Wisconsin Department of Natural Resources
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WISCONSIN DEPT. OF NATURAL RESOURCES

Wisconsin Bat Program

In Brief

- ***There were 107 acoustic bat driving surveys in 52 counties conducted by 53 surveyors that included staff from Wisconsin Department of Natural Resources, Bad River Natural Resources Department (Tribal), U.S. Forest Service and private citizens.***
- ***Central Sand Hills region, for the seventh year in a row, has consistently had the highest average bat calls per detector hour (49.3) when compared to all other ecological landscapes. However, 49.3 calls/det/hr is the lowest measurement ever recorded for that region.***
- ***Despite a record-setting effort of 107 surveys in 2019, driving transect data show a further shift toward less bats detected by all metrics analyzed, especially for little brown bats.***

Introduction

In 2013, the Wisconsin Bat Program (WBP) expanded its offering of bat surveying opportunities by adding 38 predetermined driving bat surveys (transects) (Appendix 1). The 2019 survey season marks the seventh year conducting driving surveys. This report summarizes the methods and results from the driving survey transects that were conducted in Wisconsin in 2019 and compares this year's data to the previous six years.

Methods

To better understand statewide changes in bat populations, emphasis was placed on repeating the 38 driving transects which were developed in 2013 by WBP in each of the 16 ecological landscapes (Table 1; Appendix 1). In coordination with national bat monitoring efforts, the following protocols were adopted to ensure standardization and quality-controlled data (Loeb et al. 2015). Each acoustic driving transect ranged from 20 to 30 miles per survey and used an acoustic detection system that passively records bat activity by detecting ultrasonic echolocation calls emitted as bats forage and navigate across the landscape. These echolocation calls were recorded and saved using an ultrasonic detector (AnaBat SD1/2, Titley Scientific Inc., Brendale, Australia). The call files (bat encounters) and their geospatial information were collected through one of two methods: 1) using a hand-held computer (personal data assistant - PDA) (PDA, Hewlett-Packard Company iPAQ models) with a Global Positioning System/GPS (Global Sat, BC-337) or 2) data is directly saved to a compact flash card in the ultrasonic detector which is equipped with a mouse GPS (Global Sat, BC-355S4).

Surveyed routes in 2019 were driven one to three times across a six-week window, beginning June 1 and ending July 15**.** Surveys began approximately 30 minutes after local sunset time and were driven at a target speed of 20 miles per hour. Routes were to be completed at least once during the three primary survey periods: June 1 - June 15, June 16 - June 30 and July 1- July 15, and a minimum of five days is required between replicates of the same transect. Routes were surveyed on evenings with weather conditions suitable for bat activity which included low wind (<30 mph), no precipitation and a daytime temperature of 50F^{O} or above (USFWS 2016). Survey equipment included the roof-mounted microphone, an AnaBat SD1/2 bat detector, a hand-held computer to interface with the AnaBat SD1/2, a compact flash GPS unit to record the location of each acoustic file, and other appropriate items (instructions, route maps, datasheets, batteries and cables).

Acoustic files were analyzed using Titley Scientific AnalookW (Version 4.4a) (Corben 2018). Surveys were manually filtered to separate files containing bat encounters and ignore those files with only extraneous noise from insects, birds, wind, road noise, and other sources of static. All acoustic data were processed through manual examination by one staff member who has >10 years of experience in identifying Wisconsin bat species and has an extensive call library from which to reference. Files with bat encounters were then categorized into one of the following species or species group categories: (1) hoary bat- LACI (*Lasiurus cinereus*), (2) big brown bat - EPFU (*Eptesicus fuscus*), (3) silver-haired bat - LANO (*Lasionycteris noctivagans*), (4) eastern red bat - LABO (*L. borealis*), (5) eastern pipistrelle - PESU (*Perimyotis subflavus*), (6) little brown bat - MYLU (*Myotis lucifugus),* (7) northern long-eared bat- MYSE (*M. septentrionalis*), (8) evening bat - NYHU (*Nycticeius humeralis*), (9) big brown/silver-haired bat, (10) eastern pipistrelle/eastern red/evening bat, (11) little brown/northern long-eared bat, (12) low frequency and (13) high frequency. Low and high frequency bat passes were later grouped as unclassified encounters because one of the following scenarios: there were too few calls recorded to further separate, the calls were of low-quality recording (i.e. fragmented), the bat pass did not contain search-phase calls, or general uncertainty. To compare our results year-to-year and to other state-wide acoustic inventories, results were evaluated using metrics to mitigate for variations in driving speeds among surveyors: bat encounters-per-detector-hour [bat encounters divided by survey time (hours)] and bat encounters-per-kilometer-hour [bat encounters divided by kilometers traveled per hour].

Table 1: Ecological Landscapes in Wisconsin and associated abbreviations.

Ecological Landscape	Abbreviation
Central Lake Michigan Coastal	CLMC
Central Sand Hills	CSH
Central Sand Plains	CSP
Forest Transition	FT
North Central Forest	NCF
Northeast Sands	NES
Northern Highland	NH
Northern Lake Michigan Coastal	NLMC
Northwest Lowlands	NWL
Northwest Sands	NWS
Southeast Glacial Plains	SGP
Southern Lake Michigan Coastal	SLMC
Southwest Savanna	SWS
Superior Coastal Plain	SCP
Western Coulee and Ridges	WCR
Western Prairie	WP

Results

There were 107 surveys conducted in 52 counties by 53 individuals from Wisconsin Department of Natural Resources, Bad River Natural Resources Department (Tribal), U.S. Forest Service and citizen volunteers. The 107 completed surveys were the best effort of these driving transects (Table 2) bringing the total completed driving surveys to 612 since 2013. Of the 107 routes in 2019, 49.6 kilometers (30.8 mi) was the mean survey length, with the greatest distance being 73.1 km (45.4 mi) (NCF4) and the shortest survey of 18.1 km (11.3 mi) was completed on a partial survey of FT3. Over 5,300 km were traveled resulting in 8,807 hectares (19,983 acres) surveyed (Appendix 3; Table 4).

There was at least one route driven in each ecological landscape (EL) and within each EL there are valid data for all 38 routes. In total, 29,099 files were recorded and 4,544 files (15.6%) were identified as bat encounters. Surveys had a mean of 24.3 bat calls per detector-hour, with a minimum bat calls per-detector hour of 4.67 (NLMC2 on 2 June) and a maximum of 79.8 (CSH on 10 July). For seven consecutive years, Central Sand Hills region had the highest average bat calls per detector hour (49.3, Figure 1) and the Southern Lake Michigan Coastal region had the lowest average bat calls per detector hour (10.3). The number of call files per completed survey had a mean of 54.2 and ranged from 8 (SGP2 on 8 June) to 130 (NCF4 on 13 June). The number of mean bat calls per survey was the lowest since the surveys began in 2013 (Table 3). Most surveys in 2019 were in the low encounter class (0-75 bat encounters per survey), while the remaining surveys fell into the mid- encounter class (76-150 bat encounters per survey). No surveys were classified in the high encounter class (151-225 bats encountered per survey) (Figure 4). The number of surveys varied by week (Figure 2) and bats were more likely to be detected toward the end of the third sampling period (Figure 3), which can likely be attributed to recently-volant juveniles.

Of the 4,544 bat encounters, 1,648 (36.3%) were classified into species groups: high frequency group (325), low frequency group (645), big brown/silver-haired (472), eastern red/eastern pipistrelle/evening bat (166) and little brown/northern long-eared (40) because the bat passes have similar characteristics to two or more species. The remaining 2,896 (63.7%) files were classified as big brown (1,247), eastern red (421), hoary (874), little brown (167) and silver-haired bat (187). The eastern pipistrelle, evening bat and the northern long-eared bat were not detected on acoustic driving transects in 2019. Among the 16 ecological regions, big brown bats (n=11) were the most commonly encountered species followed by the hoary bat (n=5) (Figure 7). Of note, the little brown bat, which is highly susceptible to WNS, was the most commonly encountered species in six ecological landscapes when the driving surveys began in 2013.

Table 2. Number of driving transects and surveyors by year.

Year	No. Driving Transects	No. Surveyors
2013	92	56
2014	77	45
2015	77	48
2016	71	50
2017	92	58
2018	96	55
2019	107	53

Mean Bat Calls Per Detector Hour

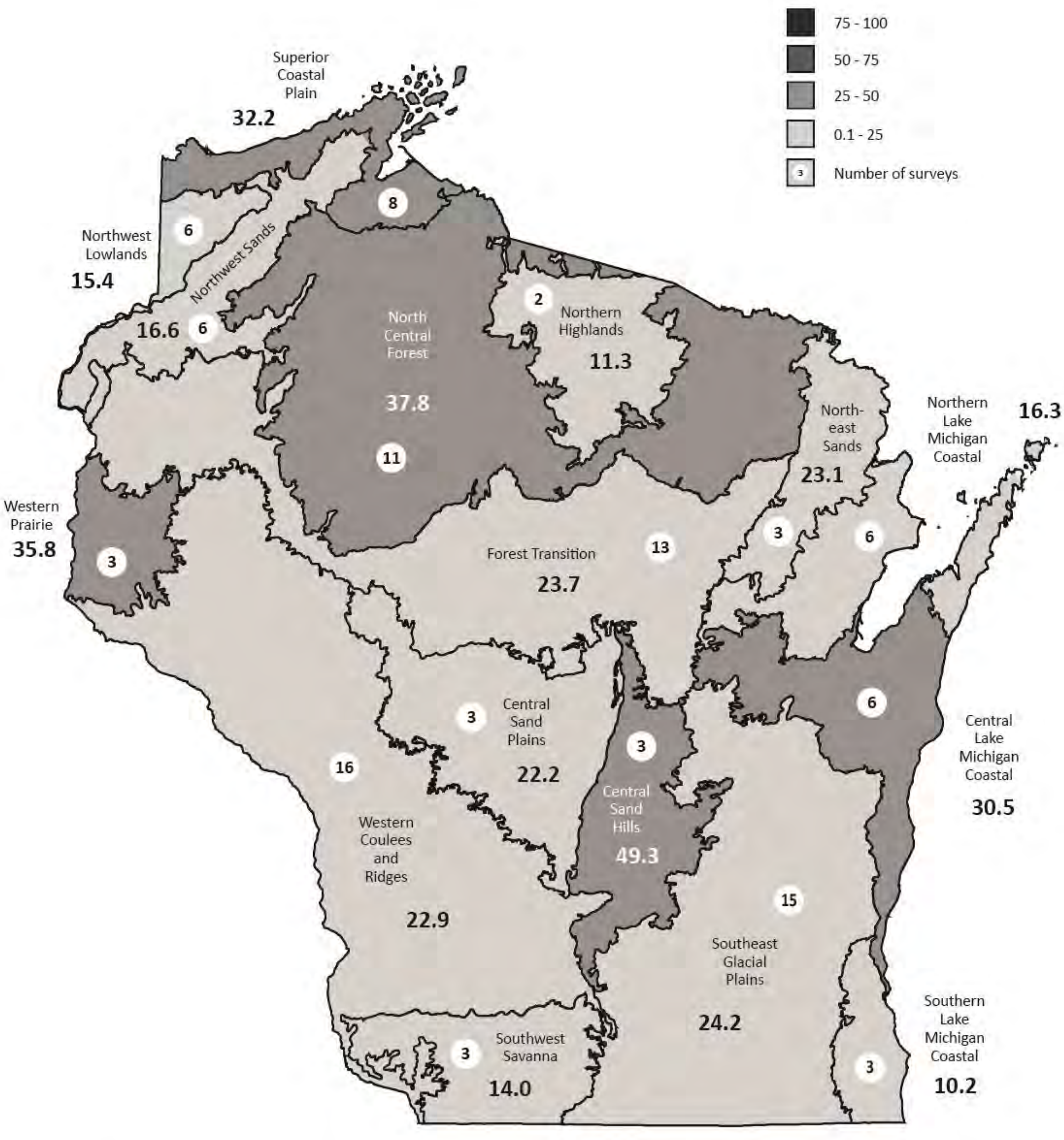


Figure 1. For the seventh year in a row, the highest mean bat calls per detector hour was the Central Sand Hills at 49.3 calls/detector/hour. Mean calls per detector hour across all landscapes was 24.3.

Figure 2. Total number of surveys by week and mean number of bat calls per survey by week (2019).

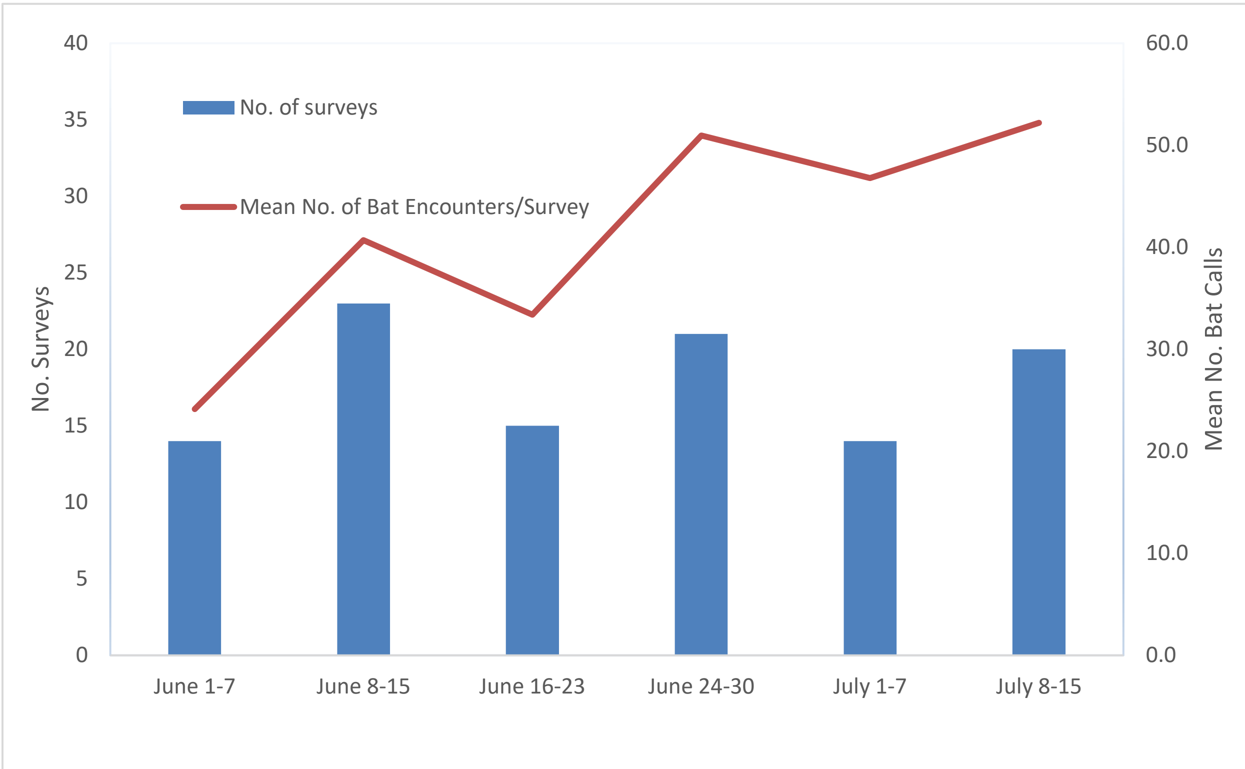


Figure 3. Comparison of mean bat calls per survey for 8-day period from 2013-2019 driving routes. Numbers in brackets indicate sample size. Boxes depict the 25th and 75th percentiles, lines within boxes mark the median, whiskers represent 95th and the 5th percentiles.

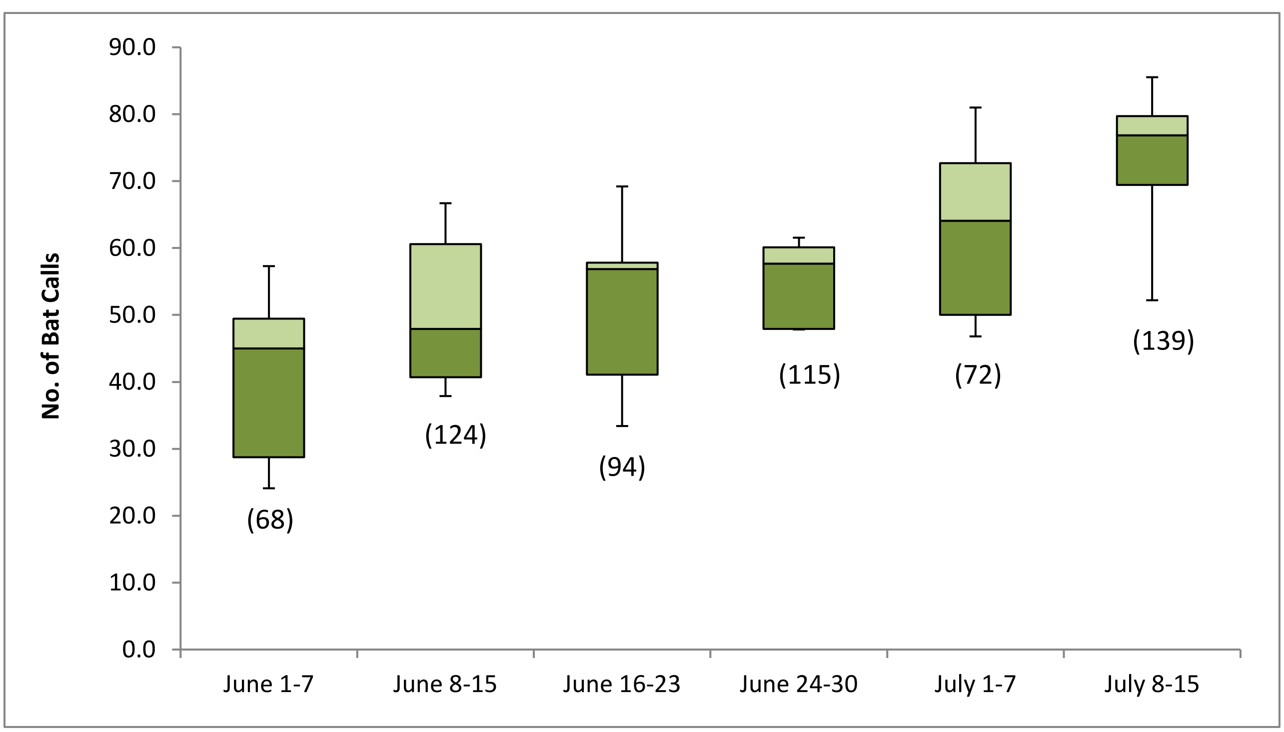


Figure 4. Number of driving surveys within one of three detection ranges by year. The legend displays three bat call detection ranges and the percentage labels are the percentage of each call group of the total surveys. Noteworthy is the decrease in mid and high classes starting in 2017.

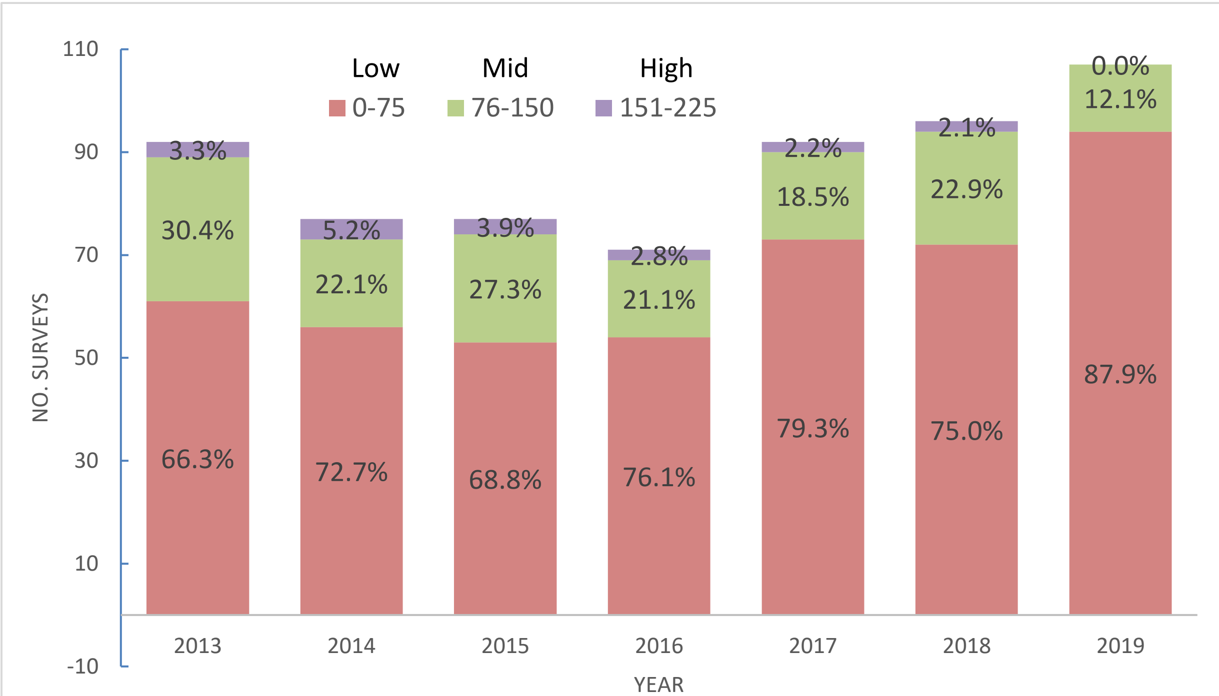


Figure 5. Bat species composition as a percentage of total bat calls per year on all driving surveys from 2013-2019. Three infrequently detected species were omitted from chart (northern long-eared bat, eastern pipistrelle and evening bat); none of which ever registered a value higher than 0.5%. The presence of little brown bats on driving surveys have decreased steadily since 2014.

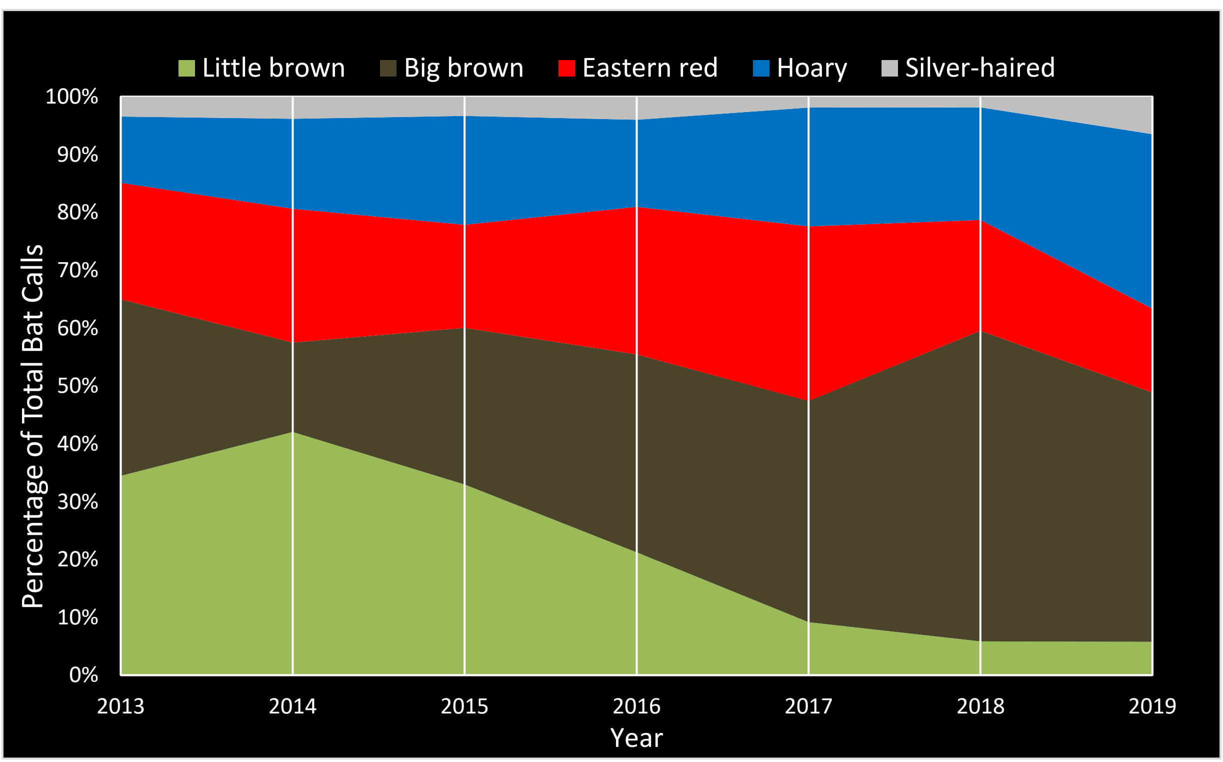
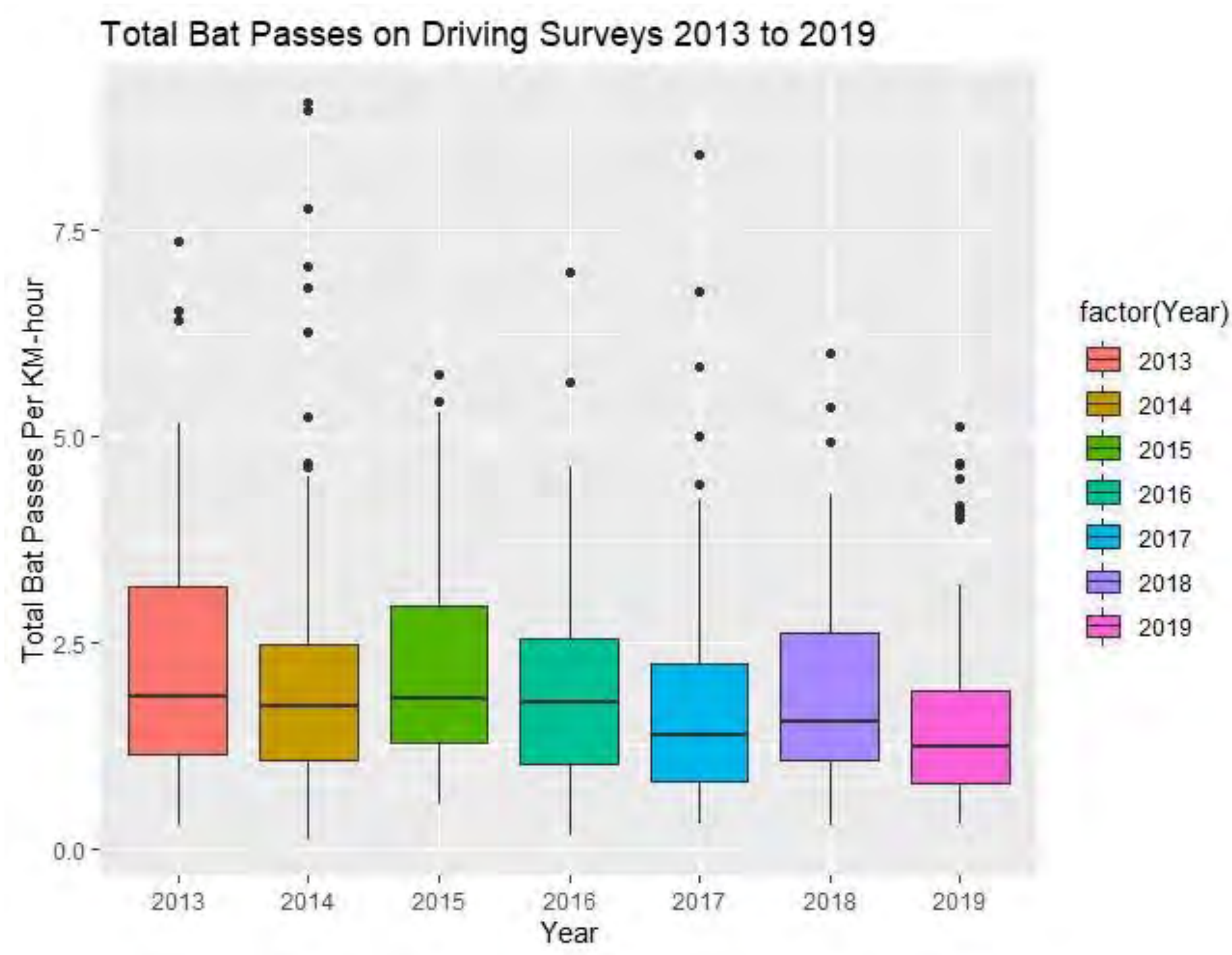


Figure 6. Total passes per kilometer hour by year. 2019 is significantly lower than 2013-2015. Estimates are 0.41 more bat passes per kilometer hour in 2013, 0.36 in 2014 and 0.32 in 2015 than in 2019. 2019 is not different from 2016-2018. The bar is median, the outside edges of the boxes are 1st and 3rd quartiles and the whiskers are, upper whisker = Q_3 + 1.5 * IQR, lower whisker = min. IQR is interquartile range.



Most Common Bat Species by Ecological Region

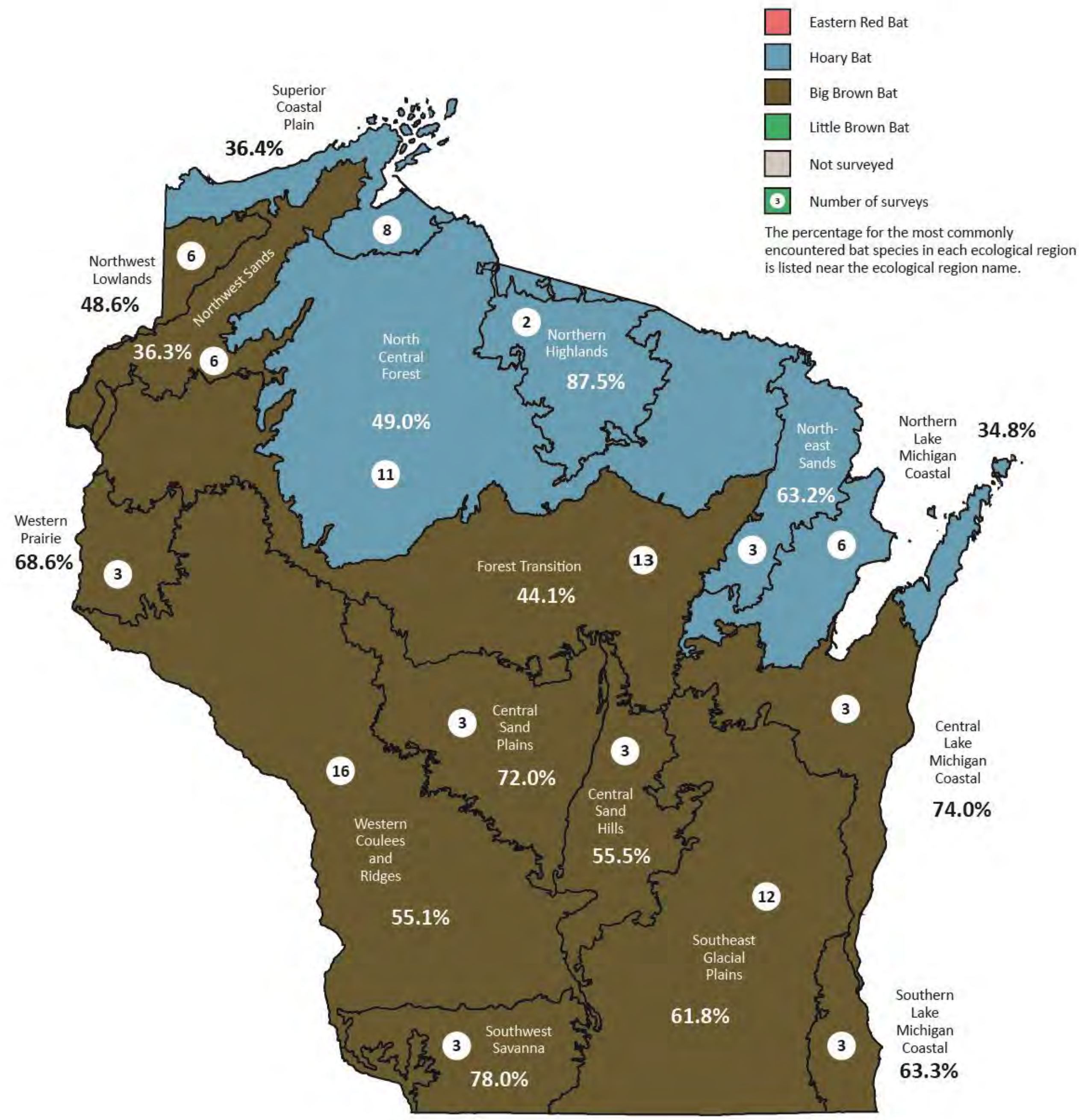
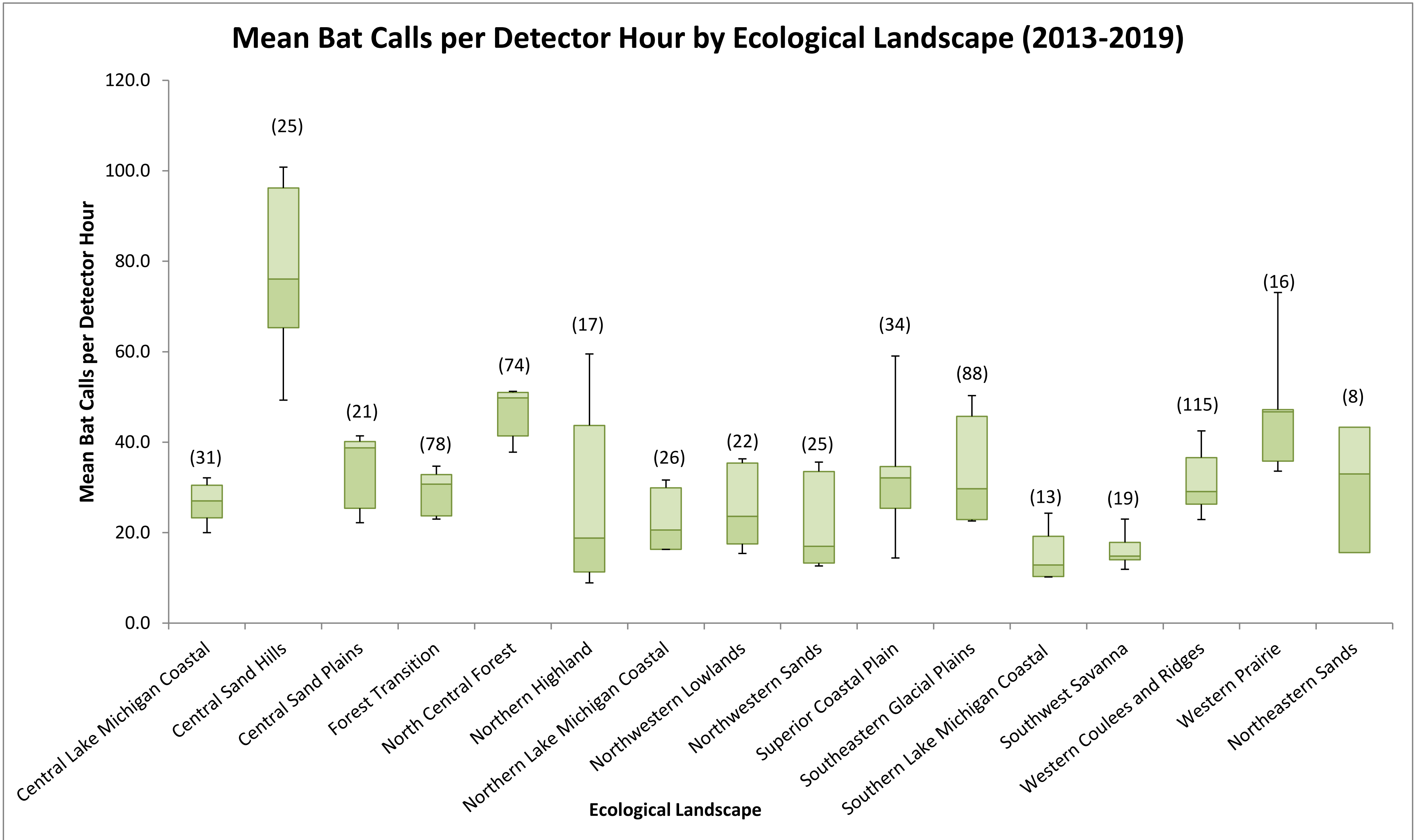


Figure 7. The most commonly encountered bat species by ecological region were the hoary bat (5) and the big brown bat (11) in 2019.

Figure 8. Mean bat calls per detector hour by ecological landscape (2013-2019). Bracketed numbers are total number of surveys per ecological landscape. A total of 612 acoustic driving surveys have been completed since 2013. Boxes depict the 25th and 75th percentiles, lines within boxes mark the median, whiskers represent 95th and the 5th percentiles.



Discussion

Advances in technology have allowed researchers, biologists and citizens to detect and record bat ultrasound in a cost-effective manner, which has created many opportunities to monitor this elusive group of mammals. For some species of bats, i.e. tree or migratory bat species, acoustic data are almost exclusively relied upon to understand habitat suitability, occupancy and seasonal movements. In addition, there are many challenges related to the acoustic detectability of a bat (Loeb et al. 2015), the bat detection system hinges upon whether a bat echolocates while passing through the zone of detection. Nevertheless, if bats are not present in the night skies as they were in the past because of WNS, we will increasingly see more surveys with fewer detections (Figure 6).

Unfortunately, using acoustic bat monitoring driving transects, as stated in previous reports (WDNR 2013 -2018), is not a useful method to assess population trends of the road-averse eastern pipistrelle (aka tri-colored bat) and northern long-eared bat (Braun de Torrez et al. 2017; Whitby 2013). Neither species were detected in the 2,896 species labeled bat passes in the 2019 dataset. The three migratory bat species commonly detected on driving transects displayed similar trends as years prior, with the silver-haired bat (Figures 14-15) and eastern red bat (Figures 16-17) detections relatively stable. The hoary bat (Figures 18-19) was the only migratory species that showed a slight increase in detections in 2019.

Table 3. A comparison of mean number of bat calls per detector hour by ecological landscape (2013-2019), including total number of surveys completed in each year. N/A signifies data are not available. Last column represents the standard deviation (SD) and standard error (SE) for each row.

Ecological Landscape	2013	2014	2015	2016	2017	2018	2019	SD (SE)
CLMC	27.0 (4)	27.5 (3)	32.1 (3)	20.0 (4)	23.7 (5)	23.3 (6)	30.5 (6)	4.3 (1.6)
CSH	81.3 (3)	75.4 (3)	100.8 (3)	96.2 (3)	76.1 (3)	65.3 (6)	49.3 (3)	17.6 (6.7)
CSP	40.2 (3)	38.8 (3)	39.6 (3)	41.4 (3)	25.4 (3)	35.0 (3)	22.2 (3)	7.7 (2.9)
FT	30.4 (12)	32.9 (10)	30.7 (12)	23.0 (9)	30.7 (11)	34.7 (11)	23.7 (13)	4.4 (1.7)
NCF	51.0 (8)	49.8 (12)	51.2 (12)	51.0 (11)	42.1 (12)	41.4 (8)	37.8 (11)	5.7 (2.2)
NES	33.0 (1)	N/A	N/A	29.1 (1)	42.1 (1)	18.8 (3)	23.1 (3)	16.9 (7.6)
NH	59.5 (1)	43.7 (2)	16.6 (3)	19.6 (3)	8.9 (3)	16.3 (3)	11.3 (2)	18.8 (7.1)
NLMC	20.7 (4)	31.6 (4)	29.4 (3)	N/A	20.5 (4)	17.6 (5)	16.3 (6)	6.6 (2.7)
NWL	36.3 (4)	17.5 (3)	35.4 (3)	27.5 (3)	23.6 (3)	N/A	15.4 (6)	8.6 (3.3)
NWS	32.8 (5)	17.4 (1)	12.6 (3)	13.5 (3)	35.6 (4)	14.4 (3)	16.6 (6)	10.1 (4.1)
SCP	27.2 (4)	59.1 (4)	32.1 (5)	34.6 (3)	25.4 (4)	50.3 (6)	32.2 (8)	13.6 (5.2)
SGP	29.7 (15)	22.6 (9)	45.7 (8)	31.6 (11)	22.9 (16)	24.3 (14)	24.2 (15)	11.2 (4.3)
SLMC	12.8 (3)	10.4 (3)	14.1 (1)	N/A	N/A	14.8 (3)	10.2 (3)	5.8 (2.6)
SWS	14.8 (3)	17.8 (3)	23.0 (2)	11.9 (2)	15.8 (3)	29.1 (3)	14.0 (3)	3.6 (1.3)
WCR	42.5 (19)	26.3 (16)	36.6 (15)	30.4 (14)	28.3 (16)	33.6 (19)	22.9 (16)	6.6 (2.5)
WP	46.7 (3)	46.9 (2)	42.9 (1)	73.1 (1)	47.2 (3)	44.5 (3)	35.8 (3)	12.9 (4.9)
Mean (Total #)	***36.9 (92)***	***34.5 (78)***	***38.5 (77)***	***34.3 (71)***	***30.6 (92)***	***31.7 (96)***	**24.3 (107)**	**9.7 (3.8)**

Mirroring the results of the 2018 driving survey analyses, the species composition of bat species recorded on the driving surveys (Figure 5) demonstrates that little brown bats represent only 5.8% of all bat species recorded. The low percentage is a stark contrast from a once-abundant bat (41.9% in 2014) and reflects the declines observed in Wisconsin in both winter surveys and little brown maternity colony counts (WDNR 2019). Recent research in Ontario, which compared acoustic data pre- and post-WNS also showed an increase in big brown activity with a corresponding decline in little brown bats which further supports our accounts (Figure 7, Morningstar et al. 2019).

When comparing three bat detection ranges (low, medium high), 2019 had the most surveys categorized in the lowest bat call range (Figure 4). This shift illustrates that despite the record-setting effort of 107 surveys in 2019, surveys are detecting fewer bats on the landscape even though effort has not diminished. This shift is further explained by data in Figure 6, where the metric of total pass per kilometer hour in 2019 are significantly lower than 2013-2015 (pre- and early years of WNS).

The acoustic bat monitoring driving project, now seven years running, continues to describe a dynamic landscape where there appears to be “winners” and “losers” of the bat world, depending on their susceptibility to WNS. Studies looking to understand the WNS-induced changes in summer bat populations suggest the loss of cave bat species could negatively impact ecosystem health (Pettit and O’Keefe 2017, O’Keefe et al. 2019). The O’Keefe et al. (2019) study goes on to illustrate the importance of monitoring bat, insect and plant communities’ responses wherever WNS is a threat. They suggest, as do other researchers, that with the absence of small-bodied bats like the little brown, eastern pipistrelle and northern long-eared bat, small forest pests such as defoliating moths could likely increase in numbers as the larger and less agile bat like the big brown bat may likely avoid or miss such small prey (USFWS 2016, Frick et al. 2010). While investigating ecological communities and the changes they experience as a result of WNS are important, these questions are outside the scope of this project. Acoustically monitoring bats however, remains a valuable method employed by the Wisconsin Bat Program to assess distribution and population trends in Wisconsin cave and tree bats alike.

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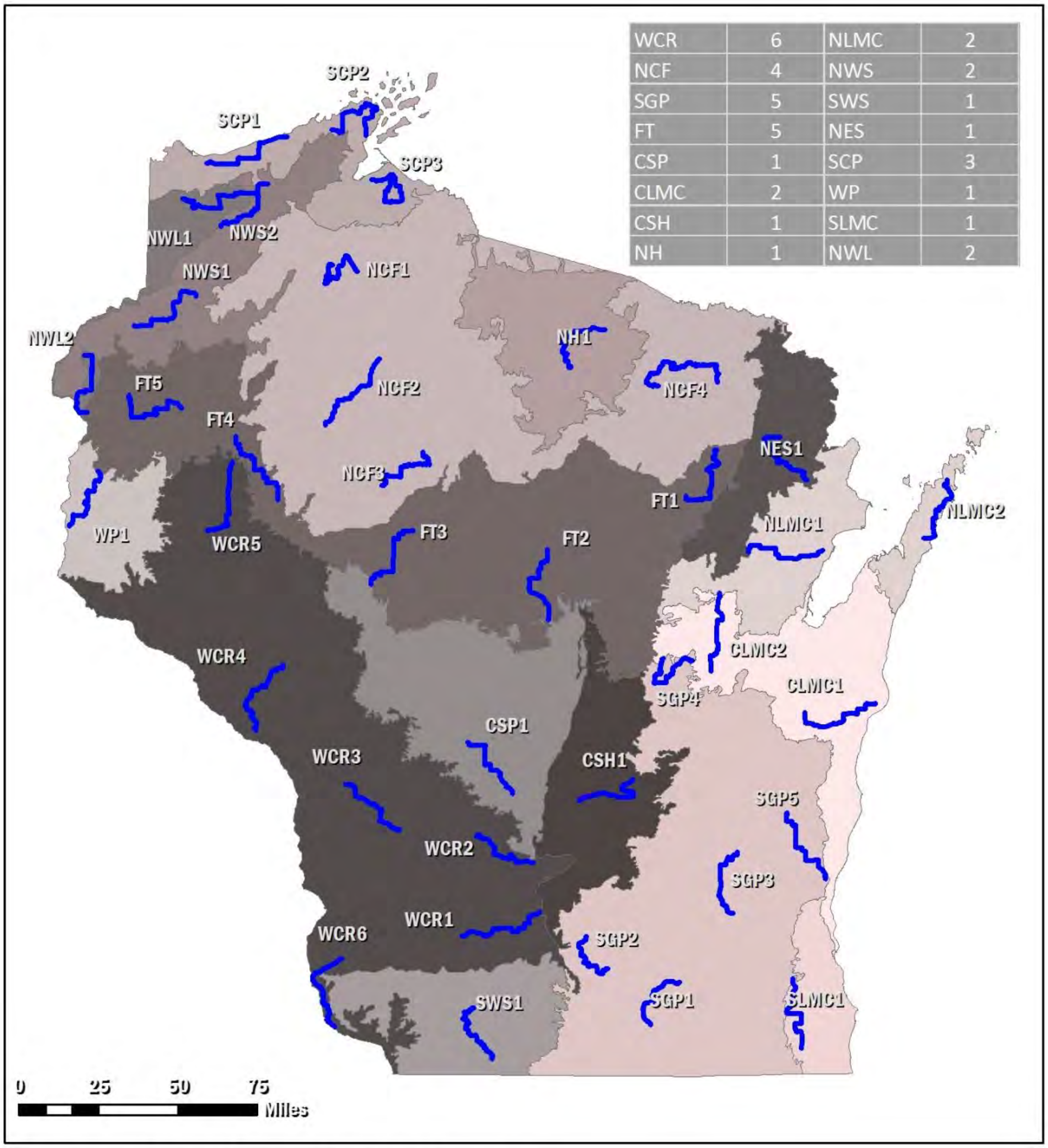
Appendix 1 Acoustic Bat Driving Transects by Ecological Landscape



Wisconsin Bat Monitoring Program
Acoustic Bat Survey Driving Routes

Driving Route

Ecological Landscapes: Central Lake Michigan Coastal (CLMC), Central Sand Hills (CSH), Central Sand Plains (CSP), Forest Transition (FT), North Central Forest (NCF), Northeast Sands (NES), Northern Highland (NH), Northern Lake Michigan Coastal (NLMC), Northwest Lowlands (NWL), Northwest Sands (NWS), Southeast Glacial Plains (SGP), Southern Lake Michigan Coastal (SLMC), Southwest Savanna (SWS), Superior Coastal Plain (SCP), Western Coulees and Ridges (WCR) and Western Prairie (WP)

Appendix 2 (Figures 9-13) Bat species encounter by ecological landscape

Note: Maps were not created for the eastern pipistrelle and northern long-eared bat because they were not detected in 2019.

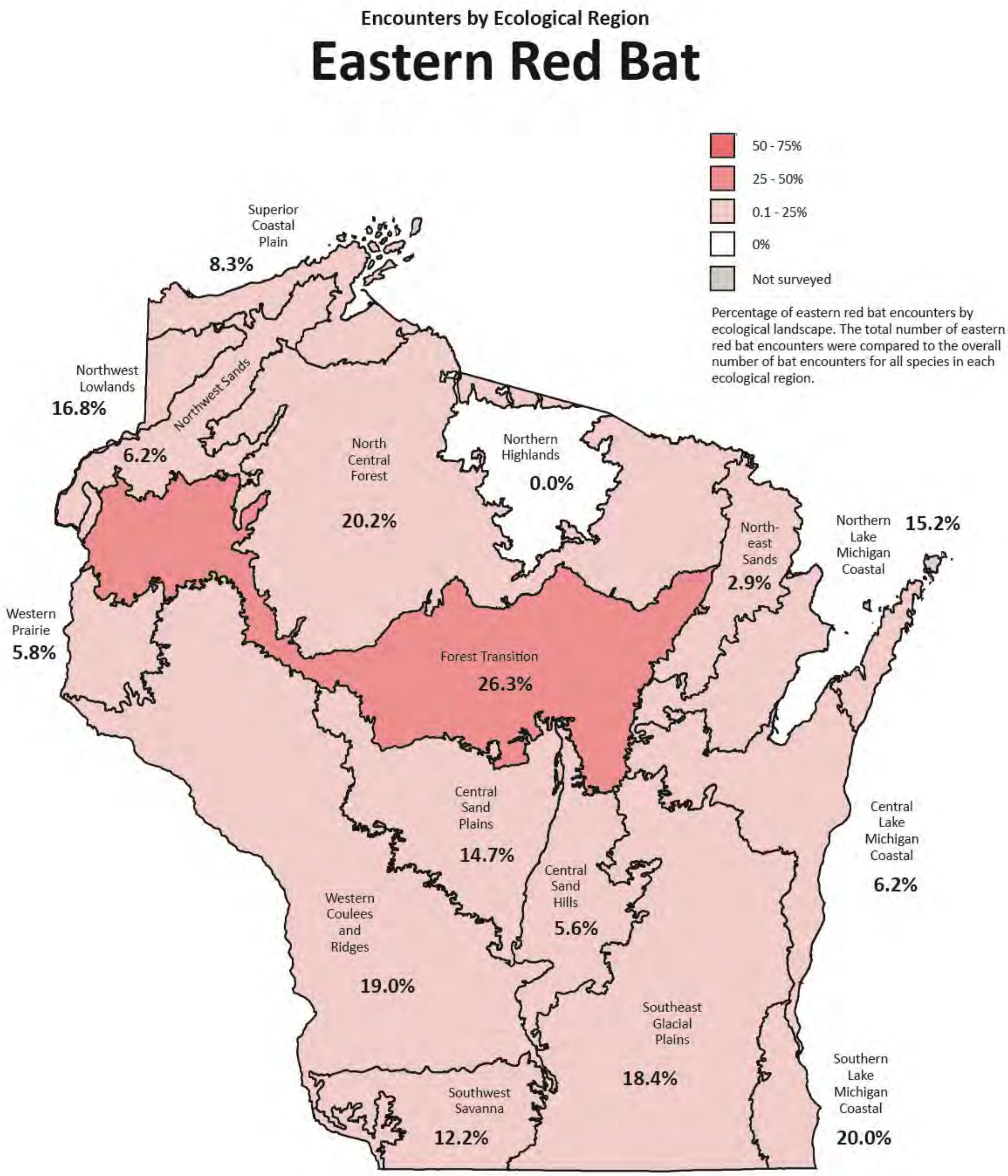


Figure 9. The eastern red bat encounters accounted for 9.4% of all recorded bat passes during driving surveys in 2019.

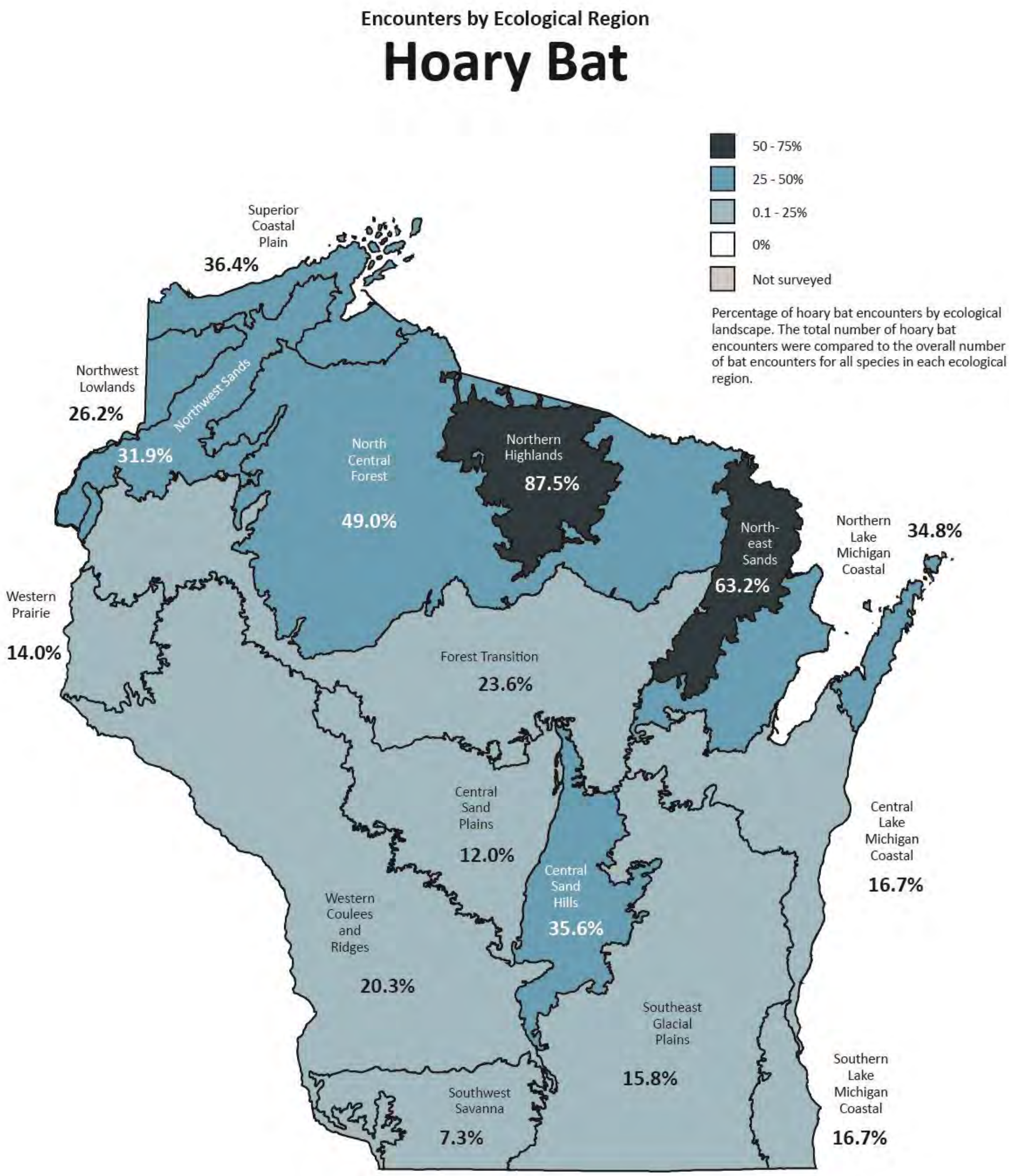


Figure 10. The hoary bat accounted for 19.6% of all bat encounters recorded during driving surveys in 2019.

Encounters by Ecological Region

Silver-haired Bat

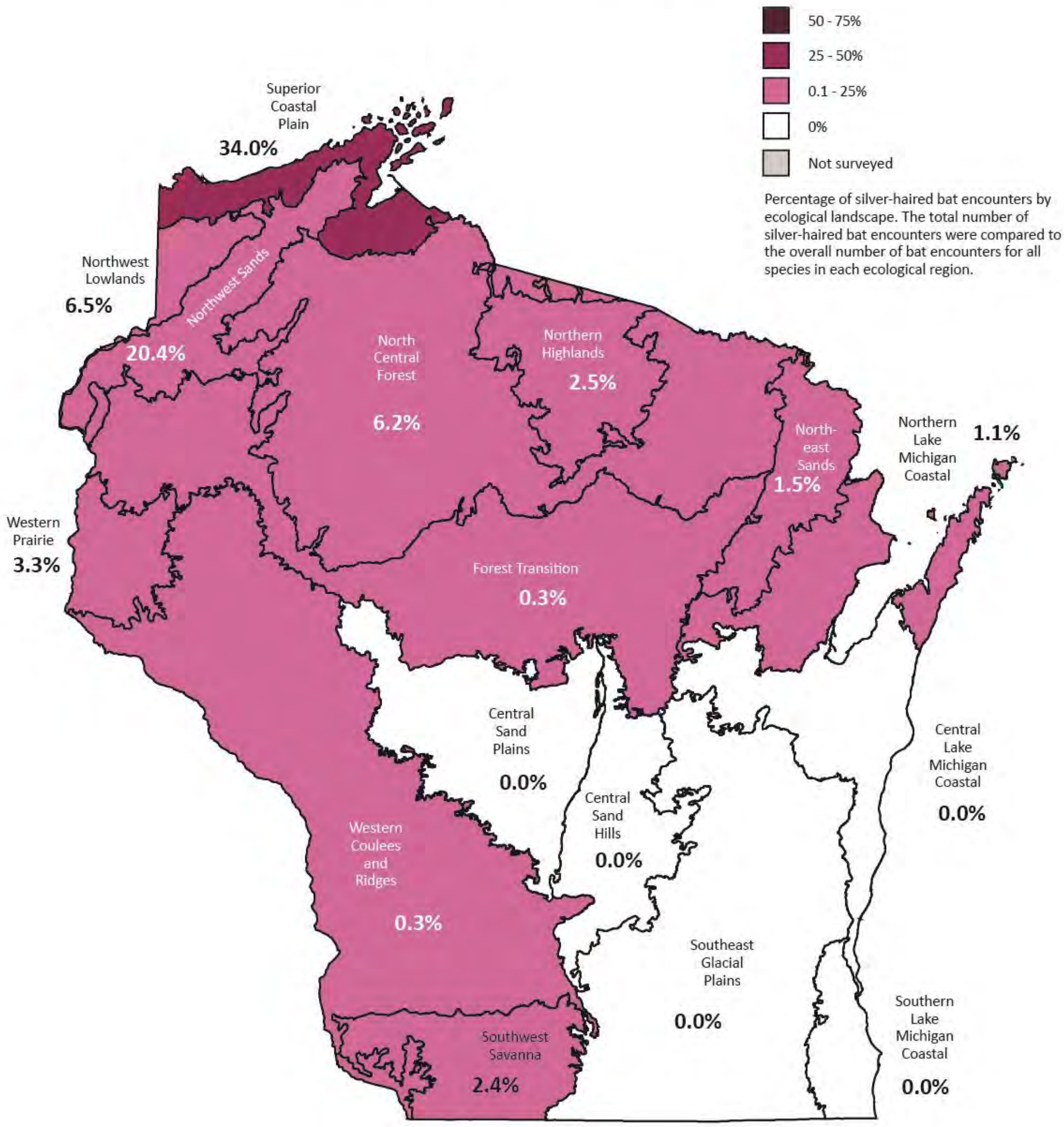


Figure 11. Silver-haired bat encounters accounted for 4.1% of all encounters recorded during driving surveys in 2019.

Encounters by Ecological Region

Little Brown Bat

Figure 12. The little brown bat encounters accounted for 3.7% of all bat encounters recorded during driving surveys in 2019. Of note, little brown bat comprised 34.3% of all encounters in 2013 driving surveys.

Figure 13. The big brown bat had the highest encounter rate (78.0%) in Southwest Savanna region, and comprised 27.4% of all bat encounters during driving surveys in 2019.

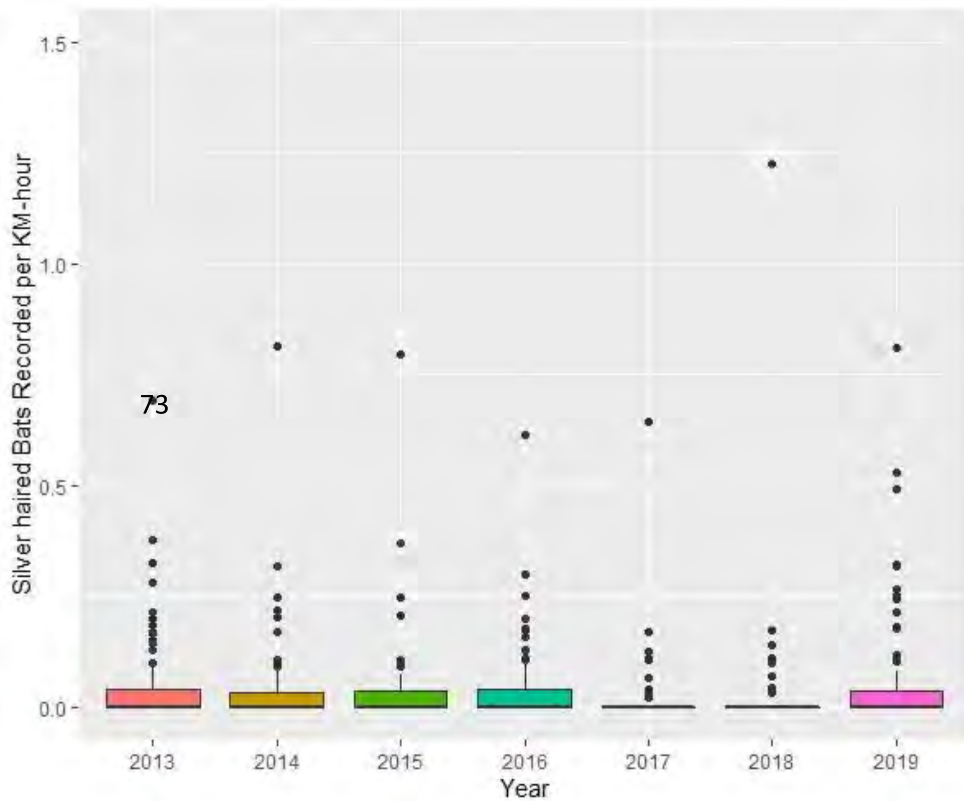
Appendix 3 Table 4. Total area surveyed in June-July 2019

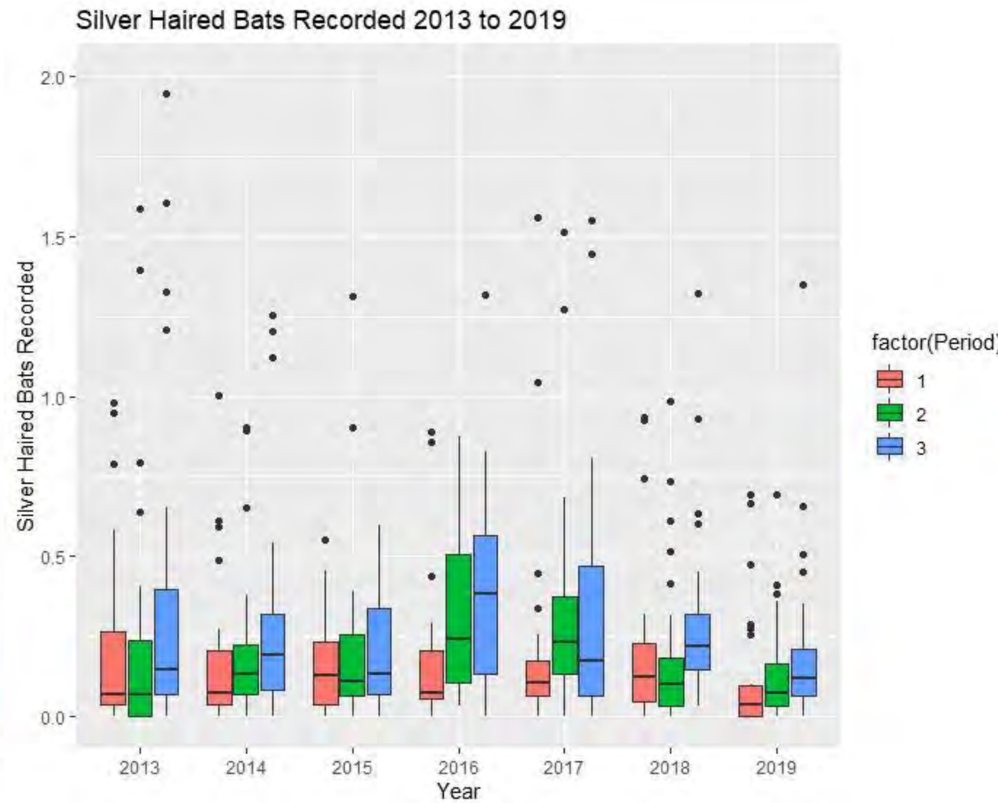
Ecological Landscape	No. Surveys	Total Kilometers	Total Miles	Acres surveyed	Hectares surveyed
CLMC 1	3	143.8	89.4	541.5	219.2
CLMC 2	3	156.1	97.0	587.9	237.9
CSH 1	3	143.7	89.3	541.2	219.0
CSP 1	3	134.0	83.3	504.6	204.2
FT 1	3	149.8	93.1	564.1	228.3
FT 2	1	51.1	31.8	192.4	77.9
FT 3	3	114.8	71.3	432.3	175.0
FT 4	3	161.9	100.6	609.7	246.7
FT 5	3	152.4	94.7	573.9	232.3
NCF 1	2	93.1	57.9	350.6	141.9
NCF 2	3	165.0	102.5	621.4	251.5
NCF 3	3	144.7	89.9	544.9	220.5
NCF 4	3	219.1	136.1	825.1	333.9
NES 1	3	149.6	93.0	563.4	228.0
NH 1	2	95.2	59.2	358.5	145.1
NLMC 1	3	155.9	96.9	587.1	237.6
NLMC 2	3	142.0	88.2	534.8	216.4
NWL 1	3	152.1	94.5	572.8	231.8
NWL 2	3	140.7	87.4	529.9	214.4
NWS 1	3	147.4	91.6	555.1	224.6
NWS 2	3	142.6	88.6	537.0	217.3
SCP 1	3	158.2	98.3	595.8	241.1
SCP 2	3	177.2	110.1	667.3	270.1
SCP 3	2	110.4	68.6	415.8	168.3
SGP 1	3	124.2	77.2	467.7	189.3
SGP 2	3	120.3	74.8	453.0	183.3
SGP 3	3	144.0	89.5	542.3	219.5
SGP 4	3	135.9	84.4	511.8	207.1
SGP 5	3	154.5	96.0	581.8	235.5
SLMC 1	3	155.1	96.4	584.1	236.4
SWS 1	3	126.7	78.7	477.1	193.1
WCR 1	3	150.8	93.7	567.9	229.8
WCR 2	1	53.4	33.2	201.1	81.4
WCR 3	3	146.6	91.1	552.1	223.4
WCR 4	3	146.2	90.8	550.6	222.8
WCR 5	3	142.8	88.7	537.8	217.6
WCR 6	3	157.8	98.1	594.3	240.5
WP 1	3	147.3	91.5	554.7	224.5
Total	**107**	**5306.1**	**3297.2**	**19983**	**8087**
Mean	**2.8**	**139.6**	**86.8**	**525.9**	**212.8**

AnaBat Acoustic Transects (USFS Protocol 2012):[Transect length (miles) x 5280 feet/1 mile x Width of the AnaBat field of detection* (feet)] divided by 43,560 feet/acre = X acres

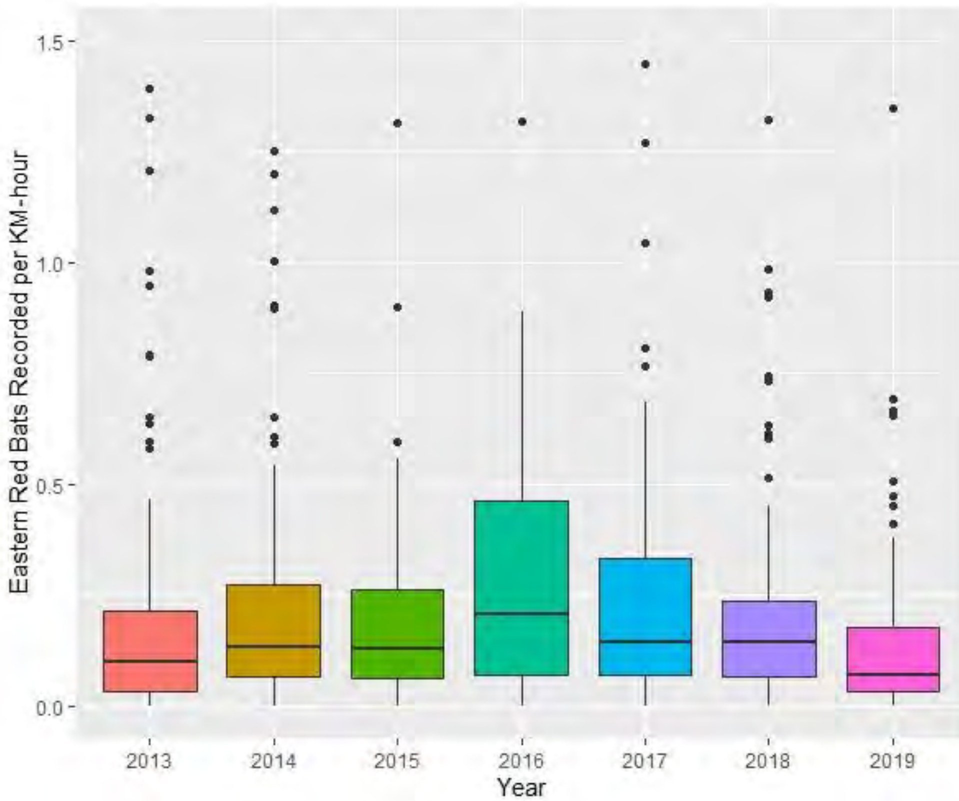
*Assuming a 50 foot field of detection

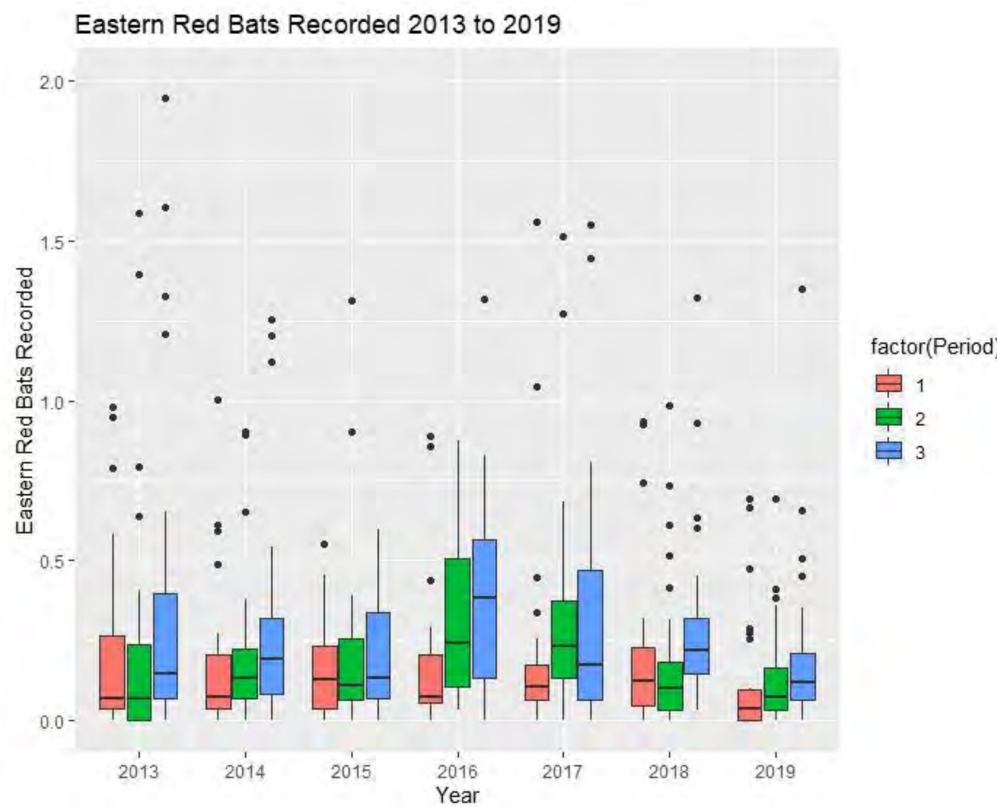
Appendix 4 (Figures 14-19). Silver-haired bat passes per kilometer hour by year (left – Figure 14) and by survey period within each year (right – Figure 15). The bar is median, the outside edges of the boxes are 1st and 3rd quartiles and the whiskers are, upper whisker = Q_3 + 1.5 * IQR, lower whisker = min. IQR is interquartile range.



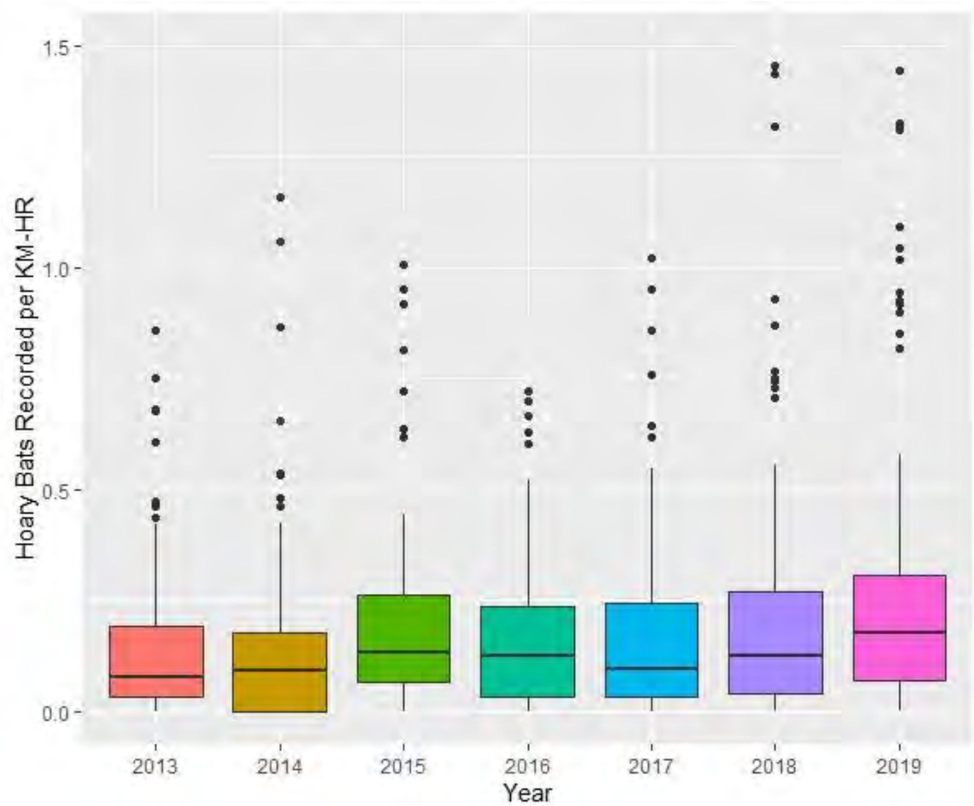


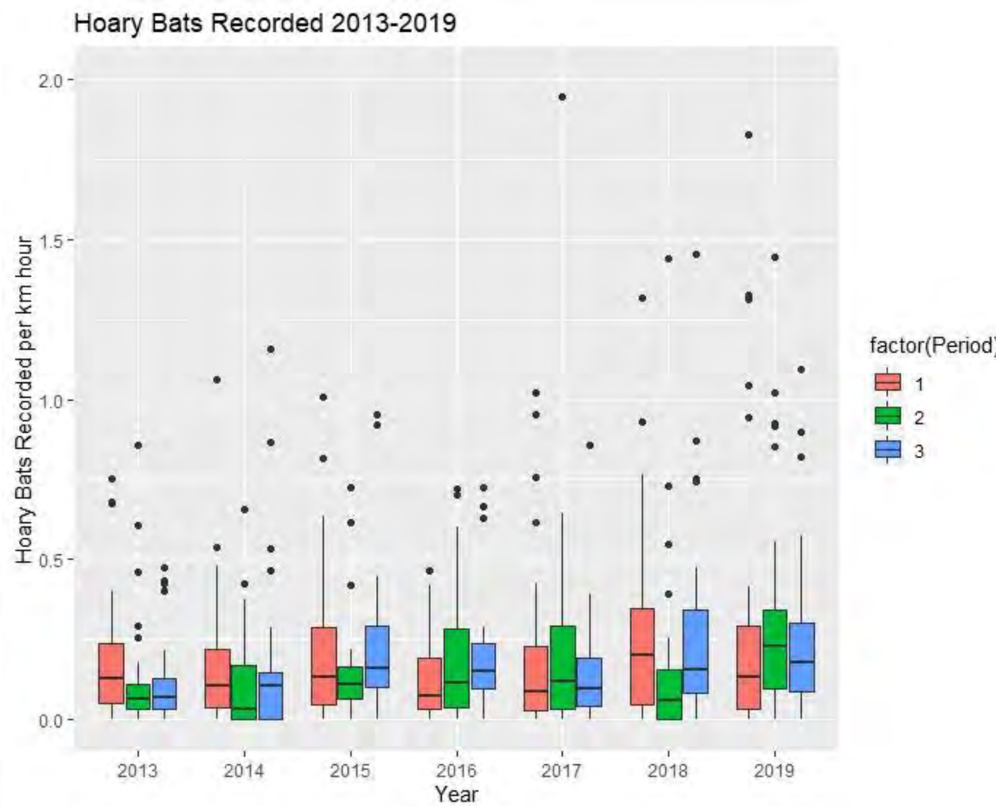
Eastern red bat passes per kilometer hour by year (left – Figure 16) and by survey period within each year (right – Figure 17). The bar is median, the outside edges of the boxes are 1st and 3rd quartiles and the whiskers are, upper whisker = Q_3 + 1.5 * IQR, lower whisker = min. IQR is interquartile range.





Hoary bat passes per kilometer hour by year (left – Figure 18) and by survey period within each year (right – Figure 19). The bar is median, the outside edges of the boxes are 1st and 3rd quartiles and the whiskers are, upper whisker = Q_3 + 1.5 * IQR, lower whisker = min. IQR is interquartile range.





Appendix 5 Table 5. Driving acoustic bat surveys (n=107) conducted in Wisconsin, June-July 2019

Ecological Landscape	No. Surveys	Total Kilometers (Miles)	Total Detector-Hours	Mean Detector-Hours	Mean Speed KMPH (MPH)	Total Calls Detected	Mean Distance KM/Route (MI)	Mean Calls/ Detector-Hour	Mean Passes/KMPH (Passes/MPH)
CLMC 1	3	143.8 (89.4)	4.9	1.4	34.2 (21.3)	131	47.9 (29.8)	30.5	1.3 (2.1)
CLMC 2	3	156.1 (101.5)	4.6	1.5	33.8 (22.0)	116	52.0 (33.8)	25.2	1.1 (1.8)
CSH 1	3	143.7 (89.3)	4.8	1.6	29.8 (18.5)	235	47.9 (29.8)	49.3	2.6 (4.2)
CSP 1	3	134.0 (83.8)	4.7	1.6	28.5 (17.7)	105	44.7 (27.8)	22.2	1.2 (2.0)
FT 1	3	149.8 (93.1)	5.6	1.9	27.0 (16.8)	211	49.9 (31.0)	37.9	2.6 (4.2)
FT 2	1	51.1 (31.8)	1.7	1.7	30.7 (19.1)	59	51.1 (31.8)	25.4	1.9 (3.1)
FT 3	3	114.8 (71.3)	3.9	1.3	29.5 (18.3)	68	38.3 (23.8)	18.3	0.8 (1.2)
FT 4	3	161.9 (100.6)	5.3	1.8	30.8 (19.2)	86	54.0 (33.5)	16.4	0.9 (1.5)
FT 5	3	152.4 (94.7)	5.1	1.7	29.9 (18.6)	93	50.8 (31.6)	18.3	1.0 (1.7)
NCF 1	2	93.1 (57.8)	3.3	1.6	28.5 (17.7)	158	46.5 (28.9)	48.4	2.8 (4.5)
NCF 2	3	165.0 (102.6)	5.4	1.8	30.7 (19.1)	201	55.0 (34.2)	37.3	2.2 (3.5)
NCF 3	3	144.7 (89.9)	5.7	1.9	25.7 (16.0)	196	48.2 (30.0)	34.2	2.6 (4.2)
NCF 4	3	219.1 (136.1)	8.6	2.9	25.7 (16.0)	295	73.0 (45.4)	34.9	3.8 (6.1)
NES 1	3	149.6 (93.0)	4.9	1.6	30.7 (19.1)	112	49.9 (31.0)	23.1	1.2 (2.0)
NH 1	2	95.2 (59.2)	4.1	2.0	23.4 (14.6)	45	47.6 (29.6)	11.3	0.9 (1.5)
NLMC 1	3	155.9 (96.8)	5.1	1.7	30.6 (19.0)	96	52.0 (32.3)	18.9	1.0 (1.7)
NLMC 2	3	142.0 (88.2)	5.0	1.7	28.6 (17.8)	66	47.3 (29.4)	13.6	0.8 (1.2)
NWL 1	3	152.1 (94.5)	5.0	1.7	30.2 (18.8)	73	50.7 (31.5)	14.5	0.8 (1.3)
NWL 2	3	140.7 (87.4)	4.6	1.5	30.4 (18.9)	75	46.9 (29.1)	16.2	0.8 (1.3)
NWS 1	3	147.4 (91.6)	5.4	1.8	30.5 (27.4)	122	49.1 (30.5)	23.0	1.5 (2.4)
NWS 2	3	142.6 (88.6)	5.2	1.7	27.8 (17.3)	52	47.5 (29.5)	10.1	0.6 (1.0)
SCP 1	3	158.2 (98.3)	4.9	1.6	32.1 (19.9)	168	52.7 (32.8)	33.8	1.8 (2.8)
SCP 2	3	177.2 (110.1)	6.3	2.1	28.3 (17.6)	139	59.1 (36.7)	22.2	1.6 (2.6)
SCP 3	2	110.4 (68.6)	5.0	2.5	22.7 (14.1)	216	55.2 (34.3)	44.7	4.8 (7.7)
SGP 1	3	124.2 (77.1)	4.2	1.4	29.6 (18.4)	113	41.4 (25.7)	27.1	1.3 (2.0)
SGP 2	3	120.3 (74.8)	4.9	1.6	24.7 (15.3)	78	40.1 (24.9)	15.7	1.1 (1.7)
SGP 3	3	144.0 (89.5)	4.8	1.6	29.8 (18.5)	103	48.0 (29.8)	21.4	1.1 (1.8)
SGP 4	3	135.9 (84.4)	4.5	1.5	30.2 (18.8)	109	45.3 (28.1)	24.2	1.2 (1.9)
SGP 5	3	154.5 (91.8)	5.1	1.7	30.6 (18.3)	72	51.5 (30.6)	14.5	0.8 (1.3)
SLMC 1	3	155.1 (96.3)	5.0	1.7	31.4 (19.5)	48	51.7 (32.1)	10.2	0.5 (0.8)
SWS 1	3	126.7 (78.7)	4.3	1.4	29.5 (18.3)	59	42.2 (26.2)	14.0	0.7 (1.0)

WCR 1	3	150.8 (93.7)	5.7	1.9	26.5 (16.5)	160	50.3 (31.2)	28.6	2.0 (3.2)
WCR 2	1	53.4 (33.2)	1.8	1.8	30.0 (18.6)	9	53.4 (33.2)	5.0	0.3 (0.5)
WCR 3	3	146.6 (91.1)	5.3	1.8	28.2 (17.6)	98	48.9 (30.4)	19.0	1.2 (1.9)
WCR 4	3	146.2 (90.8)	6.0	2.0	24.4 (15.2)	165	48.7 (30.3)	28.0	2.2 (3.6)
WCR 5	3	142.8 (88.8)	4.9	1.6	29.2 (18.1)	53	47.6 (29.6)	11.0	0.6 (1.0)
WCR 6	3	157.8 (98.1)	5.3	1.8	29.8 (18.5)	184	52.6 (32.7)	34.2	2.1 (3.4)
WP 1	3	147.3 (91.5)	4.9	1.6	30.1 (18.7)	175	49.1 (30.5)	35.8	1.9 (3.1)
Total	**107**	**5306.1 (3297.0)**	**186**			**4544**			
Mean	**2.8**	**49.6 (30.8)**	**4.9**	**1.7**	**30.7 (19.1)**	**119.6**	**29.0 (18.0)**	**24.3**	**1.5 (0.9)**