Ruffed Grouse Drumming Survey

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Results from Spring 2021

Introduction

During the spring 2021 wild turkey hunting season, DEC conducted the 15th 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 2021 season.

Results from the 2021 Season

During the 2021 season, 153 hunters participated in the Ruffed Grouse Drumming Survey. Survey participants reported data from 873 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 about 3,400 hours afield and observed almost 500 grouse. Some general findings from the 2021 season include:

- Hunters participating in the survey averaged about 22 hours afield during the 2021 season. They took about 6 trips afield and spent 4 hours afield per trip (Table 1).
- Survey participants averaged about 3 grouse observed per hunter for the 2021 season and had to spend almost 7 hours afield to hear one grouse drumming (Table 1).
- Statewide, the drumming rate for 2021 was 0.16 grouse drumming/hour (Table 1, Figure 1). Almost two-thirds of all survey effort took place during the first two weeks of May, but the drumming rate (grouse drumming/hour) was similar throughout the month of May (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 (0.37 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).
- We observed the highest drumming rate in northern New York (DEC Regions 5 and 6; 0.27 – 0.39 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 St. Lawrence Valley Ecozone (0.53 grouse drumming/hour; Table 6), followed by the Adirondacks-Tug Hill ecozone (0.46 grouse drumming/hour; Table 6, Figures 1 and 2). The drumming rate was close to the statewide average in the Champlain Valley, Appalachian Hills and Plateau, and Catskills-Delaware Hills

ecozones and was below average in the Lake Plains and Mohawk Valley-Hudson Valley-Taconic Highlands ecozones (Table 6, Figures 1 and 2).

Comparing 2021 to Previous Seasons

- Since this survey began in 2007, 800 turkey hunters have taken nearly 18,000 trips afield and spent almost 68,000 hours recording their grouse observations.
- Survey effort declined from 2020 to 2021, but the grouse drumming rate was similar between years (0.17 vs. 0.16 grouse drumming/hour; Table 1, Figure 1).
- Over the past 15 years the drumming rate has varied annually, but there has been a distinct difference between the trends observed in northern and southern parts of the state (Figures 1-4). Not only are the overall mean drumming rates higher in northern NY, but grouse populations have been relatively stable there compared to the southern parts of the state where declines in grouse numbers are more pronounced.
- Further evidence of the differences between northern and southern NY can be found in the percentage of trips afield where no grouse were observed by survey participants. Since 2007 in the Northern Zone, the number of trips where no grouse were observed has been relatively stable at just over 50%. In the Southern Zone, the percentage of trips afield where no grouse were observed has steadily increased from just over 60% during the 2007-09 period to 65% during 2013-15, and 77% from 2019-21.
- 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 Unit aggregates 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 continued loss of young forest habitats across the landscape. Potentially exacerbating the influence of habitat loss on hen survival and nest and brood success are 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 2021-22 hunting season will be similar to last fall (0.64 grouse flushed/hour in 2020-21), but below the long-term average flush rate (about 0.90 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 2016-20 Ruffed Grouse Drumming Survey.

Summary Statistics	2016	2017	2018	2019	2020	2021	5-yr Avg. (2016-20)
# Survey Participants	185	179	217	171	179	153	186
# Trips	1,193	1,142	1,973	1,074	1,161	873	1,309
# Trips/Participant	6.4	6.4	9.1	6.3	6.5	5.7	6.9
# Hours Afield	4,389	4,169	7,267	4,117	4,474	3,364	4,883
# Hours/Participant	23.7	23.3	33.5	24.1	25.0	22.0	25.9
# Hours/Trip	3.7	3.7	3.7	3.8	3.9	3.9	3.8
# Grouse Drumming	728	723	1,320	481	669	491	784
# Grouse Drumming/Participant	3.9	4.0	6.1	2.8	3.7	3.2	4.1
# Grouse Drumming/Trip	0.61	0.63	0.67	0.45	0.58	0.56	0.59
Drumming Rate (grouse drumming/hour)	0.20	0.22	0.24	0.12	0.17	0.16	0.19
Hours Afield to Hear 1 Grouse Drumming	6.0	5.8	5.5	8.6	6.7	6.9	6.5

Table 2. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by week from the 2021 Ruffed Grouse Drumming Survey.

Week	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Youth Hunt (April 24-25)	21	2%	71	2%	31	6%	0.47	0.11
Regular Season (May 1-31)	852	98%	3,293	98%	460	94%	0.15	0.02
May 1-7	341	40%	1,345	41%	196	43%	0.15	0.02
May 8-14	200	23%	748	23%	106	23%	0.14	0.03
May 15-21	166	19%	646	20%	92	20%	0.18	0.05
May 22-31	145	17%	554	17%	66	14%	0.14	0.04

Table 3. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by grouse season zone from the 2021 Ruffed Grouse Drumming Survey.

Season Zone	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Northern Zone	133	15%	457	14%	179	36%	0.37	0.06
Southern Zone	740	85%	2,907	86%	312	64%	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 2021 Ruffed Grouse Drumming Survey.

Land Type	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Public Land	165	19%	628	19%	83	17%	0.15	0.02
Private Land	700	81%	2,713	81%	400	83%	0.16	0.04

Table 5. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by DEC Region from the 2021 Ruffed Grouse Drumming Survey.

DEC Region	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
3 - Lower Hudson Valley	60	7%	217	6%	11	2%	0.04	0.02
4 - Capital Region	151	17%	542	16%	69	14%	0.14	0.03
5 - E Adks/Lk Champlain	67	8%	233	7%	58	12%	0.27	0.06
6 - W Adks/St. Law. Valley	71	8%	286	9%	106	22%	0.39	0.08
7 - Central NY	188	22%	714	21%	84	17%	0.14	0.04
8 - Finger Lakes	112	13%	467	14%	21	4%	0.04	0.02
9 - Western NY	224	26%	905	27%	142	29%	0.17	0.03

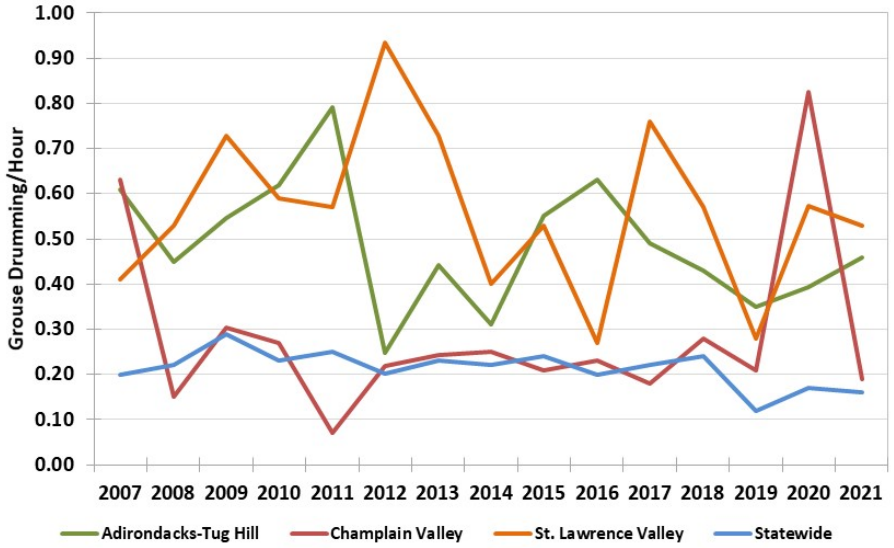
Table 6. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) Aggregate and Ecozone from the 2021 Ruffed Grouse Drumming Survey.

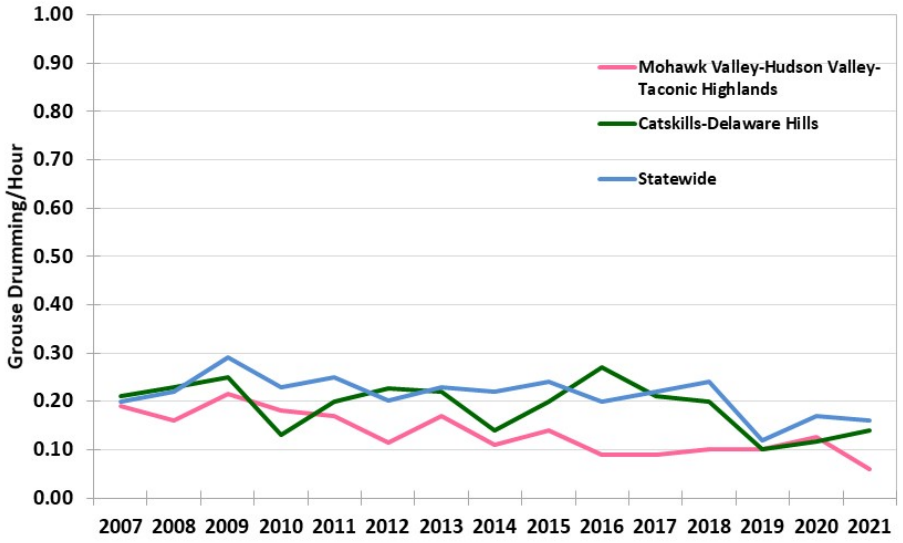
Ecozone / WMU Aggregate**	Trips		Hours		Grouse Drumming		Drumming Rate* (grouse drumming/hour)	
	#	%	#	%	#	%	Mean	SE
St. Lawrence Valley	**35**	**4.0%**	**140**	**4.2%**	**76**	**15.5%**	**0.53**	**0.11**
East Ontario Plain	18	2.1%	67	2.0%	18	3.7%	0.30	0.13
St. Lawrence Valley	17	1.9%	73	2.2%	58	11.8%	0.77	0.15
Champlain Valley	**29**	**3.3%**	**88**	**2.6%**	**17**	**3.5%**	**0.19**	**0.06**
Chmpl'n V. & Transit'n	29	3.3%	88	2.6%	17	3.5%	0.19	0.06
Adirondacks-Tug Hill	**47**	**5.4%**	**156**	**4.6%**	**69**	**14.1%**	**0.46**	**0.10**
Tug Hill	2	0.2%	3	0.1%	0	0.0%	n/a*	
Tug Hill Transition	22	2.5%	68	2.0%	34	6.9%	0.46	0.16
Northern Adirondacks	8	0.9%	29	0.9%	24	4.9%	0.97	0.32
Central Adirondacks	15	1.7%	56	1.7%	11	2.2%	0.25	0.12
Lake Plains	**147**	**16.8%**	**617**	**18.3%**	**42**	**8.6%**	**0.08**	**0.03**
Oneida Lake Plains	25	2.9%	133	4.0%	10	2.0%	0.08	0.03
Great Lakes Plain	100	11.5%	411	12.2%	15	3.1%	0.05	0.04
Oswego Lowlands	22	2.5%	73	2.2%	17	3.5%	0.19	0.15
Appalachian Hills & Plateau	**354**	**40.5%**	**1,378**	**41.0%**	**199**	**40.5%**	**0.16**	**0.03**
E. Appalachian Plt	95	10.9%	326	9.7%	44	9.0%	0.16	0.06
C. Appalachian Plt	19	2.2%	92	2.7%	11	2.2%	0.11	0.03
N. Appalachian Hills	61	7.0%	218	6.5%	26	5.3%	0.09	0.04
W. Appalachian Plt	179	20.5%	742	22.1%	118	24.0%	0.19	0.04

Catskills-Delaware Hills	**109**	**12.5%**	**413**	**12.3%**	**56**	**11.4%**	**0.14**	**0.03**
Catskills	71	8.1%	255	7.6%	38	7.7%	0.15	0.05
Otsego-Delaware Hills	23	2.6%	103	3.1%	11	2.2%	0.13	0.05
Nv'rsink-Mongaup Hills	15	1.7%	55	1.6%	7	1.4%	0.13	0.06
Mohawk Valley-Hudson Valley-Taconic Highlands	**152**	**17.4%**	**572**	**17.0%**	**32**	**6.5%**	**0.06**	**0.02**
Mohawk Valley	57	6.5%	217	6.5%	10	2.0%	0.06	0.02
Hudson Valley	48	5.5%	194	5.8%	14	2.9%	0.09	0.04
N. Tacn'c H'lands	15	1.7%	55	1.6%	8	1.6%	0.11	0.08
S. Tacn'c H'lands	20	2.3%	64	1.9%	0	0.0%	0.00	0.00
NYC Transition	12	1.4%	42	1.2%	0	0.0%	0.00	0.00
Statewide Totals	**873**		**3,364**		**491**		**0.16**	**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.





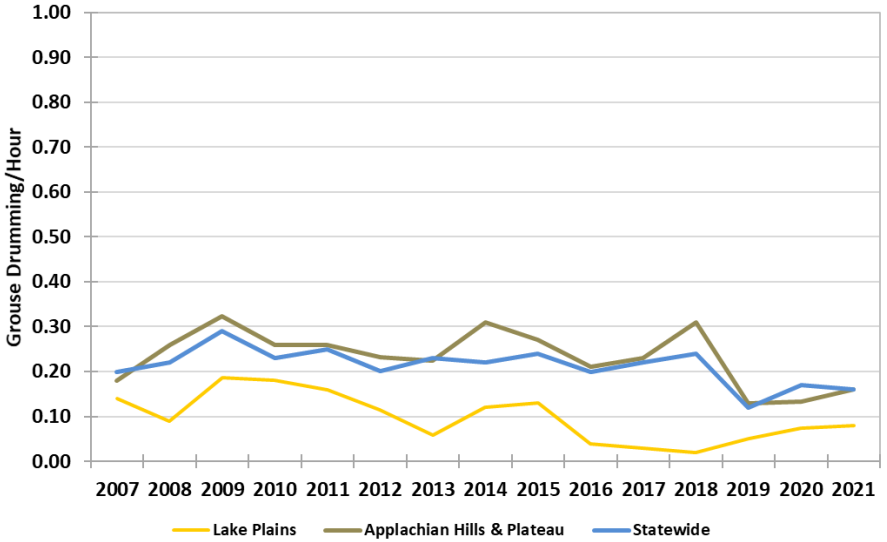


Figure 1. Drumming rate (grouse drumming/hour) by ecozone based on the Ruffed Grouse Drumming Survey data, 2007-21. Ecozones are an aggregation of Wildlife Management Units. The Costal Lowlands Ecozone (Long Island) only has a two-day youth turkey hunt, so the drumming survey was not conducted there.

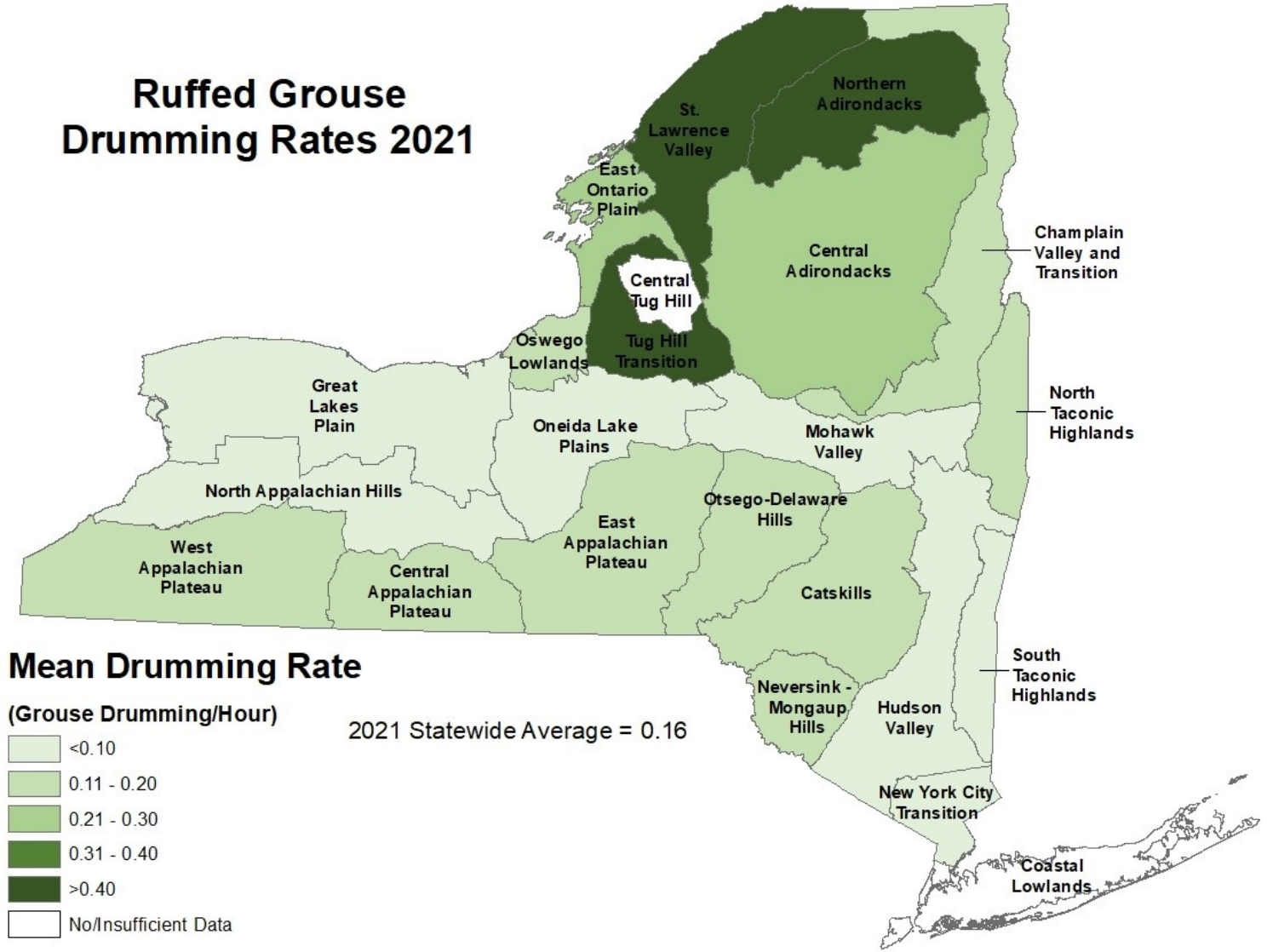


Figure 2. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2021. Only aggregates with ≥10 observations/records or ≥20 hours were included in the analysis. The statewide drumming rate for 2021 was 0.16 grouse drumming/hour. The Coastal 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.

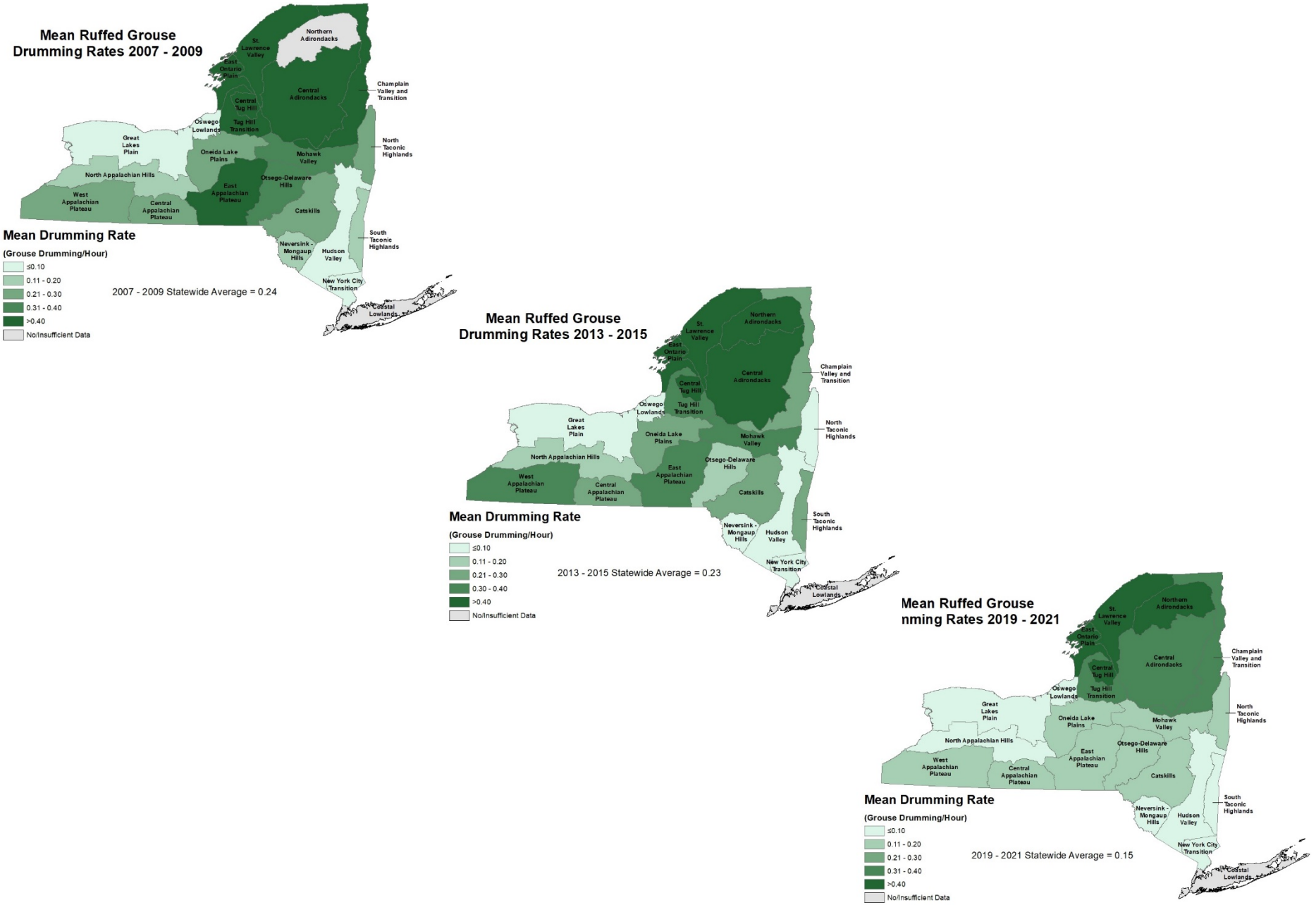


Figure 3. Three-year average drumming rates (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2007-09, 2013-15, and 2019-21.

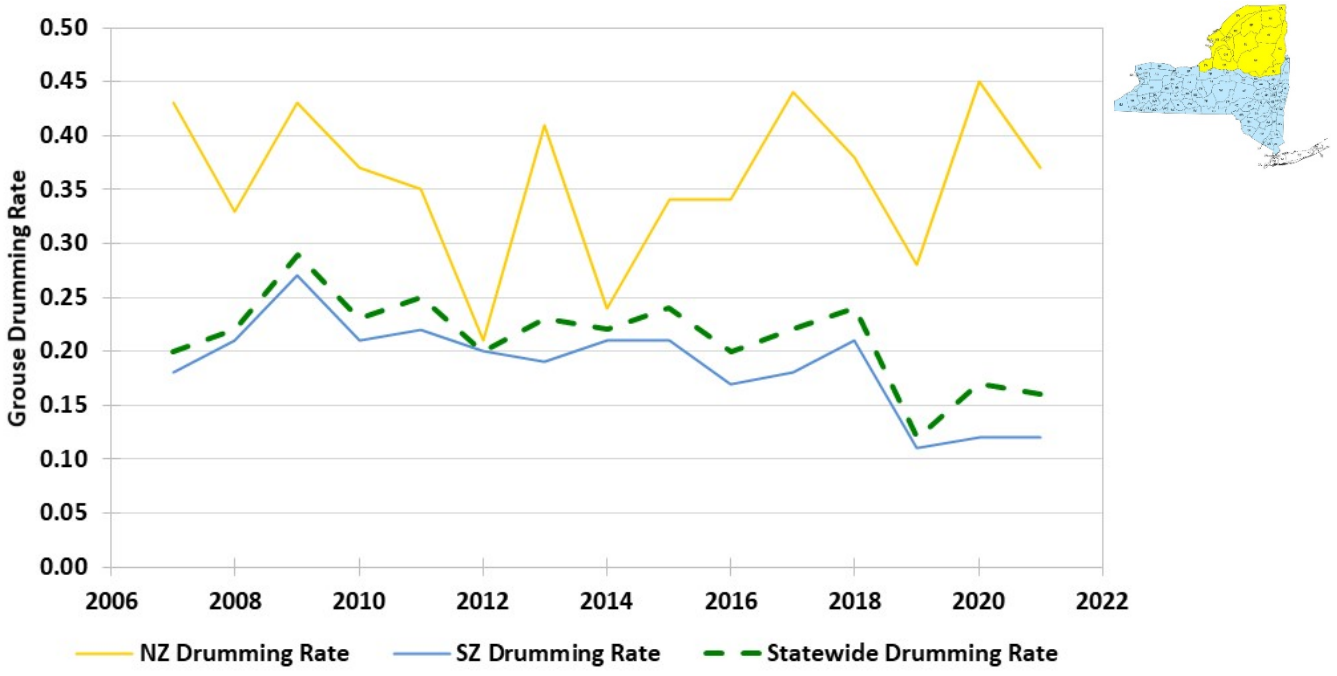


Figure 4. Ruffed grouse drumming rates in the northern (NZ) and southern (SZ) grouse hunting season zones, 2007 through 2021. Statewide drumming rate is the annual statewide average.

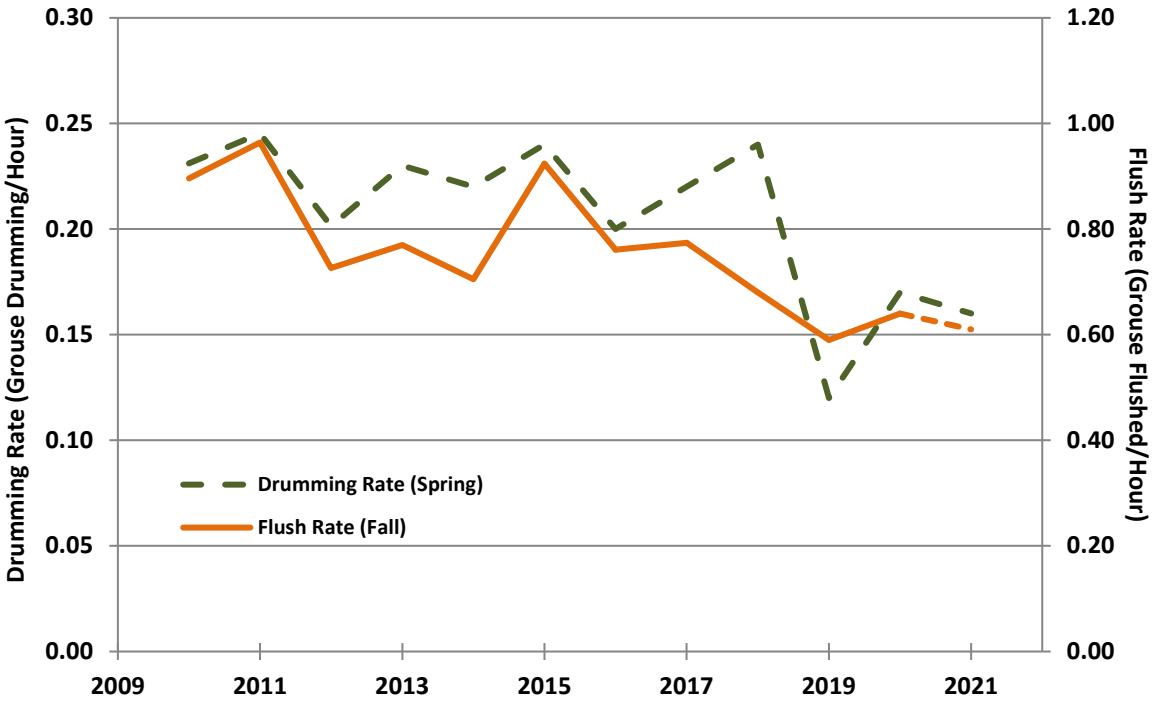


Figure 5. Ruffed grouse drumming rate (grouse drumming/hour) from the Ruffed Grouse Drumming Survey conducted during the spring, and the grouse flush rate (grouse flushed/hour) from the Grouse and Woodcock Hunting Log conducted during the fall grouse hunting season. The flush rate for fall 2021 is predicted based on the statewide estimated drumming rate from spring 2021.

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