

Cooperator Ruffed Grouse & American Woodcock Hunting Log



During the 2017-18 ruffed grouse and American woodcock hunting seasons, 212 hunters recorded their daily hunting activities, including the number of birds flushed, the number of hours hunted, the number of birds killed, and if a dog was used to hunt grouse and woodcock. The primary purpose of the log is to monitor the number of birds flushed per hour. Changes in the flush rate illustrate trends in the grouse and woodcock populations when viewed over a long period of time and will provide insight into statewide distributions for these popular game species as habitats change both locally and on a landscape scale.

We thank all the hunters that participated in this survey during the 2017-18 seasons.

Results from the 2017-18 Season

During the 2017-18 season, participants reported data from almost 2,000 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 5,300 hours afield and flushed about 4,000 grouse (about 0.75 flushes/hour) and over 1,600 woodcock (about 0.5 flushes/hour). Findings from the 2017-18 season include:

Grouse Hunting

- Hunters participating in the survey averaged about 25 hours afield during the 2017-18 season. They took about 9 trips afield for the season and spent about 3 hours afield per trip (Table 1).
- Grouse log participants averaged about 19 grouse flushed per hunter for the 2017-18 season and had to spend about one hour and 24 minutes hunting in order to flush one grouse. In addition, hunters averaged about 1 bird harvested for the season and had to invest about 19 hours of hunting effort to harvest one grouse. On average, one out of every 15 grouse flushes resulted in a kill (a 7% success rate; Table 1).
- About 70% of the effort expended by hunters occurred during the first half of the season (September - November; Table 2). In addition, about 67% of the grouse flushed and 62% of the grouse harvested occurred during this early part of the season, but the flush rate was higher during the late portion of the season (0.72 grouse flushed/hour in Sept.-Nov vs. 0.90 grouse flushed/hour in Dec.-Feb.).
- More effort was expended by hunters on public lands, and the number of grouse flushed was higher there (Table 3); however, the flush rate was higher on private lands.
- Overall, there was far more effort expended in the southern grouse season zone than the northern season zone (over 70% of the total), but the flush rate was similar between the northern and southern zones (Table 4).
- Hunting effort was well distributed across major geographic regions of New York State. About 37% of the hunting effort took place in western New York (31% Appalachian Hills & Plateau Ecozone, 6% Lake Plains Ecozone), about 28% in northern New York (20%

Adirondacks-Tug Hill Ecozone, 6% St. Lawrence Valley Ecozone, 2% Champlain Valley Ecozone), and about 36% in the southeastern part of the state (23% Catskills-Delaware Hills, 13% Mohawk Valley-Hudson-Valley-Taconic Highlands; Table 5; see Figures 1 and 2 for regions referred to here).

- The flush rate was highest in the Catskills-Delaware Hills ecozone (about 0.99 grouse flushed/hour), followed by the Appalachian Hills & Plateau ecozone (0.92 birds flushed/hour). The Adirondacks-Tug Hill ecozone had a flush rate slightly above the annual statewide average (0.88 vs. 0.77 birds flushed/hour). The rest of the ecozones were below the annual statewide average (Table 5, Figures 1 and 2).
- Most hunters that participated in the survey used a dog to hunt grouse (Table 6). In general, hunters that used a dog flushed and harvested more grouse and had a higher flush rate (0.93 grouse flushed/hour) than hunters that did not use a dog (0.50 grouse flushed/hour).

Woodcock Hunting

- Analyses for woodcock data were restricted to 20 September through 30 November. This represents the period in which resident and migrating woodcock were in New York and accounted for 99% of all the woodcock observations during the survey. The results presented in this report are based on 1,357 trips and 3,768 hours afield by 191 hunters.
- Hunters participating in the survey averaged about 20 hours afield during the 2017 woodcock season. They took about 7 trips afield for the season and spent about 3 hours afield per trip (Table 1).
- Survey participants averaged about 8 woodcock flushed per hunter for the 2017 season and had to spend about 2 hours hunting in order to flush one woodcock. In addition, hunters averaged 2 birds harvested for the season and had to invest over 10 hours of hunting effort to harvest one woodcock. On average, one out of every 4 woodcock flushes resulted in a kill (a 23% success rate; Table 1).
- Hunting effort was evenly distributed over the 45-day season (Table 7), with a peak in effort during the third week of October. More birds were flushed and killed during the third week of October than during any other week of the season, and this week also coincided with the highest flush rate (0.66 birds flushed/hour; Table 7). The overall flush rate from 20 September through 30 November was 0.48 birds/hour.
- There was more hunting effort and woodcock flushed and killed on public land than on private land, but the flush rate was similar on public and on private lands (about 0.50 woodcock flushed/hour; Table 3).
- There was more hunting effort and woodcock flushed and killed in the southern zone than in the northern zone, but the flush rate between the two zones was similar (about 0.50 woodcock flushed/hour; Table 4).
- The flush rate was highest in the Lake Plains ecozone (0.83 woodcock flushed/hour), followed by the St. Lawrence Valley ecozone (0.60 woodcock flushed/hour). The Champlain Valley, Catskill-Delaware Hills, and Adirondacks-Tug Hill ecozones were close to the statewide average flush rate (0.50 birds flushed/hour), and the remaining ecozones were below the statewide average (Table 8, Figure 4).
- Most hunters that participated in the survey used a dog to hunt woodcock (Table 6). Hunters that used a dog flushed and harvested more woodcock and had a higher flush rate (0.68 birds flushed/hour) than hunters that did not use a dog (0.09 birds flushed/hour).

Comparing 2017-18 to Previous Seasons

Ruffed Grouse

- Over the past 14 seasons, almost 1,400 hunters have participated in this survey. They have taken over 38,000 trips afield, spent over 105,000 hours pursuing grouse, flushed almost 99,000 birds, and harvested over 8,000 grouse. During this time period, the average flush rate was about 0.97 grouse flushed/hour.
- Summary statistics for hunter effort (trips/hunter, hours/hunter) during the 2017-18 season were similar to the previous season, but were below the long-term average. Similarly, indices for grouse abundance (flushes/hunter, flushes/hour) were similar to the previous year, but below the long-term average.
- Flush rates in most ecozones were similar between the 2016-17 and 2017-18 seasons, with the exception of the Champlain Valley which saw a decline in the flush rate between years (Figure 1).
- For the first decade of this survey effort, trends in grouse populations statewide and in major ecozones resembled a “bell-shaped curve” that peaked around 2009 (Figure 1). It is unclear whether this is illustrative of the grouse population “cycles” that have been observed in other states. Despite a spike observed in the flush rate in 2015-16, flush rates have been relatively flat for the past 6 seasons (since 2012-13).
- The 2017-18 survey results emphasize a “focus area” for grouse in the central part of the state from the St. Lawrence Valley south through the Catskills. When data are analyzed across the 14 years of the survey, they highlight other areas outside of this core region that will also benefit from active habitat protection, management, or restoration. Improving habitat in or close to regions with high quality habitat has a better chance at improving grouse populations than habitat management in regions devoid of high quality grouse habitat. There are several Wildlife Management Units along the southern tier in DEC Regions 8 and 9 that have relatively good grouse populations that would benefit from habitat management efforts (Figure 3).

American Woodcock

- The statewide flush rate in 2017 was down from 2016 and was the lowest flush rate observed since 2011 (Figure 6). From 2016 to 2017, there was a modest increase in the flush rate in three ecozones (Adirondacks-Tug Hill, St. Lawrence Valley, Lake Plains) and a slight decrease in another three ecozones (Appalachian Hills & Plateau, Champlain Valley, Mohawk Valley-Hudson Valley-Taconic Highlands), but there was a significant decline in the flush rate in the Catskills-Delaware ecozone (Figure 6).
- It is interesting to note that over the past five seasons the highest average flush rate for woodcock has been in the Lake Plains ecozone (Figure 6). In contrast, this is an area of the state that consistently has among the lowest flush rates for ruffed grouse. The migratory nature of woodcock means that this species can find isolated patches of early successional habitat such as young forests and shrublands, whereas ruffed grouse are more dependent upon a landscape with a preponderance of high-quality habitat. This results in there being relatively fewer grouse in the Lake Plains compared to a region like the Catskills-Delaware

Hills ecozone where there is a higher proportion of the landscape that is in an early stage of succession.

- Five of the last eight years the peak of woodcock migration occurred during the last week of October, with the exceptions being 2011, 2014, and 2017 when it occurred the week of October 18th (Figure 6). In fall 2017 we observed two peaks in woodcock flush rates: a peak in late September as resident birds mixed with early arriving migrants, and a peak in mid-late October during the height of migration.
- In the spring (April-May), DEC staff conduct the “Singing-ground Survey” (SGS) coordinated by the U.S. Fish and Wildlife Service. This survey provides a “breeding index” (the number of singing males per route) for the state and the Eastern Management Region and helps track changes in woodcock populations over time. Results of this survey indicate that woodcock populations in New York have been stable over the past 15 years.
- The decline in the woodcock flush rate from fall 2016 to fall 2017 may be attributed to a blizzard in March 2017 that negatively impacted migrating birds passing through New York prior to the breeding season. The breeding index for New York from the SGS was similar between spring 2016 and spring 2017 which would suggest that survival of resident breeding birds and nest and chick success was good, but insufficient to offset losses of migrant birds or poor recruitment north of New York.
- Results from the “*American woodcock population status*” report published by the U.S. Fish and Wildlife Service can be found on-line at <https://www.fws.gov/birds/surveys-and-data/reports-and-publications/population-status.php>.

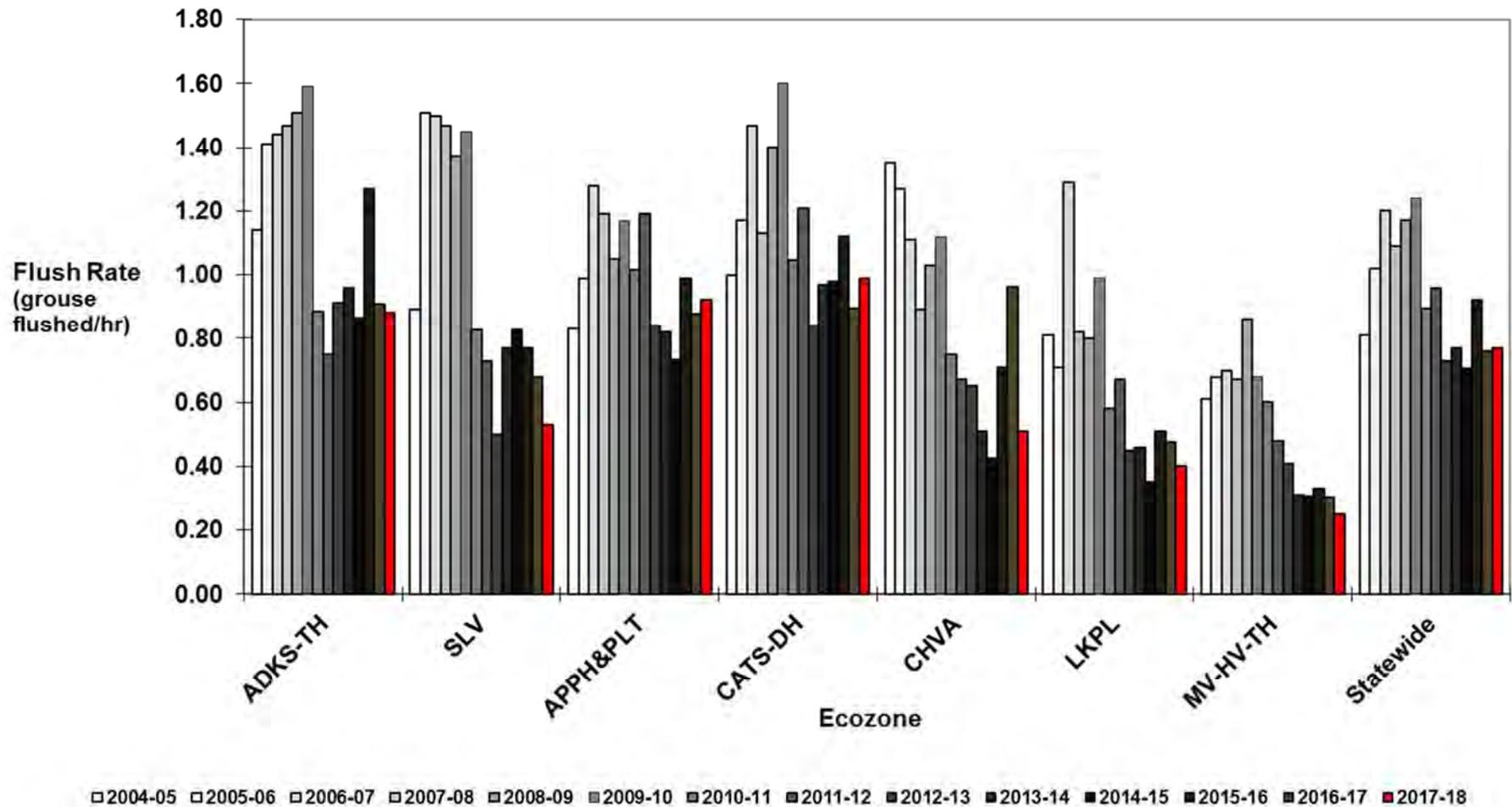


Figure 1. Flush rate (grouse flushed/hour) by ecozone based on Cooperator Ruffed Grouse Hunting Log data for the 2004-05 through 2017-18 seasons. Ecozones are an aggregation of Wildlife Management Units. Abbreviations: Champlain Valley (CHVA), Adirondacks-Tug Hill (ADKS-TH), Catskills-Delaware Hills (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 (New York City and Long Island) does not have a ruffed grouse hunting season.

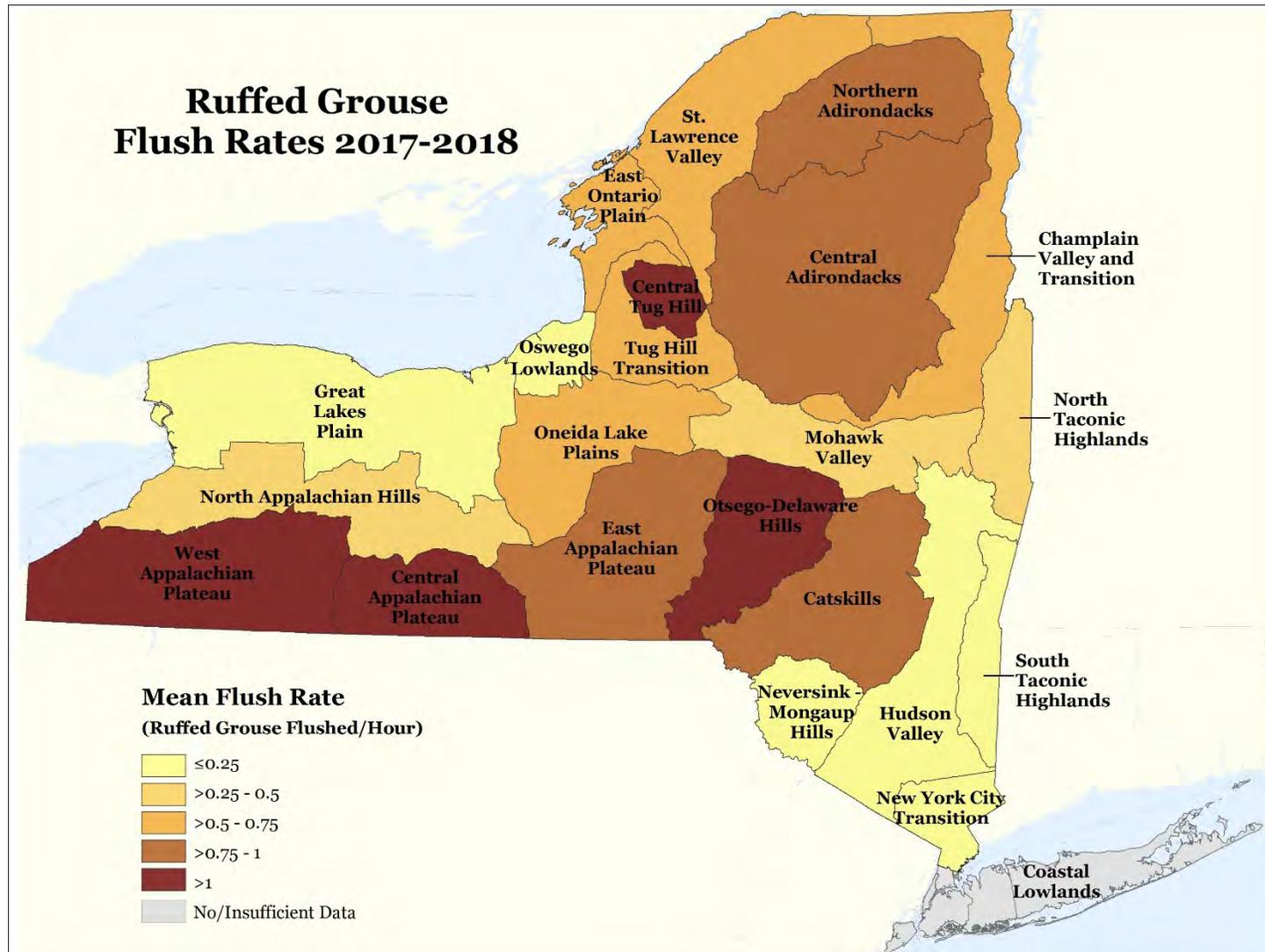


Figure 2. Ruffed Grouse flush rate (grouse flushed/hour) by Wildlife Management Unit (WMU) aggregate from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2016-17. Only aggregates with ≥ 20 observations/records and ≥ 35 hours were included in the analysis. The statewide flush rate for 2017-18 was 0.77 grouse flushed/hour. WMU aggregate in gray north of New York City had too few observations for analysis. The Coastal Lowlands aggregate does not have a grouse hunting season, so the survey was not conducted there.

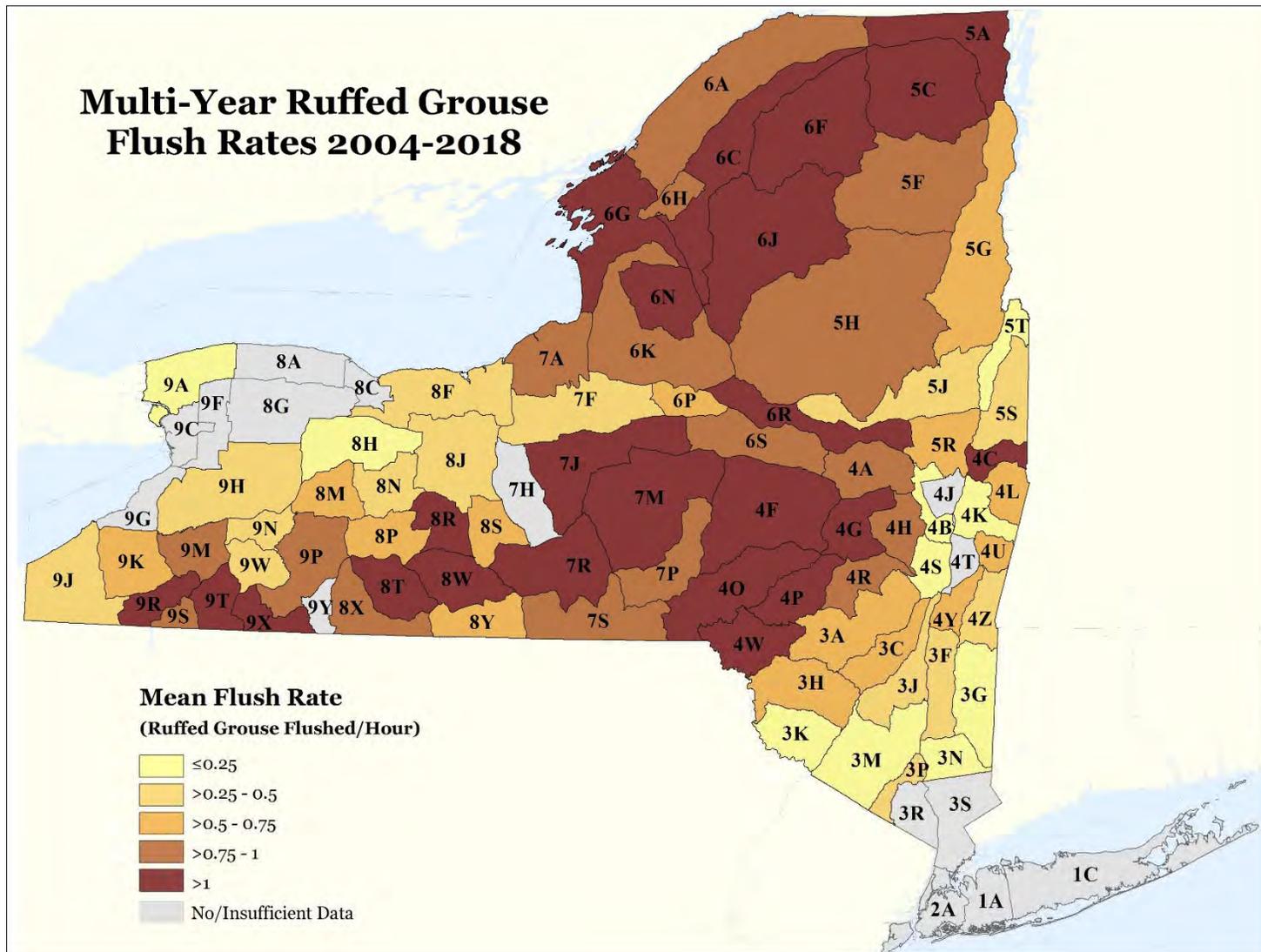


Figure 3. Ruffed Grouse flush rate (grouse flushed/hour) by Wildlife Management Unit (WMU) from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2004-05 – 2017-18. Only WMUs with ≥ 50 observations/records and ≥ 150 hours were included in the analysis. The statewide flush rate for the 14-year period was 0.97 grouse flushed/hour. WMUs in gray north of New York City (WMU 2A) had too few observations for analysis. WMUs comprising the Coastal Lowlands aggregate (WMUs 2A, 1A, and 1C) do not have a grouse hunting season.

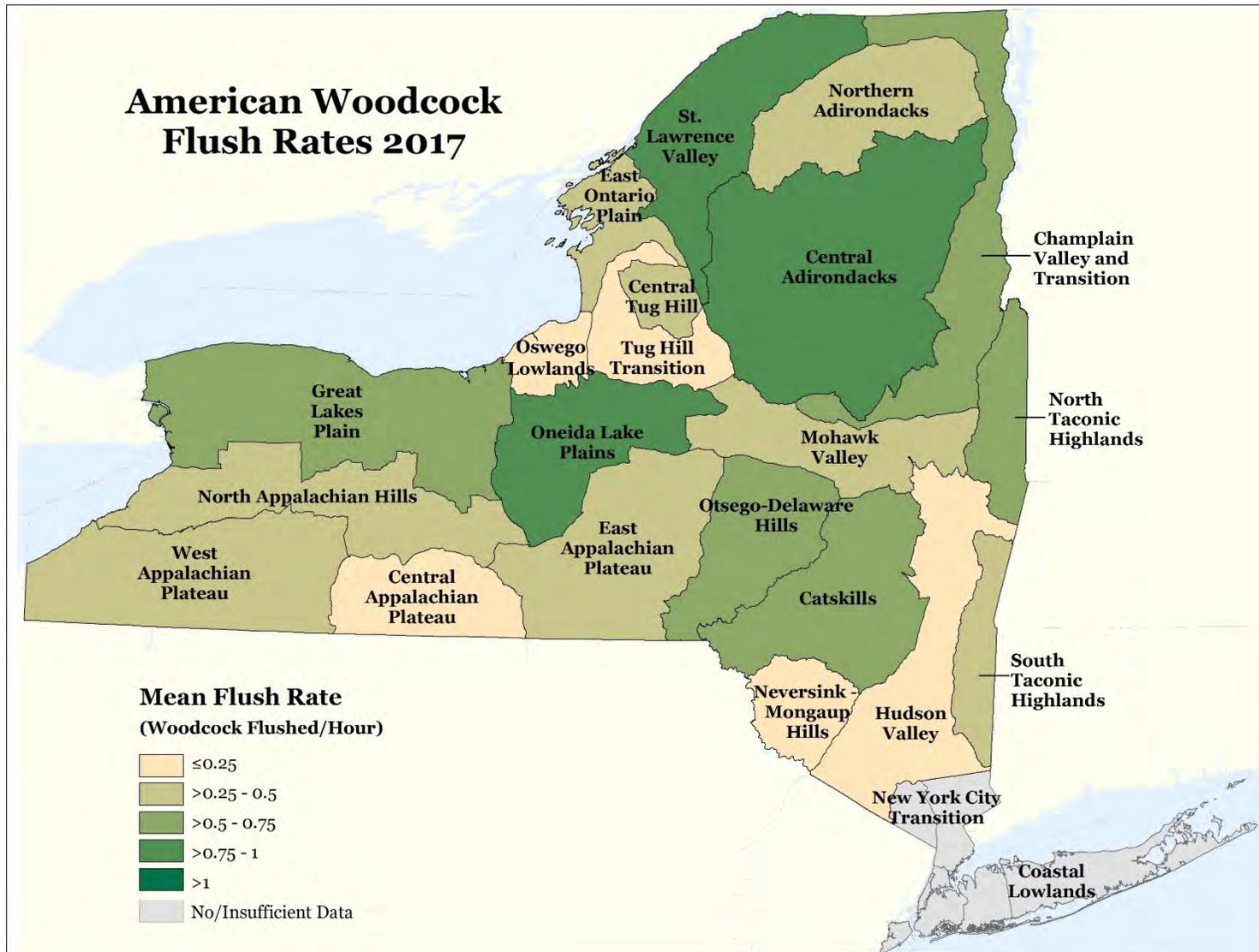


Figure 4. American woodcock flush rate (birds flushed/hour) by Wildlife Management Unit (WMU) aggregate from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18. Only aggregates with ≥ 20 observations/records and ≥ 35 hours were included in the analysis. The statewide flush rate for 2017 was 0.48 woodcock flushed/hour. The Coastal Lowlands aggregate does not have a grouse hunting season, so the survey was not conducted there.

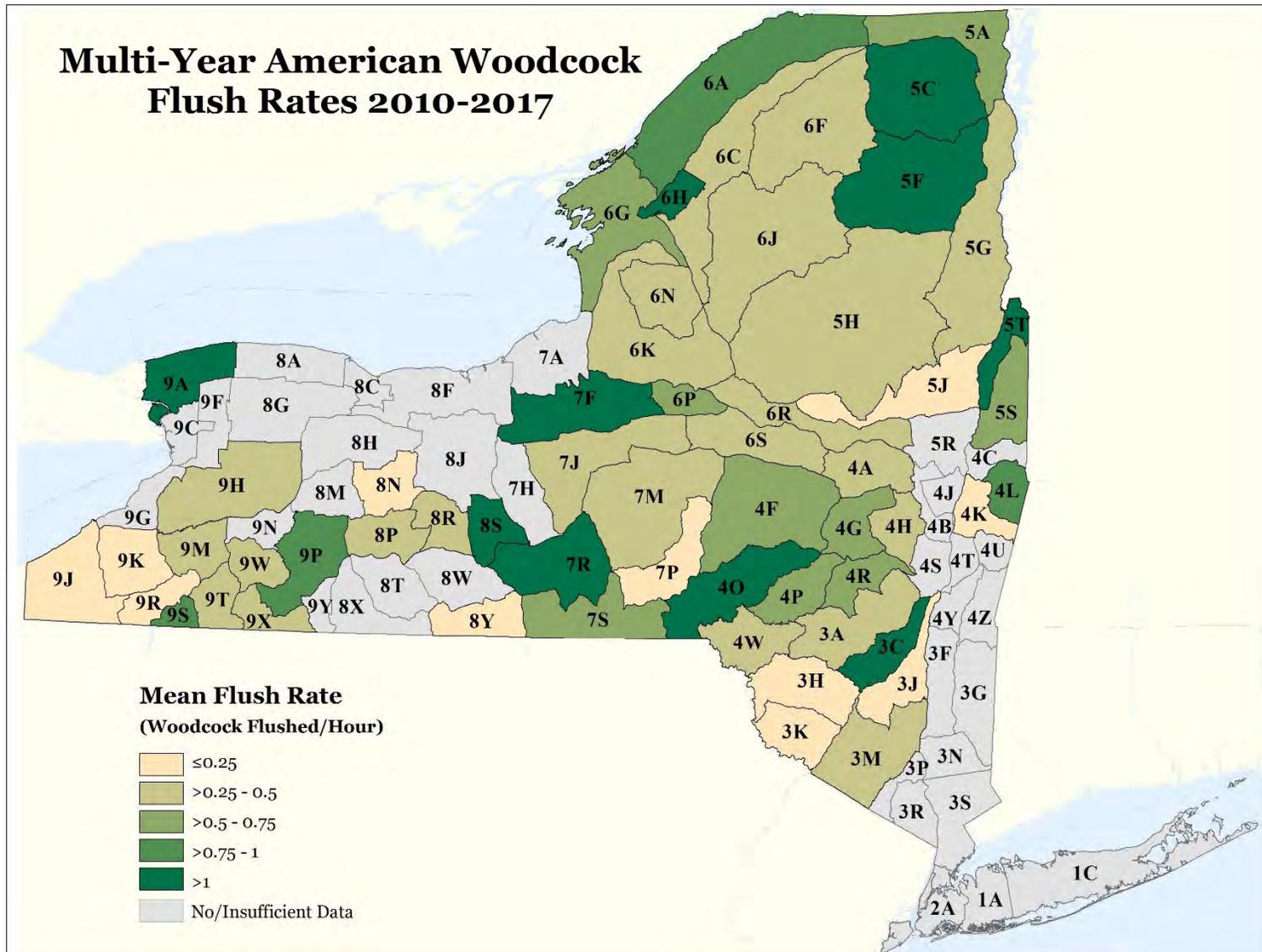


Figure 5. American woodcock flush rate (birds flushed/hour) by Wildlife Management Unit (WMU) from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2010-11 – 2017-18. Only WMUs with ≥ 50 observations/records and ≥ 150 hours were included in the analysis. The statewide flush rate for 2010-17 was 0.57 woodcock flushed/hour. WMUs in gray north of New York City (WMU 2A) had too few observations for analysis. WMUs comprising the Coastal Lowlands aggregate (WMUs 2A, 1A, and 1C) do not have a grouse hunting season, so the survey was not conducted there.

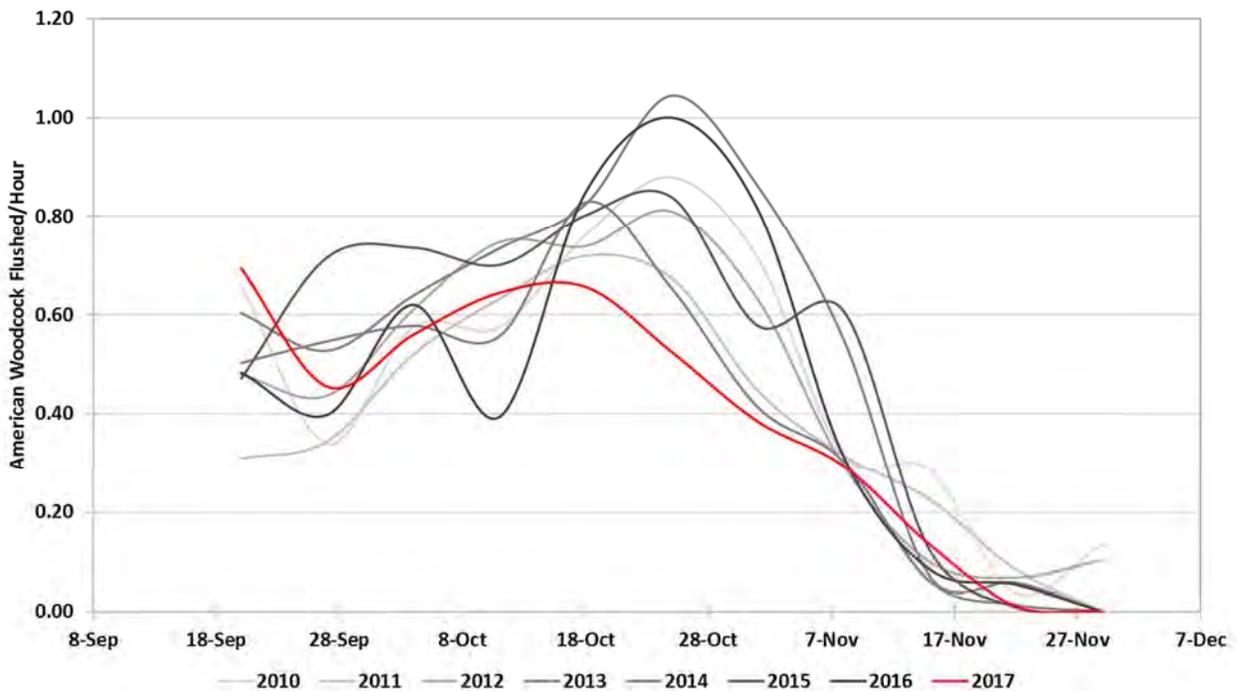
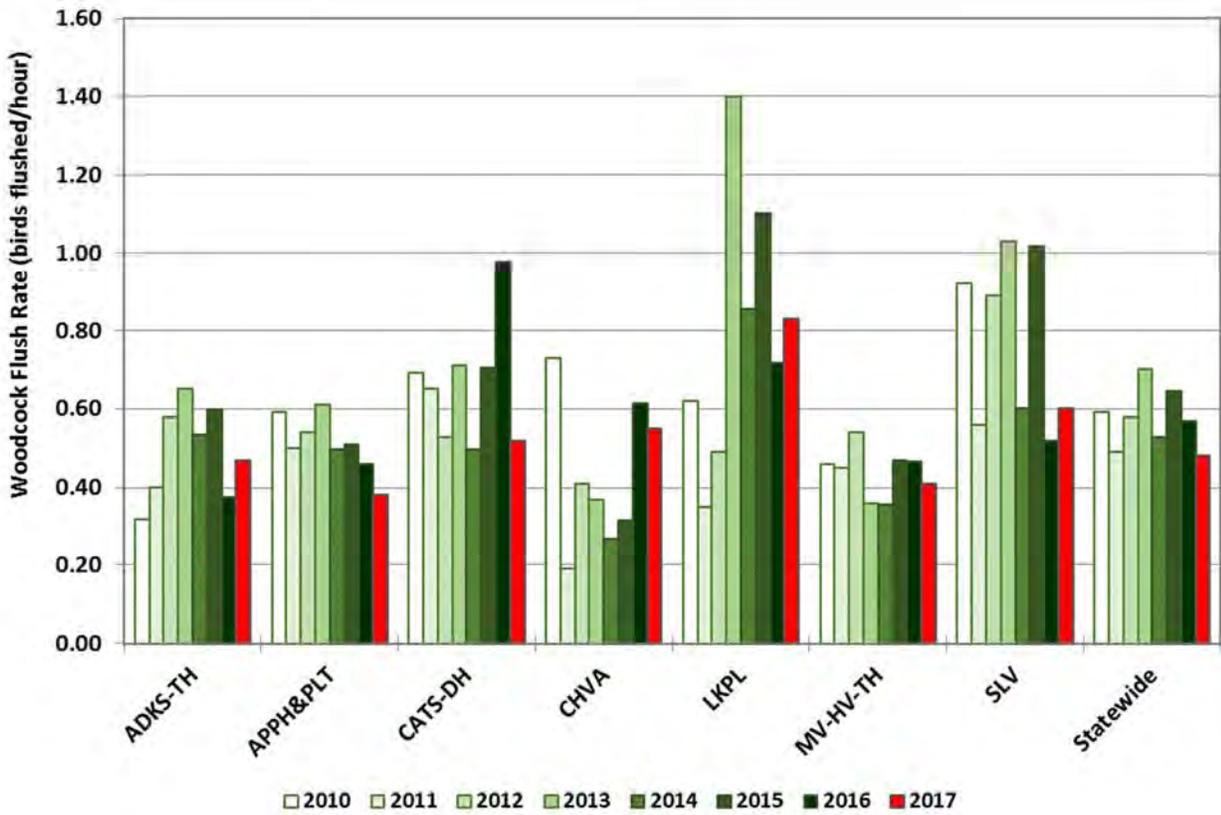


Figure 6. American woodcock flush rate (woodcock flushed/hour) by ecozone (top) and the flush rate by week (bottom) from the Cooperator Ruffed Grouse & Woodcock Hunting Log. The statewide flush rate for 2017 was 0.48 woodcock flushed/hour. Abbreviations: Champlain Valley (CHVA), Adirondacks-Tug Hill (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 (New York City and Long Island) does not have a grouse season, so data are not available for this region.

Table 1. Summary statistics for the grouse and woodcock hunting seasons from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

Summary Statistics	Grouse Hunting					Woodcock Hunting				
	2014-15	2015-16	2016-17	2017-18	3-Year Avg. (14-15 - 16-17)	Fall 2014	Fall 2015	Fall 2016	Fall 2017	3-Year Avg. (2014-16)
Number of Hunters	271	237	239	212	249	252	211	213	191	225
Trips/Hunter	9.2	11.2	9.1	9.2	9.7	7.4	8.3	6.8	7.1	7.5
Hours/Trip	2.8	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8
Hours/Hunter	25.4	30.5	24.7	25.2	26.4	21.0	23.2	19.4	19.7	21.2
Birds Flushed/Hunter	18.1	27.1	18.0	18.7	20.5	10.1	12.3	9.5	8.4	10.6
Birds Harvested/Hunter	1.5	1.8	1.2	1.3	1.5	2.0	2.4	2.0	1.9	2.1
Hours/Bird Flushed*	1.4	1.1	1.4	1.4	1.3	2.1	1.9	2.0	2.3	2.0
Hours/Bird Harvested*	17.2	16.6	19.8	19.3	18.2	10.7	9.7	9.8	10.3	10.1
% of Birds Flushed that were Harvested	8.1	6.8	6.9	7.0	7.2	19.5	19.3	20.7	22.7	19.8
Flush Rate (birds flushed/hour)**	0.70	0.92	0.76	0.77	0.79	0.53	0.65	0.57	0.48	0.58

* Number of hours afield to flush or harvest one bird.

** Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of birds flushed by the total number of hours hunted.

NOTE: Analyses for woodcock data were restricted to 20 September through 30 November. This represents the period in which resident and migrating woodcock were in New York and accounted for 99% of all the woodcock observations during the survey. Results for 2017 are based on 1,357 trips and 3,768 hours afield by 191 hunters.

Table 2. Hunting effort, grouse flushed and killed, and flush rates (grouse flushed/hour) by month from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18

Month	# of Trips	% of Total	# of Hours	% of Total	# Grouse Flushed	% of Total	# Grouse Harvested	% of Total	Flush Rate \pm SE* (flushes/hour)
September	74	4%	203	4%	179	5%	10	4%	0.83 \pm 0.11
October	855	44%	2,356	45%	1,606	41%	105	38%	0.65 \pm 0.03
November	428	22%	1,209	23%	875	22%	58	21%	0.84 \pm 0.06
December	132	7%	382	7%	302	8%	33	12%	0.91 \pm 0.10
January	203	10%	520	10%	405	10%	28	10%	0.88 \pm 0.08
February	255	13%	574	11%	591	15%	43	16%	0.91 \pm 0.07

* SE = standard error; Data analysis included logs with some missing data. Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of birds flushed by the total number of hours hunted.

Table 3. Hunting effort, grouse and woodcock flushed and killed, and flush rates (birds flushed/hour) by land type (public vs. private) from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

	Public Land				Private Land			
	Grouse Hunting		Woodcock Hunting		Grouse Hunting		Woodcock Hunting	
	#	%	#	%	#	%	#	%
Number of Trips	1,087	56%	801	60%	843	44%	542	40%
Number of Hours	3,229	61%	2,392	64%	2,075	39%	1,343	36%
# Birds Flushed	2,287	58%	1,049	66%	1,645	42%	550	34%
# Birds Harvested	133	48%	255	70%	143	52%	107	30%
Flush Rate \pm SE* (flushes/hour)	0.71 \pm 0.03		0.50 \pm 0.04		0.85 \pm 0.04		0.46 \pm 0.04	

Table 4. Hunting effort, grouse and woodcock flushed and killed, and flush rates (birds flushed/hour) by season zone from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

	Northern Zone				Southern Zone			
	Grouse Hunting		Woodcock Hunting		Grouse Hunting		Woodcock Hunting	
	#	%	#	%	#	%	#	%
Number of Trips	490	25%	409	30%	1,457	75%	948	70%
Number of Hours	1,474	28%	1,291	34%	3,870	72%	2,477	66%
# Birds Flushed	1,140	29%	592	37%	2,818	71%	1,021	63%
# Birds Harvested	84	30%	123	34%	193	70%	243	66%
Flush Rate \pm SE* (flushes/hour)	0.76 \pm 0.04		0.51 \pm 0.05		0.78 \pm 0.03		0.47 \pm 0.03	

* SE = standard error; Data analysis included logs with some missing data. Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of birds flushed by the total number of hours hunted.

NOTE: Analyses for woodcock data were restricted to 20 September through 30 November. This represents the period in which resident and migrating woodcock were in New York and accounted for 99% of all the woodcock observations during the survey. Results for 2016 are based on 1,458 trips and 4,125 hours afield by 213 hunters.

Table 5. Number of hours hunted, number of grouse flushed and killed, and flush rates (grouse flushed/hour) from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

Ecozone / WMU Aggregate*	Trips		Hours		Grouse Flushed		Grouse Killed		Flush Rate** (grouse flushed/hour)	
	#	%	#	%	#	%	#	%	Mean	SE**
	St. Lawrence Valley	117	6.0%	293	5.5%	165	4.2%	13	4.7%	0.53
East Ontario Plain	58	3.0%	177	3.3%	106	2.7%	9	3.2%	0.54	0.09
St. Lawrence Valley	59	3.0%	116	2.2%	59	1.5%	4	1.4%	0.72	0.09
Champlain Valley	43	2.2%	93	1.7%	52	1.3%	8	2.9%	0.51	0.11
Champlain Valley & Transition	43	2.2%	93	1.7%	52	1.3%	8	2.9%	0.51	0.11
Adirondacks-Tug Hill	326	16.8%	1,082	20.3%	921	23.3%	63	22.7%	0.88	0.06
Tug Hill	81	4.2%	217	4.1%	259	6.5%	16	5.8%	1.21	0.15
Tug Hill Transition	65	3.3%	221	4.2%	107	2.7%	8	2.9%	0.53	0.12
Northern Adirondacks	90	4.6%	376	7.1%	292	7.4%	27	9.7%	0.89	0.11
Central Adirondacks	90	4.6%	268	5.0%	263	6.6%	12	4.3%	0.81	0.10
Lake Plains	121	6.2%	296	5.6%	115	2.9%	7	2.5%	0.40	0.06
Oneida Lake Plains	85	4.4%	213	4.0%	112	2.8%	7	2.5%	0.55	0.08
Great Lakes Plain	32	1.6%	77	1.4%	1	0.0%	0	0.0%	0.01	0.01
Oswego Lowlands	4	0.2%	6	0.1%	2	0.1%	0	0.0%	n/a**	
Appalachian Hills & Plateau	672	34.6%	1,640	30.8%	1,356	34.3%	91	32.9%	0.92	0.05
East Appalachian Plateau	304	15.7%	629	11.8%	592	15.0%	29	10.5%	0.93	0.06
Central Appalachian Plateau	19	1.0%	48	0.9%	73	1.8%	8	2.9%	1.54	0.41
North Appalachian Hills	93	4.8%	277	5.2%	115	2.9%	5	1.8%	0.45	0.08
West Appalachian Hills	256	13.2%	686	12.9%	576	14.6%	49	17.7%	1.02	0.09
Catskills-Delaware Hills	414	21.3%	1,231	23.1%	1,196	30.2%	75	27.1%	0.99	0.05
Catskills	239	12.3%	794	14.9%	741	18.7%	39	14.1%	0.97	0.07
Otsego-Delaware Hills	153	7.9%	404	7.6%	453	11.4%	36	13.0%	1.16	0.09
Neversink-Mongaup Hills	22	1.1%	33	0.6%	2	0.1%	0	0.0%	0.04	0.03
Mohawk Valley-Hudson Valley-Taconic Highlands	249	12.8%	689	12.9%	153	3.9%	20	7.2%	0.25	0.04
Mohawk Valley	46	2.4%	122	2.3%	62	1.6%	5	1.8%	0.47	0.09
Hudson Valley	111	5.7%	338	6.3%	23	0.6%	5	1.8%	0.08	0.04
North Taconic Highlands	79	4.1%	196	3.7%	63	1.6%	8	2.9%	0.37	0.08
South Taconic Highlands	12	0.6%	31	0.6%	5	0.1%	2	0.7%	n/a**	
New York City Transition	1	0.1%	2	0.0%	0	0.0%	0	0.0%	n/a**	
Statewide Totals	1,942		5,324		3,958		277		0.77	0.02

*WMU Aggregates are groupings of Wildlife Management Units. Ecozones are groupings of WMU Aggregates. The Coastal Lowlands Aggregate (New York City and Long Island) does not have a ruffed grouse season, thus is not listed.

** Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of grouse flushed by the total number of hours hunted; Data analysis included logs with some missing data. SE = Standard Error

***There was an insufficient sample size in these WMU aggregates. A minimum of 20 trips or 35 hours is needed for analysis. Data from these aggregates contributed to the ecozone and statewide totals.

Table 6. Hunting effort, grouse and woodcock flushed and killed, and flush rates (birds flushed/hour) by hunting method (with dog vs. without) from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

	Hunted <i>WITH</i> a Dog				Hunted <i>WITHOUT</i> a Dog			
	Grouse Hunting		Woodcock Hunting		Grouse Hunting		Woodcock Hunting	
	#	%	#	%	#	%	#	%
Number of Trips	1,227	63%	897	66%	710	37%	456	34%
Number of Hours	3,119	59%	2,311	62%	2,193	41%	1,443	38%
# Birds Flushed	2,985	76%	1,492	93%	934	24%	107	7%
# Birds Harvested	222	81%	345	95%	52	19%	18	5%
Flush Rate \pm SE (flushes/hour)	0.93 \pm 0.03		0.68 \pm 0.04		0.50 \pm 0.03		0.09 \pm 0.01	

* SE = standard error; Data analysis included logs with some missing data. Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of birds flushed by the total number of hours hunted.

NOTE: Analyses for woodcock data were restricted to 20 September through 30 November. This represents the period in which resident and migrating woodcock were in New York and accounted for 99% of all the woodcock observations during the survey. Results for 2017 are based on 1,357 trips and 3,768 hours afield by 191 hunters.

Table 7. Hunting effort, woodcock flushed and killed, and flush rates (woodcock flushed/hour) by week from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

Week of	# of Trips	% of Total	# of Hours	% of Total	# Woodcock Flushed	% of Total	# Woodcock Harvested	% of Total	Flush Rate \pm SE* (flushes/hour)
20 September	44	3%	129	3%	69	4%	0	0%	0.69 \pm 0.26
27 September	142	10%	387	10%	163	10%	26	7%	0.45 \pm 0.08
4 October	169	13%	417	11%	205	13%	52	14%	0.56 \pm 0.08
11 October	223	16%	585	16%	345	21%	77	21%	0.64 \pm 0.06
18 October	195	14%	605	16%	360	22%	82	22%	0.66 \pm 0.08
25 October	156	11%	436	12%	203	13%	63	17%	0.52 \pm 0.09
1 November	148	11%	403	11%	135	8%	38	10%	0.38 \pm 0.07
8 November	160	12%	429	11%	108	7%	28	8%	0.29 \pm 0.06
15 November	66	5%	222	6%	23	1%	0	0%	0.13 \pm 0.05
22 November	49	4%	138	4%	2	0%	0	0%	0.01 \pm 0.01
29 November	5	0%	17	0%	0	0%	0	0%	0.00 \pm 0.00

* Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of woodcock flushed by the total number of hours hunted; Data analysis included logs with some missing data; SE = Standard Error

NOTE: Analyses for woodcock data were restricted to 20 September through 30 November. This represents the period in which resident and migrating woodcock were in New York and accounted for 99% of all the woodcock observations during the survey. Results for 2017 are based on 1,357 trips and 3,768 hours afield by 191 hunters.

Table 8. Number of hours hunted, number of woodcock flushed and killed, and flush rates (woodcock flushed/hour) from the Cooperator Ruffed Grouse & American Woodcock Hunting Log, 2017-18.

Ecozone / WMU Aggregate*	Trips		Hours		Woodcock Flushed		Woodcock Killed		Flush Rate** (woodcock flushed/hour)	
	#	%	#	%	#	%	#	%	Mean	SE**
St. Lawrence Valley	92	6.8%	249	6.6%	153	9.5%	43	11.7%	0.60	0.09
East Ontario Plain	50	3.7%	161	4.3%	67	4.2%	22	6.0%	0.34	0.08
St. Lawrence Valley	42	3.1%	88	2.3%	86	5.3%	21	5.7%	0.91	0.15
Champlain Valley	34	2.5%	79	2.1%	47	2.9%	7	1.9%	0.55	0.15
Champlain Valley & Transition	34	2.5%	79	2.1%	47	2.9%	7	1.9%	0.55	0.15
Adirondacks-Tug Hill	280	20.7%	959	25.5%	392	24.3%	73	19.9%	0.47	0.06
Tug Hill	76	5.6%	204	5.4%	52	3.2%	7	1.9%	0.28	0.06
Tug Hill Transition	58	4.3%	188	5.0%	36	2.2%	7	1.9%	0.23	0.09
Northern Adirondacks	75	5.5%	348	9.3%	157	9.7%	41	11.2%	0.49	0.09
Central Adirondacks	71	5.2%	219	5.8%	147	9.1%	18	4.9%	0.87	0.20
Lake Plains	95	7.0%	233	6.2%	178	11.0%	51	13.9%	0.83	0.12
Oneida Lake Plains	62	4.6%	159	4.2%	159	9.9%	48	13.1%	0.99	0.17
Great Lakes Plain	30	2.2%	70	1.9%	19	1.2%	3	0.8%	0.58	0.13
Oswego Lowlands	3	0.2%	4	0.1%	0	0.0%	0	0.0%	n/a**	
Appalachian Hills & Plateau	405	29.9%	982	26.1%	310	19.2%	56	15.3%	0.38	0.05
East Appalachian Plateau	207	15.3%	450	12.0%	206	12.8%	31	8.5%	0.43	0.07
Central Appalachian Plateau	2	0.1%	4	0.1%	0	0.0%	0	0.0%	n/a**	
North Appalachian Hills	45	3.3%	113	3.0%	19	1.2%	4	1.1%	0.26	0.08
West Appalachian Hills	151	11.2%	415	11.0%	85	5.3%	21	5.7%	0.37	0.08
Catskills-Delaware Hills	278	20.5%	792	21.1%	363	22.5%	71	19.4%	0.52	0.07
Catskills	147	10.9%	482	12.8%	171	10.6%	38	10.4%	0.52	0.10
Otsego-Delaware Hills	109	8.1%	277	7.4%	191	11.8%	33	9.0%	0.62	0.10
Neversink-Mongaup Hills	22	1.6%	33	0.9%	1	0.1%	0	0.0%	n/a**	
Mohawk Valley-Hudson Valley-Taconic Highlands	170	12.6%	462	12.3%	170	10.5%	65	17.8%	0.41	0.05
Mohawk Valley	28	2.1%	76	2.0%	23	1.4%	4	1.1%	0.38	0.14
Hudson Valley	75	5.5%	222	5.9%	58	3.6%	24	6.6%	0.25	0.06
North Taconic Highlands	56	4.1%	137	3.6%	84	5.2%	37	10.1%	0.68	0.11
South Taconic Highlands	11	0.8%	27	0.7%	5	0.3%	0	0.0%	n/a**	
New York City Transition	0	0.0%	0	0.0%	0	0.0%	0	0.0%	n/a**	
Statewide Totals	1,354		3,756		1,613		366			

*WMU Aggregates are groupings of Wildlife Management Units. Ecozones are groupings of WMU Aggregates. The Coastal Lowlands Aggregate (New York City and Long Island) does not have a ruffed grouse season, thus is not listed.

** Overall flush rates are calculated as an average flush rate for all days hunted, not a simple division of the total number of woodcock flushed by the total number of hours hunted; Data analysis included logs with some missing data. SE = Standard Error

***There was an insufficient sample size in these WMU Aggregates. A minimum of 20 trips or 35 hours is needed for analysis. Data from this aggregate contributed to the ecozone and statewide totals.

NOTE: Analyses for woodcock data were restricted to 20 September through 30 November. This represents the period in which resident and migrating woodcock were in New York and accounted for 99% of all the woodcock observations during the survey. Results for 2017 are based on 1,357 trips and 3,768 hours afield by 191 hunters.



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