat Stamp sales from 2011 and 2012 to quantify 'churn' rates in Wetland Stamp sales over a one year period. While neither intention to hunt waterfowl, nor wetland stamp sales is sufficient to quantify whether a person actually hunted waterfowl in consecutive years, it is a first step towards quantifying retention among waterfowl hunters in Ohio.

The use of controlled hunts is often used by state and federal wildlife agencies to control hunting pressure to increase use by waterfowl, while also providing hunting opportunity to waterfowl hunters on areas that are otherwise closed to waterfowl hunting. The ODOW currently uses a variety of methods to provide opportunity to waterfowl hunters through the use of controlled hunts; two of those methods are pre-season online based drawings, and either pre-season or day-of walk-in lotteries; both methods give hunters opportunity for one day of hunting. The Ohio Division of Parks also offers pre-season blind drawings where applicants are drawn for blinds on reservoirs throughout the state for access to blinds for the entire season. We quantify use of these opportunities, however one must keep in mind that this survey was open to all respondents and may be biased toward more avid hunters.

Methods

We developed an open internet based survey using the website surveyMonkey.com. The survey was open from 21 January - 15 February 2013. Invitations to participate in the study were sent to all wetland habitat stamp buyers who purchased a stamp in 2012 and provided a valid email address in Wild Ohio Customer Relationship Management System (WOCRMS) (n=9597) on 22 January 2013. Additionally, we sent a press release to news sources and posted on the Division of Wildlife website on 22 January 2013. The emails and press releases included a brief description and a direct link to the survey. Additionally, customers were given the option to call 1-800-WILDLIFE and submit their survey over the phone through a call center operator from 9am-5pm Monday through Friday during the dates the survey was open. We disabled the survey link on 18 February 2013.

We required respondents to enter their unique ODOW customer identification number. Customer IDs are issued through WOCRMS and are unique to each customer and consistent over time. We filtered the survey data by removing surveys with duplicate customer IDs and customers that did not buy an Ohio Wetland Habitat Stamp from the 2012-13 licensing year. The final survey data set therefore contained only surveys filled out with non-duplicated Customer IDs of customers who purchased a wetland stamp in 2012-13 licensing year.

In addition we asked respondents to indicate in which duck hunting zone they primarily hunted during the 2012-13 waterfowl hunting season. Since preferences towards regulations, where people hunt, and even the methods used to hunt may vary geographically, we grouped all responses by the primary duck hunting zone each respondent indicated they hunted the most in during the 2012-13 waterfowl season, and also tabulated responses overall (i.e. all zones combined).

To detect age bias, we used respondent's customer ID number to calculate age and then compared the ages of survey respondents to the entire list of customers who purchased an Ohio Wetlands Habitat Stamp in the 2012-13 year.

We compared customer IDs of Ohio Wetland Habitat Stamp sales between 2011 and 2012 from the WOCRMS database. We coded each unique customer ID with a 1 if they purchased a stamp in a given year and a 0 if they did not. We used pivot tables in Microsoft Excel to quantify the number of customers who purchased a stamp in 2011 only, 2012 only, and both 2011 and 2012 to determine retention (i.e. 1, 1), recruitment (i.e. 0,1), and 'churn' (i.e. 0,1 or 1,0) between the 2011 and 2012 licensing years.

Results and Discussion

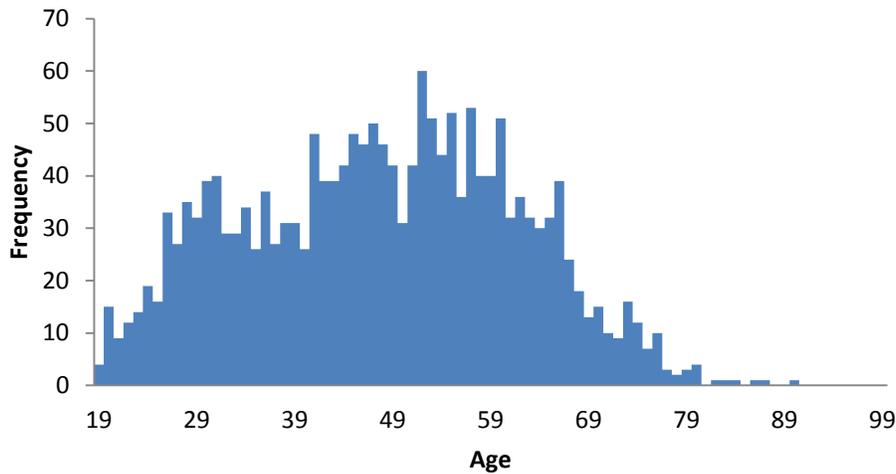
Sample size, cost, and bias

We received 2041 unique survey responses, 2031 (99.5%) were submitted online, and 10 (0.05%) were submitted using the call center. We removed 223 responses, 42 respondents (2%) entered the same customer ID more than once, and 181 (9%) entered customer ID's which did not match the list of wetland habitat stamp customers. Therefore, the total number of responses used for analysis was 1818. Removal of these data ensures the integrity of the final data set.

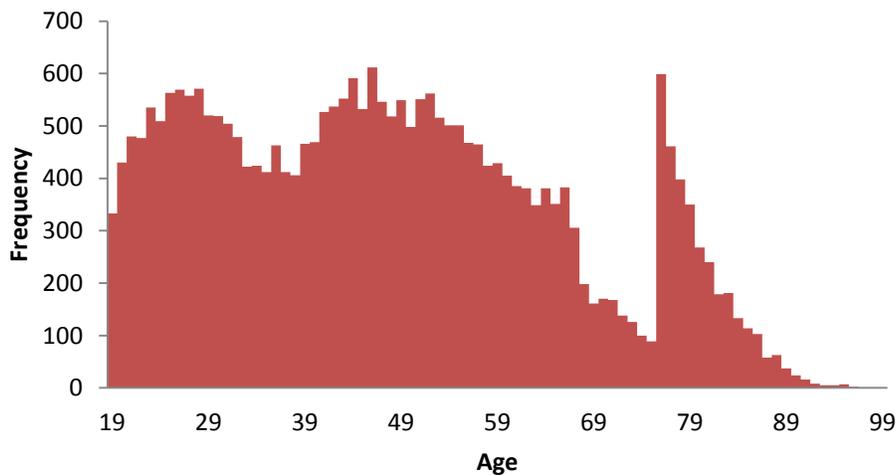
The non-payroll expense involved in conducting this survey was \$0, compared to a mail based waterfowl hunter survey conducted in 2000 by the ODOW which cost \$9,042.40 in non-payroll expense (Barry and Shieldcastle 2002). No metric exists to test whether or not respondents to this survey were more or less avid than to the entire population of Ohio's waterfowl hunters. Based in the findings of Laborde et al. (2012) we believe the responses to this survey reasonably represent the opinions of Ohio's waterfowl hunters towards waterfowl hunting regulations.

The age distribution from respondents to this survey appears to be similar to the age distribution of all Ohio Wetland Habitat Stamp buyers in 2012-13 (Figure 1). The high frequency of stamps issued to customers >75 years of age represents the free senior wetland stamp endorsement. While some in this age class are likely active hunters, the large majority are senior citizens taking advantage of the free endorsement, and not active hunters. Therefore the apparent lack of representation of this age class in the survey is inconsequential.

Figure 1: Age distribution of survey respondents to the 2013 Ohio Waterfowl Hunter Survey



Age Distribution of all Ohio Wetland Habitat Stamp customers in 2012-13



Spatial distribution of respondents

The spatial distribution of respondents to this survey is representative of the total population of Ohio Wetland Habitat Stamp customers in 2011-12. In response to the question “What is the primary Ohio Duck Zone where you hunted waterfowl most often during the 2012-13 season?” 319 (17.5%) respondents indicated Lake Erie Marsh Zone (LEMZ), 1078 (59.2%) indicated North Zone, 351 (19.3%) indicated South Zone, and 70 (3.8%) did not respond. Addresses of Ohio Wetland Habitat Stamp customers in 2011-12 indicated that 7.4% resided in the LEMZ, 70.2% in the North Zone, and 22.4% in the South Zone. Similarly, in a random mail based survey of Ohio waterfowl hunters in 2000 (Barry and Shieldcastle 2002) 21.1% of respondent primarily hunted in the Marsh Zone Counties, 59.0% in the North Zone excluding the Marsh Zone counties, and 19.8% in the South/Ohio River Zone. Since some

customers likely live in the North Zone, but primarily hunt in the LEMZ; and the similarities with the 2000 survey, we consider this sample representative of the actual distribution of where Ohio waterfowl hunters actually hunt.

Responses to survey questions

The paragraphs below present results and discussion of individual survey questions. See Appendix A for the exact wording of questions asked in this survey and summarized response data in tables and figures.

Type of hunting (Table 1)

The majority of hunters (87.3%) within and among all zones indicated they hunted both ducks and geese. Few hunters specialized in either duck (6.2%) or goose (4.4%) hunting exclusively; however 11.7% of LEMZ hunters indicated hunting ducks exclusively. Since the vast majority of hunters pursue both ducks and geese three potential hypotheses about how waterfowl hunters hunt can be generated from these responses. Either they are opportunistic and hunt ducks and geese simultaneously, or specialize in duck and goose hunting during separate hunting occasions, or both. The former would suggest duck and goose seasons should be open simultaneously when possible, and middle scenario would suggest optimizing seasons based on migration of both ducks and geese, and the latter would indicate some plasticity and compromises between the two former scenarios. Further results and discussion presented on this in *Relationship of goose and duck seasons (Table 7)*.

Satisfaction with duck season dates (Table 2)

Satisfaction with duck season dates was generally normally distributed but slightly skewed toward dissatisfaction overall, and for the LEMZ and North Zone, while South Zone hunters generally indicated satisfaction with the duck hunting season dates. Interestingly, also overall and in the LEMZ and North Zone, the responses were bimodal, and *Neutral* responses were underrepresented, suggesting ducks hunters were divided in terms of their satisfactions with duck hunting season dates.

Although hunters indicated general dissatisfaction with duck hunting season dates, when asked about their *Intention to hunt waterfowl in 2013-14 season (Table 11)* 89.3% indicated *yes* (they plan to hunt in 2013-14), and 10.3% indicated *maybe*, totaling 99.6% which indicated potential intent to hunt waterfowl in the 2013-14 season. This is consistent with Laborde (2013 unpublished data) who found the most dissatisfied hunters in the Mississippi Flyway were most likely to purchase a stamp five of five consecutive hunting seasons. One potential explanation of this phenomenon is that the most avid hunters (e.g. the hunters most likely to hunt year after year) are the most vocal with criticism.

Satisfaction with goose season dates (Table 3)

The distribution of satisfaction with the 2012-13 Ohio goose hunting season was skewed towards satisfaction overall and for each zone independently. The distributions of responses to this question were nearly identical for each of the three waterfowl hunting zones.

Interestingly when compared to *Goose hunting package preference (Table 9)*, though most respondents indicated satisfaction with the 2012-13 goose season dates, a slight majority overall, and in both the LEMZ and the North Zone, indicated they preferred a different goose season package than was offered in the 2012-13 season.

Most preferred time to hunt ducks (Table 4), Second most preferred time to hunt ducks (Table 5), and Season split preference (Table 6)

LEMZ

The majority (75.9%) of respondents indicated they preferred a split in the duck hunting season in the LEMZ, while 24.1% indicated they preferred no split. Respondents indicated early-November (24.8%) as the most preferred time to split (close) the duck hunting season in the LEMZ, followed by mid-November (12.1%).

LEMZ respondents indicated the highest preference for the time period from mid-November through late-December to hunt ducks. Cumulatively this time period represents 60.2% of the most preferred and 65.3% of the second most preferred time to hunt ducks in the LEMZ. These data suggest that the most stakeholder support for the second split of the duck season in the LEMZ exists for the time period between mid-November and late-December.

A first duck season split in October best accommodates the preferences to have a split season, for the timing of the split, and the dates for the second split. Respondents indicated the most preferred (28.2%) and the second most preferred (19.6%) times to hunt for the period from mid-October through early-November. These data suggest that the most stakeholder support for the first split of the duck season in the LEMZ exists for the time period between mid-October and early-November.

North Zone

The majority (72%) of respondents indicated they preferred a split in the duck hunting season in the North Zone, while 28% indicated they preferred no split. Respondents indicated early-November (18.6%) as the most preferred time to split (close) the duck hunting season in the North Zone, followed by mid-November (10.9%), late-November (12.1%), and early-December (13.0%).

North Zone respondents indicated no date preference to hunt ducks. Respondents indicated late-December most often for most preferred (12.3%) and second most preferred (10.5%) dates to hunt ducks; however most other time periods received similar support. Early-October and late-January received the lowest support among respondents. Given the preference to split the season, the preferred timing of the split, and the lack date preference to hunt ducks, the data suggest that the most stakeholder support for the first split of the season exists for the time periods from mid-October to late-October, and second split of the season from mid-December through mid-January.

South Zone

The majority (70.2%) of respondents indicated they preferred a split in the duck hunting season in the South Zone, while 29.8% indicated they preferred no split. Respondents indicated early-November (15.6%) and mid-November (15.6%) as the most preferred times to split (close) the duck hunting season in the South Zone, followed by late-November (11.6%), and early-December (10.4%). These data suggest that the most stakeholder support for the split (closed portion of the season) exists for the time period between early-November and early-December.

South Zone respondents indicated the highest preference for the time period from mid-November through late-December to hunt ducks. Cumulatively this time period represents 67.3% of the most preferred and 62.6% of the second most preferred time to hunt ducks in the South. These data suggest that the most stakeholder support for the second split of the season exists for the time period between late-December and late-January.

Given the preference to split the season, the preferred timing of the split, and the preference of the dates for the second split, the most stakeholder support for the first split of the duck season exists for October. Cumulatively respondents indicated the most preferred (13.2%) and second most preferred (14.9%) times to hunt for the period from mid-October through early-November.

Relationship of goose and duck seasons (Table 7)

Respondents marginally indicated overall (53.4%), and in the LEMZ (57.7%) and North Zone (55.2%), preference for goose season to be open without regard to the duck season. This would lend some support for the hypothesis (presented in *Type of hunting (Table 1)*) that hunters are pursuing ducks and geese on separate hunting occasions targeted at either ducks or geese exclusively; or that there is some plasticity and hunters are opportunistic when regulations allow them to be, but hunt exclusively for ducks or geese on certain occasions. Perhaps this is a relic of current and past regulations where season frameworks allow more days to hunt geese than ducks and hunters are taking advantage of the opportunities to pursue geese exclusively when regulations allow.

Goose season timing preference (Table 8)

Respondents clearly indicated overall, and in each zone preference (75.2%) to hunt geese in December and January rather than October and November (24.8%). These data correspond well with aerial survey data from the LEMZ (ODNR [DOW 3](#)), which indicate generally higher goose abundance as the hunting season progresses. These data also potentially indicate that hunters still perceive dependence on migratory goose populations for harvest opportunity despite increasing temperate nesting Canada Goose populations in Ohio.

Goose hunting package preference (Table 9)

Respondents indicated marginal preference overall (55.8%), and in the LEMZ (60.6%) and North zone (56.0%) for the goose hunting regulations package of 92-2 compared to 78-3. Respondents from the South zone showed essentially no preference (50.6%) to change from 78-3 to 9202. This is a change

from the preference of respondents to the 2012 Waterfowl Hunter Survey where respondents in both the North (50.1%) and South (55.1%) zones marginally preferred the 78-3 package. Although a slight preference exists to change from 78-3 to 92-2 in the 2013 data, a regulations change based off of such a slight majority may add hunter perceived complexity of a regulations change for only a marginal gain (i.e. 5.8% majority). In addition (see *Satisfaction with goose season dates (Table 3)*) goose hunters were satisfied overall and in all zones with the goose hunting season dates in the 2012-13 season further suggesting that no strong support exists to change the goose hunting package from 78-3 to 92-2.

Hunting methods used in 2012-13 (Table 10)

Respondents were asked to select methods they used to hunt waterfowl in the 2012-13 season. The responses to this question were compared to responses to an identical question in a survey of Ohio waterfowl hunters from 1983 (Miller and Bart 1987), 30 years ago. Respondents to the 2013 survey indicated *hunting over decoys in water* (39.3%) as the primary means of hunting waterfowl; similarly in the 1983 survey 47.5% of respondents indicated hunting from a *blind (fixed or floating)* as the primary means of hunting. Differing between the two surveys are the percentages of respondents who indicated *hunting over decoys in a dry field*, 27.8% in 2013, compared to only 7.7% in the 1983 survey. It appears more contemporary hunters are hunting in dry fields more often than in years past with a lower percentage of hunters *hunting over decoys in water*, and *jump shooting*. Perhaps this shift in method of hunting is in response to the increase in the population of Canada Geese between the two surveys, since dry field hunting is a widely used method for hunting Canada Geese in Ohio.

Responses were similar among waterfowl hunting zones, however minor discrepancies are present in the data. Respondents in the LEMZ were more likely to hunt *over decoys in water*, and *hunt from a layout boat* than in other zones. Respondents from the south zone were more likely to *float a river or stream* than in any other zone. The minor discrepancies between zones are likely indications of what habitats, and therefore waterfowl hunting opportunities, are geographically close to hunters.

Intention to hunt waterfowl in 2013-14 season (Table 11)

The vast majority (89.3%) of respondents overall, and in each zone, indicated they intend to hunt waterfowl in the 2013-14 season, while fewer indicated *maybe* (10.3%) or *no* (0.4%). Compared to an identical question asked in a 1983 survey of Ohio waterfowl hunters, where the survey samples was randomly drawn (Miller and Bart 1987), respondents indicated *yes* (76.4%) less frequently than in the 2013 survey, and *maybe* (19.7%) and *no* (5.6%) more frequently. The differences between responses to the two surveys may represent the avidity bias Laborde et al. (2012) found between open internet based surveys and random mail based surveys of Louisiana ducks hunters. Therefore we expect this estimate from the 2013 survey to be biased high, and we believe the intention to hunt waterfowl in the 2013-14 season for the entire population of Ohio's waterfowl hunters is likely lower than 89.3%, and may be more similar to the estimates from Miller and Bart (1987).

Our analysis of Ohio Wetland Habitat Stamp sales for 2011 and 2012 indicated that 28,868 unique individuals purchased a stamp in either 2011, 2012, or both. The one year retention rate (i.e. customers purchased a stamp in both years) was 54%. Of the remainder 23.94% purchased a stamp in

2012 but not in 2011 and 21.96% purchased a stamp in 2011, but not in 2012; representing a one year churn rate of 46%.

The 54% retention rate is 22.4% lower than the 76.4% of respondents who indicated they intended to hunt the following year in the 1983 survey (Miller and Bart 1987) and 35.3% lower than the 89.3% of respondents who indicated they intend to hunt in the 2013-14 waterfowl hunting season. Since intent to hunt appears high, and the segment of hunters who purchase wetland habitat stamps intermittently is relatively large, future marketing efforts could be focused on this group as a means of hunter retention.

Most likely reasons hunters would not participate in 2013-14 season (Table 12)

Respondents who answered *maybe* or *no* to whether or not they intended to hunt were asked to select among a group of reasons they may not waterfowl hunt in the 2013-14 season. Respondents indicated *not enough waterfowl where/when I hunt* (49.5%) as the most likely reason they would not participate in the 2013-14 season, followed by *no place to hunt* (10.3%), and *not enough time to hunt* (8.2%). This is similar to a survey of Ohio waterfowl hunters in 2009 (Bruskotter 2010) in which respondents indicated, in order of magnitude, *work commitments* (time), *waterfowl arriving after the season* (waterfowl where/when I hunt), and *access to private land* (no place to hunt) as the top three constraints to participation in waterfowl hunting. The large majority of response in this survey to *not enough waterfowl where/when I hunt* may be an indication of avidity bias and the expectations of avid hunters to see or harvest more ducks, as compared to the responses to the 2009 randomly selected survey of hunters.

Duck hunting on public vs. private land (Table 13)

Respondents indicated overall (46.6%) and in all zones that they hunted ducks on *both* public and private land most often as compared to *exclusively private* (23.8%) or *exclusively public* (24.5%) land. Overall 71.1% of respondents utilized public land to hunt ducks in the 2012-13 season. This is interesting since only roughly 5% of land in Ohio is publically owned. These data emphasize the importance of public land management for wetland and waterfowl resources, since waterfowl hunters are using public land more frequently than expected based on availability.

Conversely, 70.4% of respondents utilized private land to hunt ducks in the 2012-13 season, which is interesting since obtaining permission to hunt is often cited as a limitation to hunting waterfowl, or hunting in general, on private land. This may be partially explained if respondents to this survey are more avid waterfowl hunters than the total population of Ohio waterfowl hunters, since more avid hunters may be more prone to invest time to obtain permission to hunt waterfowl on private land.

Duck hunting on private land (Table 14)

Respondents indicated hunting ducks on private land *not owned by me or a family member and paid no fee for permission to hunt* most frequently overall (74.3%), and in each zone. This trend was the

strongest in the South Zone (87.4%) and weakest in the LEMZ (43.6%). Respondents from the LEMZ indicated hunting ducks on *land owned by a family member* (22.3%), *paying a fee to hunt* (13.2%), or *through a membership to a hunting club* (19.5%) more frequently than in any other zone. Overall, in all zones, 12% of respondents indicated *paying a fee to hunt*, hunting through *membership to a hunt club*, or using an *outfitter* to hunt ducks. Again, these data should be interpreted cautiously given the potential avidity bias associated with open online surveys.

Goose hunting on public vs. private land (Table 15)

Respondents indicated hunting geese on *both* public and private land most frequently overall (44.9%), and in the North Zone (46.3%) and south Zone (49.6%); however respondents from the LEMZ indicated hunting *exclusively private* lands (37.5%) marginally more frequently than *both* public and private land (35.2%). Overall 61.1% of respondents utilized public land to hunt geese in the 2012-13 season, less than the 71.1% of respondents which indicated hunting ducks on public land. Overall 76.9% of respondents indicated hunting geese on private land during the 2012-13 season, highlighting the relative importance of private land as hunting opportunity for geese in Ohio.

Goose hunting on private land (Table 16)

Responses to goose hunting on private land were similar to responses to duck hunting on private land. Respondents indicated hunting geese on private land *not owned by me or a family member and paid no fee for permission to hunt* most frequently overall (79.1%), and in each zone. This trend was the strongest in the South Zone (89.7%) and weakest in the LEMZ (51.3%). Respondents from the LEMZ indicated hunting geese on *land owned by a family member* (22.8%), *paying a fee to hunt* (11.8%), or *through a membership to a hunting club* (12.7%) more frequently than in any other zone. Overall, in all zones, 8.7% of respondents indicated *paying a fee to hunt*, hunting through *membership to a hunt club*, or using an *outfitter* to hunt geese.

Use of controlled waterfowl hunts/lotteries (Table 17)

Overall 60.4% of respondents indicated using some type of special waterfowl hunting opportunity. Respondents used special waterfowl hunting opportunities most in the LEMZ (67.4%) and least in the South Zone (50.7%). The use of both online and walk-in lotteries on ODOW property was highest in the LEMZ and lowest in the South Zone, while the use of State Parks pre-season drawings was highest in the South Zone and lowest in the LEMZ. Respondents indicated using the online drawings 2.5 times more frequently than the use of walk-in drawings overall and nearly 4 times more frequently than walk-in drawings in the South Zone. These results suggest that if a goal of controlled waterfowl hunts is to provide the highest quantity of opportunity to all of Ohio's waterfowl hunters, then the online draw system may be the best means of doing so.

Variation in use of special waterfowl hunt opportunities between zones is likely a function of the spatial distribution of these opportunities. The online drawings are held primarily for areas in the LEMZ and North Zone; and none are held for areas in the South Zone. Therefore the distance South Zone hunters would have to travel to participate is greater than that of hunters in the LEMZ and the North

Zone. Conversely, State Parks blind drawings are held on more areas in the South Zone, where participation is the highest. These data are supportive of data gathered by Bruskotter (2010) where respondents indicated traveling 30 miles or less to hunt waterfowl on average. Combined, these data suggest hunters are taking advantage of 'close to home' waterfowl hunting opportunity.

Management Implications

This survey efficiently gathered hunter input from a large sample of Ohio waterfowl hunters. Future developments of this survey should work towards further increasing the number of unique respondents, and curtailing or quantifying any potential biases. A potential mechanism to accomplish this would be to include survey invitations in the envelope when the wetland habitat stamps are mailed. This would efficiently invite (sample) a census of waterfowl hunters since envelopes and postage are already paid for in the wetland stamp mailings; and would curtail any sampling bias, though response bias may still exist.

The hunter input gathered through this survey will provide guidance during the regulations setting process for the 2013-14 waterfowl hunting seasons. In addition we now have data on waterfowl hunting methods showing increased use of *hunting over decoys in a dry field* and suggesting more hunters are perhaps pursuing Canada Goose hunting opportunities on private land than in 1983. Intent to hunt waterfowl in the 2013-14 season is high, however retention of waterfowl hunters is low. The difference between intent to hunt waterfowl and hunters who are retained represents a unique marketing opportunity.

We also quantified the use of both public and private and for duck and goose hunting, and what types of private lands are being hunted. These data suggest hunters are utilizing both public and private opportunities to hunt ducks and geese, and that duck hunters are utilizing public lands more frequently than expected given that most of the land base in Ohio is privately owned. These data highlight the importance of public land management for waterfowl, and ducks in particular. Additionally we now have data suggesting that few waterfowl hunters are paying for the opportunity hunt waterfowl on private lands in Ohio. Data gathered through this survey also provide a means of assessing customer response to our online controlled hunt opportunities and suggests use of the online method exceeds use of ODOW walk-in controlled hunt opportunities. Use of controlled hunts varies spatially suggesting that South Zone hunters utilize blind drawings on State Parks more frequently, and do not utilize controlled hunt opportunities offered by the ODOW likely because those opportunities do not exist within the South Zone.

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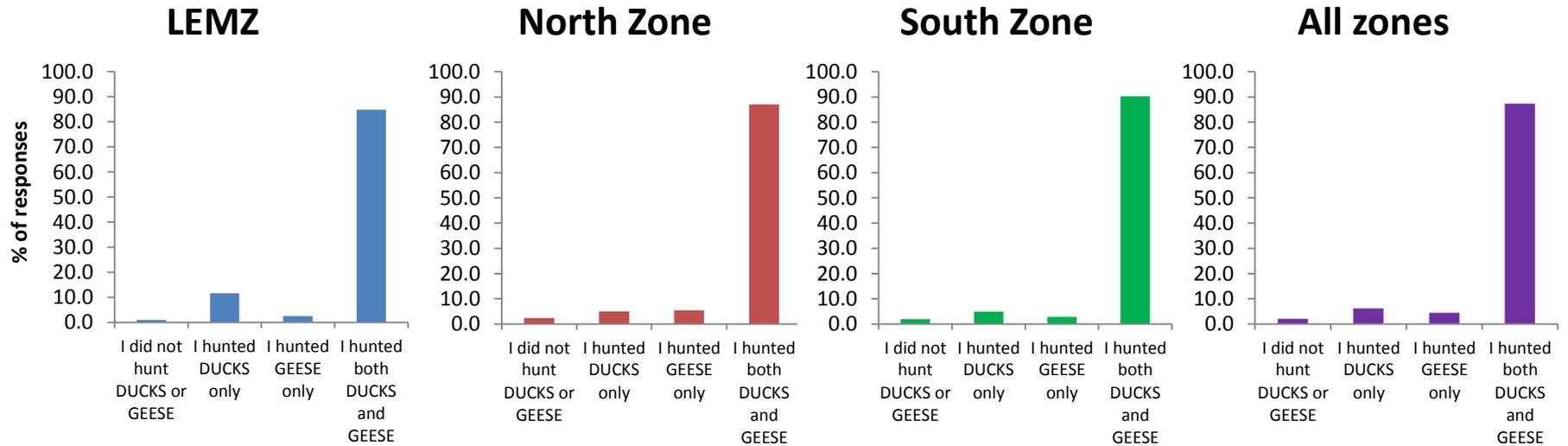
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APPENDIX A

Table 1: Responses to "Select from the list below which best describes your waterfowl hunting during the 2012-13 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Type of hunting in 2012-13	Zone							
	LEMZ*		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
I did not hunt DUCKS or GEESE	3	0.9	26	2.4	7	2.0	36	2.1
I hunted DUCKS only	37	11.7	54	5.0	17	4.9	108	6.2
I hunted GEESE only	8	2.5	59	5.5	10	2.9	77	4.4
I hunted both DUCKS and GEESE	269	84.9	936	87.1	316	90.3	1521	87.3
Grand Total	317		1075		350		1742	



* LEMZ refers to Lake Erie Marsh Zone

Table 2: Responses to "If you hunted DUCKS in the 2012-13 season, then select from the list below which best describes your overall satisfaction with the DUCK hunting season DATES in Ohio in the 2012-13 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Satisfaction with duck season dates	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Very satisfied	45	14.2	74	7.0	27	7.7	146	8.4
Satisfied	67	21.1	254	23.9	110	31.5	431	24.9
Neutral	46	14.5	182	17.1	81	23.2	309	17.9
Dissatisfied	91	28.7	286	26.9	71	20.3	448	25.9
Very Dissatisfied	62	19.6	204	19.2	48	13.8	314	18.2
Did not hunt DUCKS	6	1.9	62	5.8	12	3.4	80	4.6
Grand Total	317		1062		349		1728	

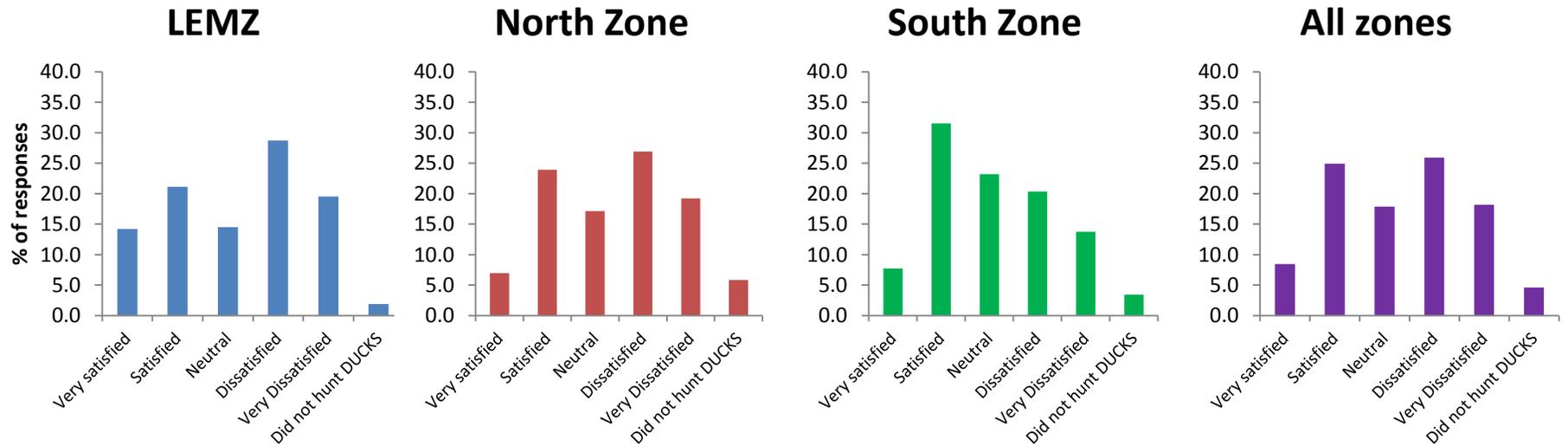


Table 3: Responses to "If you hunted GEESE in the 2012-13 season, then select from the list below which best describes your overall satisfaction with the GOOSE hunting season DATES in Ohio in the 2012-13 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Satisfaction with goose season dates	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Very satisfied	33	10.5	116	10.9	35	10.2	184	10.7
Satisfied	101	32.2	361	34.0	117	34.0	579	33.7
Neutral	64	20.4	235	22.1	78	22.7	377	21.9
Dissatisfied	49	15.6	179	16.9	67	19.5	295	17.2
Very Dissatisfied	34	10.8	111	10.5	31	9.0	176	10.2
Did not hunt GEESE	33	10.5	59	5.6	16	4.7	108	6.3
Grand Total	314		1061		344		1719	

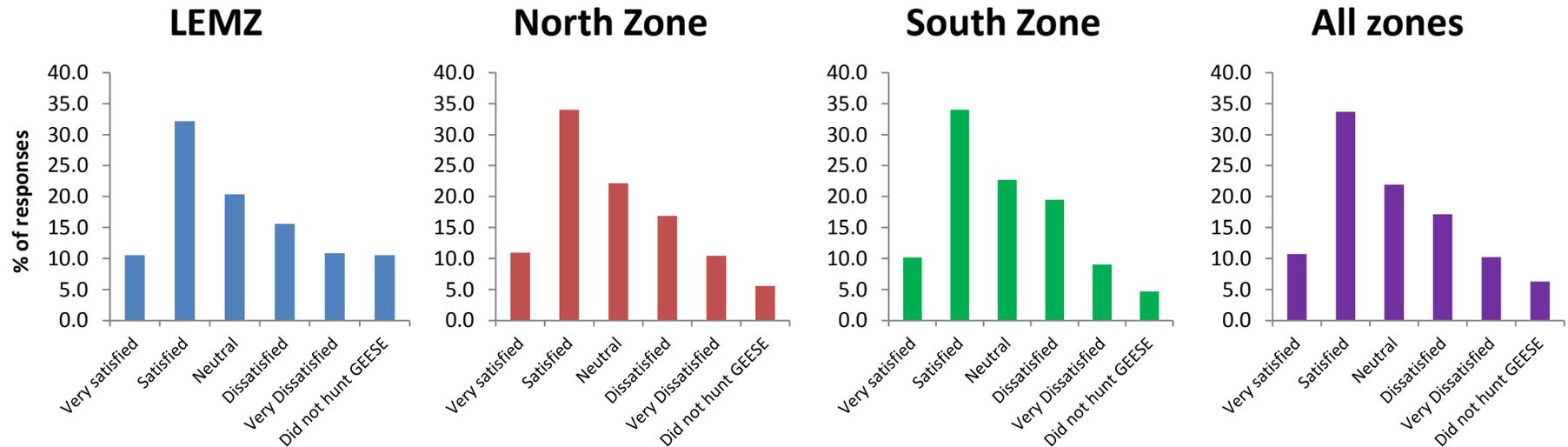


Table 4: Responses to "Select from the list below your most preferred time of the year to hunt DUCKS in Ohio in the zone/county you selected above" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Most preferred date to hunt ducks	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Early October	9	2.8	65	6.1	7	2.0	81	4.7
Mid October	32	10.1	100	9.5	14	4.0	146	8.5
Late October	28	8.9	97	9.2	18	5.2	143	8.3
Early November	29	9.2	100	9.5	14	4.0	143	8.3
Mid November	35	11.1	96	9.1	10	2.9	141	8.2
Late November	43	13.6	105	9.9	13	3.7	161	9.3
Early December	40	12.7	77	7.3	15	4.3	132	7.7
Mid December	30	9.5	99	9.4	23	6.6	152	8.8
Late December	42	13.3	130	12.3	65	18.7	237	13.8
Early January	15	4.7	61	5.8	47	13.5	123	7.1
Mid January	9	2.8	67	6.3	48	13.8	124	7.2
Late January	4	1.3	61	5.8	74	21.3	139	8.1
Grand Total	316		1058		348		1722	

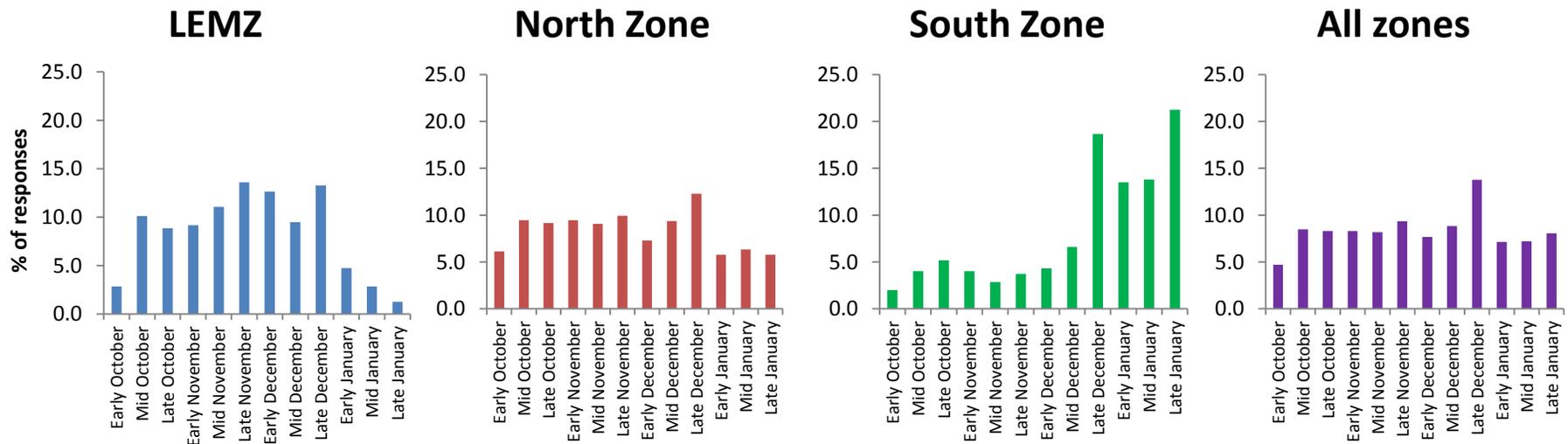
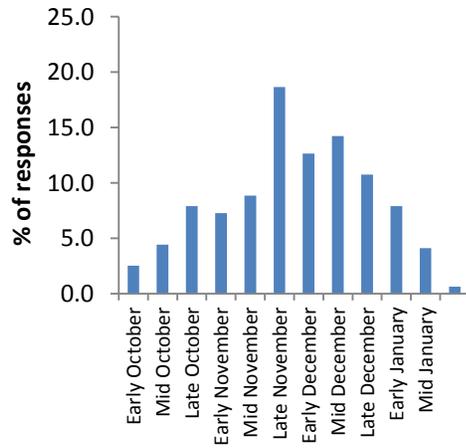


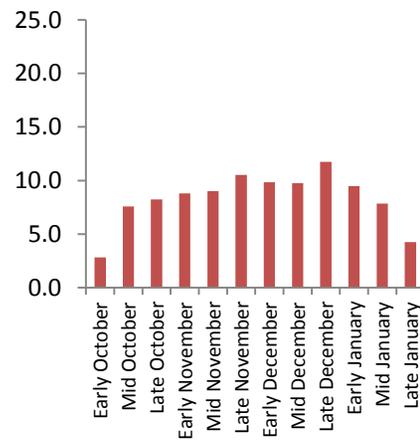
Table 5: Responses to "Select from the list below your second most preferred time of the year to hunt DUCKS in Ohio in the zone/county selected above" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Second most preferred date to hunt ducks	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Early October	8	2.5	30	2.8	8	2.3	46	2.7
Mid October	14	4.4	80	7.6	14	4.0	108	6.3
Late October	25	7.9	87	8.2	26	7.5	138	8.0
Early November	23	7.3	93	8.8	12	3.4	128	7.4
Mid November	28	8.9	95	9.0	16	4.6	139	8.1
Late November	59	18.7	111	10.5	11	3.2	181	10.5
Early December	40	12.7	104	9.9	27	7.8	171	9.9
Mid December	45	14.2	103	9.8	16	4.6	164	9.5
Late December	34	10.8	124	11.8	55	15.8	213	12.4
Early January	25	7.9	100	9.5	55	15.8	180	10.5
Mid January	13	4.1	83	7.9	63	18.1	159	9.2
Late January	2	0.6	45	4.3	45	12.9	92	5.4
Grand Total	316		1055		348		1719	

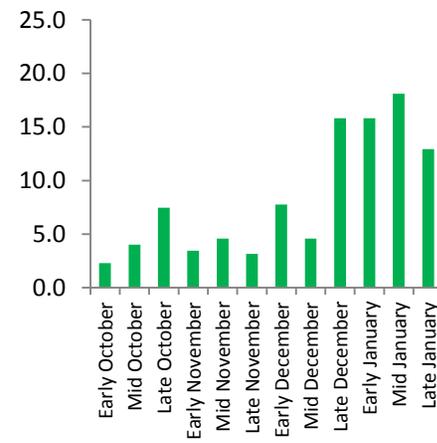
LEMZ



North Zone



South Zone



All zones

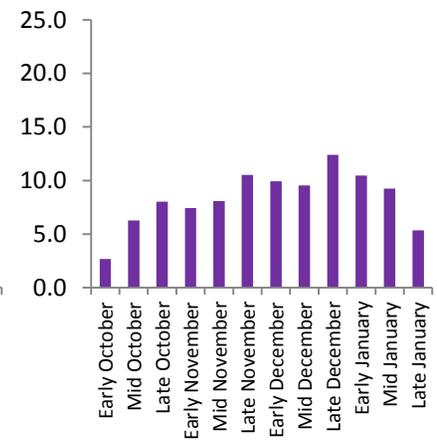


Table 6: Responses to "When would you most like to have the SPLIT (closed portion) between open season segments in Ohio in the zone/county selected above?" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Season split preference	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Do not split the season	76	24.1	298	28.0	103	29.8	477	27.7
Early October	6	1.9	21	2.0	5	1.4	32	1.9
Mid October	9	2.9	19	1.8	10	2.9	38	2.2
Late October	25	7.9	77	7.2	19	5.5	121	7.0
Early November	78	24.8	198	18.6	54	15.6	330	19.1
Mid November	38	12.1	116	10.9	54	15.6	208	12.1
Late November	28	8.9	129	12.1	40	11.6	197	11.4
Early December	27	8.6	138	13.0	36	10.4	201	11.7
Mid December	18	5.7	43	4.0	14	4.0	75	4.3
Late December	5	1.6	15	1.4	5	1.4	25	1.4
Early January	1	0.3	3	0.3	2	0.6	6	0.3
Mid January	2	0.6	3	0.3	2	0.6	7	0.4
Late January	2	0.6	4	0.4	2	0.6	8	0.5
Grand Total	315		1064		346		1725	

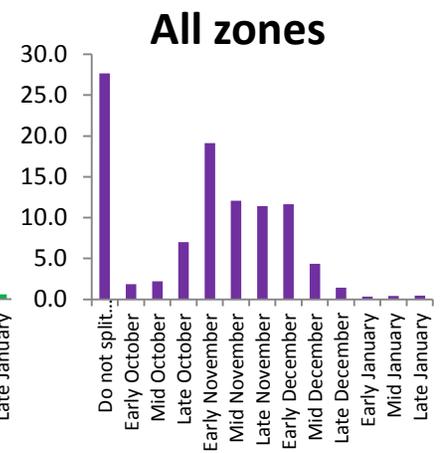
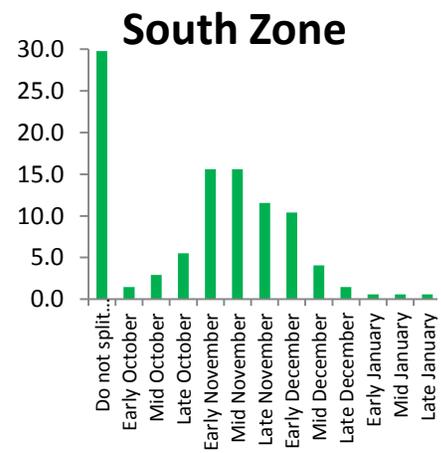
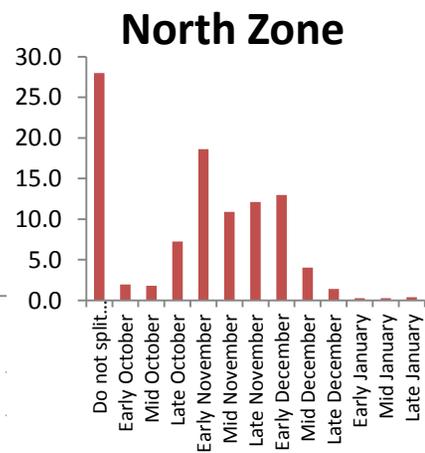
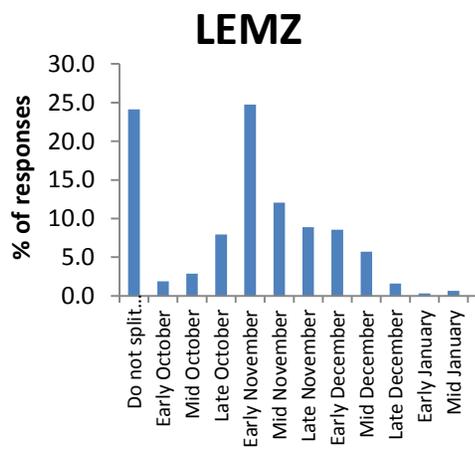


Table 7: Responses to "Given your preferred times to hunt DUCKS, select from the list below which best describes your preference for GOOSE hunting in the 2013-14 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Relationship of goose and duck seasons	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
GOOSE season should be open when DUCK season is open.	134	42.3	478	44.8	195	56.4	807	46.6
GOOSE season should be open without regard to DUCK season.	183	57.7	589	55.2	151	43.6	923	53.4
Grand Total	317		1067		346		1730	

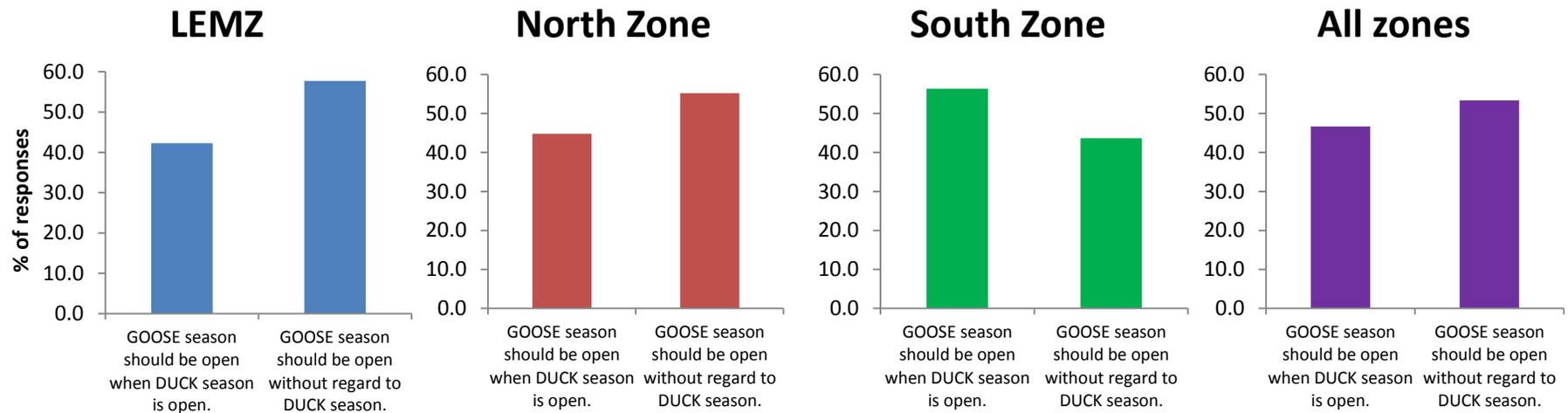


Table 8: Responses to "The USFWS allows more days to hunt GEESE than ducks. Given your responses above, select from the list below which best describes your preference for the extra GOOSE hunting days in the 2013-14 season. (Note: these will be days open for GEESE, but not DUCKS. This does not pertain to the early September Canda Goose Season)" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Goose season timing preference	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
GOOSE hunting season should be earlier (i.e. Oct & Nov.) rather than later (i.e. Dec. & Jan.).	70	22.4	290	27.3	66	19.2	426	24.8
GOOSE hunting season should be later (i.e. Dec. & Jan.) rather than earlier (i.e. Oct. & Nov.).	243	77.6	773	72.7	278	80.8	1294	75.2
Grand Total	313		1063		344		1720	

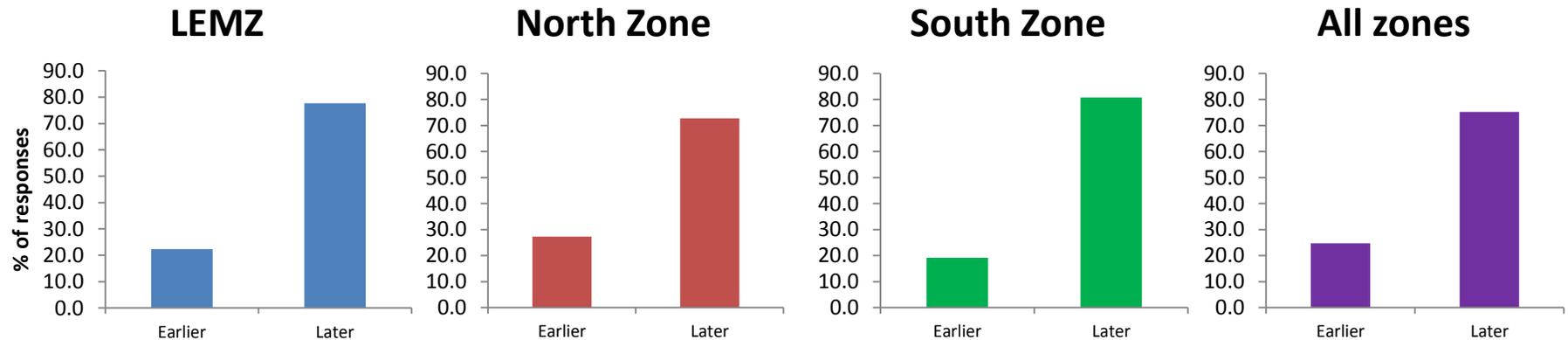


Table 9: Responses to "The USFWS may allow states to choose Canada Goose frameworks again this year. If given the choice, which of the following options would you prefer for enhancing Ohio's CANADA GOOSE hunting season?" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Goose package preference	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Fewer days with larger bag limit- 78 day season and 3 bird bag limit	124	39.4	468	44.0	170	49.4	762	44.2
More days with smaller bag limit - 92 days and 2 bird bag limit	191	60.6	596	56.0	174	50.6	961	55.8
Grand Total	315		1064		344		1723	

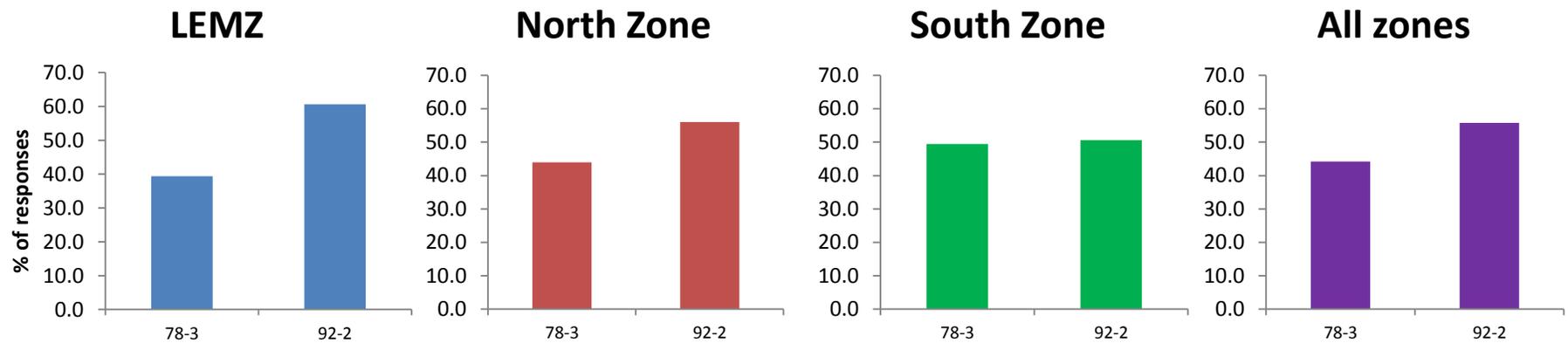
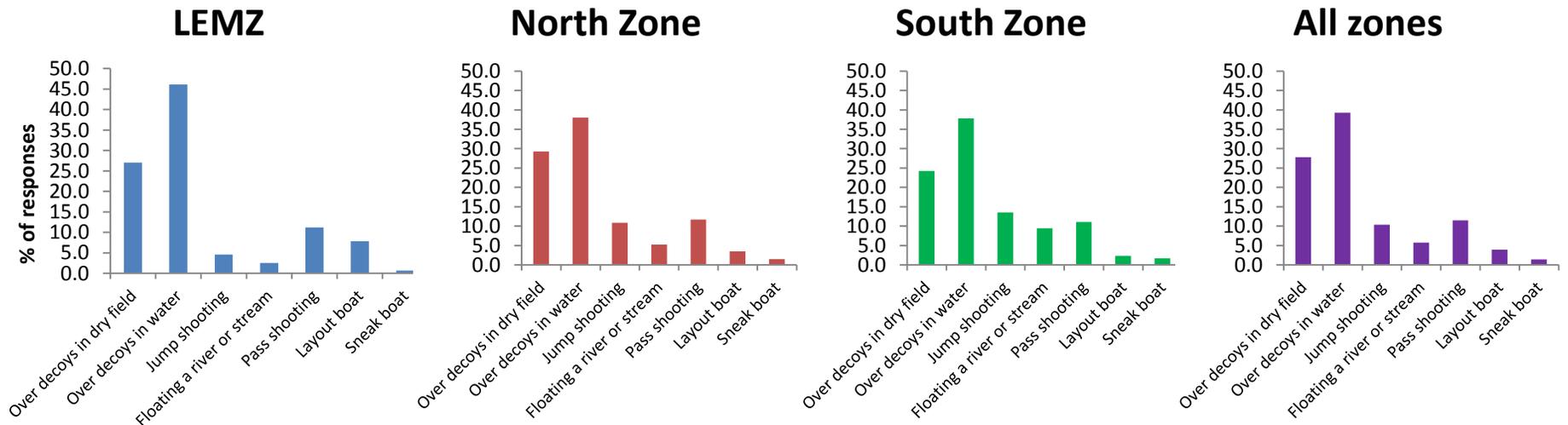


Table 10: Responses to "Select hunting methods from the list below which you used in the 2012-13 waterfowl hunting season in Ohio" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Hunting methods used in 2012-13	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n*	%	n*	%	n*	%	n*	%
Over decoys in dry field	159	27.0	657	29.3	190	24.2	1006	27.8
Over decoys in water	271	46.1	853	38.0	297	37.8	1421	39.3
Jump shooting	27	4.6	243	10.8	106	13.5	376	10.4
Floating a river or stream	15	2.6	118	5.3	74	9.4	207	5.7
Pass shooting	66	11.2	263	11.7	87	11.1	416	11.5
Layout boat	46	7.8	78	3.5	18	2.3	142	3.9
Sneak boat	4	0.7	33	1.5	13	1.7	50	1.4
Grand Total	588		2245		785		3618	



* respondents allowed to select more than one response.

Table 11: Responses to "Do you intend to hunt waterfowl in Ohio in the 2013-14 season?" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Do you intend to hunt waterfowl in 2013-14	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
Yes	288	90.3	962	89.3	309	88.3	1559	89.3
No	1	0.3	5	0.5	1	0.3	7	0.4
Maybe	30	9.4	110	10.2	40	11.4	180	10.3
Grand Total	319		1077		350		1746	

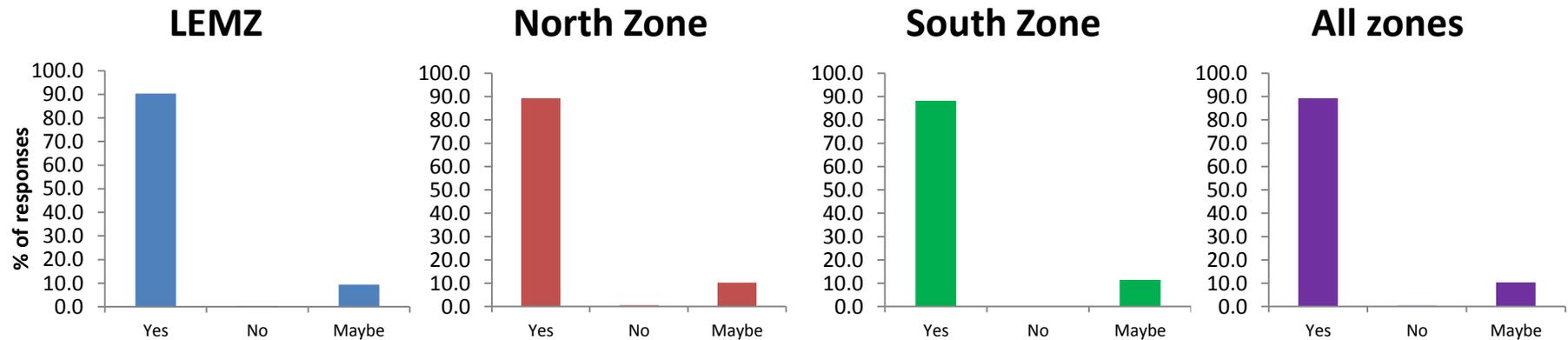
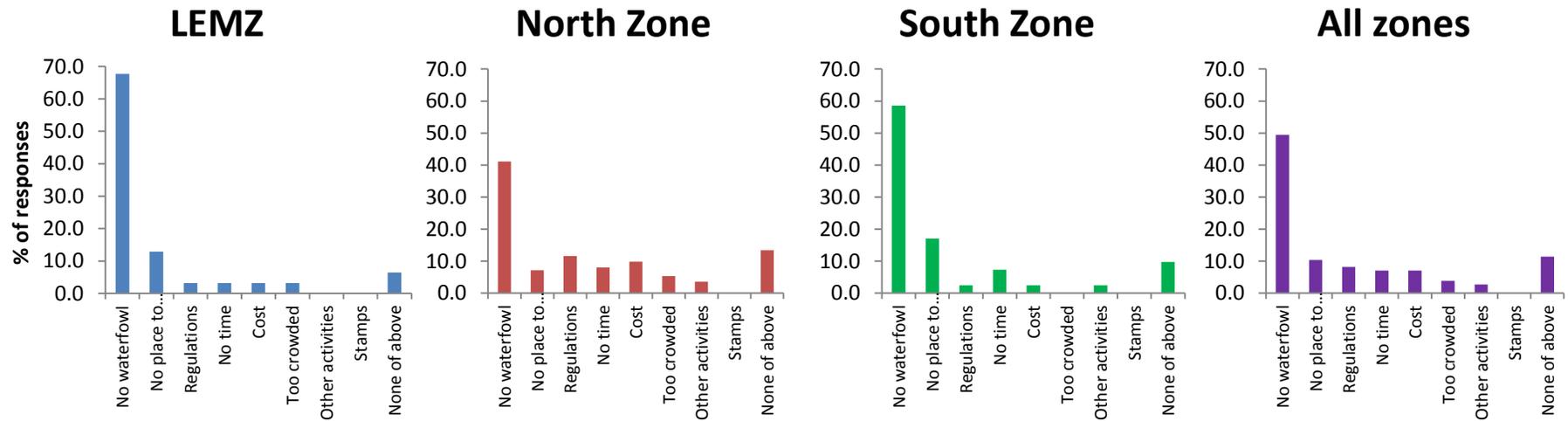


Table 12: Responses to "Select from the list below the most likely reason you would not participate in the 2013-14 waterfowl hunting season in Ohio" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Most likely reason you would not hunt waterfowl next year	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n*	%	n*	%	n*	%	n*	%
Not enough waterfowl where/when I hunt	21	67.7	46	41.1	24	58.5	91	49.5
No place to hunt	4	12.9	8	7.1	7	17.1	19	10.3
Regulations too complex	1	3.2	13	11.6	1	2.4	15	8.2
Not enough time	1	3.2	9	8.0	3	7.3	13	7.1
Cost to hunt is too high	1	3.2	11	9.8	1	2.4	13	7.1
Hunting areas too crowded on opening day	1	3.2	6	5.4	0	0.0	7	3.8
Other recreational activities more important	0	0.0	4	3.6	1	2.4	5	2.7
Stamps are too hard to find	0	0.0	0	0.0	0	0.0	0	0.0
None of the above applies	2	6.5	15	13.4	4	9.8	21	11.4
Grand Total	31		112		41		184	



* respondents who entered "Yes" in Table 11 were removed from Table 12

Table 13: Responses to "Select from the list below which best describes where you hunted DUCKS in Ohio in the 2012-13 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Duck hunting public vs. private land	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
I hunted DUCKS exclusively on public land	91	28.7	264	24.8	68	19.5	423	24.5
I hunted DUCKS exclusively on private land	102	32.2	233	21.9	77	22.1	412	23.8
I hunted DUCKS both on private and public land	118	37.2	498	46.8	190	54.6	806	46.6
I did not hunt DUCKS during the 2012-13 season	6	1.9	68	6.4	13	3.7	87	5.0
Grand Total	317		1063		348		1728	

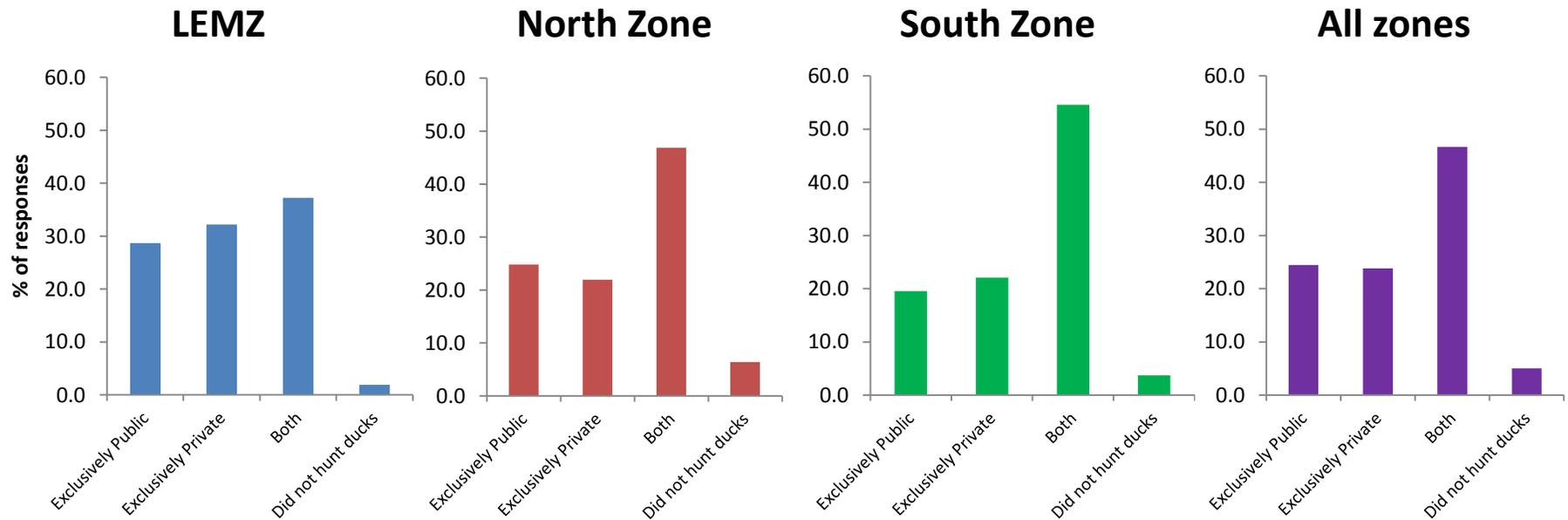


Table 14: Responses to "If you hunted DUCKS on private land in Ohio, then select from the list below which best describes the private land where you hunted" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Ducks hunting on private land	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
I hunted DUCKS on private land owned by me or a family member	49	22.3	100	13.5	18	6.9	167	13.7
I hunted DUCKS on private land not family owned and paid no fee for permission to hunt	96	43.6	582	78.8	229	87.4	907	74.3
I hunted DUCKS on private land and paid a fee for permission to hunt	29	13.2	27	3.7	14	5.3	70	5.7
I hunted DUCKS on private land through a membership to a hunting club	43	19.5	20	2.7	1	0.4	64	5.2
I hunted DUCKS on private land through and outfitter or guide	3	1.4	10	1.4	0	0.0	13	1.1
Grand Total	220		739		262		1221	

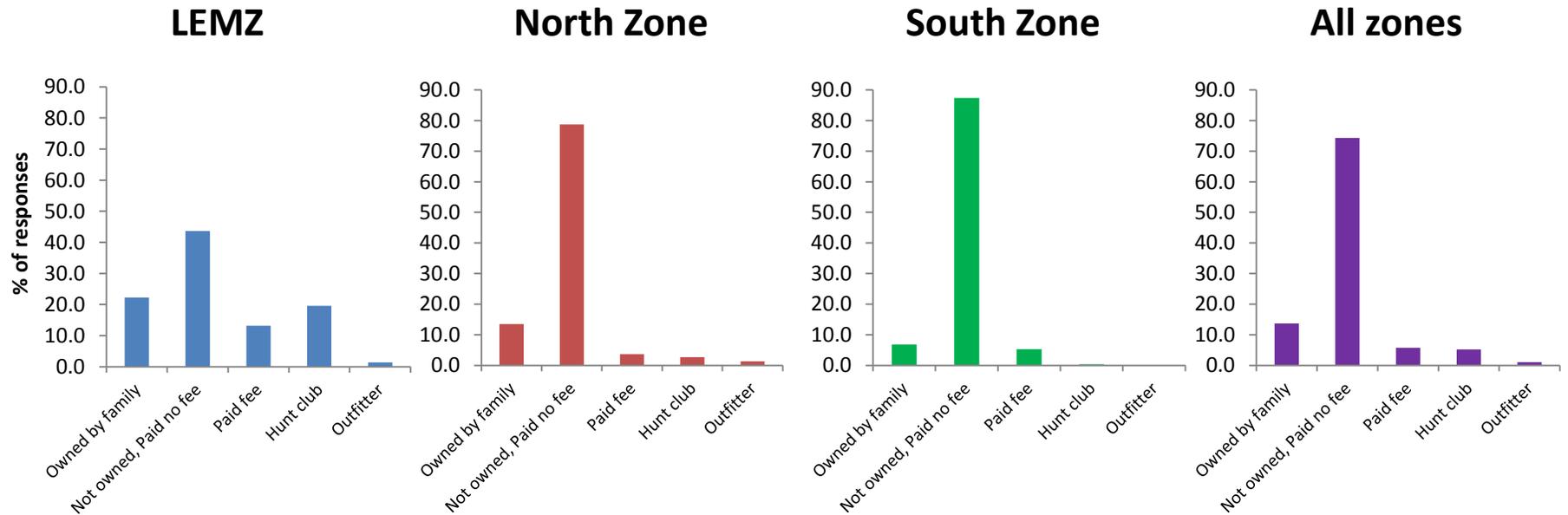


Table 15: Responses to "Select from the list below which best describes where you hunted GEESE in Ohio in the 2012-13 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Goose hunting on private land	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
I hunted GEESE exclusively on public land	49	15.6	169	15.9	60	17.4	278	16.2
I hunted GEESE exclusively on private land	118	37.5	338	31.9	94	27.2	550	32.0
I hunted GEESE both on private and public land	111	35.2	491	46.3	171	49.6	773	44.9
I did not hunt GEESE during the 2012-13 season	37	11.7	63	5.9	20	5.8	120	7.0
Grand Total	315		1061		345		1721	

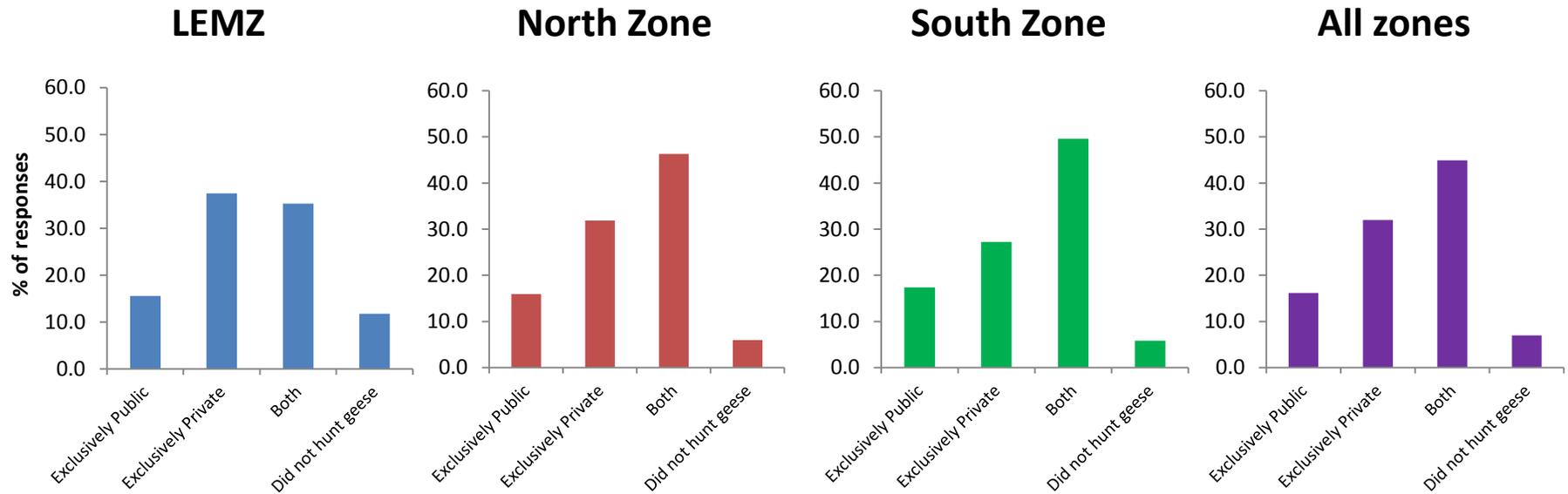


Table 16: Responses to "If you hunted GEESE on private land in Ohio, then select from the list below which best describes the private land where you hunted" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Goose hunting public vs. private land	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n	%	n	%	n	%	n	%
I hunted GEESE on private land owned by me or a family member	52	22.8	93	11.2	17	6.5	162	12.2
I hunted GEESE on private land not family owned and paid no fee for permission to hunt	117	51.3	694	83.3	235	89.7	1046	79.1
I hunted GEESE on private land and paid a fee for permission to hunt	27	11.8	24	2.9	9	3.4	60	4.5
I hunted GEESE on private land through a membership to a hunting club	29	12.7	16	1.9	1	0.4	46	3.5
I hunted GEESE on private land through and outfitter or guide	3	1.3	6	0.7	0	0.0	9	0.7
Grand Total	228		833		262		1323	

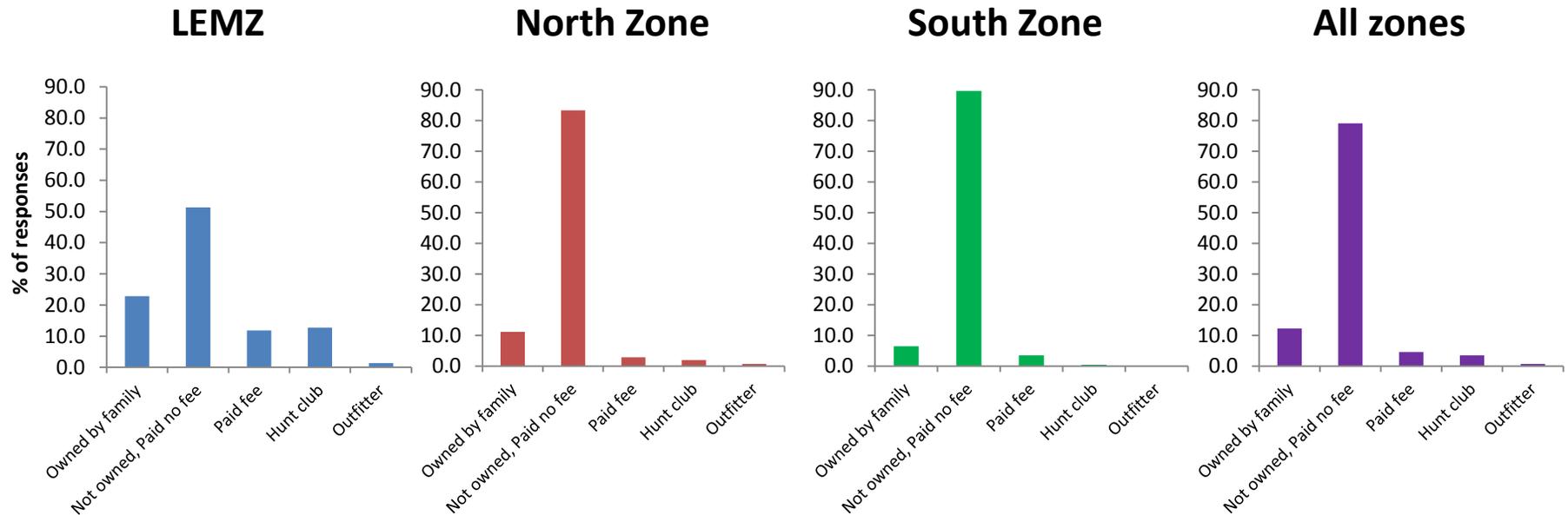
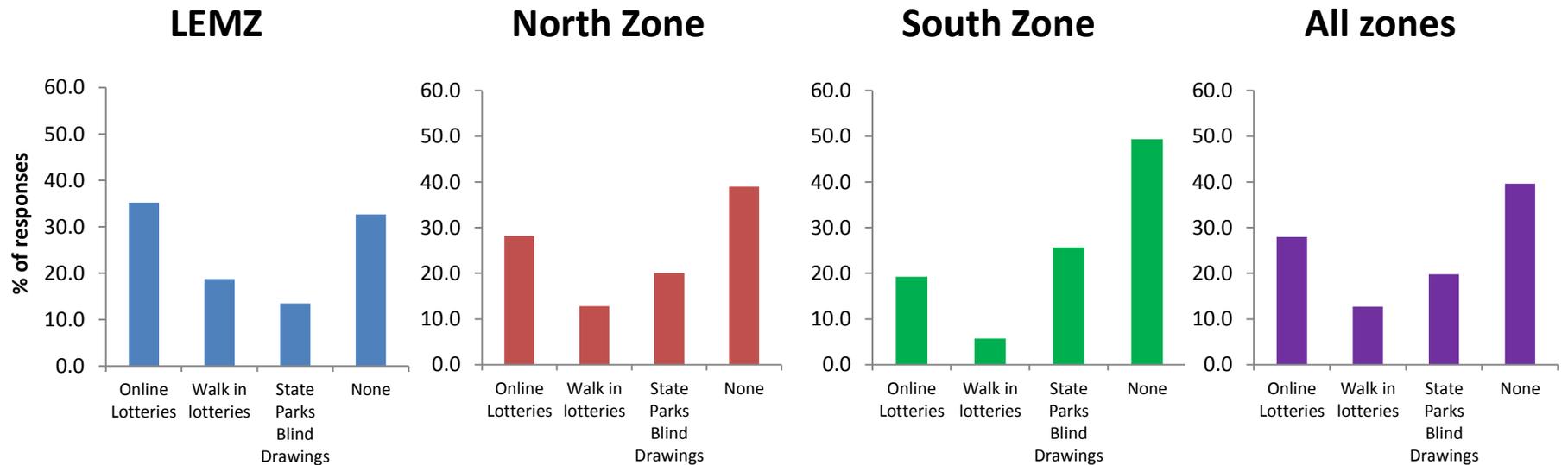


Table 17: Responses to "Select from the list below special waterfowl hunting opportunities which you attended or applied for in Ohio in the 2012-13 season" organized by responses per duck hunting zone from the online Ohio Waterfowl Hunter Survey conducted January 21st - February 15th, 2013.

Use of controlled waterfowl hunts/lotteries	Zone							
	LEMZ		North Zone		South Zone		All zones	
	n*	%	n*	%	n*	%	n*	%
Online lotteries for controlled hunts on Division of Wildlife property	154	35.2	388	28.2	78	19.3	620	28.0
Walk in lotteries on Division of Wildlife Property	82	18.7	176	12.8	23	5.7	281	12.7
Waterfowl blind drawings on State Parks/Reservoirs	59	13.5	275	20.0	104	25.7	438	19.7
None of the above	143	32.6	536	39.0	200	49.4	879	39.6
Grand Total	438		1375		405		2218	



* respondents allowed to choose more than one