



First results on the regional distribution, seasonal timing, and habitat association of Little Brown Bats (*Myotis lucifugus*) in Southcentral, Interior, and Western Alaska



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Introduction

Important life history traits of Little Brown Bats (*Myotis lucifugus*) that are germane to species management and conservation are not well understood in Southcentral, Interior and Western Alaska. White-Nose Syndrome (*Pseudogymnoascus destructans*) is now found in 27 of the lower 48 states and 5 Canadian provinces and baseline data for Little Brown Bats in Alaska is needed.

Tessler et al. (2013) compiled existing anecdotal reports and photographs of bat presence throughout the three regions. Our study examined a subset of locations in greater detail.

White Nose Syndrome



Source: http://www.fws.gov/northeast/white_nose.html Nov 08

Objectives

Engage citizen science volunteers and ADF&G biologists at pre-selected sites in Southcentral, Interior and Western Alaska to address knowledge gaps related to:

1. Regional Distribution
2. Habitat Association
3. Seasonal Activity

Little Brown Bats were detected in 89% of our recording locations (calls detected at 33/37 sites; Fig. 1)
We collected, in total, 32,063 calls.

Results

1. Regional Distribution: Detectors were put in four novel locations during the summer of 2015:

- Round Island (no bats detected).
- McNeil State Game Refuge and Reserve (bats detected).
- Stuyahok Wier (bats detected).
- Kotzebue (no bats detected).

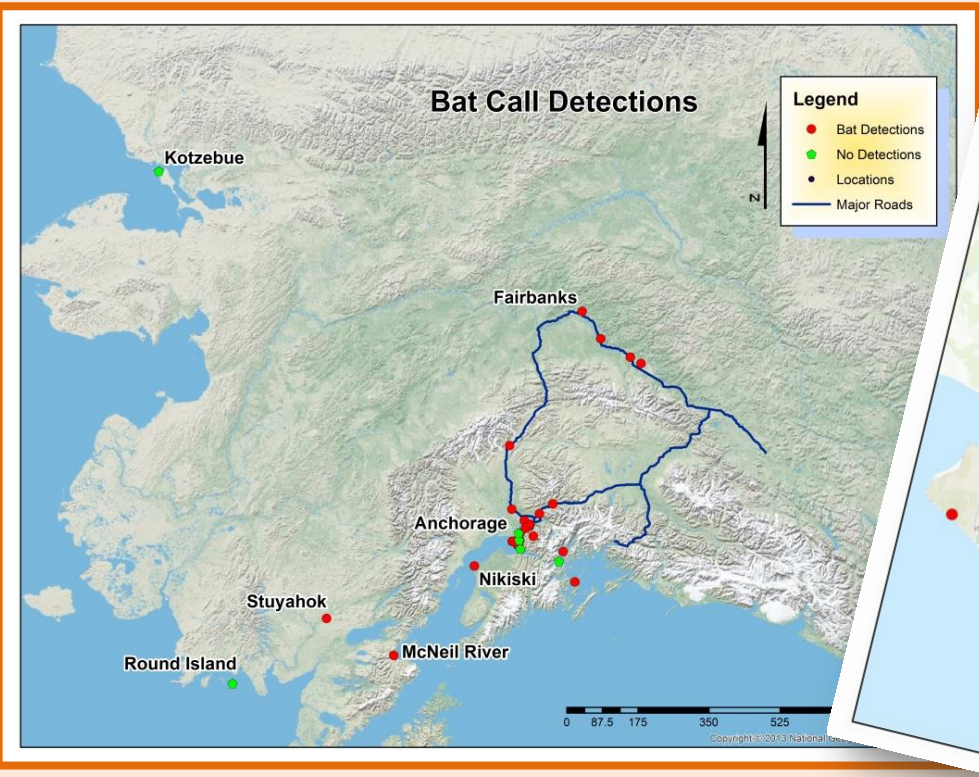


Fig. 1. Locations of bat detection sites.

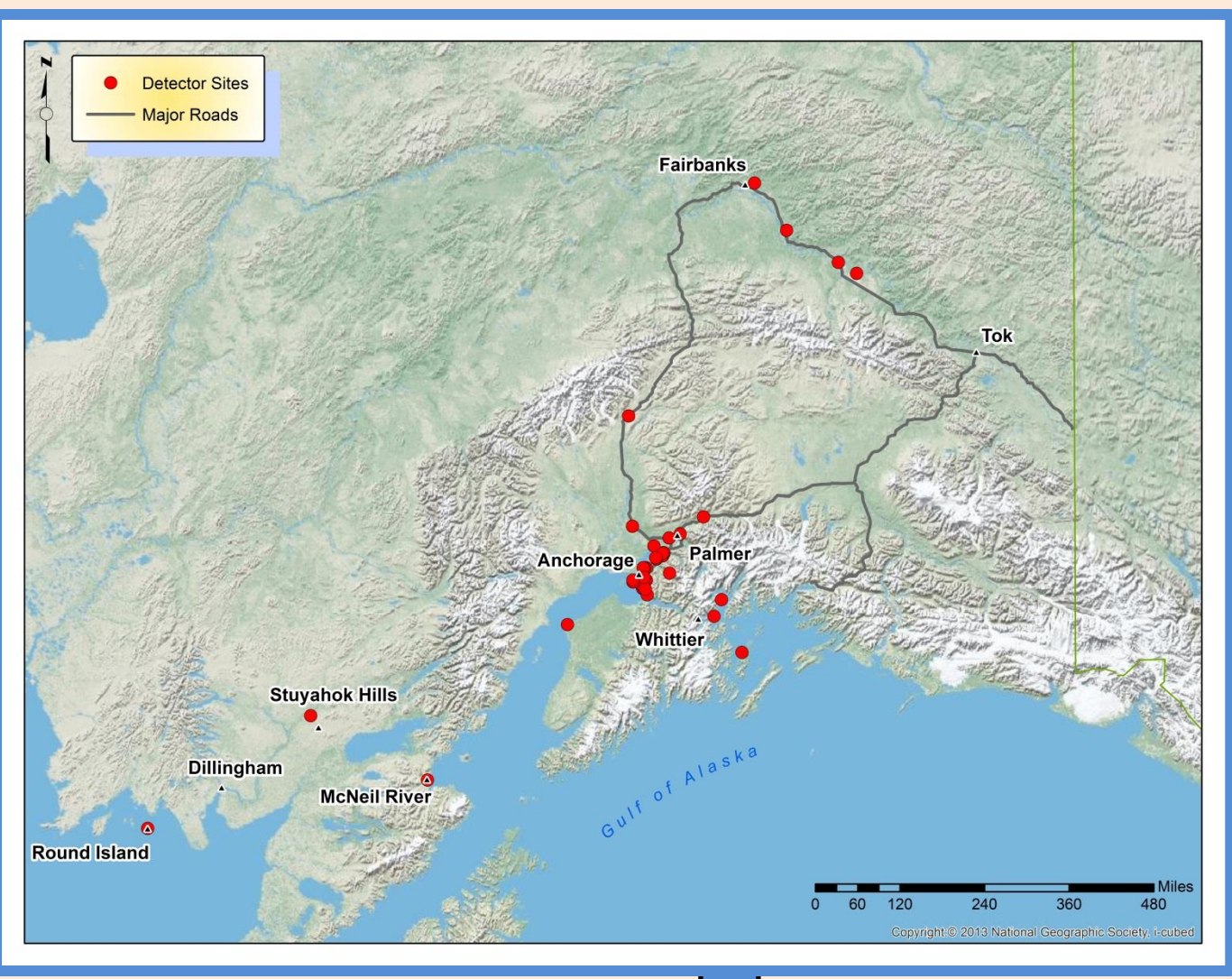
<http://3.bp.blogspot.com>

Methods

This ongoing project utilizes citizen scientists and biologists at the Alaska Department of Fish and Game (ADF&G) to distribute and run Wildlife Acoustic ultrasonic bat recorders across Southcentral, Interior, and Western Alaska, starting late fall of 2013-present.

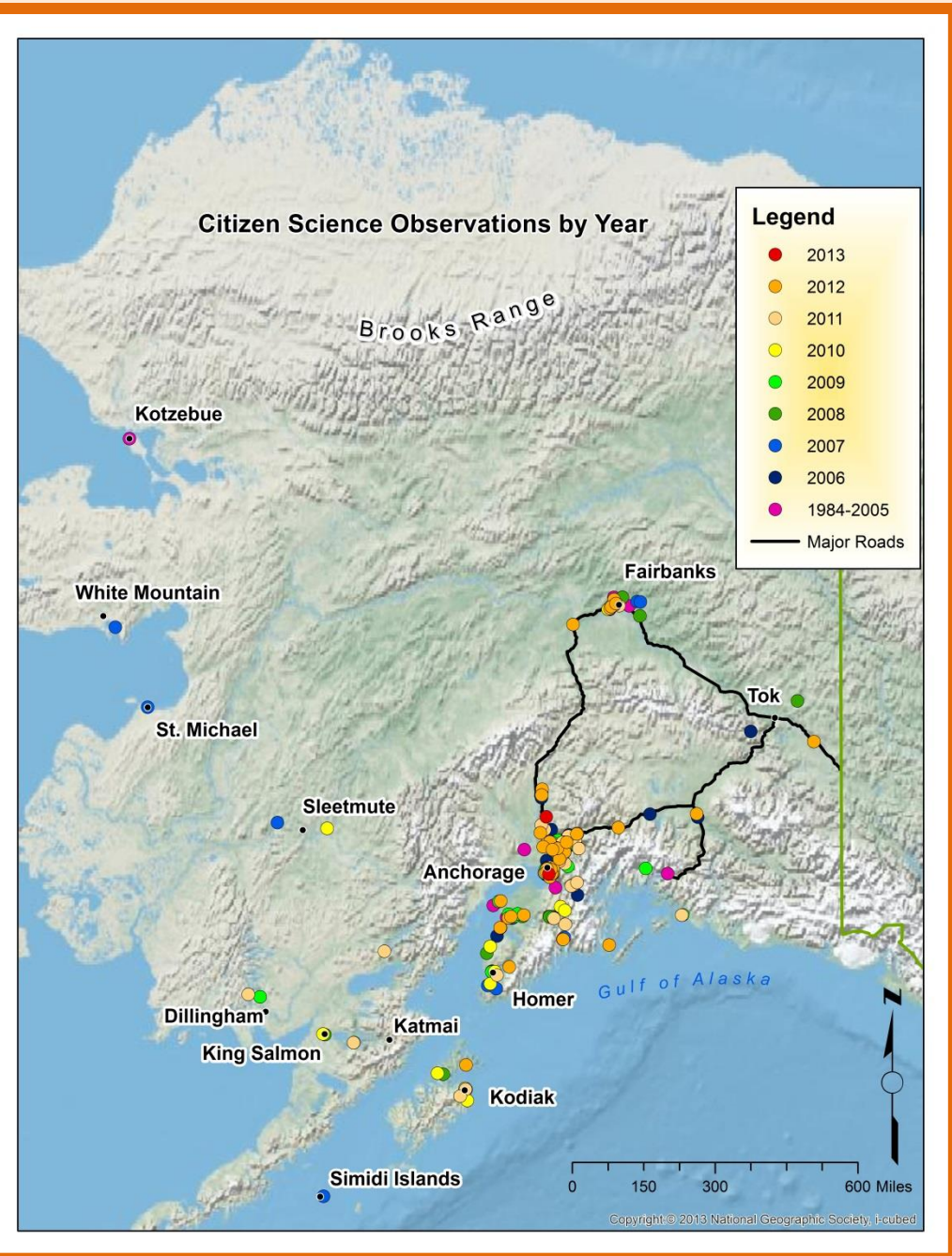
1. Determine **Regional Distribution** by using:

- Detectors at anecdotal locations.
- Detectors at sites with no data.
- Pre-existing detector data.



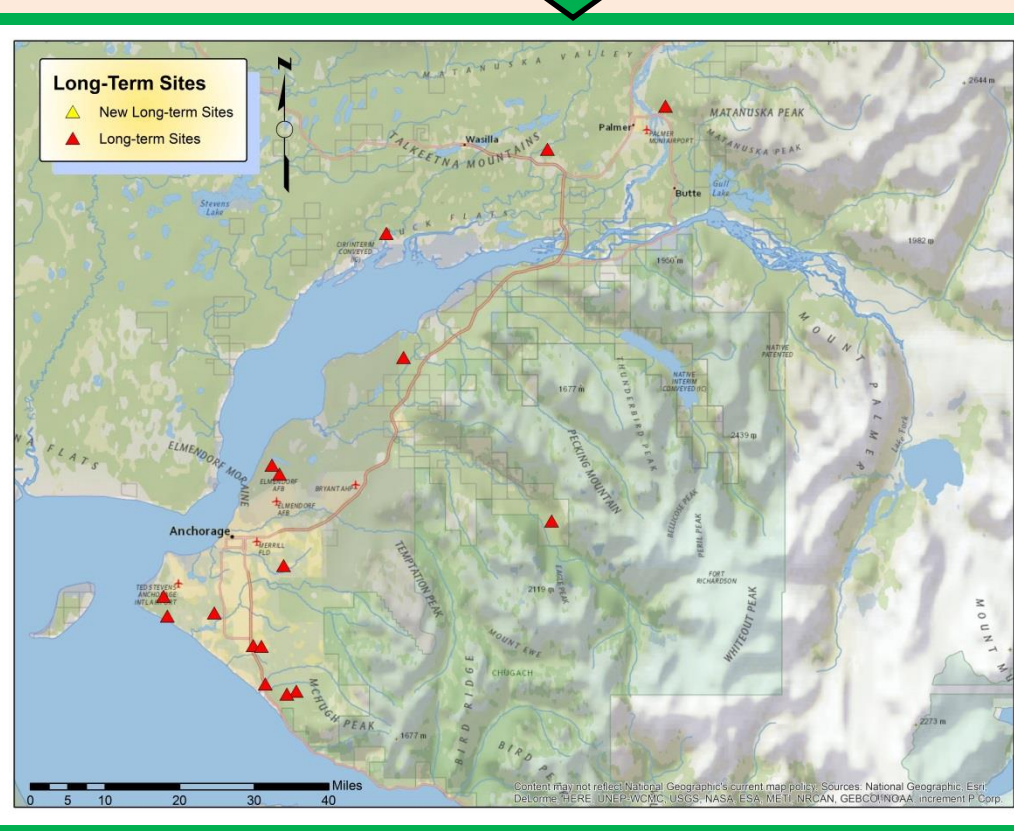
2. Determine **Habitat Association** by:

- Extracting landcover habitat.
- Ground-truth with photos.



3. Determine **Seasonal Activity** by:

- Finding winter locations.
- Engaging citizens in year-round monitoring.



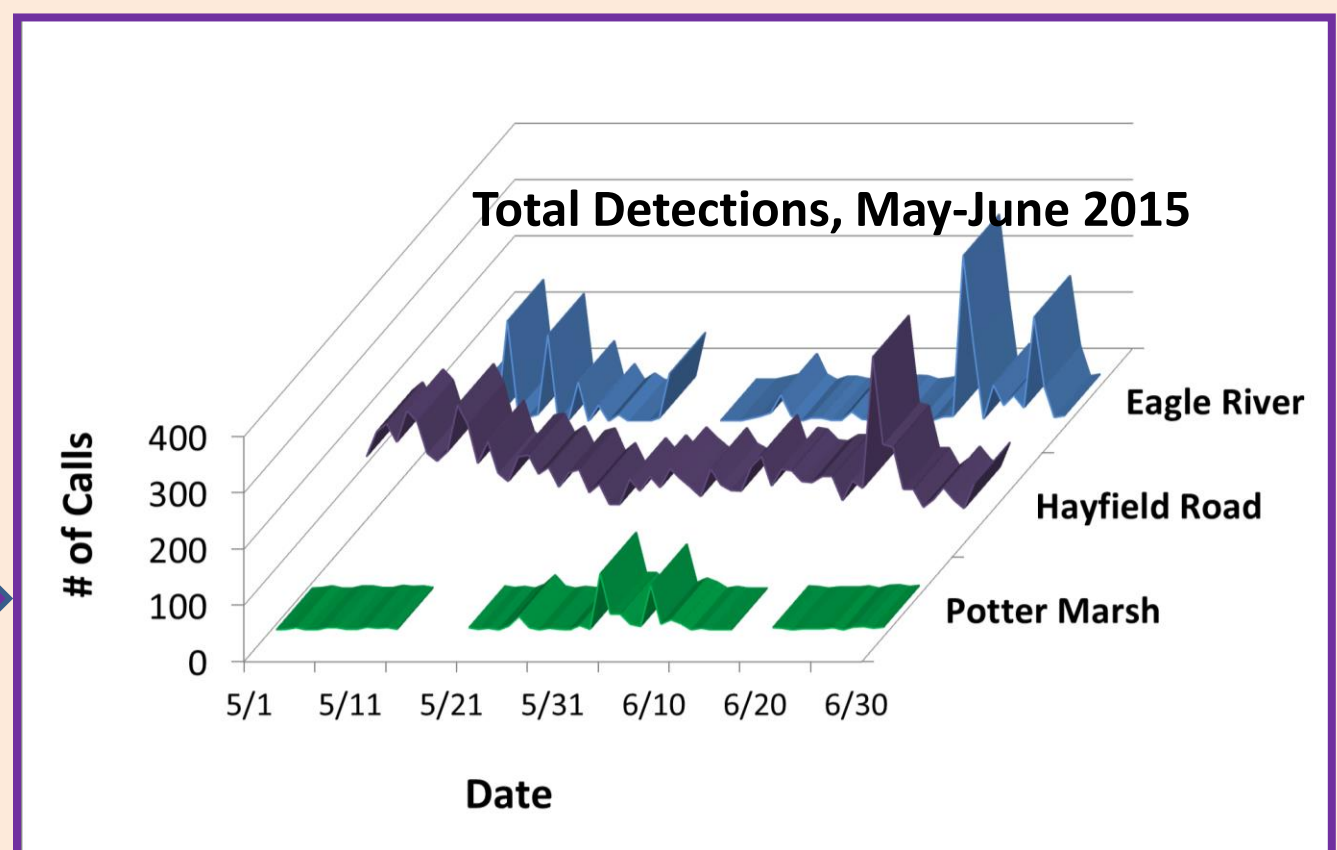
A) We chose locations depending on the objective:

1. For **Regional Distribution** we put detectors where we have no data.
2. For **Habitat Association** we put detectors out in a variety of habitats.
3. For **Seasonal Activity** we target areas that have open water year-round and where bats have been detected previously.

- Location: Granite Mine
- Date: June 24, 2014
- Time: 02:26 a.m.

B) After retrieving data cards from recorders we:

1. Analyze data using Analook software.
2. Use filters to analyze calls.
3. Use Excel to graph data.



Analook software output files.

2. Habitat Association:

- Bats were most closely associated in conifer sites (n=7) and deciduous sites (n=5), with 100% detection at each habitat type.
- Although there was detection in all described habitats bats were slightly less associated with mixed forest sites (75%, 6/8).
- 89% (33/37) of sites that detected bats were closely associated with water ($\leq 450m$).



3. Seasonal Activity:

- Earliest bat detection; April 11, 2015, Wasilla
- Latest bat detection; Oct 16, 2014, Chugiak.
- Highest number of calls; Sept (n=10,079)
- Lowest number of calls; Nov-Mar (n=0; fig 2).
- Highest call rate (# of calls/det. night); May (44/det. nights) and Sept (49/det. nights; fig 3).
- Pulses in May, late June and mid-Sept through mid-Oct (Fig 4,5).

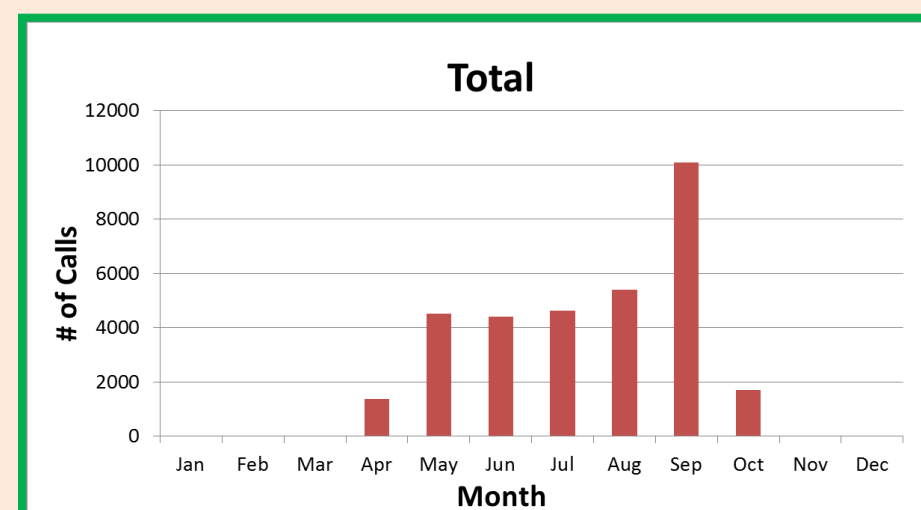


Fig 2. Total number of calls in 2014 and 2015.

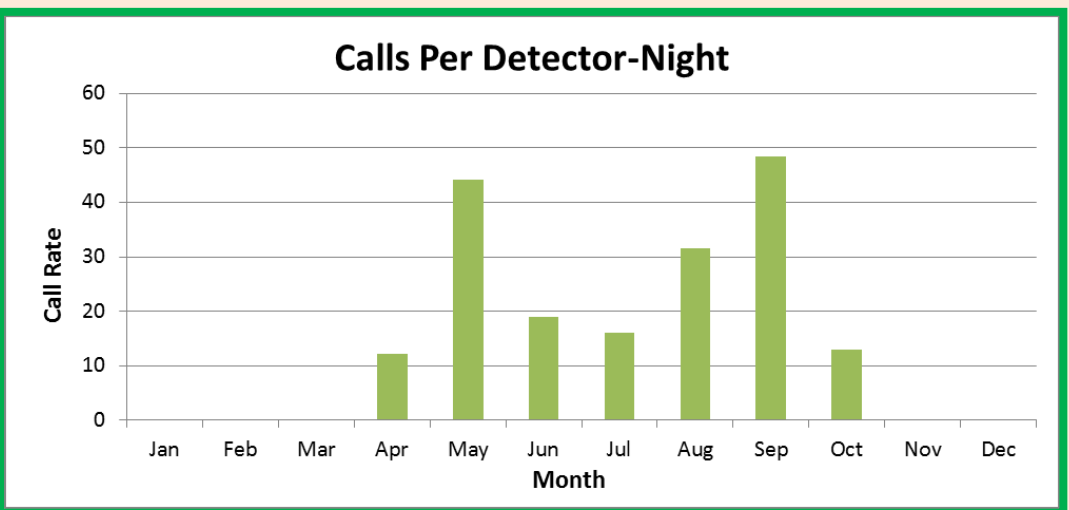


Fig 3. Call rate (calls/det. Nights) from 2014 and 2015.

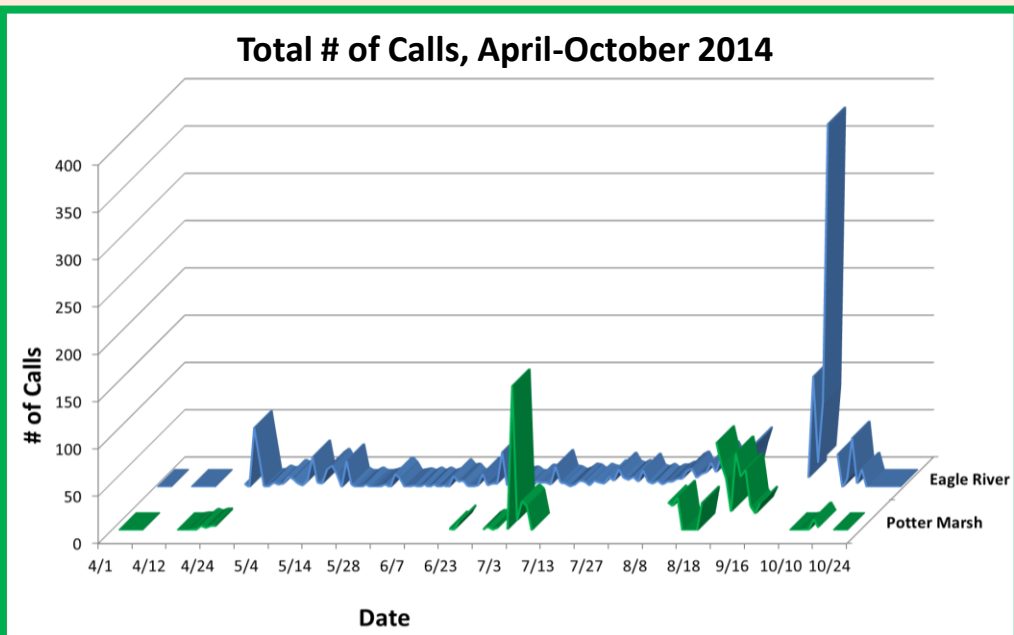
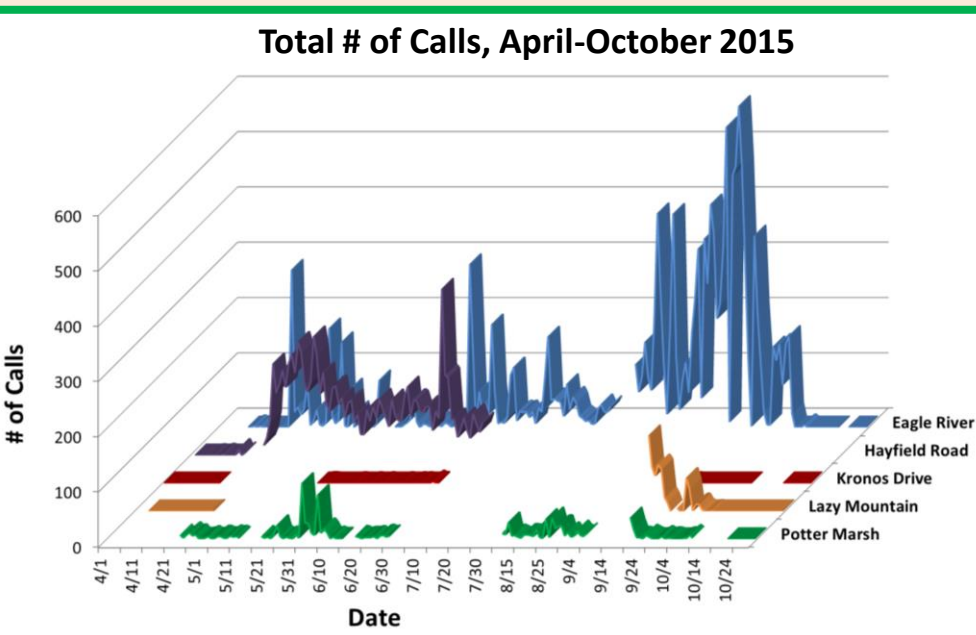


Fig 4. Total number of calls from Apr-Oct 2014 (2 locations) and 2015 (5 locations).



Conclusion

1. Regional Distribution: In Southcentral Alaska, we detected Little Brown Bats nearly everywhere we put a detector. Our extreme northern site, Kotzebue, had citizen science observations, so it was surprising there were no detections.

2. Habitat Association: Bats have been detected in every habitat type that we described. This may be partly due to the proximity of water at all of the detector locations. Bats go to water when they become active in the evenings.

3. Seasonal Activity: Bats are first detected in April and last detected in Oct. There are peaks in detections in some of our long-term sites in the fall, which suggests that bats may be overwintering in place.

Future Work and Management Implications To get a better understanding of our objectives for important baseline data to make informed management decisions we need:

1. more recorders outside the known distribution of Little Brown Bats
2. a randomized sample for habitat types
3. more long-term sites with more consistent recording throughout the year

Acknowledgements

- Citizen Scientists for keeping the bat recorders running year-round.
- Jesika Reimer-for her help in habitat assessment.
- Laura McDuffie and Keegan Crowley for their hard work and dedication.
- Laura Kruger for manning the longest running recorder at the Eagle River Nature Center.

References

Tessler DF, Snively ML, Gotthardt TA. New Insights on the Distribution, Ecology, and Overwintering Behavior of the Little Brown Bat in Alaska. *Northwestern Naturalist* 95(3). December 2013.
Vegetation Map: <http://accs.uaa.alaska.edu/vegetation-ecology/vegetation-map-northern-western-and-interior-alaska/>

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