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RUFFED GROUSE AND AMERICAN WOODCOCK STATUS IN MICHIGAN, 2013

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ABSTRACT

Hunter cooperator surveys, spring breeding surveys, and mail harvest surveys are conducted each year to monitor Ruffed grouse (*Bonasa umbellus*) and American woodcock (*Scolopax minor*) populations. Yearly data comparisons are described for hunter cooperator surveys (2011–2012), spring breeding surveys (2012-2013), and mail harvest surveys (2009-2010). Cooperators hunting the first 4 days of ruffed grouse season reported an average of 1.7 grouse per hour in 2012 compared to 2.0 grouse per hour in 2011. Hunter's opinions about the 2012 ruffed grouse population were mixed; 27% of the respondents thought the grouse population was up or slightly up from 2011 in the areas they hunted, with 41% reporting the population was the same and 32% reported ruffed grouse were down or slightly down. No significant changes in the Michigan woodcock index based on the singing-ground survey from 2012 to 2013 were detected. There also were no significant changes in the number of singing woodcock males detected in Michigan and the Central Region during 2002-2013, but significant longer-term (1968–2012) declines were detected. Woodcock banders in Michigan spent almost 2205 hours afield in 2013 and banded approximately 808 woodcock. There were about 53 chicks observed and 37 chicks banded per 100 hours of search time, compared to 81 chicks observed and 49 banded in 2012. There were 97 ruffed grouse drumming routes surveyed in 2013 and 103 in 2012. Statewide there was a 10.3% decrease in the average number of drums heard per route among 87 (n=87; t=1.16, P=0.13) identical routes between 2012 (11.8) and 2013 (10.7). An estimated 260,000 grouse were harvested in Michigan during 2010 which was not significantly different than the number harvested in 2009 (241,000).

INTRODUCTION

Ruffed grouse and American woodcock are forest game birds appreciated by many people. In 2010, about 85,000 hunters pursued grouse (Frawley 2012). In 2012, about 25,700 hunters pursued woodcock (USFWS 2013).

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In addition, the federal Harvest Information Program indicates that Michigan leads the nation in the number of active woodcock hunters and harvest (Cooper & Rau 2013). Non-hunters also value ruffed grouse and American woodcock. Bird watchers, hikers, bikers, campers, and others familiar with Michigan's woods know ruffed grouse well for the soft beat of a drumming male and the surprising start of an explosive grouse flush. Bird watchers explore open areas on spring mornings and evenings to observe the woodcock's unique and entertaining courtship display. For these and many other reasons, ruffed grouse and American woodcock are valuable Michigan wildlife resources.

The Department of Natural Resources (DNR) uses several surveys to monitor ruffed grouse and woodcock populations. Hunter cooperator surveys, spring breeding surveys, and harvest surveys contribute valuable management information each year. Ruffed grouse and woodcock spring surveys are conducted by DNR staff, biologists from other agencies, and volunteers. The hunter cooperator survey is made possible through data collected by volunteer hunters and shared with the DNR. Harvest information is collected from a random sample of license buyers after the end of each hunting season. The results from 2011 through 2012 hunting seasons and 2012 and 2013 breeding seasons are described in this report.

METHODS

2009–2010 Comparisons

Harvest Survey

Each year, questionnaires are sent to a randomly selected set of people who had purchased a small game hunting license during the previous hunting seasons. Detailed methods and results from the 2010 small game harvest survey are compiled in a separate report (Frawley 2012). Findings pertaining to ruffed grouse and woodcock have been summarized in the results section of this report.

2011–2012 Comparisons

Hunter Cooperator Surveys

Hunter Cooperator surveys rely on volunteer hunters that record numbers of hours hunted and ruffed grouse and woodcock flushed each day of hunting. Data obtained from cooperating hunters are summarized by county and by two-week intervals as the average number of grouse or woodcock flushed per hour of hunting. Hunting data were excluded from analyses when effort was <20 hours. Flush rates reported by cooperators provide an early indicator of harvest, but the final estimates of hunting effort and harvest come from a post-season mail survey of randomly selected hunters (Frawley, et al. 2010). Full season data from 2011 and 2012 were available for analyses. Early season reports from ruffed grouse and American woodcock cooperators allow biologists to quickly assess hunter success and local field conditions across the state of Michigan at the beginning of the grouse season.

2012–2013 Comparisons

Spring Breeding Surveys

Department of Natural Resources personnel and volunteers conduct spring breeding surveys of ruffed grouse and woodcock along roadside routes. Each route has ten listening stops that are consistent from year to year. The number of ruffed grouse drums or woodcock heard during a fixed time interval (four and two minutes, respectively) is recorded at each stop. Because timing of

breeding and habitat preferences differ for the two species, separate surveys are conducted. The woodcock singing-ground survey is coordinated by the United States Fish and Wildlife Service (USFWS) in cooperation with the DNR. The grouse drumming survey is coordinated by the DNR. Ruffed grouse survey routes were established in locations of known grouse populations. Similarly, before 1968, woodcock routes were established in locations of known woodcock populations. However, beginning in 1968, the USFWS established woodcock routes within randomly-chosen 10-minute blocks (Cooper and Parker 2011). Data for both surveys are summarized as the number of woodcock or grouse heard per survey route.

In addition, volunteers band woodcock each spring to monitor recruitment and trends in survival. The data are summarized as the number of woodcock chicks observed and banded per 100 hours of effort.

RESULTS

2009–2010 Comparisons

Harvest Surveys

An estimated 260,000 grouse were harvested in Michigan during 2010 which was not significantly different than the 241,000 harvested in 2009 (Frawley 2012) (Figure 6). Approximately 85,000 grouse hunters spent nearly 616,000 days grouse hunting in Michigan during the 2010 hunting season (Figure 6).

Approximately 37,000 hunters harvested about 97,000 woodcock and spent about 213,000 days afield in 2010 (Frawley 2012). The 2010 harvest was approximately 75% lower than the record harvest of 390,000 woodcock in 1976. However, there also were more hunters (126,000) spending more days afield (908,000) in 1976 than in 2010 (Figure 1). The average number of woodcock harvested per hunter day was higher in 2010 than in 1976 (Figure 2).

2011–2012 Comparisons

Hunter Cooperator Surveys

Hunter records were available from 143 cooperators who spent 5537 hours afield in 2012 and 184 cooperators who spent 6,086 hours afield in 2011. The average number of ruffed grouse flushed per hour by cooperators in 2012 (1.66) was slightly lower than the number of ruffed grouse flushed per hour in 2011 (1.91). Ruffed grouse flush rates were highest in Zone 1 (Upper Peninsula; 2.08) followed by Zone 2 (Northern Lower Peninsula; 1.50) and Zone 3 (Southern Lower Peninsula; 0.79), respectively (Figure 3 and Appendix A). The highest average flush rate was during December 1st - 15th in Zone 1 (Table 1).

The average number of American woodcock flushed per hour statewide by cooperators was slightly higher in 2012 (1.57) than 2011 (1.2), respectively. American woodcock flush rates were highest in Zone 2 (1.83), followed by Zone 1 (1.37) and zone 3 (0.93), respectively (Figure 4 and appendix B). Average flush rates peaked during October 1st – 15th in Zone 1 and 2, and during October 16th -31st Zone 3.

Cooperators returned 89 useable early season report surveys. They hunted 604 hours in 42 counties during the survey period. Respondents hunted most in Zone 2, followed by Zone 1, and Zone 3. Hunters reported the highest average flush rates for grouse in Zones 2 and 1, respectively (Table 3). Individual counties having at least 10 hours of hunting with the highest flush rates for grouse were

Montmorency, Iron, Mackinaw, Ontonagon, and Crawford counties. Although the woodcock season was not open during the survey period, cooperators were asked to also count woodcock flushes. Individual counties having at least 10 hours of hunting with the highest flush rates for woodcock were Kalkaska, Ogemaw, Cheboygan, Crawford, and Lake Counties.

About 27% of the respondents thought grouse populations were up or slightly up from last year in the areas they hunted, with 41% reporting populations about the same as the previous year and 32% describing them as down or slightly down (Table 3). About 33% of the respondents thought woodcock populations were up or slightly up from last year, while about 37% thought they were the same as last year and 30% thought they were down or slightly down (Table 3).

2012–2013 Comparisons

Spring Breeding Surveys

Ruffed Grouse Drumming Survey

Ruffed grouse drumming counts were conducted statewide along 97 survey routes during April and May 2013. There was an average of 10.7 drums heard per routes statewide, a 13% decline from 2012 (12.3) average (Figure 8). Highest drumming counts were in Zone 1 (Upper Peninsula; 14.4), following by Zone 2 (Northern Lower Peninsula; 9.4) and Zone 3 (Southern Lower Peninsula; 6.4) (Figure 7).

In 2012, 103 survey routes were conducted statewide and paired t-tests were performed to statistically compare data from 87 identical routes run in both 2012 and 2013. Statewide there was a 10.3% decrease ($n=87$; $t=1.15$, $P=0.25$) in the average number of drums heard per route between 2012 (11.8) and 2013 (10.6). Analysis at the regional scale indicated there was no significant difference ($n=26$; $t=0.82$, $P=0.41$) in the number of drums heard per route in Zone 1 (Upper Peninsula) between 2012 (17.4) and 2013 (14.9). There was no significant change in the average number of drums heard per route in Zone 2 (Northern Lower Peninsula) between 2012 (9.9) and 2013 (9.1; $n=53$; $t=0.90$, $P=0.38$). In zone 3, there were 8 routes conducted in both 2012 and 2013. Due to the low sample size, statistical analysis at the Zone 3 regional scale is not appropriate.

Woodcock Singing-ground Survey

Results of Michigan Woodcock singing-ground survey were based on preliminary analysis of data from 106 survey routes (Cooper and Rau 2013). No significant changes in the woodcock index for Michigan between 2012 and 2013 were detected. An average of 5.04 and 5.33 singing males were heard per route in 2012 and 2013, respectively. The 2013 Central Region index, consisting of information from Illinois, Indiana, Manitoba, Michigan, Minnesota, Ohio, Ontario and Wisconsin, was not significantly different from 2012 ($n=449$,$P<0.05$). In the Central Region, there was an average of 2.68 and 2.66 singing males heard per route in 2012 and 2013, respectively (Cooper and Rau 2013). Significant declines in the number of singing males were not detected in Michigan and the Central Region during 2003-2013. The ten-year trend for the Central Region has remained stable for the third year in a row (Cooper and Rau 2013). Michigan and the Central Region have experienced an average long-term decline of 0.72% and 0.80% per year, respectively, since 1968 ($P<0.05$; Cooper and Rau 2013)

Woodcock Banding Activities

For 2013, 76 Woodcock banders spent 2204.8 hours afield, located 385 broods and banded 808 birds. Average brood size for 2013 was 3.0 chicks. The number of chicks banded per 100 hours afield was 36.7 and the number of chicks observed per 100 hours afield was 53.2. In 2012, 80 woodcock banders spent 1808.5 hours afield, located 462 broods and banded 915 birds. Average

brood size for 2012 was 3.2 chicks. The number of chicks banded per 100 hours afield was 49.2 and the number of chicks observed per 100 hours afield was 81.4. In 2013, the number of hours banders spent afield is the highest with some of the lowest totals and averages in the past decade, respectively.

DISCUSSION

2013 Grouse Population Status

Ruffed grouse have approximately ten-year cycles in abundance over much of Canada, Alaska, and the Great Lakes states of Wisconsin, Minnesota, and Michigan (Rusch et al. 1999). Biologists in Minnesota have conducted drumming surveys since 1949, and grouse cycles have peaked near the end of each decade (Dexter 1999). Michigan ruffed grouse harvest estimates appear to follow similar population cycles (Figures 3 and 6). These population cycles appear similar to the fluctuations observed in Wisconsin and Minnesota (Figure 5). Over the years, many theories have been proposed to explain these cycles including diseases, weather, forest fires, sunspots, starvation, crowding, predators, genetic changes, and chance (Rusch 1989). Another possible contributing factor of population fluctuations may involve food options. Quaking aspen (*Populus tremuloides*) is an important food source for grouse, especially during the winter and early spring (Svoboda and Gullion 1972). Aspen produces a compound called coniferyl benzoate (CB) that acts as a natural feeding deterrent for grouse and other birds, and this level can vary between years and between trees (Jakubas and Gullion 1991). Grouse have tendencies to use specific or clones of aspen due to their history of having low concentrations of the deterrent (Jakubas and Mason 1991). Lack of suitable aspen in the winter may cause grouse to expend more energy and to be more susceptible to predation when feeding on other food sources (Jakubus and Gullion 1991). With the snowshoe hare and ruffed grouse having synchronized cycles, Donald Rusch found predation mortality on ruffed grouse climbed when large fluxes of raptors migrate south into the northern United States during a decline in snowshoe hares in their Canadian home range (Rusch 1982).

The most recent low in grouse abundance occurred during 2004-2005 for most of Michigan (Figures 3, 6, and 7). The most recent high in grouse abundance occurred between 2009 and 2011 in Zone 1 (Figures 3 and 7). Michigan appears to be descending from the peak in the grouse population cycle. Nationwide, Michigan is among the top states in ruffed grouse harvested annually. Minnesota's annual harvest varies from approximately 150,000 to 1.4 million birds (Roy 2013); Wisconsin harvested 336,530 grouse in 2011-2012 (Dhuey 2012); Michigan harvested 260,000 grouse in 2010, respectively (Frawley 2012).

Hunters should note the 2012 dry weather conditions may have impacted brood survival. This could explain why many hunters in 2012 thought the population was the same in 2011; the decreased abundance of animals at a regional scale does not ensure the same trend locally. Areas of good habitat will continue to provide the best grouse hunting opportunities. Grouse are most abundant in areas where dense young forest habitats (5-15 years old) are common (Association of Fish and Wildlife Agencies Resident Game Bird Working Group 2006). The best grouse cover is usually provided by dense aspen stands 6 to 15 years old or older stands with dense understories of alder or hazel (Thompson and Dessecker 1997). Hunters are encouraged to use the DNR's online mapping application, Mi-Hunt, to search for habitat types on public hunting lands. There are multiple layers of information that can be turned on or off, depending on your needs. For example, you can view the different forest types, topography, satellite imagery, and road layers to help plan your trip. See *www.michigan.gov/mihunt* for more details about this interactive mapping application.

2013 Woodcock Population Status

The long-term decline in the woodcock population index raises questions and concerns about available habitat and the effects of hunting. The declining availability of quality habitat is believed to be a primary cause for the decline in the population (Dessecker and Pursglove 2000). Adverse weather conditions including drastic temperature changes from March through May, 2013 delayed nesting and brood rearing. This year, reports of young broods late in the nesting season were observed. An individual bander located and banded a brood of three chicks on June 25th that was five days old, which is an unusually late occurrence. The USFWS has adjusted woodcock hunting season dates and reduced bag limits four times since 1968 in response to the general status of woodcock.

A North American Woodcock Conservation Plan was written to help guide woodcock management in each region of the continent within woodcock range. The document is available online at *www.michigan.gov/dnr* or *www.timberdoodle.org*. Professionals are also working on developing habitat initiatives where the plan will be used to guide the creation of quality habitat that will benefit woodcock as well as other species that have similar habitat requirements.

More woodcock are banded in Michigan than in any other state or Canada. In fact, Michigan banders have banded greater than 20,000 more woodcock than the next largest banding state (Maine) since 1981 (Mayhew and Luukkonen 2010). Woodcock survival estimates based on Michigan woodcock banding data analyses is reported by Krementz et al. (2003) and Mayhew and Luukkonen (2010).

Woodcock hunters may expect a season similar to last year. While good numbers of woodcock can be found in all parts of Michigan, the highest densities are located in the northern two-thirds of the state.

Ruffed Grouse & American Woodcock 2013 Forecast

Based on current survey data, hunters should expect the grouse population this fall will be on a slight decline following the peak of the cycle in 2010. The 2013 fall ruffed grouse and woodcock numbers could be similar if not a little bit lower statewide compared to 2012. With favorable annual production, hunters could take approximately 260,000 grouse in 2013. This year has shown a remarkable record high wet spring at the Midwest regional scale since 1985. With respects to last year's drought, this year's prevalence of high precipitation rates will have considerable effects on essential food abundance, distribution and quality. Having such a significant wet spring may also have positive impacts on brood survival this year. With favorable production this spring, we anticipate fall ruffed grouse and woodcock numbers could be similar to last year.

The ruffed grouse season begins on September 15, statewide. In 2013, the opening date for woodcock hunting will be September 21. The USFWS framework for Michigan allows for the woodcock hunting season to open no earlier than the Saturday closest to September 21 and to run for no more than 45 days.

"I'm also excited about a new hunting tool available to grouse hunters in Michigan" said Stewart. "I encourage bird hunters to use the DNR's online mapping application, Mi-Hunt, to search for habitat types on public hunting lands. There are multiple layers of information that can be turned on or off, depending on your needs. For example, you can view the different forest types, topography, satellite imagery, and road layers to help plan your trip. See www.michigan.gov/mihunt for more details about this interactive mapping application."

ACKNOWLEDGMENTS

We thank all the cooperators who provided grouse and woodcock hunting records and participated in banding woodcock. Steve Merchant and Adam Bump provided historical data for Minnesota and Wisconsin drumming counts. Many DNR employees and volunteers conducted spring breeding surveys and assisted in data entry. Artwork was drawn by Jennifer Kleitch. Steve Beyer, Brian Frawley, Valerie Frawley, Dave Luukkonen, Russ Mason, Cheryl Nelson, Mark Sargent, and Doug Reeves reviewed an earlier version of this report. Portions of this report were copied in whole or in part from previous status reports. Similar reports may be found at www.michigan.gov/dnr.

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Table 1. Average ruffed grouse and American woodcock flushes per hour[a], by two-week intervals, as reported by cooperating hunters in 2012.

Species and dates	Zone 1	Zone 2	Zone 3
Ruffed Grouse			
September 15-30	2.04	1.71	0.91
October 1-15	2.03	1.18	0.83
October 16-31	2.25	1.43	0.74
November 1-14	1.51	1.68	0.72
December 1-15	3.17	1.58	0.70
December 16-January 1	2.37	1.44	0.77
American Woodcock			
September 15-30	0.79	2.52	1.42
October 1-15	2.15	3.02	1.50
October 16-31	1.25	1.81	1.52
November 1-14	0.00	0.08	0.23
December 1-15	0.00	0.004	0.00
December 16-January 1	0.00	0.24	0.00

Does not Include hunting Data When effort was <20 hours.
See Appendix A for Boundaries of Zones.

Table 2. Ruffed grouse and American woodcock flush rates reported by zone and year for September 15-18, 2011-2012.

		2011				2012	
Zone	Hours:	Grouse/Hour	Woodcock/Hour	**Zone**	Hours:	Grouse/Hour	Woodcock/Hour
1	156	1.6	0.7	1	174	2.2	0.6
2	443	2.3	1.1	2	402	1.6	1.5
3	145	0.4	0.5	3	27	1.3	1.2
Statewide	644	2	0.9	Statewide	604	1.7	1.2

Table 3. Hunter opinions about ruffed grouse and American woodcock populations, 2011-2012.

	Ruffed grouse		Woodcock	
Trend	2011	2012	2011	2012
Up	3%	13%	4%	16%
Slightly Up	25%	14%	14%	17%
Same	23%	41%	14%	37%
Slightly Down	34%	17%	41%	16%
Down	15%	15%	28%	14%

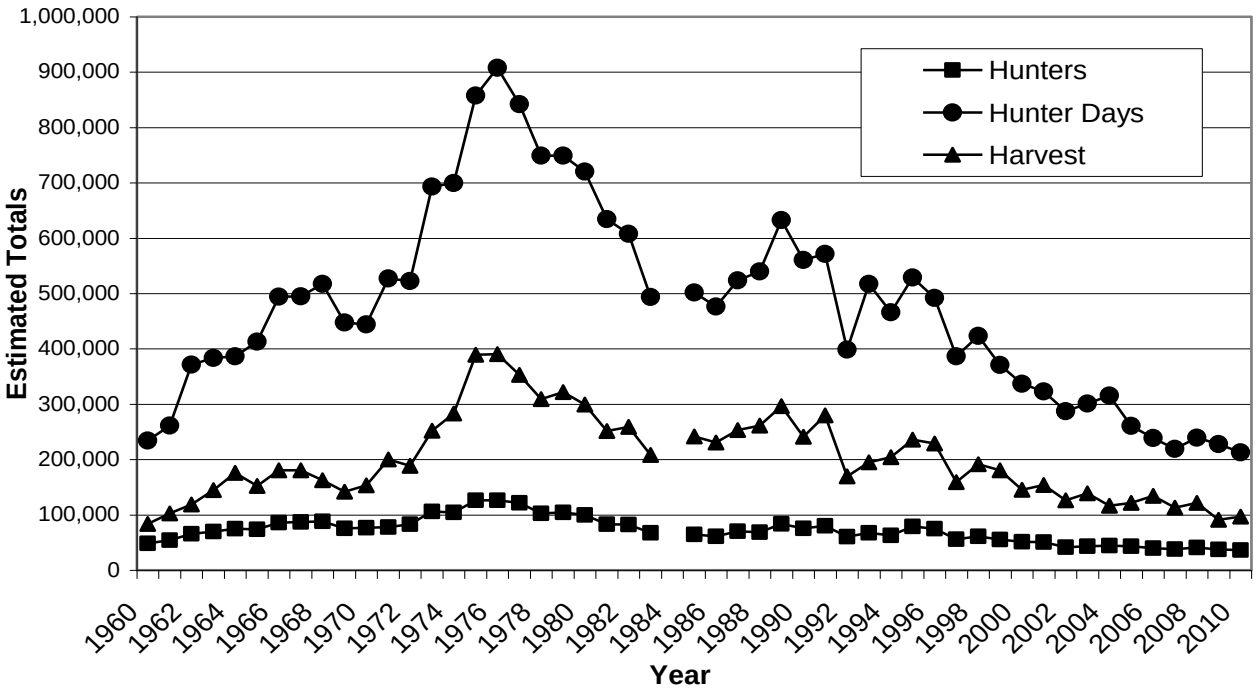


Figure 1. Mail survey estimates of the number of American woodcock hunters, hunter days, and harvest in Michigan, 1960-2010 (estimates not available for 1984).

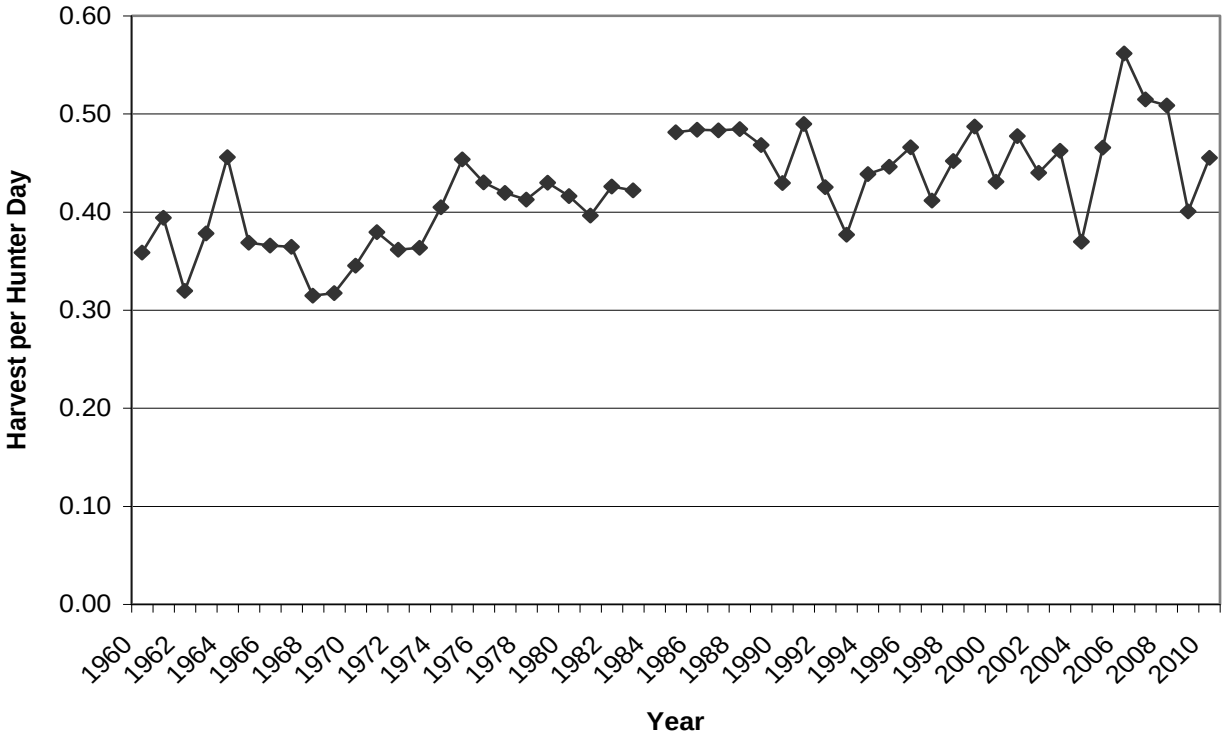


Figure 2. Mail survey estimates of woodcock harvest per hunter day in Michigan, 1960-2010 (estimates are not available for 1984).

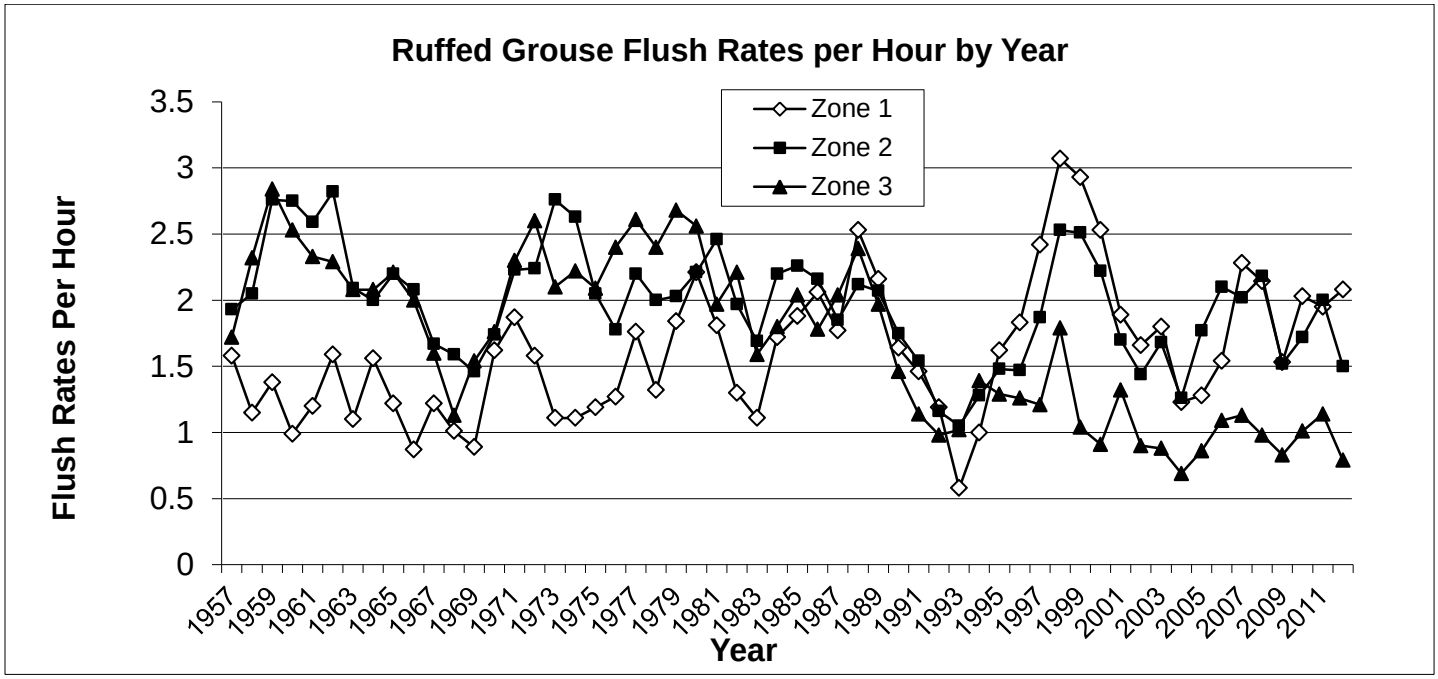


Figure 3. Ruffed grouse flush rates reported by cooperating hunters, 1957-2012.

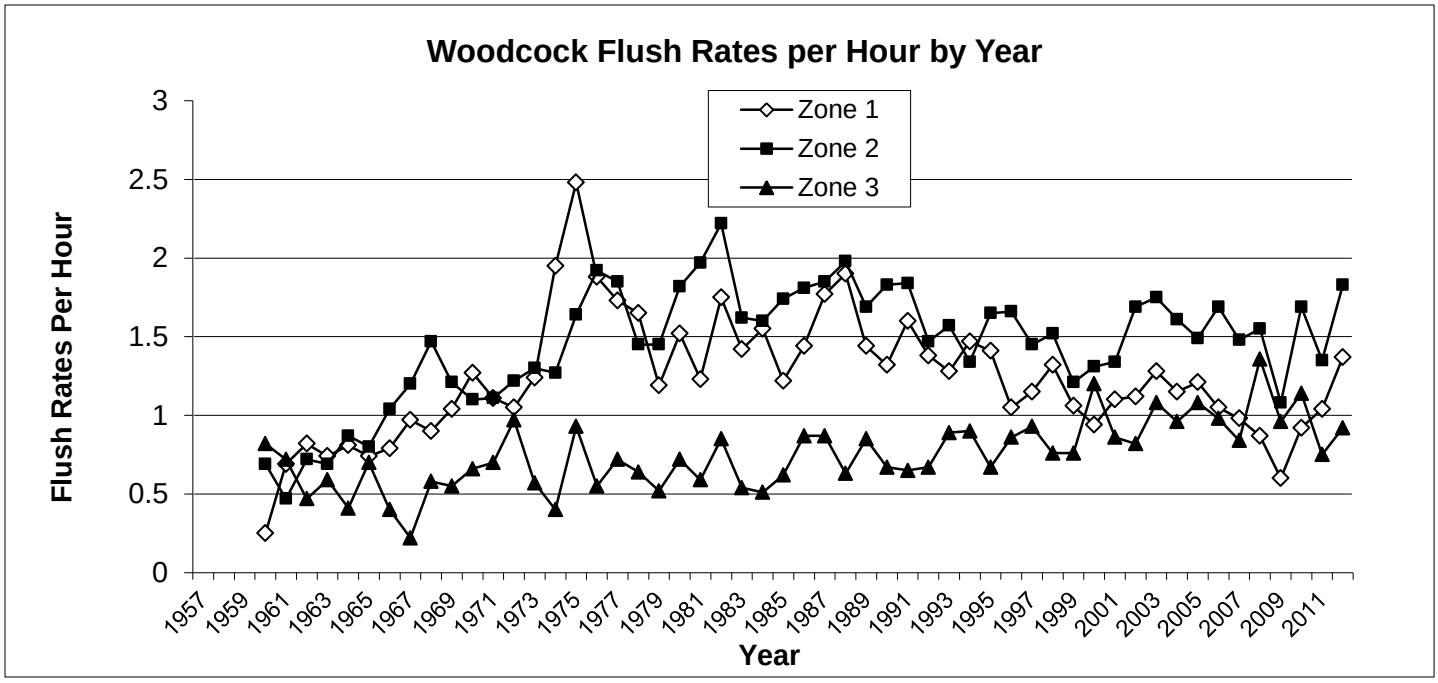


Figure 4. Woodcock flush rates reported by cooperating hunters, 1957-2012.

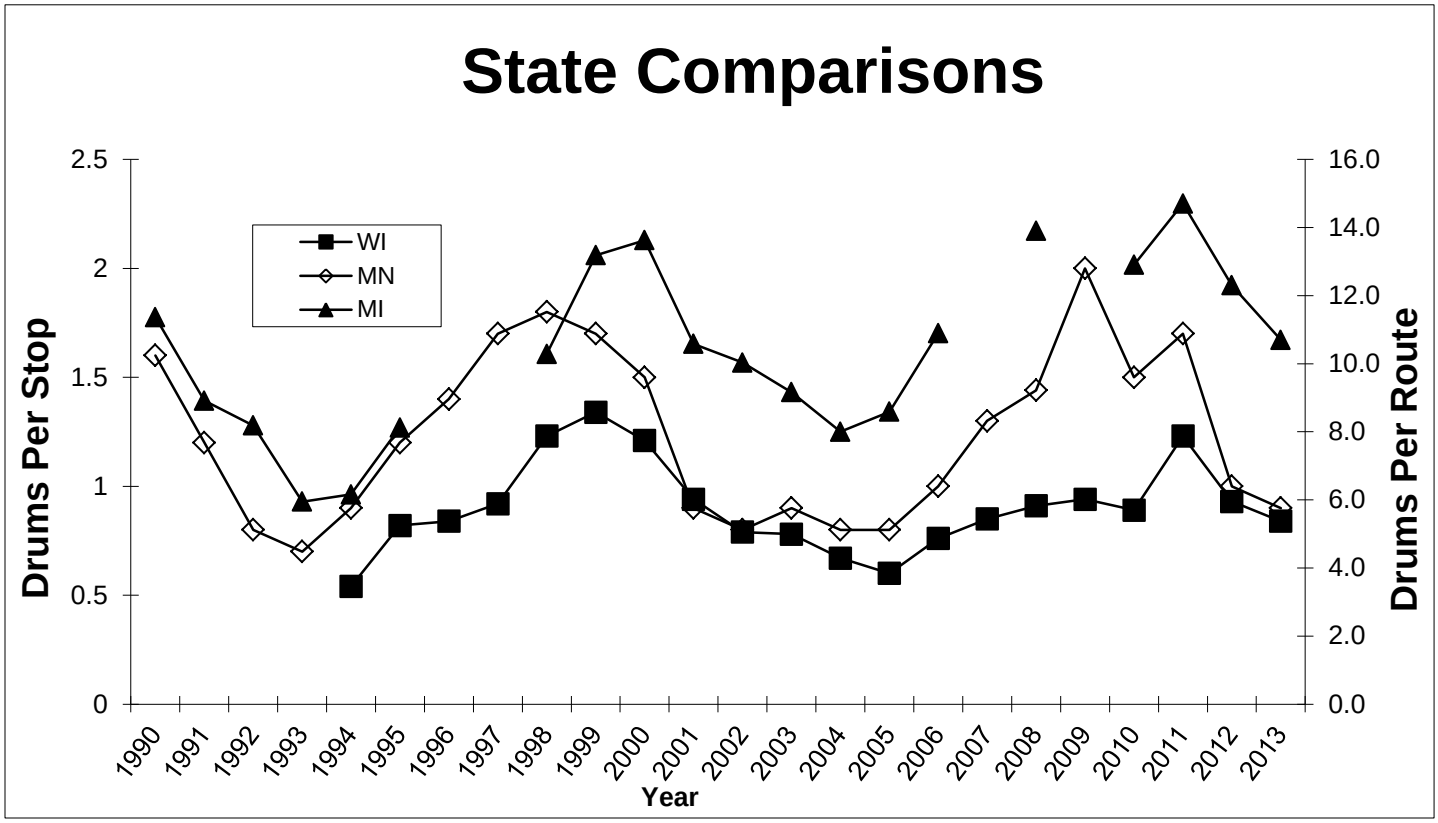


Figure 5. Ruffed grouse breeding population indices from Michigan (drums per route), Minnesota and Wisconsin (drums per stop), 1990-2013. Michigan statewide data is not available for 1996, 1997, 2007 and 2009.

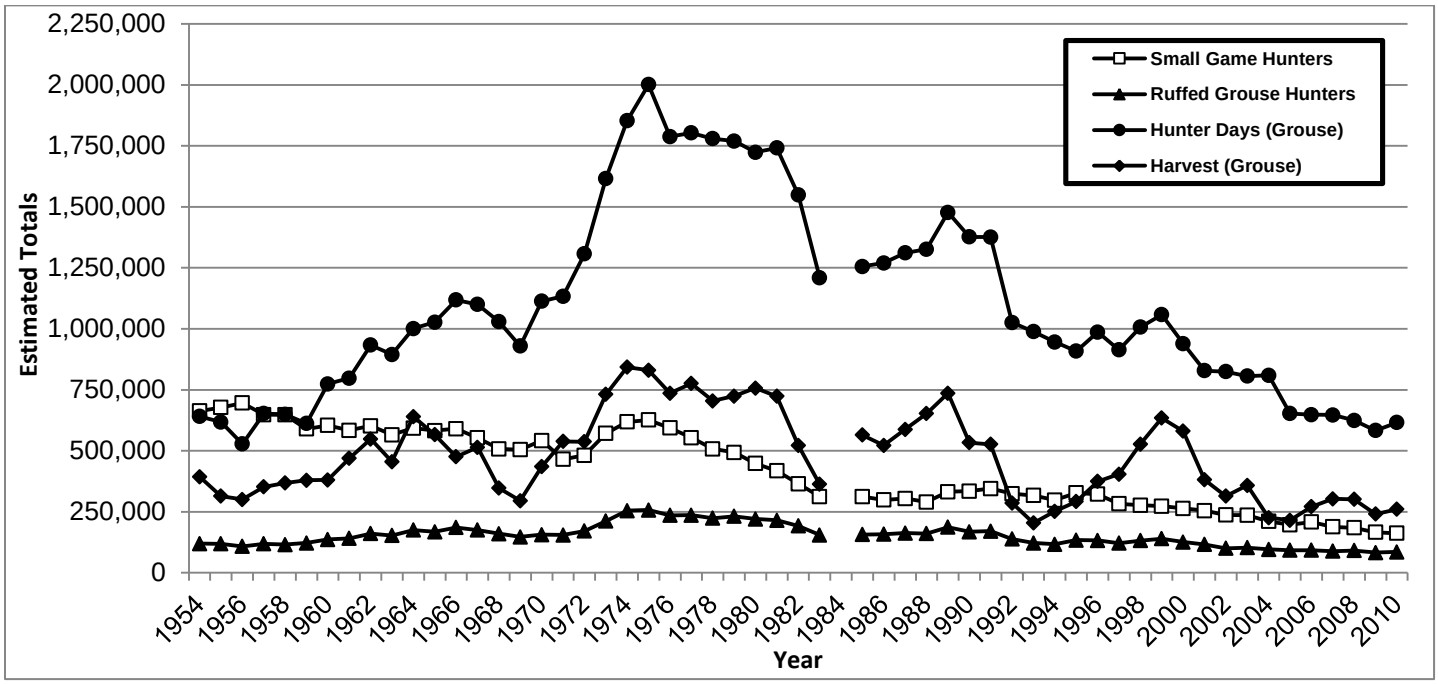


Figure 6. Mail survey estimates of the number of small game hunters and estimates of ruffed grouse hunters, harvest, and hunter days in Michigan, 1954-2010 (estimates are not available for 1984).

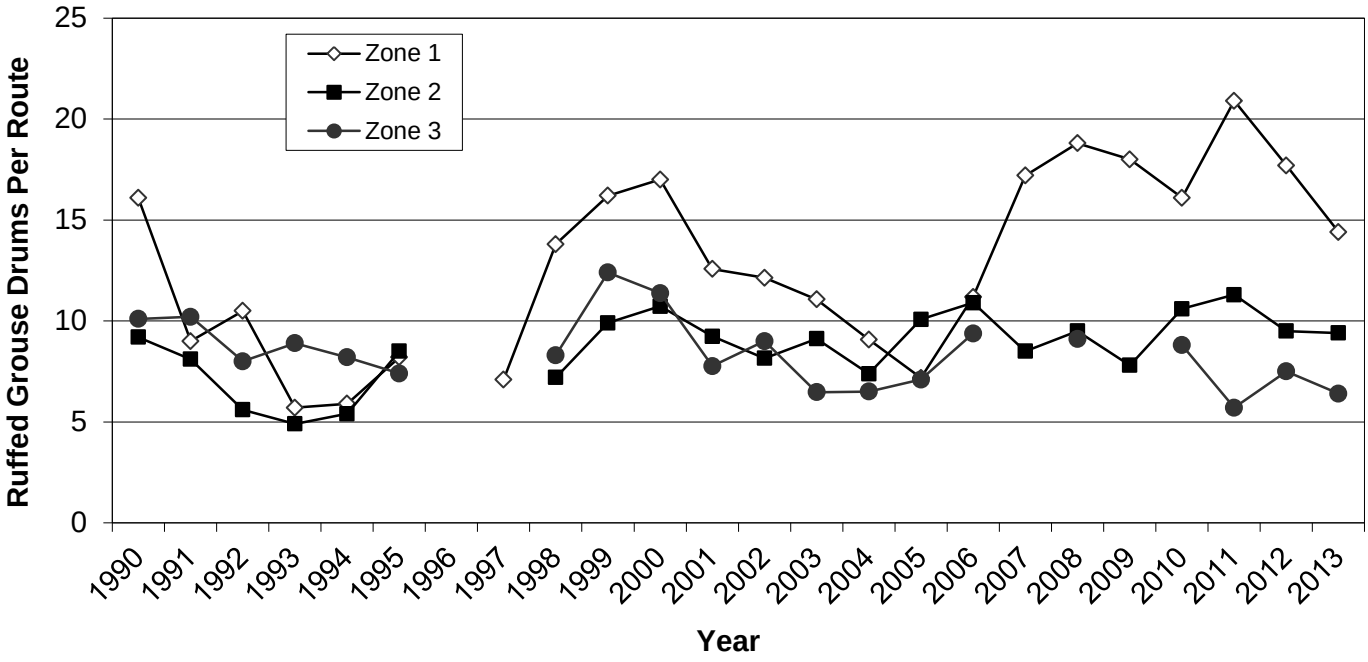


Figure 7. Ruffed grouse breeding population index (average number of drums per route by Zone) in Michigan, 1990-2013. Drumming surveys were not conducted statewide in 1996, and were conducted only in Zone 1 in 1997. Drumming Surveys were not conducted in Zone 3 in 2007 & 2009.

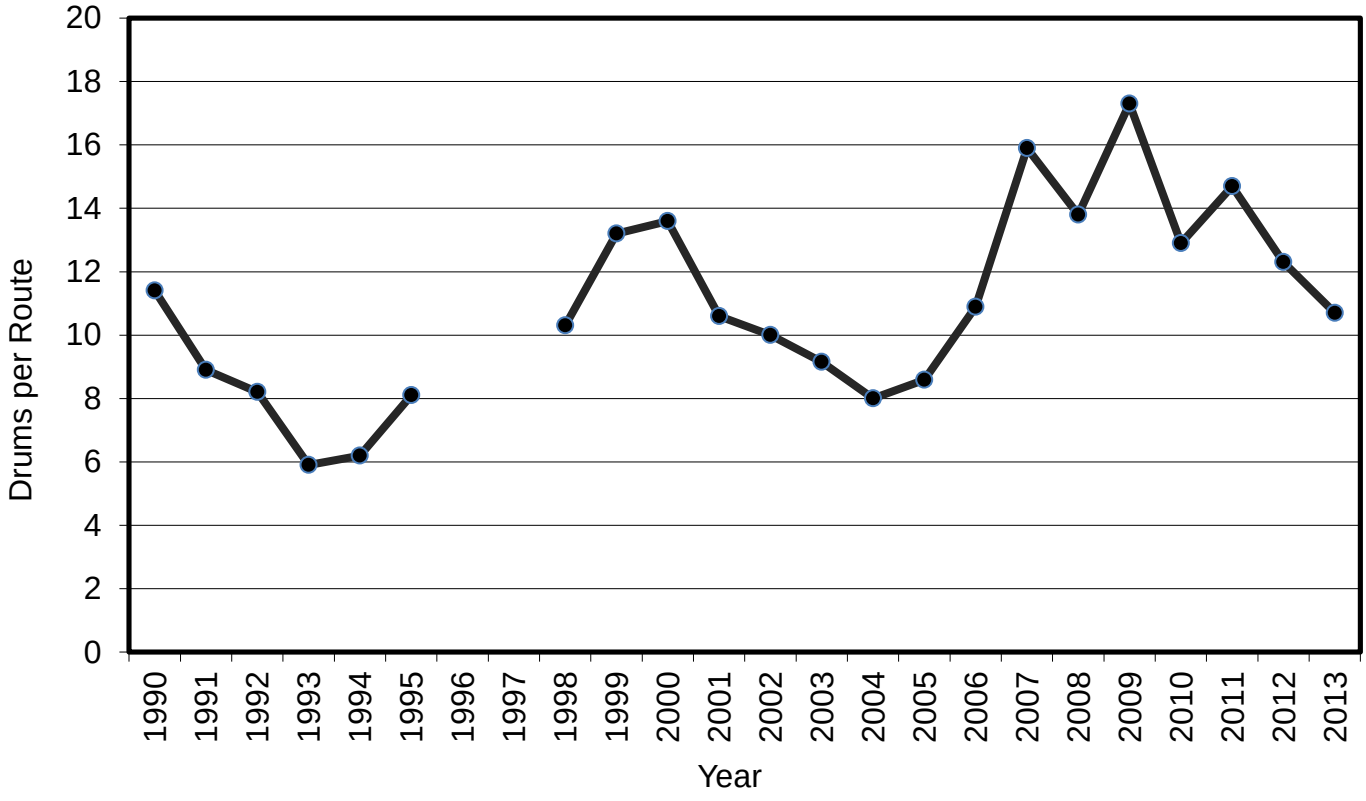
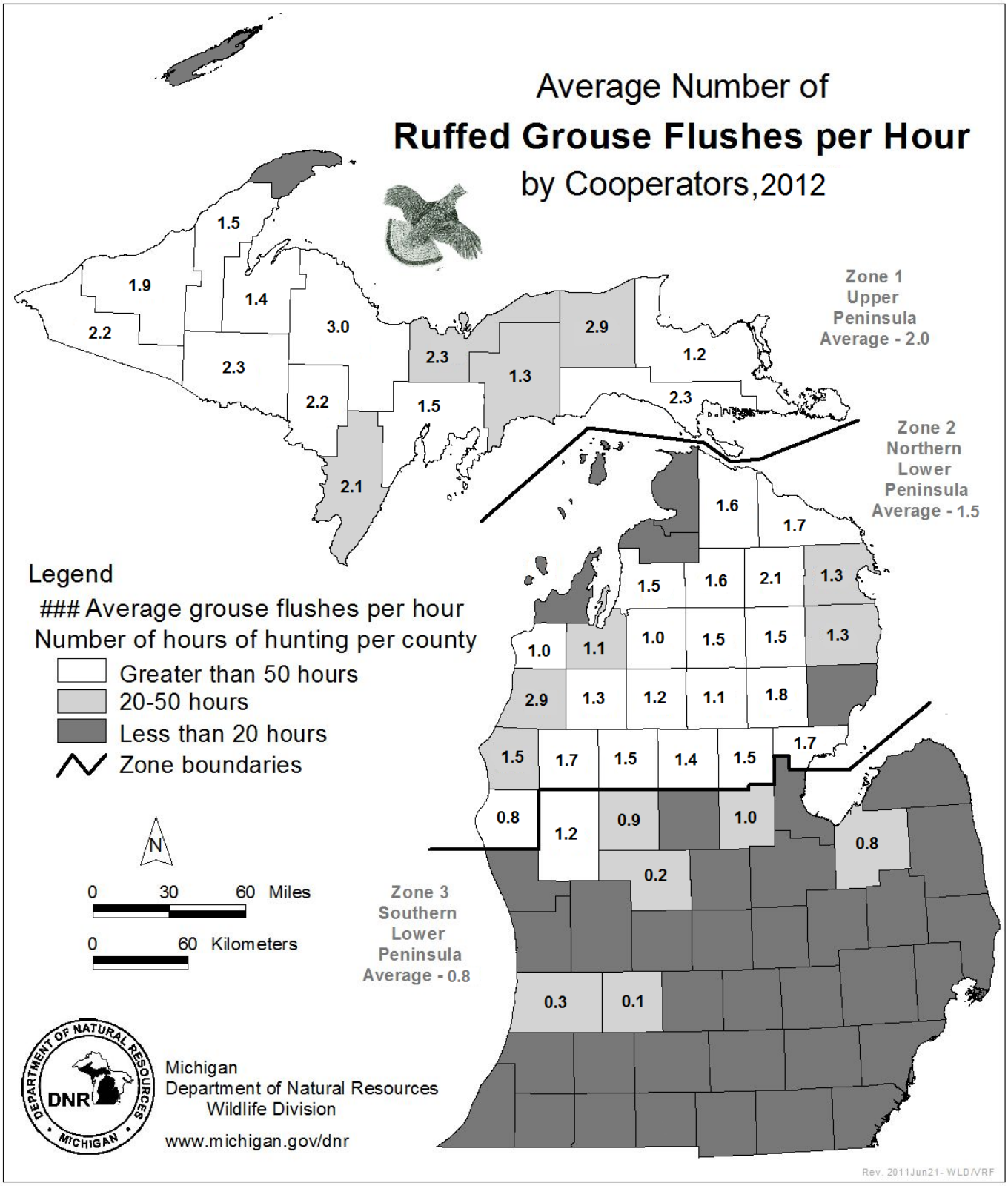
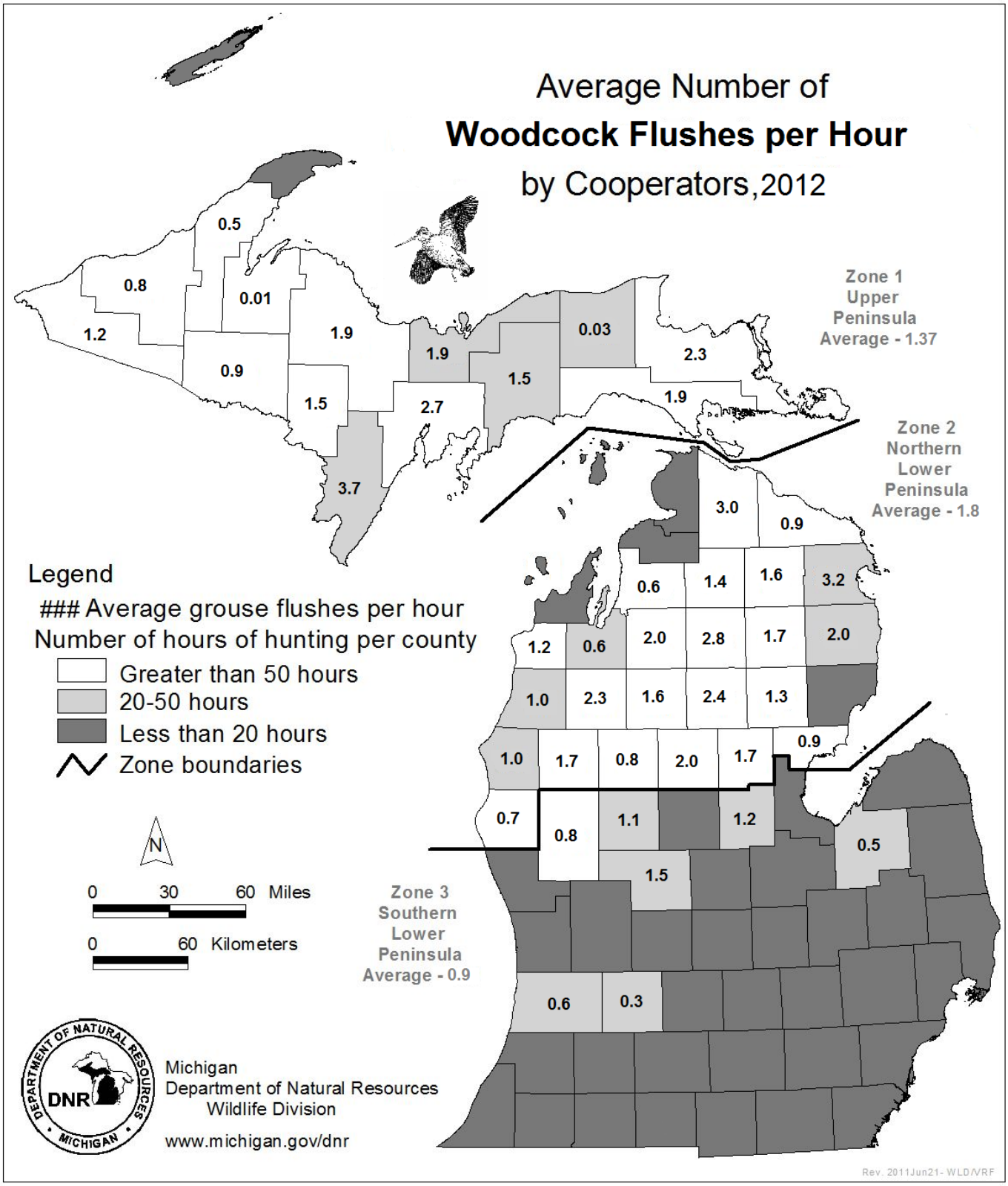


Figure 8. Ruffed grouse breeding population index (average number of drums statewide) in Michigan, 1990-2013. Drumming surveys were not conducted statewide in 1996 and only Zone 1 & 2 in 2007 and 2009 were conducted statewide. 1997 is not appropriate due to only one zone surveyed.



Appendix A. Average number of ruffed grouse flushed per hour by cooperators in 2012.



Appendix B. Average number of woodcock flushed per hour by cooperators in 2012.