

Ruffed Grouse Drumming Survey



Results from Spring 2017

Introduction

During the spring 2017 wild turkey hunting season, DEC conducted the 11th annual Ruffed Grouse Drumming Survey. This survey asks turkey hunters to record the number of grouse they hear drumming while afield. The primary purpose of the survey is to monitor the number of birds drumming per hour (i.e., the drumming rate). Changes in the drumming rate illustrate trends in the grouse population when viewed over time and will provide insight into statewide distributions for this popular game species as habitats change both locally and on a landscape scale.

We thank all the hunters that participated in the Ruffed Grouse Drumming Survey during the 2017 season.

Results from the 2017 Season

During the 2017 season, 179 hunters participated in the Ruffed Grouse Drumming Survey. Survey participants reported data from over 1,100 hunting trips across the state, from the lower Hudson Valley in the south, to the Adirondacks and St. Lawrence Valley in the north, and the Lake Plains and Allegheny Plateau in far western New York. They spent almost 4,200 hours afield and observed over 700 grouse. Some general findings from the 2017 season include:

- Hunters participating in the survey averaged about 23 hours afield during the 2017 season. They took about 6 trips afield for the season and spent almost 4 hours afield per trip (Table 1).
- Survey participants averaged about 4 grouse observed per hunter for the 2016 season and had to spend 6 hours afield in order to hear one grouse drumming (Table 1).
- About two-thirds of all survey effort took place during the first two weeks of May, but the drumming rate (grouse drumming/hour) was highest during the third week of the month (Table 2).
- Overall, there was far more effort expended in the southern zone (about 85% of the total), but the drumming rate was higher in the northern zone (0.44 vs. 0.18 grouse drumming/hour; Table 3).
- Significantly more effort was expended, and more grouse were observed, on private land than public land; however, public land had a slightly higher drumming rate (Table 4).
- Survey effort was distributed across major geographic regions of New York State (25% in southeastern NY, 14% in northern NY, 61% in central and western NY; Table 5). We observed the highest drumming rate in DEC Region 6 in the St. Lawrence Valley/western Adirondacks (0.72 grouse drumming/hour, respectively) followed by DEC Region 5 in the Eastern Adirondacks (0.27 grouse drumming/hour). The drumming rate was close to the statewide average (0.22 grouse drumming/hour) in DEC regions 4, 7, and 9, and below average in DEC regions 3 and 8 (0.04 and 0.12 grouse drumming/hour, respectively).

- The drumming rate was highest in the St. Lawrence Valley Ecozone (0.76 grouse drumming/hour), followed by the Adirondacks-Tug Hill Ecozone (0.49 grouse drumming/hour; Table 6, Figures 1 and 2). The drumming rate was close to the statewide average in the Catskills-Delaware Hills, Champlain Valley, and Appalachian Hills & Plateau ecozones, and below average in the Mohawk Valley-Hudson Valley-Taconic Highlands and Lake Plains ecozones (Table 6, Figures 1 and 2).

Comparing 2017 to Previous Seasons

- Since this survey started in 2007, 745 turkey hunters have taken over 12,700 trips afield and spent over 48,000 hours recording their grouse observations. Over the past 11 years, grouse numbers increased, peaked around 2009, and have declined since. Whether this is a result of some cyclical fluctuation or is related to the influence of habitat and weather on nest and brood success is unknown. A similar pattern has been observed in the flush rate from the Grouse and Woodcock Hunting Log conducted during the fall, providing evidence that changes in the drumming rate reflect changes in abundance over time (Figure 4).
- From 2016 to 2017 the number of survey participants, survey effort, and number of grouse drumming was similar between years. The drumming rate increased slightly from 2016 to 2017, but the change was not significant (Table 1, Figure 4).
- When we look at the ecozone level, the changes in the drumming rate from 2016 to 2017 are minimal. Most ecozones increased or decreased slightly between years, with the exception of the St. Lawrence Valley (Figure 1) where a dramatic increase was observed, mostly driven by observations in the East Ontario Plain aggregate (Table 6). The Lake Plains and Hudson Valley regions are consistently below the statewide average over the past 11 seasons.
- Annual variation in grouse abundance is likely a result of variation in weather, including spring temperature and rainfall and winter snow conditions, and food availability during the summer and fall (e.g., hard and soft mast, insects). Data from the U.S. Department of Agriculture National Agricultural Statistics Service indicate that May rainfall was below average in most regions, despite cold, wet weather in many areas during the first week of the month. Similarly, rainfall was below average in most regions in June, with the exception of portions of the St. Lawrence Valley in northern New York. Below average rainfall in May and June can positively impact nest and brood success, but this may have been offset by the cold, wet start to the month of May. This may have resulted in below-average reproductive success in many areas, but mild winter conditions and good overwinter survival may have offset the negative effects of poor productivity in some regions.
- In areas with a lack of the early successional habitats on which this species depends (e.g., Lake Plains, lower Hudson Valley), grouse, their nests, and young are more vulnerable to predation and other limiting factors, thus we tend to observe lower drumming rates in these areas. Over the past 11 years, the Wildlife Management Units with the highest drumming rates are those that have a landscape with a greater proportion of the early successional habitats (e.g., shrubland, young forests) that grouse depend upon than aggregates with below-average drumming rates (Figure 3).

Drumming Survey vs. Grouse Hunting Log

- At the statewide scale the drumming rate from the spring survey and the flush rate from the Grouse Hunting Log conducted during the fall are correlated (i.e., when we observe an annual change in the drumming rate, we see a similar change in the flush rate; Figure 4). Based on this, we anticipate that the flush rate during the upcoming 2017-18 hunting season will be slightly higher than last fall (0.76 grouse flushed/hour in 2016-17) and below the long-term average flush rate (about 1 bird/hour). Unfortunately, nesting conditions have been relatively wet in May and June, so that's a bad sign for nest and chick success. Poor production this summer could hurt hunter prospects this fall and off-set improvements in grouse numbers.
- When we attempt to link drumming rates with flush rates at smaller scales, the results are often inconsistent; drumming rates do not consistently predict flush rates at the ecozone or WMU aggregate level. Part of the reason for this may be the unpredictability of the nesting season (i.e., percent of nests that are successful, survival of broods) between the time the drumming survey is conducted in the spring and the time the grouse log is conducted during the fall.

Table 1. Summary statistics for the 2012-17 Ruffed Grouse Drumming Survey.

Summary Statistics	2012	2013	2014	2015	2016	2017	5-yr Avg. (2012-16)
# Survey Participants	157	236	210	193	185	179	196
# Trips	1,046	1,493	1,348	1,181	1,193	1,142	1,252
# Trips/Participant	6.7	6.3	6.4	6.1	6.4	6.4	6.4
# Hours Afield	3,918	5,921	5,009	4,472	4,389	4,169	4,742
# Hours/Participant	25.0	25.1	23.9	23.2	23.7	23.3	24.2
# Hours/Trip	3.7	4.0	3.7	3.8	3.7	3.7	3.8
# Grouse Drumming	710	1,128	944	987	728	723	899
# Grouse Drumming/Participant	4.5	4.8	4.5	5.1	3.9	4.0	4.6
# Grouse Drumming/Trip	0.68	0.76	0.70	0.84	0.61	0.63	0.72
Drumming Rate (grouse drumming/hour)	0.20	0.23	0.22	0.24	0.20	0.22	0.22
Hours Afield to Hear 1 Grouse Drumming	5.0	4.3	4.5	4.5	6.0	5.8	4.9

Table 2. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by week from the 2017 Ruffed Grouse Drumming Survey.

Week	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Youth Hunt (April 22-23)	19	2%	64	2%	23	3%	0.46	0.10
Regular Season (May 1-31)	1,123	98%	4,105	98%	700	97%	0.21	0.02
May 1-7	470	41%	1,845	45%	247	35%	0.16	0.02
May 8-14	262	23%	917	22%	179	26%	0.24	0.03
May 15-21	208	18%	714	17%	176	25%	0.30	0.06
May 22-31	180	16%	624	15%	97	14%	0.22	0.06

Table 3. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by grouse season zone from the 2017 Ruffed Grouse Drumming Survey.

Season Zone	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Northern Zone	184	16%	568	14%	194	27%	0.44	0.08
Southern Zone	958	84%	3,601	86%	529	73%	0.18	0.02

Table 4. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by land type (public vs. private) from the 2017 Ruffed Grouse Drumming Survey.

Land Type	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Public Land	173	15%	616	15%	155	22%	0.25	0.04
Private Land	959	84%	3,519	85%	564	78%	0.21	0.02

Table 5. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by DEC Region from the 2017 Ruffed Grouse Drumming Survey.

DEC Region	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
3 - Lower Hudson Valley	98	9%	361	9%	12	2%	0.04	0.01
4 - Capital Region	180	16%	684	16%	99	14%	0.18	0.04
5 - E Adks/Lk Champlain	93	8%	293	7%	66	9%	0.27	0.04
6 - W Adks/St. Law. Valley	83	7%	299	7%	148	20%	0.72	0.16
7 - Central NY	294	26%	1,048	25%	170	24%	0.19	0.03
8 - Finger Lakes	139	12%	528	13%	68	9%	0.12	0.03
9 - Western NY	255	22%	956	23%	160	22%	0.21	0.03

Table 6. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) Aggregate and Ecozone from the 2017 Ruffed Grouse Drumming Survey.

Ecozone WMU Aggregate**	Trips		Hours		Grouse Drumming		Drumming Rate* (grouse drumming/hour)	
	#	%	#	%	#	%	Mean	SE
St. Lawrence Valley	50	4.4%	178	4.3%	87	12.0%	0.76	0.26
East Ontario Plain	22	1.9%	68	1.6%	58	8.0%	1.00	0.52
St. Lawrence Valley	28	2.5%	110	2.6%	29	4.0%	0.56	0.22
Champlain Valley	25	2.2%	74	1.8%	12	1.7%	0.18	0.09
Champlain Valley & Transition	25	2.2%	74	1.8%	12	1.7%	0.18	0.09
Adirondacks-Tug Hill	77	6.7%	206	4.9%	95	13.1%	0.49	0.07
Tug Hill	10	0.9%	34	0.8%	13	1.8%	0.45	0.20
Tug Hill Transition	29	2.5%	75	1.8%	45	6.2%	0.60	0.15
Northern Adirondacks	23	2.0%	52	1.2%	22	3.0%	0.43	0.09
Central Adirondacks	15	1.3%	45	1.1%	15	2.1%	0.41	0.09
Lake Plains	162	14.2%	611	14.7%	12	1.7%	0.03	0.01
Oneida Lake Plains	60	5.3%	230	5.5%	8	1.1%	0.07	0.04
Great Lakes Plain	70	6.1%	271	6.5%	4	0.6%	0.01	0.01
Oswego Lowlands	32	2.8%	110	2.6%	0	0.0%	0.00	0.00
Appalachian Hills & Plateau	510	44.7%	1,882	45.1%	372	51.5%	0.23	0.02
East Appalachian Plateau	182	15.9%	655	15.7%	145	20.1%	0.26	0.05
Central Appalachian Plateau	35	3.1%	137	3.3%	19	2.6%	0.15	0.04
North Appalachian Hills	78	6.8%	277	6.6%	58	8.0%	0.19	0.05
West Appalachian Hills	215	18.8%	813	19.5%	150	20.7%	0.24	0.03

Catskills-Delaware Hills	133	11.6%	545	13.1%	87	12.0%	0.21	0.06
Catskills	76	6.7%	297	7.1%	50	6.9%	0.17	0.03
Otsego-Delaware Hills	37	3.2%	172	4.1%	30	4.1%	0.34	0.20
Neversink-Mongaup Hills	20	1.8%	76	1.8%	7	1.0%	0.11	0.04
Mohawk Valley-Hudson Valley-Taconic Highlands	185	16.2%	673	16.1%	58	8.0%	0.09	0.02
Mohawk Valley	41	3.6%	145	3.5%	34	4.7%	0.26	0.05
Hudson Valley	93	8.1%	338	8.1%	10	1.4%	0.03	0.01
North Taconic Highlands	27	2.4%	116	2.8%	14	1.9%	0.12	0.03
South Taconic Highlands	15	1.3%	50	1.2%	0	0.0%	0.00	0.00
New York City Transition	9	0.8%	24	0.6%	0	0.0%	0.00	0.00
Statewide Totals	1,142		4,169		723		0.22	0.02

*Overall drumming rates are calculated as an average drumming rate for all days afield, not a simple division of the total number of grouse drumming by the total number of hours afield. A minimum of 10 trips or 20 hours is needed for analysis. SE = Standard Error

**WMU Aggregates are groupings of Wildlife Management Units. Ecozones are groupings of WMU Aggregates. The Coastal Lowlands Aggregate (Long Island) only has a two-day youth turkey season, thus is not listed.

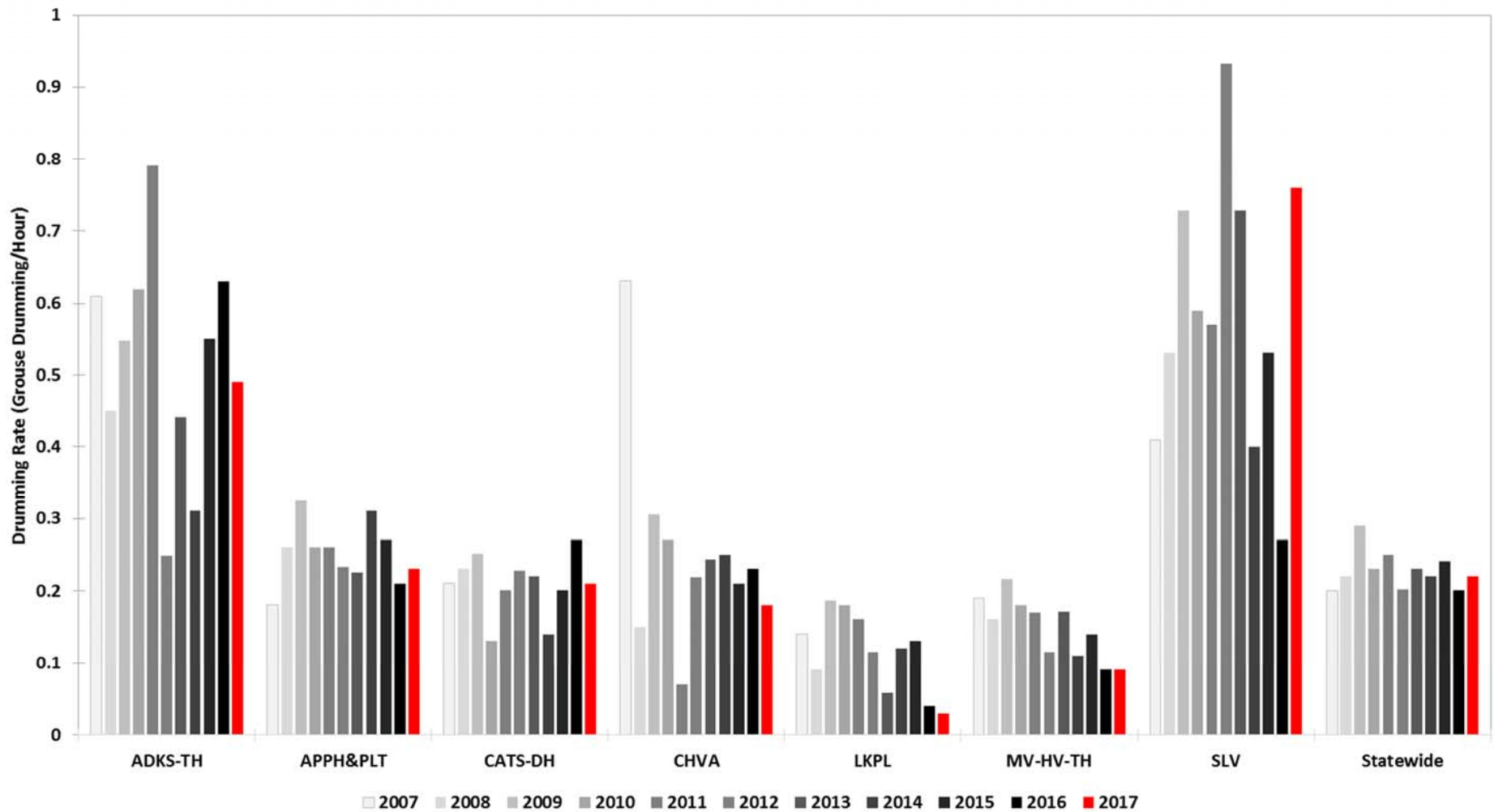


Figure 1. Drumming rate (grouse drumming/hour) by ecozone based on the Ruffed Grouse Drumming Survey data, 2007-17. Ecozones are an aggregation of Wildlife Management Units. Abbreviations: Champlain Valley (CHVA), Adirondacks-Tug Hill (ADKS-TH), Catskills-Delaware Hills (CATS-DH), St. Lawrence Valley (SLV), Appalachian Hills & Plateau (APPH&PLT), Lake Plains (LKPL), Mohawk Valley-Hudson Valley-Taconic Highlands (MV-HV-TH). The Coastal Lowlands Ecozone (Long Island) only has a two-day youth turkey hunt, so the drumming survey was not conducted there.

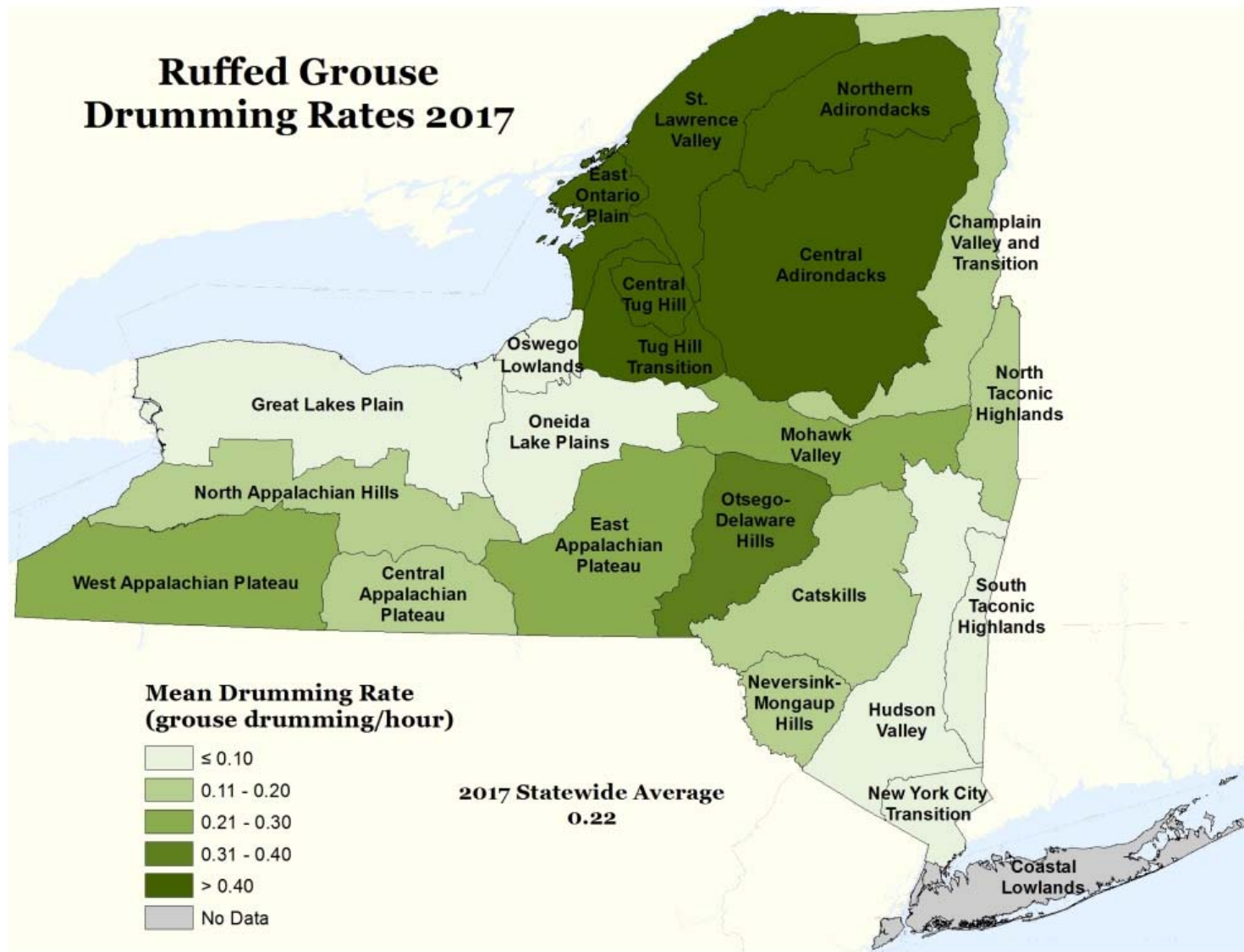


Figure 2. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2017. Only aggregates with ≥ 10 observations/records or ≥ 20 hours were included in the analysis. The statewide drumming rate for 2017 was 0.22 grouse drumming/hour. The Coastal Lowlands aggregate only has a two-day youth turkey hunt, so the drumming survey was not conducted there. Drumming rates and sample sizes for each WMU aggregate can be found in Table 6.

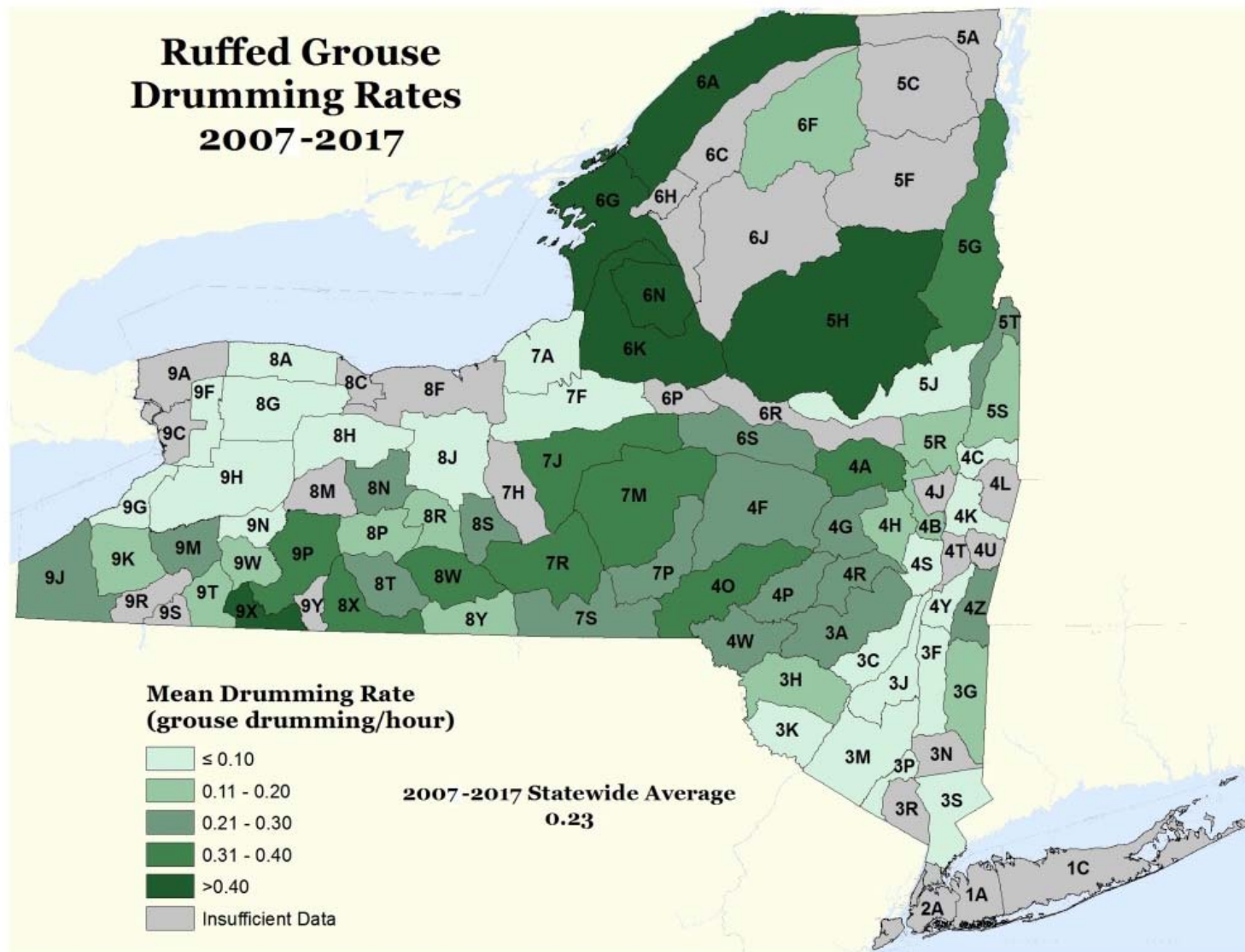


Figure 3. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) from the Ruffed Grouse Drumming Survey, 2007-2017. Only WMUs with ≥ 50 observations/records or ≥ 150 hours were included in the analysis. The statewide drumming rate for the 11-year period was 0.23 grouse drumming/hour. The Wildlife Management Units in gray had too few observations for analysis. Long Island (WMUs 1A, 1C) only has a two-day youth turkey hunt in Suffolk County, so the drumming survey was not conducted there.

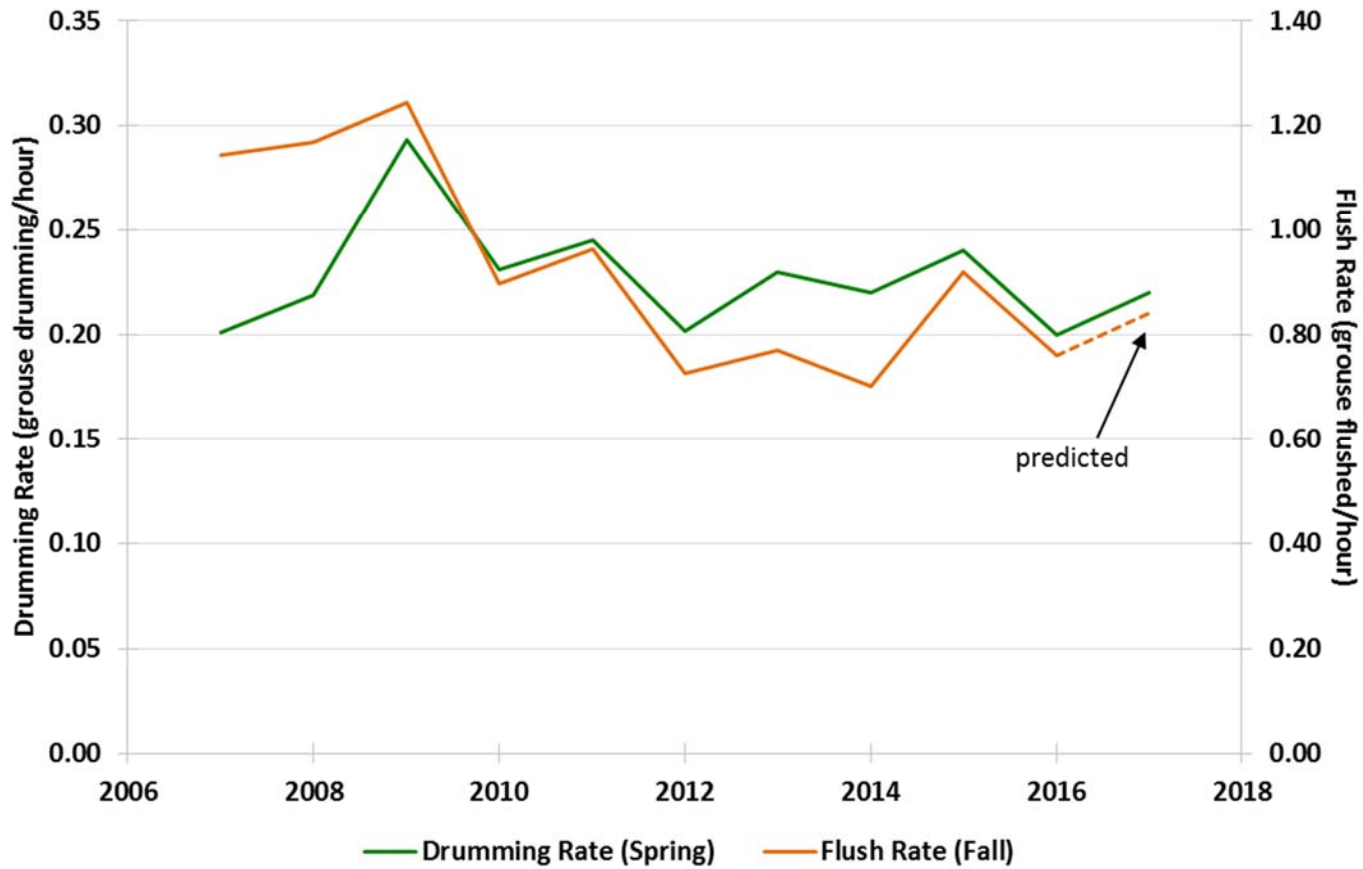


Figure 4. Ruffed grouse drumming rate (grouse drumming/hour) from the Ruffed Grouse Drumming Survey conducted during the spring, and the grouse flush rate (grouse flushed/hour) from the Grouse and Woodcock Hunting Log conducted during the fall grouse hunting season. The flush rate for fall 2017 is predicted based on the statewide estimated drumming rate from spring 2017.



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