

Ruffed Grouse Drumming Survey



Results from Spring 2020

Introduction

During the spring 2020 wild turkey hunting season, DEC conducted the 14th 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 2020 season.

Results from the 2020 Season

During the 2020 season, 179 hunters participated in the Ruffed Grouse Drumming Survey. Survey participants reported data from 1,161 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 4,500 hours afield and observed over 600 grouse. Some general findings from the 2020 season include:

- Hunters participating in the survey averaged about 25 hours afield during the 2020 season. They took about 7 trips afield for the season and spent 4 hours afield per trip (Table 1).
- Survey participants averaged about 4 grouse observed per hunter for the 2020 season and had to spend almost 7 hours afield to hear one grouse drumming (Table 1).
- Statewide, the drumming rate for 2020 was 0.17 grouse drumming/hour (Table 1, Figure 1). Almost two-thirds of all survey effort took place during the first two weeks of May, and the drumming rate (grouse drumming/hour) was highest during the first 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 (0.45 vs. 0.12 grouse drumming/hour; Table 3).
- Significantly more effort was expended, and more grouse were observed, on private land than public land; however, the drumming rate was similar on public and private lands (Table 4).
- Survey effort was distributed across major geographic regions of New York State (26% in southeastern NY, 17% in northern NY, 57% in central and western NY; Table 5). We observed the highest drumming rate in northern New York (DEC Regions 5 and 6; 0.38 – 0.41 grouse drumming/hour). The drumming rate was close to the statewide average in DEC Regions 4, 7, and 9, and below the statewide average in DEC Regions 3 and 8 (Table 5).
- The drumming rate was highest in the Champlain Valley Ecozone (0.83 grouse drumming/hour; Table 6), followed by the St. Lawrence Valley (0.57 grouse drumming/hour) and Adirondacks-

Tug Hill ecozones (0.39 grouse drumming/hour; Table 6, Figures 1 and 2). The drumming rate was close to the statewide average in the Appalachian Hills and Plateau, Catskills-Delaware Hills, and Mohawk Valley-Hudson Valley-Taconic Highlands ecozones (Table 6, Figures 1 and 2).

Comparing 2020 to Previous Seasons

- Since this survey began in 2007, 794 turkey hunters have taken almost 17,000 trips afield and spent over 64,000 hours recording their grouse observations.
- Survey effort was similar between 2019 and 2020, but both the number of grouse observed and the drumming rate increased between years (0.12 to 0.17 grouse drumming/hour; Table 1, Figure 1).
- When we look at the ecozone level, from 2019 to 2020 the drumming rate increased in every ecozone except the Appalachian Hills and Plateau ecozone, which was similar between years (Figure 1).
- 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). Cold, wet weather during early May 2019 may have negatively influenced the prevalence of grouse drumming, affecting the drumming rate estimate for that season. In addition, wet weather in spring 2017 and 2019 may have limited reproductive success and grouse abundance in recent years.
- Since 2007, the drumming rates in northern New York are consistently above the statewide average, while the drumming rates in the Lake Plains and Hudson Valley regions are consistently below the statewide average (Figure 3). 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. 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.
- Trends in grouse populations are likely related to the influence of habitat and weather on nest and brood success, and potentially, the negative effects of West Nile Virus (WNV) on grouse chick survival. New York and several other states are currently collaborating on a study to better understand the prevalence of WNV in grouse.

Drumming Survey vs. Grouse Hunting Log

- At the statewide scale, the drumming rate from the spring survey and the flush rate from the Grouse and Woodcock 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 2020-21 hunting season will be higher than last fall (0.59 grouse flushed/hour in 2019-20), but below the long-term average flush rate (about 0.80 birds/hour).
- 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. Another reason may be that the relatively small sample sizes in some WMU aggregates are not reflective of the actual grouse population so do not allow us to accurately predict fall flush rates at that spatial scale.

Table 1. Summary statistics for the 2015-20 Ruffed Grouse Drumming Survey.

Summary Statistics	2015	2016	2017	2018	2019	2020	5-yr Avg. (2015-19)
# Survey Participants	193	185	179	217	171	179	189
# Trips	1,181	1,193	1,142	1,973	1,074	1,161	1,313
# Trips/Participant	6.1	6.4	6.4	9.1	6.3	6.5	6.9
# Hours Afield	4,472	4,389	4,169	7,267	4,117	4,474	4,883
# Hours/Participant	23.2	23.7	23.3	33.5	24.1	25.0	25.6
# Hours/Trip	3.8	3.7	3.7	3.7	3.8	3.9	3.7
# Grouse Drumming	987	728	723	1,320	481	669	848
# Grouse Drumming/Participant	5.1	3.9	4.0	6.1	2.8	3.7	4.4
# Grouse Drumming/Trip	0.84	0.61	0.63	0.67	0.45	0.58	0.64
Drumming Rate (grouse drumming/hour)	0.24	0.20	0.22	0.24	0.12	0.17	0.20
Hours Afield to Hear 1 Grouse Drumming	4.5	6.0	5.8	5.5	8.6	6.7	6.1

Table 2. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by week from the 2020 Ruffed Grouse Drumming Survey.

Week	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Youth Hunt (April 25-26)	12	1%	52	1%	21	2%	0.43	0.10
Regular Season (May 1-31)	1,149	99%	4,422	99%	648	97%	0.17	0.01
May 1-7	519	45%	2,043	46%	343	53%	0.20	0.02
May 8-14	203	18%	745	17%	78	12%	0.12	0.02
May 15-21	220	19%	861	19%	140	22%	0.18	0.02
May 22-31	207	18%	773	17%	87	13%	0.11	0.02

Table 3. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by grouse season zone from the 2020 Ruffed Grouse Drumming Survey.

Season Zone	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Northern Zone	170	15%	608	14%	255	38%	0.45	0.04
Southern Zone	991	85%	3,866	86%	414	62%	0.12	0.01

Table 4. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by land type (public vs. private) from the 2020 Ruffed Grouse Drumming Survey.

Land Type	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Public Land	251	22%	966	22%	154	23%	0.17	0.02
Private Land	902	78%	3,482	78%	510	77%	0.17	0.01

Table 5. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by DEC Region from the 2020 Ruffed Grouse Drumming Survey.

DEC Region	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
3 - Lower Hudson Valley	89	8%	365	8%	8	1%	0.03	0.01
4 - Capital Region	213	18%	811	18%	111	17%	0.16	0.02
5 - E Adks/Lk Champlain	77	7%	289	6%	102	15%	0.41	0.07
6 - W Adks/St. Law. Valley	119	10%	476	11%	165	25%	0.38	0.05
7 - Central NY	260	22%	1,007	23%	132	20%	0.14	0.02
8 - Finger Lakes	126	11%	505	11%	23	3%	0.08	0.03
9 - Western NY	277	24%	1,021	23%	128	19%	0.14	0.02

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 2020 Ruffed Grouse Drumming Survey.

Ecozone WMU Aggregate**	Trips		Hours		Grouse Drumming		Drumming Rate* (grouse drumming/hour)	
	#	%	#	%	#	%	Mean	SE
St. Lawrence Valley	47	4.0%	193	4.3%	106	15.8%	0.57	0.09
East Ontario Plain	17	1.5%	59	1.3%	49	7.3%	0.80	0.22
St. Lawrence Valley	30	2.6%	134	3.0%	57	8.5%	0.44	0.06
Champlain Valley	14	1.2%	52	1.2%	29	4.3%	0.83	0.25
Champlain Valley & Transition	14	1.2%	52	1.2%	29	4.3%	0.83	0.25
Adirondacks-Tug Hill	95	8.2%	325	7.3%	120	17.9%	0.39	0.05
Tug Hill	9	0.8%	28	0.6%	12	1.8%	0.55	0.14
Tug Hill Transition	41	3.5%	137	3.1%	40	6.0%	0.31	0.09
Northern Adirondacks	27	2.3%	87	1.9%	37	5.5%	0.44	0.10
Central Adirondacks	18	1.6%	73	1.6%	31	4.6%	0.44	0.08
Lake Plains	171	14.7%	703	15.7%	53	7.9%	0.07	0.03
Oneida Lake Plains	63	5.4%	292	6.5%	31	4.6%	0.09	0.03
Great Lakes Plain	94	8.1%	373	8.3%	22	3.3%	0.07	0.05
Oswego Lowlands	14	1.2%	38	0.8%	0	0.0%	0.00	0.00
Appalachian Hills & Plateau	474	40.8%	1,780	39.8%	210	31.4%	0.13	0.01
E. Appal. Plateau	163	14.0%	616	13.8%	80	12.0%	0.14	0.02
C. Appal. Plateau	23	2.0%	111	2.5%	6	0.9%	0.11	0.06
N. Appal. Hills	95	8.2%	359	8.0%	11	1.6%	0.06	0.02
W. Appal. Hills	193	16.6%	694	15.5%	113	16.9%	0.17	0.03
Catskills-Delaware Hills	163	14.0%	652	14.6%	75	11.2%	0.12	0.02
Catskills	129	11.1%	514	11.5%	53	7.9%	0.11	0.02
Otsego-Delaware Hills	23	2.0%	93	2.1%	19	2.8%	0.19	0.05
Neversink-Mongaup Hills	11	0.9%	45	1.0%	3	0.4%	0.07	0.06
Mohawk Valley-Hudson Valley-Taconic Highlands	197	17.0%	769	17.2%	76	11.4%	0.13	0.02
Mohawk Valley	77	6.6%	279	6.2%	47	7.0%	0.21	0.05
Hudson Valley	70	6.0%	300	6.7%	13	1.9%	0.05	0.02
N. Taconic Highlands	24	2.1%	105	2.3%	13	1.9%	0.15	0.07

S. Taconic Highlands	16	1.4%	57	1.3%	3	0.4%	0.07	0.04
NYC Transition	10	0.9%	28	0.6%	0	0.0%	0.00	0.00

Statewide Totals	1,161		4,474		669		0.17	0.01
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*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.

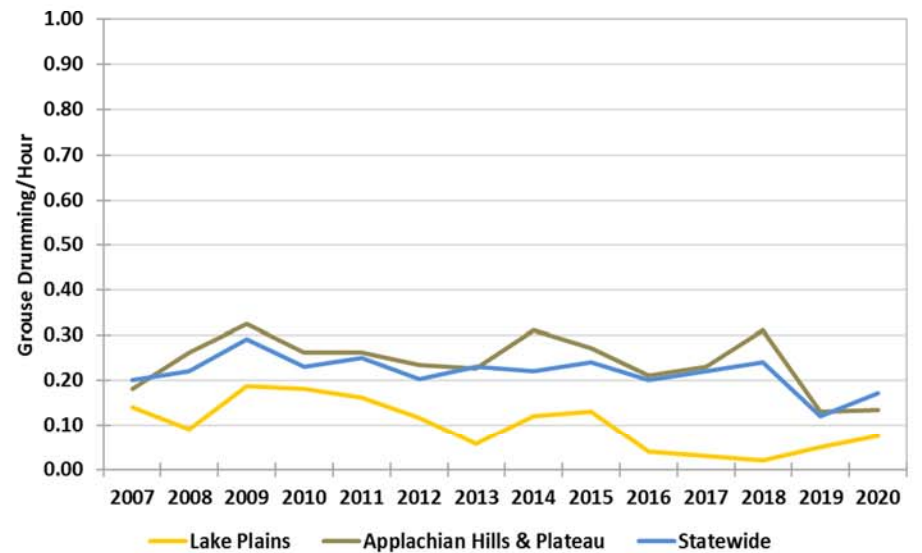
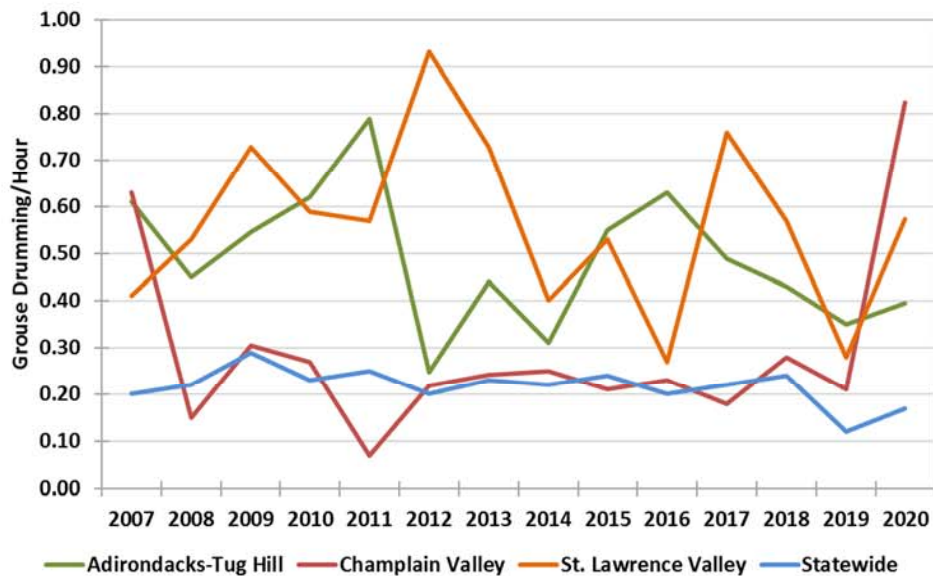
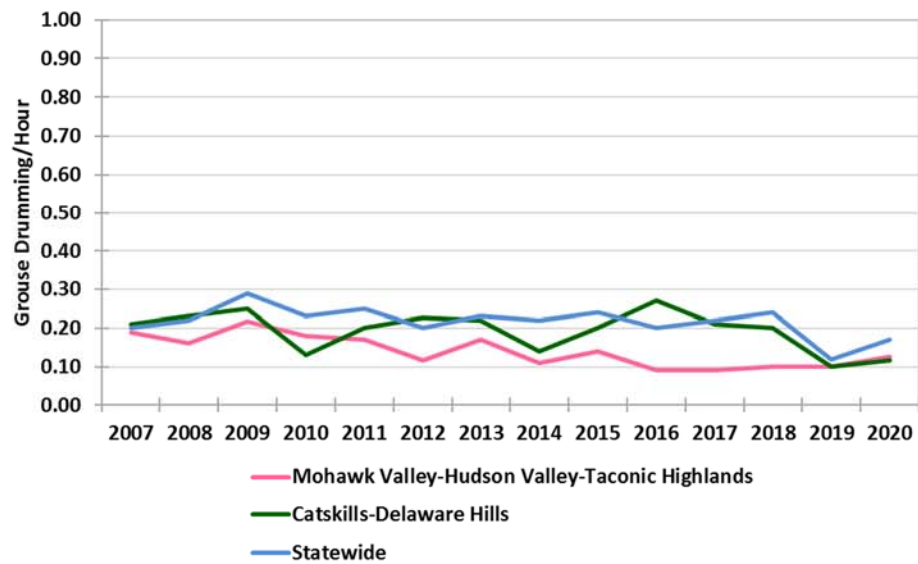


Figure 1. Drumming rate (grouse drumming/hour) by ecozone based on the Ruffed Grouse Drumming Survey data, 2007-20. Ecozones are an aggregation of Wildlife Management Units. The Coastal Lowlands Ecozone (Long Island) only has a two-day youth turkey hunt, so the drumming survey was not conducted there.

Ruffed Grouse Drumming Rates 2020

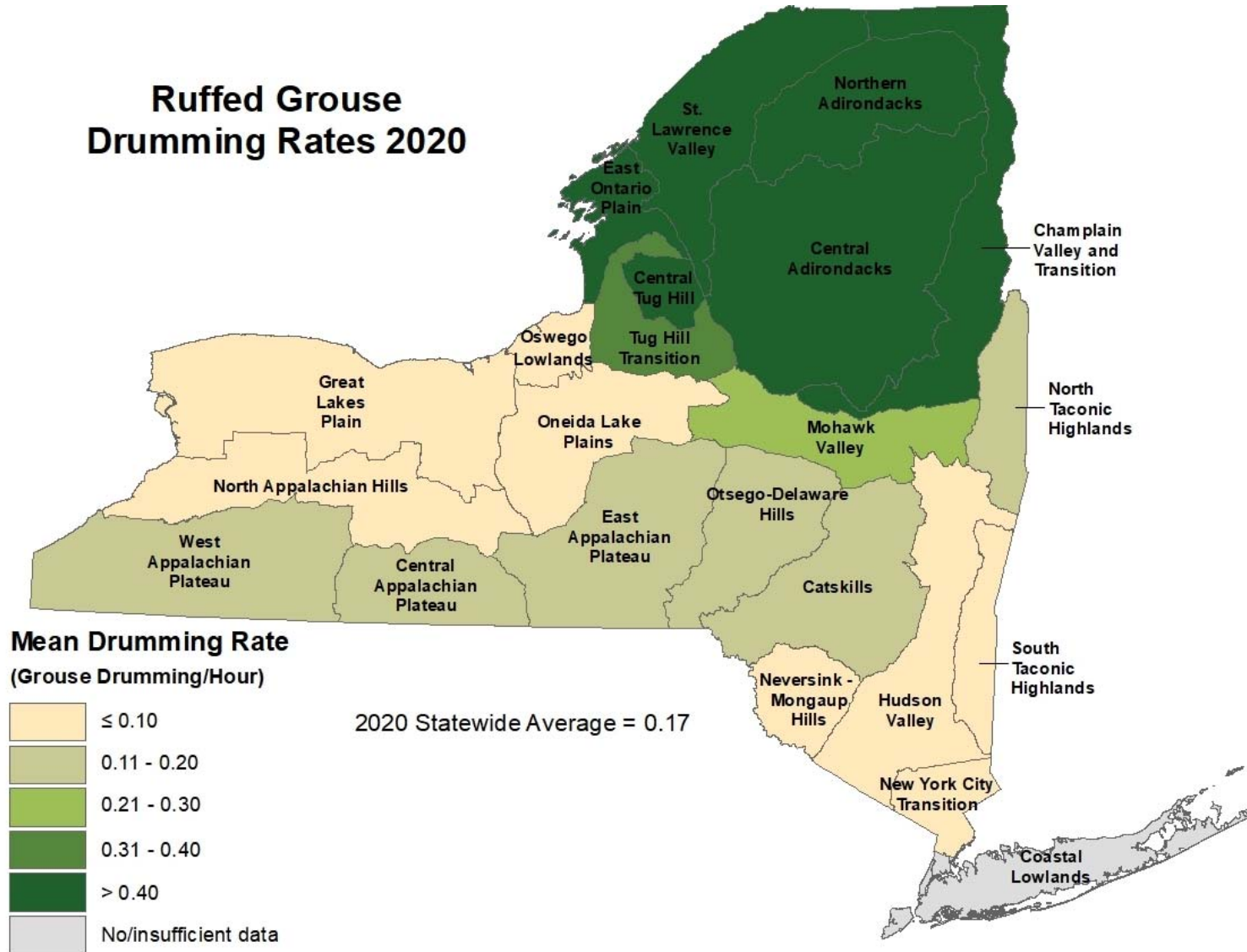


Figure 2. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2020. Only aggregates with ≥ 10 observations/records or ≥ 20 hours were included in the analysis. The statewide drumming rate for 2020 was 0.17 grouse drumming/hour. The 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.

Multi-Year Ruffed Grouse Drumming Rates 2007-2020

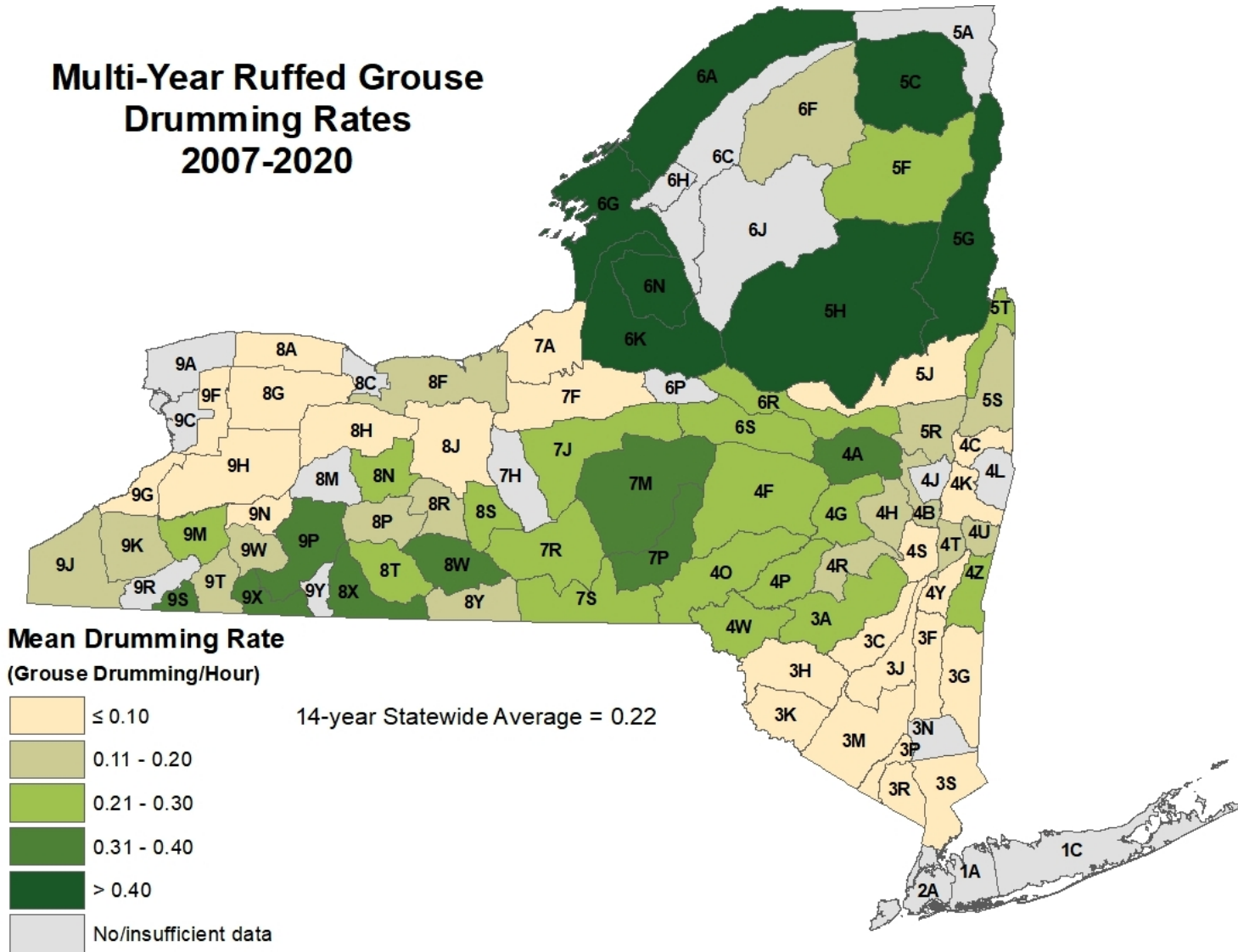


Figure 3. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) from the Ruffed Grouse Drumming Survey, 2007-2020. Only WMUs with ≥ 50 observations/records or ≥ 150 hours were included in the analysis. The statewide drumming rate for the 14-year period was 0.22 grouse drumming/hour. 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.

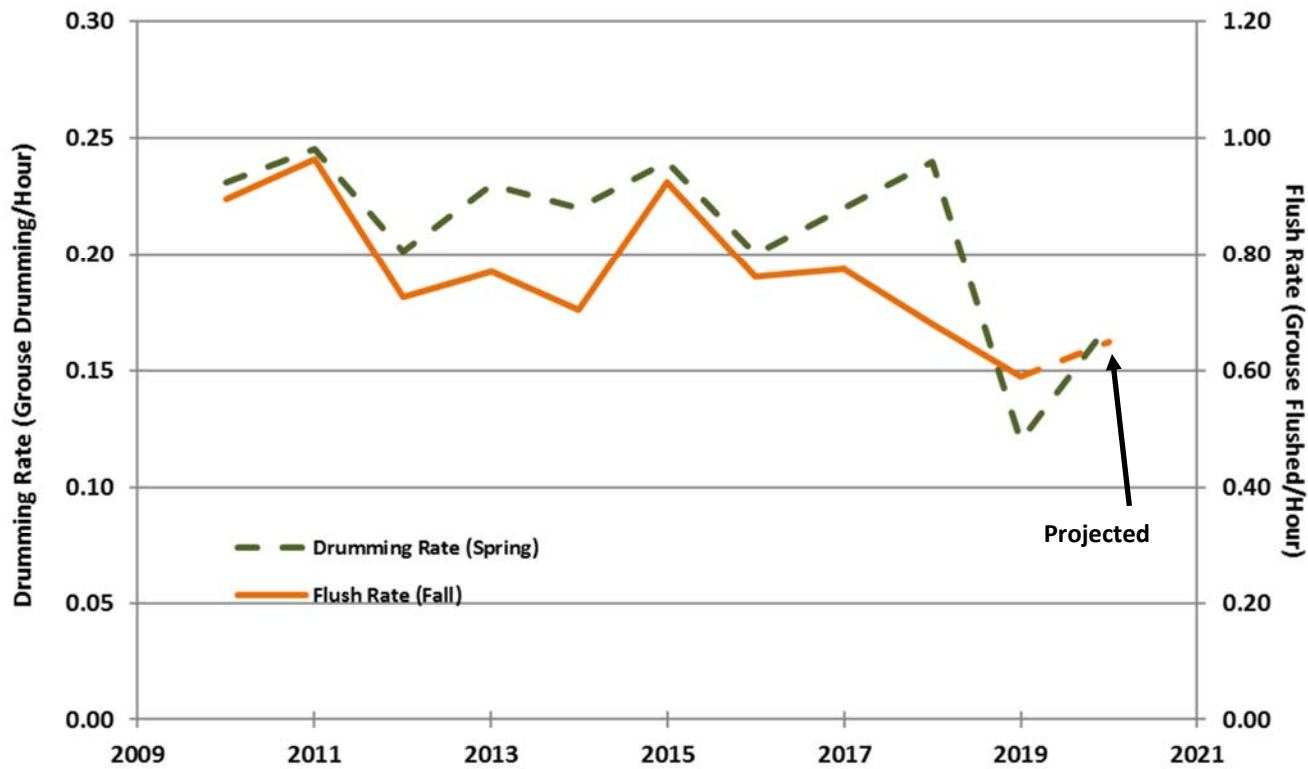


Figure 4. Ruffed grouse drumming rate (grouse drumming/hour) from the Ruffed Grouse Drumming Survey conducted during the spring, and the grouse flush rate (grouse flushed/hour) from the Grouse and Woodcock Hunting Log conducted during the fall grouse hunting season. The flush rate for fall 2020 is predicted based on the statewide estimated drumming rate from spring 2020.



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