

DISTRIBUTION OF BAT SPECIES IN SOUTHEASTERN SASKATCHEWAN BASED ON ACOUSTIC SURVEYS AND CAPTURES

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White-nose syndrome is a disease caused by an invasive fungal pathogen (*Pseudogymnoascus destructans*) that is causing significant population declines in North American bat species.^{1,2} White-nose syndrome disrupts hibernating bats' physiology and behaviour³⁻⁵ causing infected bats to be active during the

winter hibernation period depleting fat stores before resources become available the following spring.²

White-nose syndrome is suspected to have been introduced to New York state in 2006 and has since spread to 36 of the United States and seven Canadian provinces, affecting 13 of the 47 species of bat found in North America.⁶

There are many factors that have made bat conservation challenging in light of white-nose syndrome, one of which being a relative lack of information about these species large-scale movements and space use.^{7,8} Given the current trajectory of the fungus' spread, it seems probable that white-nose syndrome will

arrive in Saskatchewan, most likely arriving initially in the southeastern corner near the Manitoba and United States borders. Knowledge of species distribution throughout Saskatchewan is important for developing conservation action plans which may include implementing population monitoring programs or increased habitat protection. Our objective, therefore, was to determine where bats, principally Big Brown Bats (*Eptesicus fuscus*) and Little Brown Myotis (*Myotis lucifugus*) occurred. We predicted there would be a shift in species composition moving east from Regina towards the Manitoba border. Big Brown Bats are the predominant species in



Little Brown Myotis in flight, showing the four finger bones that give bats their scientific name (Chiroptera = hand wing). This bat is also banded for individual identification. Photo credit: Sherri and Brock Fenton.

Regina (R.M. Brigham, unpublished data) while Little Brown Bat colonies seem to occur more frequently in Manitoba (C.K.R. Willis, unpublished data). We were particularly interested in these two species because they are the species found in this area that are most affected by WNS.¹ Despite our specific interest in Big Brown and Little Brown Myotis, we present data from our survey for all species, including information on the two migratory species; Hoary Bats (*Lasiurus cinereus*) and Silver-haired (*Lasionycteris noctivagans*) bats, which are not known to be symptomatically affected by WNS,⁹ however, these species are also of conservation concern, as they are commonly killed at wind turbines.^{10,11}

We surveyed 18 towns (Figure 1) in southeastern SK between 20 May and 19 August 2014 using mist nets and Anabat acoustic detectors (Table 1). Nets were set up in areas where we expected that bats would forage for insects including: golf courses, community parks, and residential

backyards. We used an average of three mist nets for 2.5 hours a night for a total of 310 netting hours over 40 nights and an average of eight net hours per night. Acoustic bat detectors were placed at a height of approximately 1 m with the microphone pointed upwards at an angle of about 45° outside of suspected maternity colonies (where females aggregate to give birth to

and raise pups) and in potential foraging areas. Suspected maternity colony sites included community centres, churches, and abandoned buildings. We used an average of 1.5 bat detectors for three hours per night for a total of 121 acoustic sampling hours over 34 nights and an average of 3.5 sampling hours per night. All calls were manually identified using Analoook software

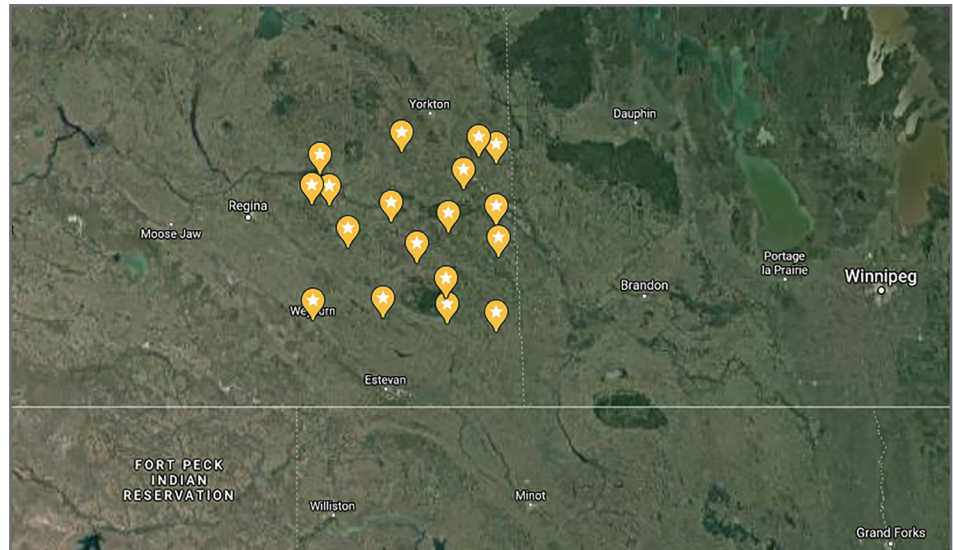


FIGURE 1: Southeastern towns in Saskatchewan that were surveyed for bats using both acoustic bat detectors and mist nets are indicated with stars.

LOCATION	NET HOURS	CAPTURES	ACOUSTIC HOURS	ACOUSTIC DETECTIONS
Carlyle	26	MYLU, LACI	7.5	LANO/EPFU, MYLU, LACI
Churchbridge	15.5	-	-	-
Esterhazy	14.5	LANO	3.5	-
Fort Qu'Appelle	8	MYLU	-	-
Grenfell	14.5	-	6.5	LANO/EPFU, MYLU, LACI
Indian Head	20.5	EPFU, MYLU	21	LANO/EPFU, MYLU
Kipling	11	-	3.5	LANO/EPFU, MYLU
Langenburg	8	-	1.5	LANO/EPFU, MYLU, LACI
Melville	32	LANO, EPFU	10	LANO/EPFU, MYLU
Montmartre	20	MYLU	5.5	-
Moose Mountain Provincial Park	11	-	4.5	LANO/EPFU, MYLU
Moosomin	15.5	-	4.5	-
Qu'Appelle	18.5	-	8	LANO/EPFU, LACI
Redvers	21	-	6	LANO/EPFU, LACI
Rocanville	14	-	4.5	-
Stoughton	17.5	-	3.5	MYLU, LACI
Weyburn	23.5	MYLU	23.5	LANO/EPFU, MYLU
Whitewood	14.5	-	8	LANO/EPFU

TABLE 1: Species of bats detected using acoustic detectors and caught in mist nets in Southeastern Saskatchewan. Silver-haired Bat (*Lasionycteris noctivagans*; LANO) and Big Brown Bat (*Eptesicus fuscus*; EPFU) calls cannot be reliably differentiated based on acoustic sampling, and are therefore combined. Little Brown Myotis (*Myotis lucifugus*; MYLU) and Hoary Bats (*Lasiurus cinereus*; LACI) were also detected and can be reliably identified.

based on the minimum echolocation call frequency as being Little Brown, Hoary or Big Brown/Silver-haired. It was not possible to confidently discriminate Big Brown from Silver-haired bats based on the similar acoustic structure of their calls.

While we expected that there would be a clear distinction between towns where Big Brown Bats and Little Brown Bats were found, based on the observations of M. Brigham and C. Willis, there did not appear to be any division between the two species distributions in southeastern Saskatchewan. There were 14 sites where either Big Brown or Little Brown *Myotis* were captured or possibly acoustically detected. Of these sites, there were eight where both species were detected together. This suggests that these species are frequenting the same types of foraging and roosting sites in these small towns. If this is the case, we predict that species composition will change as WNS spreads to these areas. Little Brown Bats tend to suffer dramatically higher mortality¹ from this disease than Big Brown Bats,¹² so towns with both species present may experience a shift towards primarily Big Brown Bats.

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POETRY

Dawn Beat

A Downy Woodpecker draws
my gaze
with his rat-a-tat-tat,
on a warped and weathered
board of porosity fencing.

Clearly, he's found something
worthwhile there,
his red-capped head an
indistinguishable blur
as he applies his
small, iron-hard bill
to his work.

He drums a dizzilyingly,
rapid-fire staccato beat
that Gene Krupa or
Buddy Rich could
only envy,
animating and brightening
the still, grey morning.

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