Ruffed Grouse Drumming Survey

Results from Spring 2015

Introduction

During the spring 2015 wild turkey hunting season, DEC conducted the ninth 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 2015 season.

Results from the 2015 Season

During the 2015 season, 193 hunters participated in the Ruffed Grouse Drumming Survey. Survey participants reported data from almost 1,200 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 4,500 hours afield and observed almost 1,000 grouse. Some general findings from the 2015 season include:

- Hunters participating in the survey averaged about 23 hours afield during the 2015 season. They took about 6 trips afield for the season and spent almost 4 hours afield per trip (Table 1).
- Survey participants averaged about 5 grouse observed per hunter for the 2015 season and had to spend 4.5 hours afield in order to hear one grouse drumming (Table 1).
- About 65% 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 80% of the total), but the drumming rate was higher in the northern zone (0.34 vs. 0.21 grouse drumming/hour; Table 3).
- Significantly more effort was expended, and more grouse were observed, on private land than public land; however, public and private land had similar drumming rates (Table 4).
- Survey effort was distributed across major geographic regions of New York State (27% in southeastern NY, 16% in northern NY, 57% in central and western NY; Table 5). We observed the highest drumming rate in DEC Region 6 in northern NY (0.62 grouse drumming/hour) followed by DEC Region 9 in western NY (0.27 grouse drumming/hour). The drumming rate was close to the statewide average in DEC regions 4, 5, and 7, and below average in DEC Regions 3 and 8 (0.03 and 0.14 grouse drumming/hour, respectively).
- The drumming rate was highest in the Adirondacks-Tug Hill and St. Lawrence Valley ecozones (0.55 and 0.53 grouse drumming/hour, respectively), followed by the Appalachian Hills and Plateau Ecozone (0.27 grouse drumming/hour; Table 6, Figures 1 and 2). The drumming rate

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

Comparing 2015 to Previous Seasons

- Since this survey started in 2007, about 680 turkey hunters took over 10,400 trips afield and spent over 40,000 hours recording their grouse observations. Over the past nine 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 2014 to 2015 the number of survey participants, and the number of trips and hours afield decreased, but the drumming rate increased from 0.22 to 0.24 grouse drumming/hour (Table 1, Figure 4). The amount of time spent afield to hear one grouse drumming was similar between years (Table 1).
- Most of the state saw an increase in the drumming rate from 2014 to 2015 with the exception of the Champlain Valley and the Appalachian Hills and Plateau (Figure 1). The Lake Plains and Hudson Valley regions are consistently below the statewide average over the past nine 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 from April 1 through the end of June 2014, rainfall amounts were close to normal in many areas of the state (with the exception of isolated areas in central New York, the Finger Lakes, and the Western Adirondacks/Black River Valley). This may have resulted in average to above-average reproductive success in many areas, but severe winter conditions may have negatively affected overwinter survival 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 nine 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 2015-16 hunting season will be slightly higher than last fall (0.70 grouse flushed/hour in 2014-15) and below the long-term average flush rate (about 1 bird/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.

Table 1. Summary statistics for the 2010-15 Ruffed Grouse Drumming Survey.

Summary Statistics	2010	2011	2012	2013	2014	2015	5-yr Avg. (2010-14)
# Survey Participants	148	153	157	236	210	193	181
# Trips	1,036	1,009	1,046	1,493	1,348	1,181	1,186
# Trips/Participant	7.0	6.6	6.7	6.3	6.4	6.1	6.6
# Hours Afield	3,998	3,688	3,918	5,921	5,009	4,472	4,507
# Hours/Participant	27.0	24.1	25.0	25.1	23.9	23.2	25.0
# Hours/Trip	3.9	3.7	3.7	4.0	3.7	3.8	3.8
# Grouse Drumming	787	789	710	1,128	944	987	872
# Grouse Drumming/Participant	5.3	5.2	4.5	4.8	4.5	5.1	4.9
# Grouse Drumming/Trip	0.76	0.78	0.68	0.76	0.70	0.84	0.74
Drumming Rate (grouse drumming/hour)	0.23	0.25	0.20	0.23	0.22	0.24	0.23
Hours Afield to Hear 1 Grouse Drumming	4.3	4.1	5.0	4.3	4.5	4.5	4.4

Table 2. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by week from the 2015 Ruffed Grouse Drumming Survey.

Week	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Youth Hunt (April 25-26)	30	3%	119	3%	64	6%	0.71	0.15
Regular Season (May 1-31)	1,151	97%	4,353	97%	923	94%	0.22	0.01
May 1-7	524	46%	2,030	47%	524	57%	0.27	0.03
May 8-14	242	21%	908	21%	151	17%	0.19	0.02
May 15-21	171	15%	608	14%	131	14%	0.22	0.04
May 22-31	204	18%	772	18%	106	12%	0.14	0.02

Table 3. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by grouse season zone from the 2015 Ruffed Grouse Drumming Survey.

Season Zone	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Northern Zone	198	17%	662	15%	218	22%	0.34	0.06
Southern Zone	983	83%	3,810	85%	769	78%	0.21	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 2015 Ruffed Grouse Drumming Survey.

Land Type	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Public Land	249	21%	952	21%	234	24%	0.23	0.02
Private Land	926	79%	3,502	79%	752	76%	0.24	0.02

Table 5. Survey effort, number of drumming grouse observed, and drumming rate (grouse drumming/hour) by DEC Region from the 2015 Ruffed Grouse Drumming Survey.

DEC Region	Hunter Trips		Hours Afield		Grouse Drumming		Drumming Rate*	
	#	%	#	%	#	%	Grouse Drumming/Hour	SE
Region 3	87	7%	353	8%	8	1%	0.03	0.01
Region 4	216	18%	855	19%	187	19%	0.22	0.02
Region 5	91	8%	342	8%	61	6%	0.22	0.03
Region 6	93	8%	370	8%	182	18%	0.62	0.12
Region 7	295	25%	1,032	23%	218	22%	0.22	0.02
Region 8	159	13%	611	14%	96	10%	0.14	0.02
Region 9	240	20%	909	20%	235	24%	0.27	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 2015 Ruffed Grouse Drumming Survey.

Ecozone	Trips		Hours		Grouse Drumming		Drumming Rate* (grouse drumming/hour)	
WMU Aggregate**	#	%	#	%	#	%	Mean	SE
St. Lawrence Valley	**44**	**3.7%**	**191**	**4.3%**	**73**	**7.4%**	**0.53**	**0.19**
East Ontario Plain	13	1.1%	27	0.6%	13	1.3%	0.35	0.26
St. Lawrence Valley	31	2.6%	164	3.7%	60	6.1%	0.61	0.25
Champlain Valley	**28**	**2.4%**	**81**	**1.8%**	**18**	**1.8%**	**0.21**	**0.05**
Champ Vly & Transtn	28	2.4%	81	1.8%	18	1.8%	0.21	0.05
Adirondacks-Tug Hill	**68**	**5.8%**	**199**	**4.4%**	**122**	**12.4%**	**0.55**	**0.11**
Tug Hill	9	0.8%	13	0.3%	11	1.1%	n/a***	
Tug Hill Transition	29	2.5%	87	1.9%	75	7.6%	0.59	0.21
Northern Adirondacks	17	1.4%	54	1.2%	15	1.5%	0.29	0.07
Central Adirondacks	13	1.1%	45	1.0%	21	2.1%	0.51	0.12
Lake Plains	**236**	**20.0%**	**843**	**18.9%**	**106**	**10.7%**	**0.13**	**0.02**
Oneida Lake Plains	82	6.9%	292	6.5%	87	8.8%	0.34	0.05
Great Lakes Plain	96	8.1%	360	8.1%	14	1.4%	0.03	0.01
Oswego Lowlands	58	4.9%	191	4.3%	5	0.5%	0.02	0.01
Appalachian Hills & Plateau	**438**	**37.1%**	**1,660**	**37.1%**	**442**	**44.8%**	**0.27**	**0.02**
East Appal. Plateau	135	11.4%	500	11.2%	125	12.7%	0.25	0.03
Central Appal. Plateau	35	3.0%	149	3.3%	38	3.9%	0.25	0.06
N. Appalachian Hills	83	7.0%	319	7.1%	62	6.3%	0.18	0.03
W. Appalachian Hills	185	15.7%	692	15.5%	217	22.0%	0.33	0.04

Catskills-Delaware Hills	**168**	**14.2%**	**733**	**16.4%**	**142**	**14.4%**	**0.20**	**0.02**
Catskills	95	8.0%	395	8.8%	102	10.3%	0.25	0.04
Otsego-Delaware Hills	47	4.0%	211	4.7%	35	3.5%	0.17	0.03
Nvrsink-Mongaup Hills	26	2.2%	127	2.8%	5	0.5%	0.06	0.03
Mohawk Valley-Hudson Valley-Taconic Highlands	**199**	**16.9%**	**765**	**17.1%**	**84**	**8.5%**	**0.14**	**0.02**
Mohawk Valley	71	6.0%	269	6.0%	58	5.9%	0.29	0.05
Hudson Valley	87	7.4%	307	6.9%	15	1.5%	0.06	0.02
N. Taconic Highlands	24	2.0%	115	2.6%	3	0.3%	0.03	0.02
S. Taconic Highlands	9	0.8%	36	0.8%	8	0.8%	0.18	0.12
NYC Transition	8	0.7%	38	0.8%	0	0.0%	0.00	0.00
Statewide Totals	**1,181**		**4,472**		**987**		**0.24**	**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; 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.

***There was an insufficient sample size in these WMU Aggregates. A minimum of 10 trips or 20 hours is needed for analysis.

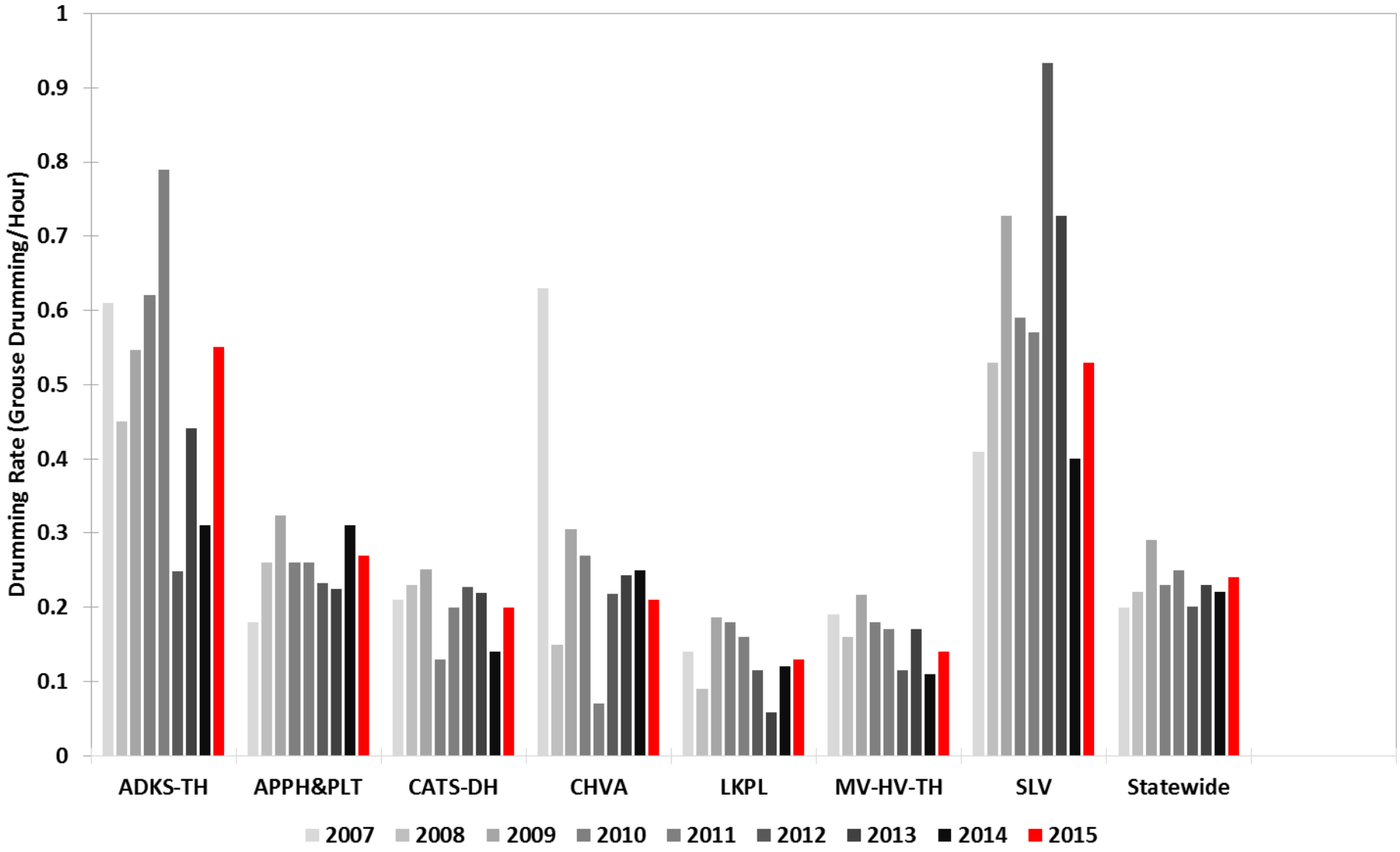

Figure 1. Drumming rate (grouse drumming/hour) by ecozone based on the Ruffed Grouse Drumming Survey data, 2007-15. Ecozones are an aggregation of Wildlife Management Units. Abbreviations: Champlain Valley (CHVA), Adirondacks-Tug Hill (ADKS-TH), Catskills-Delaware Hills (CATS-DH), St. Lawrence Valley (SLV), Appalachian Hills & Plateau (APPH&PLT), Lake Plains (LKPL), Mohawk Valley-Hudson Valley-Taconic Highlands (MV-HV-TH). The Costal Lowlands Ecozone (Long Island) only has a two-day youth turkey hunt, so the drumming survey was not conducted there.

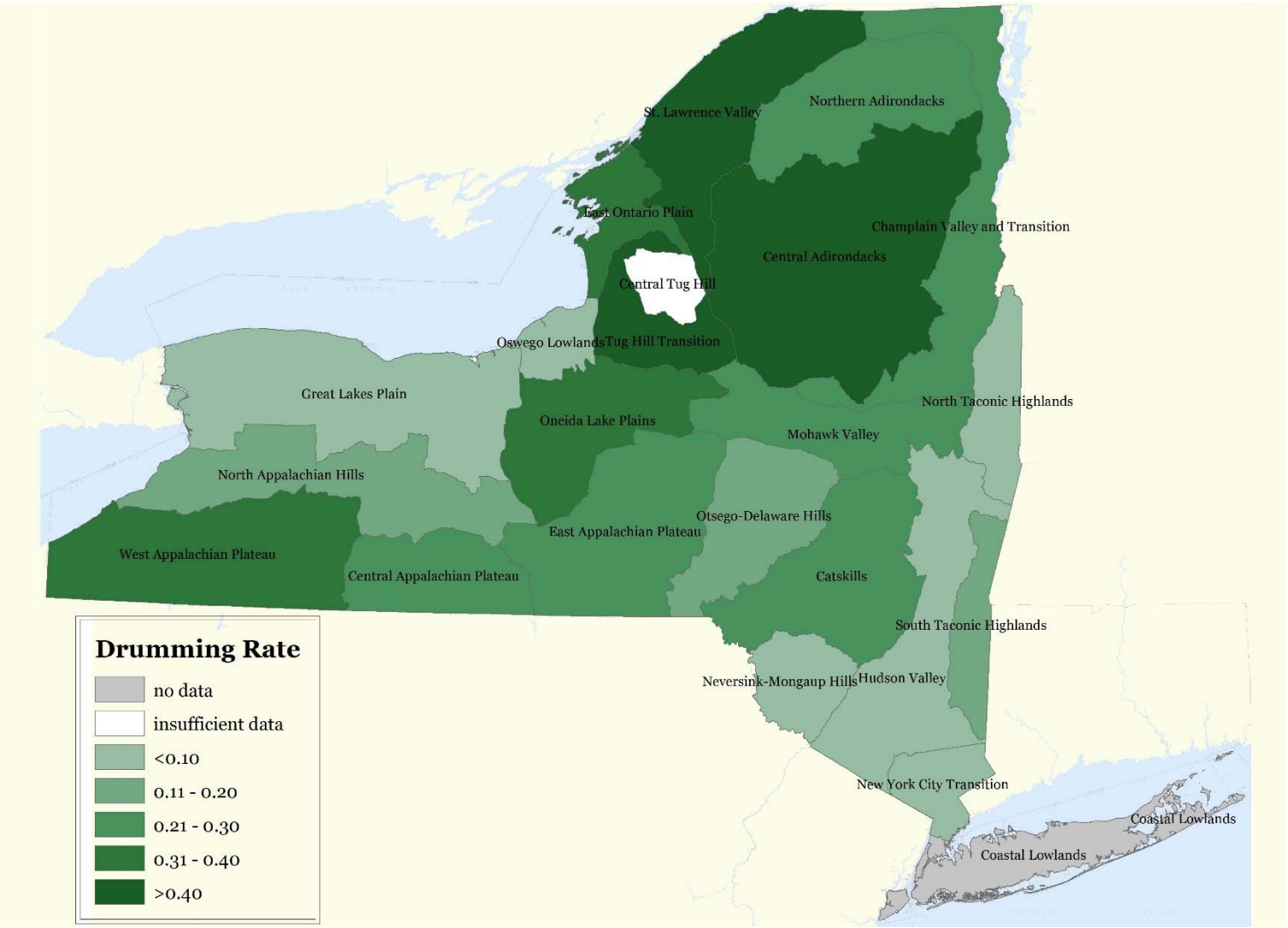

Figure 2. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) aggregate from the Ruffed Grouse Drumming Survey, 2015. Only aggregates with ≥10 observations/records or ≥25 hours were included in the analysis. The statewide drumming rate for 2015 was 0.24 grouse drumming/hour. The Tug Hill aggregate had too few observations for analysis, and 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.

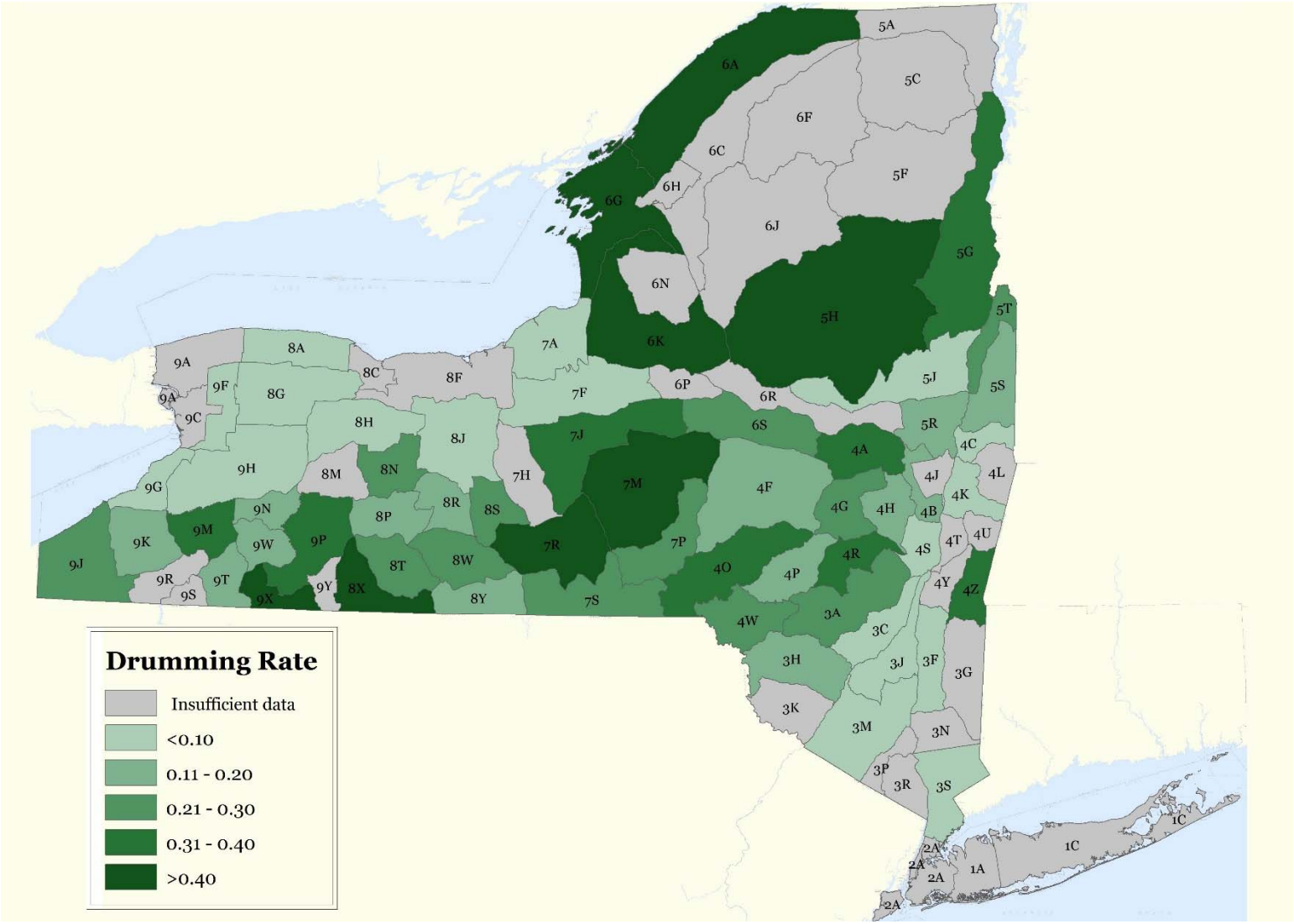

Figure 3. Drumming rate (grouse drumming/hour) by Wildlife Management Unit (WMU) from the Ruffed Grouse Drumming Survey, 2007-2015. Only WMUs with ≥50 observations/records or ≥150 hours were included in the analysis. The statewide drumming rate for the nine-year period was 0.23 grouse drumming/hour. 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.

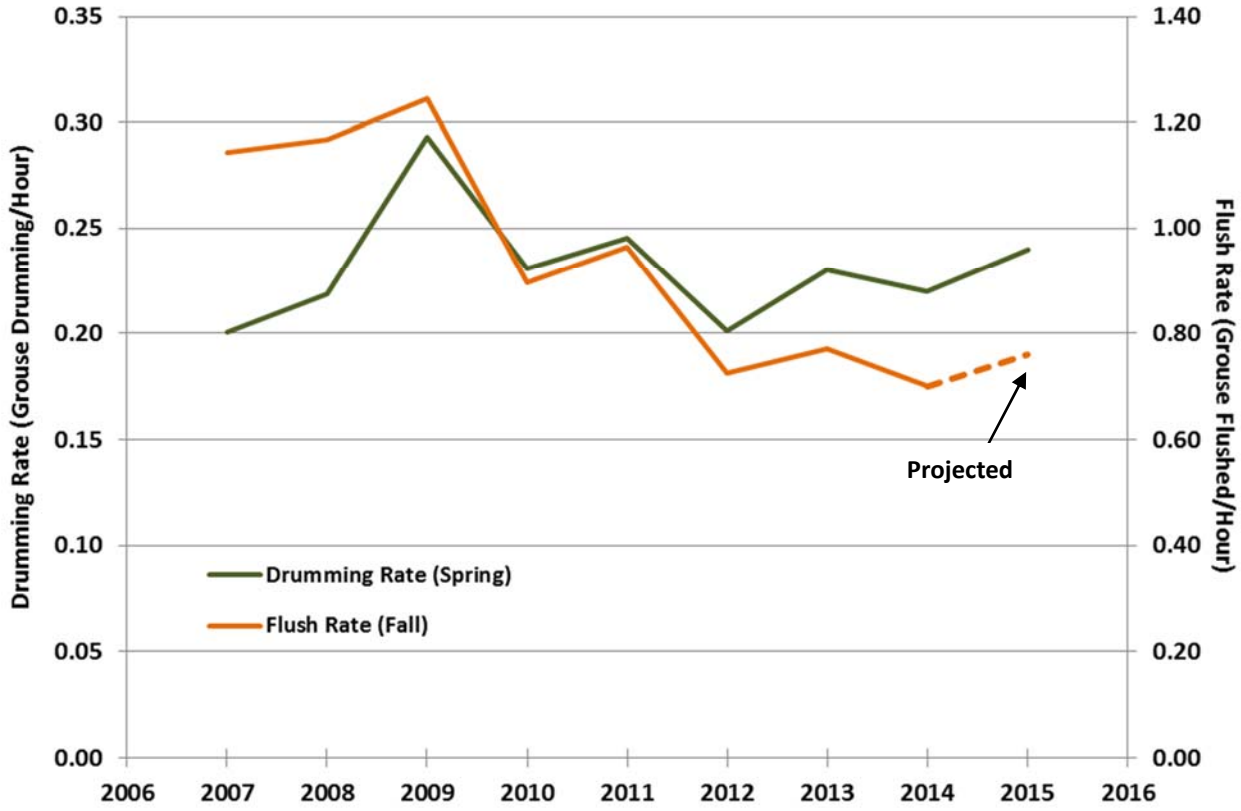

Figure 4. Ruffed grouse drumming rate (grouse drumming/hour) from the Ruffed Grouse Drumming Survey conducted during the spring, and the grouse flush rate (grouse flushed/hour) from the Grouse and Woodcock Hunting Log conducted during the fall grouse hunting season. The flush rate for fall 2015 is predicted based on the statewide estimated drumming rate from spring 2015.

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