Ruffed Grouse Drumming Survey

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Results from Spring 2022

Introduction

During the spring 2022 wild turkey hunting season, DEC conducted the 16th 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 2022 season.

Results from the 2022 Season

During the 2022 season, 154 hunters participated in the Ruffed Grouse Drumming Survey. Survey participants reported data from 927 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 3,600 hours afield and observed almost 500 grouse. Some general findings from the 2022 season include:

- Hunters participating in the survey averaged about 23 hours afield during the 2022 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 2022 season and had to spend almost 8 hours afield to hear one grouse drumming (Table 1).
- Statewide, the drumming rate for 2022 was 0.15 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 (0.42 vs. 0.11 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; 0.35 – 0.38 grouse drumming/hour). The drumming rate was close to the statewide average in DEC Regions 7 and 9, and below the statewide average in DEC Regions 3, 4, and 8 (Table 5).
- The drumming rate was highest in the Adirondacks-Tug Hill ecozone (0.74 grouse drumming/hour; Table 6), followed by the St. Lawrence Valley Ecozone (0.41) and Champlain Valley (0.32; Figures 1 and 2). The drumming rate was close to the statewide average in the Appalachian Hills and Plateau ecozones and was below average in the Lake Plains, Catskills-Delaware Hills, and Mohawk Valley-Hudson Valley-Taconic Highlands ecozones (Table 6, Figures 1 and 2).

Comparing 2022 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 increased slightly from 2021 to 2022, but the grouse drumming rate was similar between years (0.16 vs. 0.15 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 recently completed a collaborative study to better understand the prevalence of WNV in grouse throughout their range. In addition, New York and the State University of New York – Environmental Science and Forestry are collaborating on a new research project to investigate the effects of West Nile on grouse demographics in New York, specifically looking for differences between the Adirondacks and southern NY.

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 2022-23 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 2016-22 Ruffed Grouse Drumming Survey.

Summary Statistics	2016	2017	2018	2019	2020	2021	2022	Long-term Average
# Survey Participants	185	179	217	171	179	153	154	177
# Trips	1,193	1,142	1,973	1,074	1,161	873	927	1192
# Trips/Participant	6.4	6.4	9.1	6.3	6.5	5.7	6.0	6.6
# Hours Afield	4,389	4,169	7,267	4,117	4,474	3,364	3,638	4,488
# Hours/Participant	23.7	23.3	33.5	24.1	25.0	22.0	23.6	25.0
# Hours/Trip	3.7	3.7	3.7	3.8	3.9	3.9	3.9	3.8
# Grouse Drumming	728	723	1,320	481	669	491	454	695
# Grouse Drumming/Participant	3.9	4.0	6.1	2.8	3.7	3.2	2.9	3.8
# Grouse Drumming/Trip	0.61	0.63	0.67	0.45	0.58	0.56	0.49	0.57
Drumming Rate (grouse drumming/hour)	0.20	0.22	0.24	0.12	0.17	0.16	0.15	0.18
Hours Afield to Hear 1 Grouse Drumming	6.0	5.8	5.5	8.6	6.7	6.9	8.0	6.8

Table 2. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by week from the 2022 Ruffed Grouse Drumming Survey.

Week	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Youth Hunt (April 24-25)	5	1%	79	2%	24	5%	0.51	0.12
Regular Season (May 1-31)	906	99%	3,638	98%	467	95%	0.14	0.01
May 1-7	363	40%	1,478	42%	191	43%	0.15	0.02
May 8-14	258	28%	980	28%	108	24%	0.12	0.02
May 15-21	146	16%	581	16%	62	14%	0.12	0.03
May 22-31	139	15%	520	15%	82	19%	0.19	0.04

Table 3. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by grouse season zone from the 2022 Ruffed Grouse Drumming Survey.

Season Zone	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/ Hour	SE
Northern Zone	126	14%	422	12%	149	33%	0.42	0.06
Southern Zone	794	86%	3,178	88%	305	67%	0.11	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 2022 Ruffed Grouse Drumming Survey.

Land Type	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/ Hour	SE
Public Land	173	19%	692	19%	91	20%	0.16	0.03
Private Land	748	81%	2,925	81%	362	80%	0.15	0.01

Table 5. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by DEC Region from the 2022 Ruffed Grouse Drumming Survey.

	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
3 - Lower Hudson Valley	60	7%	302	8%	25	6%	0.11	0.05
4 - Capital Region	151	17%	684	19%	77	17%	0.13	0.02
5 - E Adks/Lk Champlain	67	8%	247	7%	73	16%	0.38	0.08
6 - W Adks/St. Law. Valley	71	8%	294	8%	74	16%	0.35	0.07
7 - Central NY	188	22%	798	22%	77	17%	0.10	0.02
8 - Finger Lakes	112	13%	395	11%	21	5%	0.05	0.02
9 - Western NY	224	26%	880	24%	107	24%	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 2022 Ruffed Grouse Drumming Survey.

Ecozone	Trips		Hours		Grouse Drumming		Drumming Rate* (grouse drumming/hour)	
WMU Aggregate**	#	%	#	%	#	%	Mean	SE
St. Lawrence Valley	29	3.2%	120	3.3%	37	8.1%	0.41	0.1
East Ontario Plain	10	1.1%	45	1.3%	9	2.0%	0.19	0.05
St. Lawrence Valley	19	2.1%	75	2.1%	28	6.2%	0.52	0.14
Champlain Valley	33	3.6%	112	3.1%	37	8.1%	0.32	0.12
Champlain Valley & Transition	33	3.6%	112	3.1%	37	8.1%	0.32	0.12
Adirondacks-Tug Hill	38	4.1%	105	2.9%	68	15.0%	0.74	0.14
Tug Hill	0	0.0%	0	0.0%	0	0.0%	n/a*	
Tug Hill Transition	14	1.5%	38	1.1%	32	7.0%	0.89	0.24
Northern Adirondacks	4	0.4%	8	0.2%	13	2.9%	1.92	0.52
Central Adirondacks	20	2.2%	59	1.6%	23	5.1%	0.40	0.11

Lake Plains	147	16.0%	612	17.0%	27	5.9%	0.04	0.2
Oneida Lake Plains	63	6.8%	300	8.3%	20	4.4%	0.06	0.02
Great Lakes Plain	58	6.3%	227	6.3%	0	0.0%	0.00	0.00
Oswego Lowlands	26	2.8%	85	2.4%	7	1.5%	0.08	0.04
Appalachian Hills & Plateau	369	40.1%	1,461	40.6%	178	39.2%	0.14	0.02
East Appalachian Plateau	106	11.5%	413	11.5%	50	11.0%	0.13	0.03
Central Appalachian Plateau	23	2.5%	93	2.6%	15	3.3%	0.16	0.06
North Appalachian Hills	76	8.3%	312	8.7%	9	2.0%	0.03	0.01
West Appalachian Hills	164	17.8%	643	17.9%	104	22.9%	0.19	0.03
Catskills-Delaware Hills	157	17.1%	624	17.3%	58	12.8%	0.10	0.02
Catskills	105	11.4%	419	11.6%	31	6.8%	0.08	0.02
Otsego-Delaware Hills	38	4.1%	153	4.3%	25	5.5%	0.16	0.04
Neversink-Mongaup Hills	14	1.5%	52	1.4%	2	0.4%	0.04	0.04
Mohawk Valley-Hudson Valley-Taconic Highlands	147	16.0%	566	15.7%	49	10.8%	0.12	0.03
Mohawk Valley	50	5.4%	187	5.2%	11	2.4%	0.10	0.04
Hudson Valley	57	6.2%	218	6.1%	15	3.3%	0.08	0.04
North Taconic Highlands	21	2.3%	88	2.4%	3	0.7%	0.04	0.03
South Taconic Highlands	17	1.8%	68	1.9%	12	2.6%	0.17	0.06
New York City Transition	2	0.2%	5	0.1%	8	1.8%	2.00	2.00
Statewide Totals	920		3,600		454		0.15	0.01

*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.

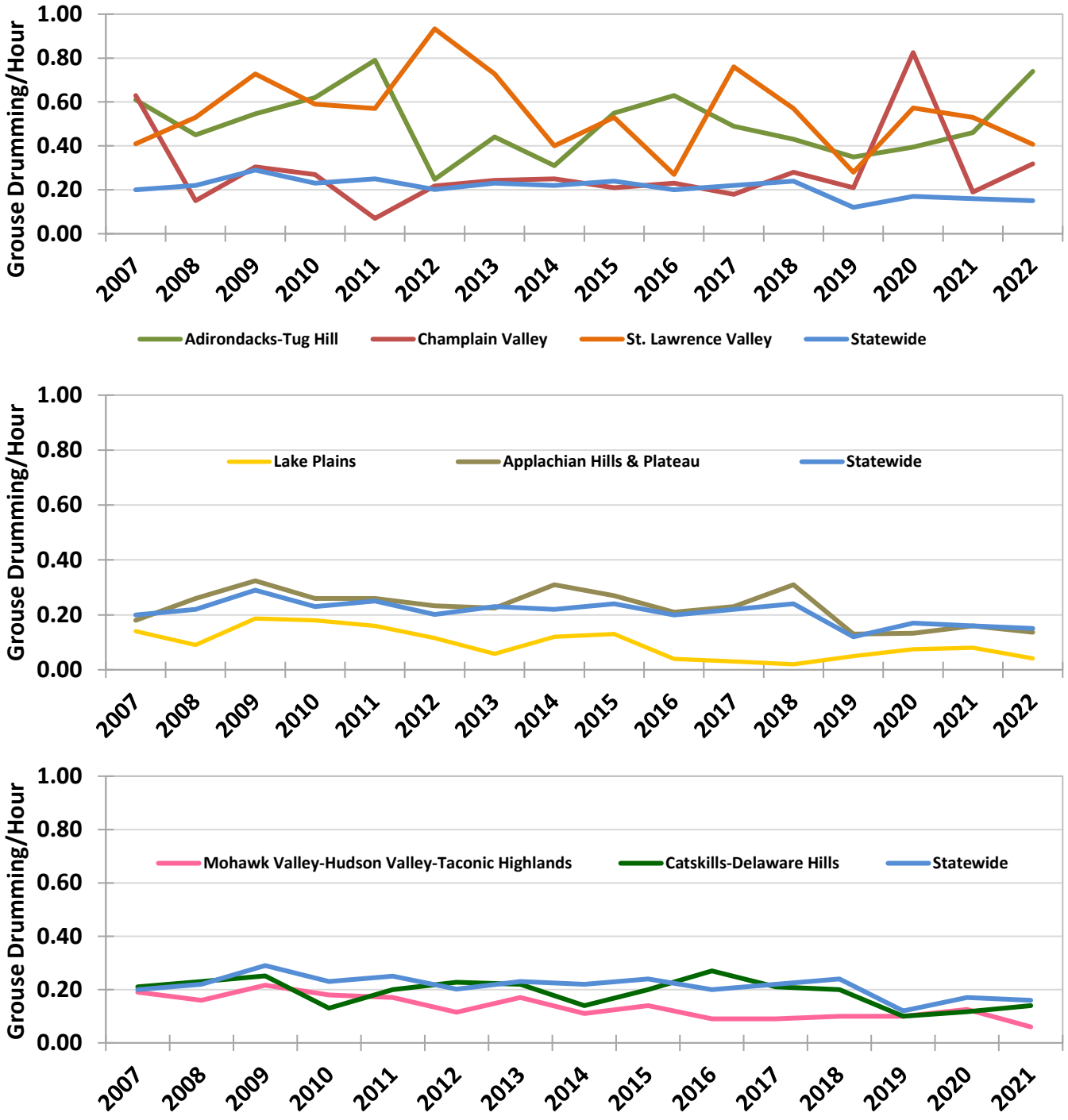

Figure 1. Drumming rate (grouse drumming/hour) by ecozone based on the Ruffed Grouse Drumming Survey data, 2007-21. Ecozones are an aggregation of Wildlife Management Units. The Costal Lowlands Ecozone (Long Island) only has a two-day youth turkey hunt, so the drumming survey was not conducted there.

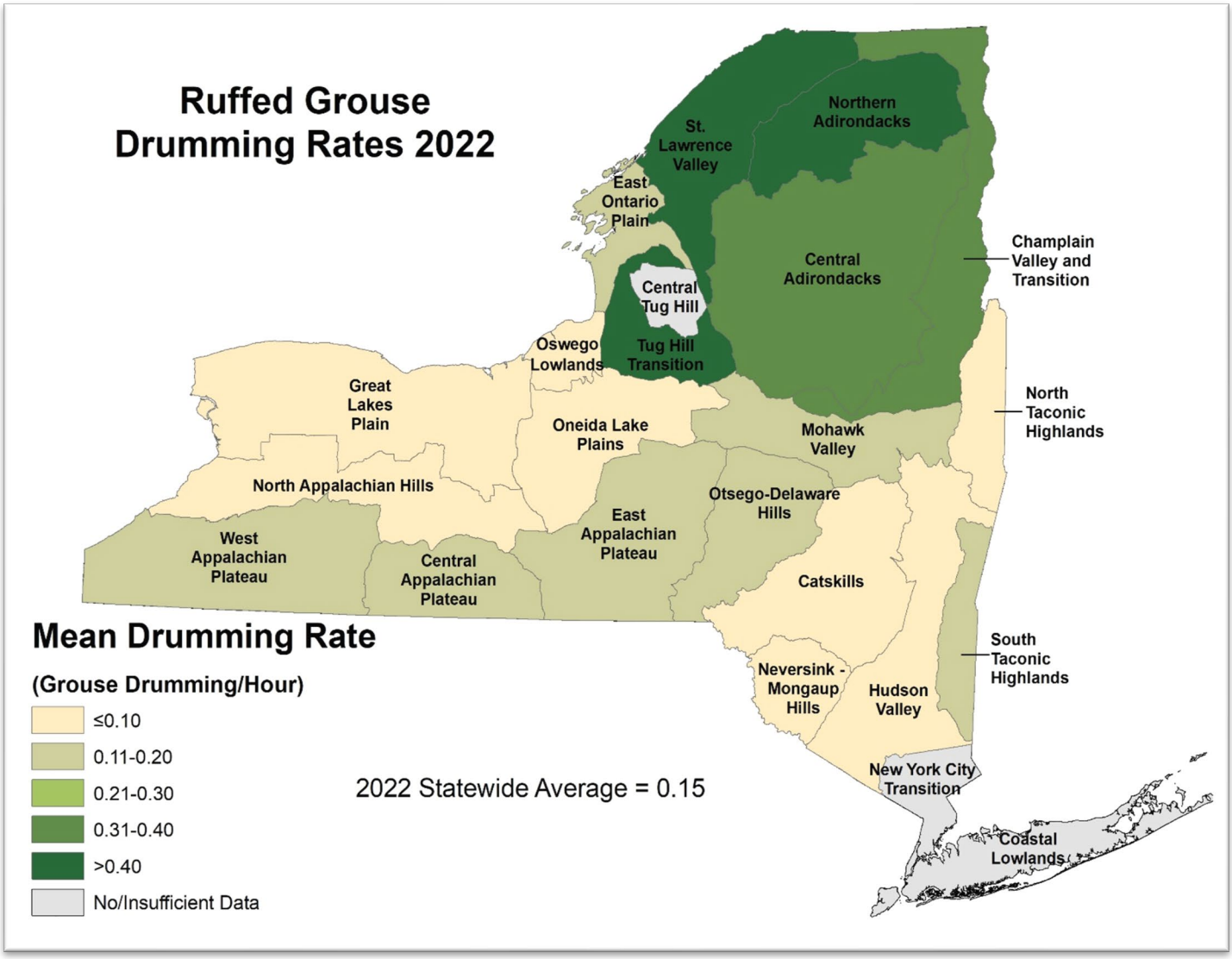

Figure 2. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2022. Only aggregates with ≥10 observations/records or ≥20 hours were included in the analysis. The statewide drumming rate for 2022 was 0.15 grouse drumming/hour. The Coastal 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.

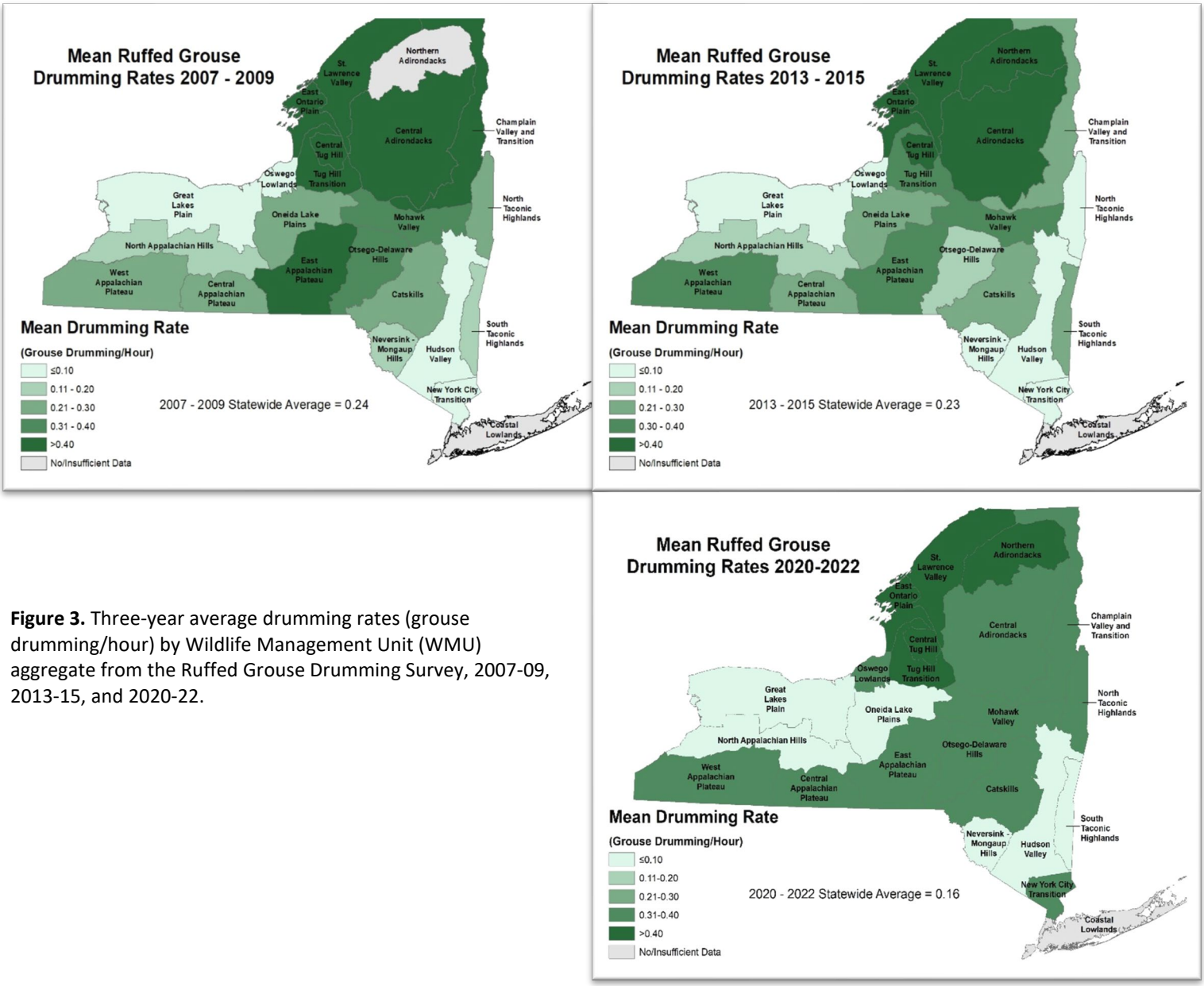

Figure 3. Three-year average drumming rates (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2007-09, 2013-15, and 2020-22.

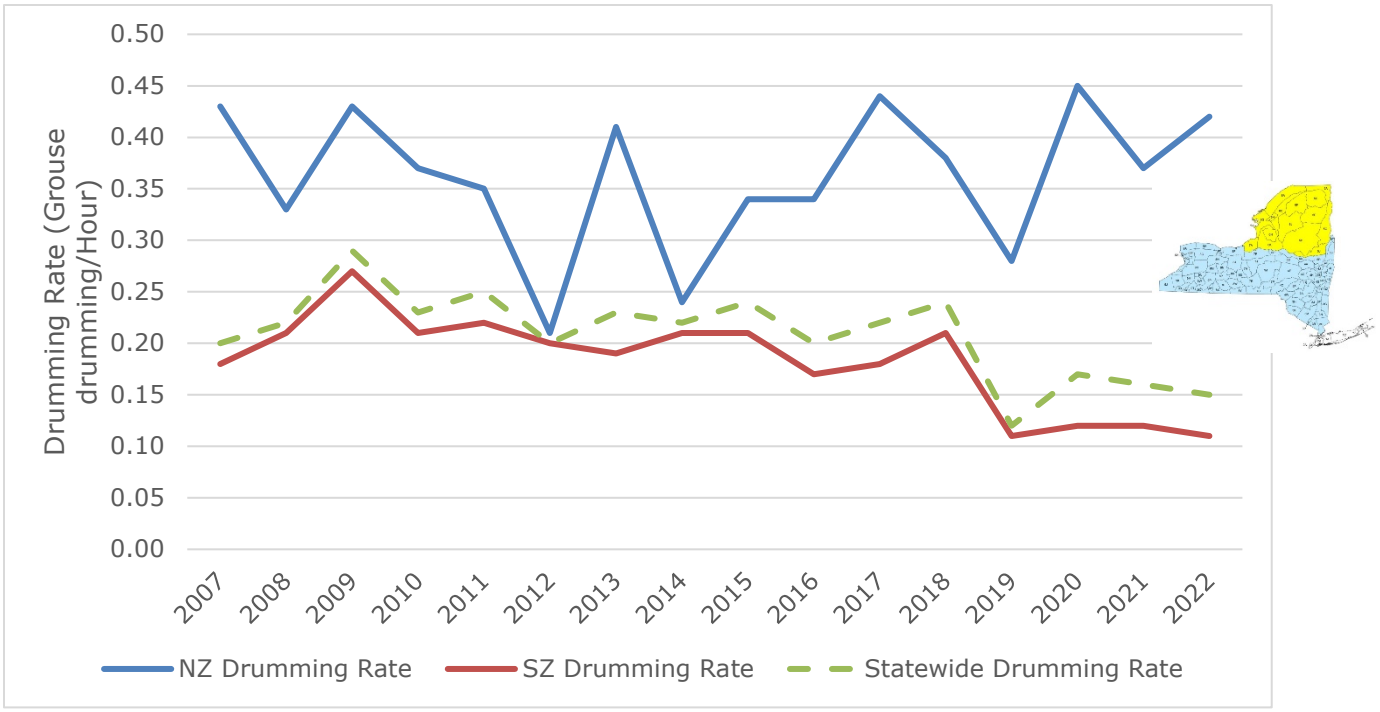

Figure 4. Ruffed grouse drumming rates in the northern (NZ) and southern (SZ) grouse hunting season zones, 2007 through 2022. Statewide drumming rate is the annual statewide average.

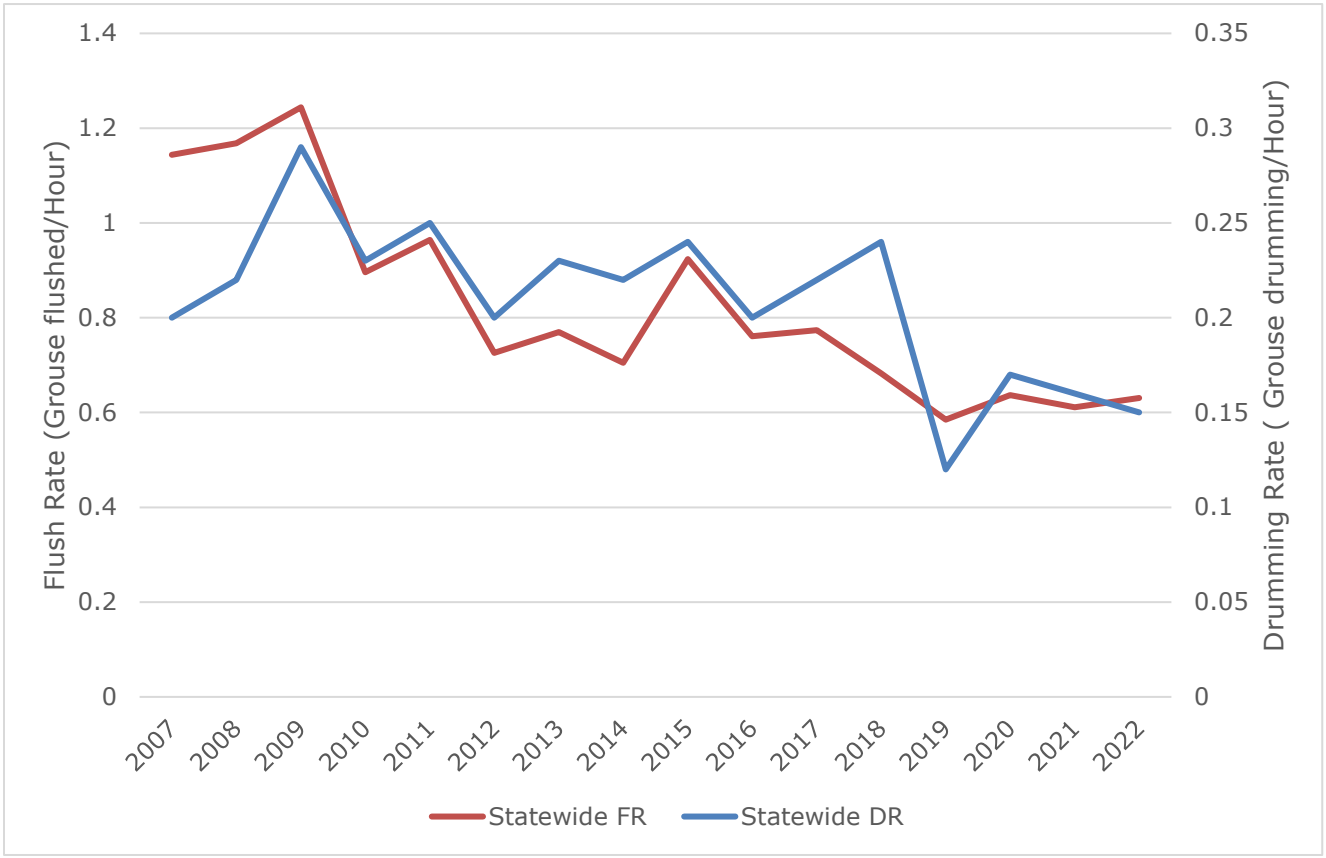

Figure 5. Ruffed grouse drumming rate (grouse drumming/hour) from the Ruffed Grouse Drumming Survey conducted during the spring, and the grouse flush rate (grouse flushed/hour) from the Grouse and Woodcock Hunting Log conducted during the fall grouse hunting season. The flush rate for fall 2022 is predicted based on the statewide estimated drumming rate from spring 2022.

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