Habitat Preferences of the Common Nighthawk *(Chordeiles minor)* in Southeastern Wisconsin Cities and Villages

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Habitat

- Forages over open areas
- Roosts in trees, on rocks, or on ground *(gravel-like substrate)*
- Nests in open areas on ground or on flat graveled rooftops

<u>Open Areas</u>:

- Fields & Prairies
- Forest Clearings
- Sand dunes & beaches
- Pine Oak Barrens
- Agricultural areas
- Cities

Nesting

Rural: On ground

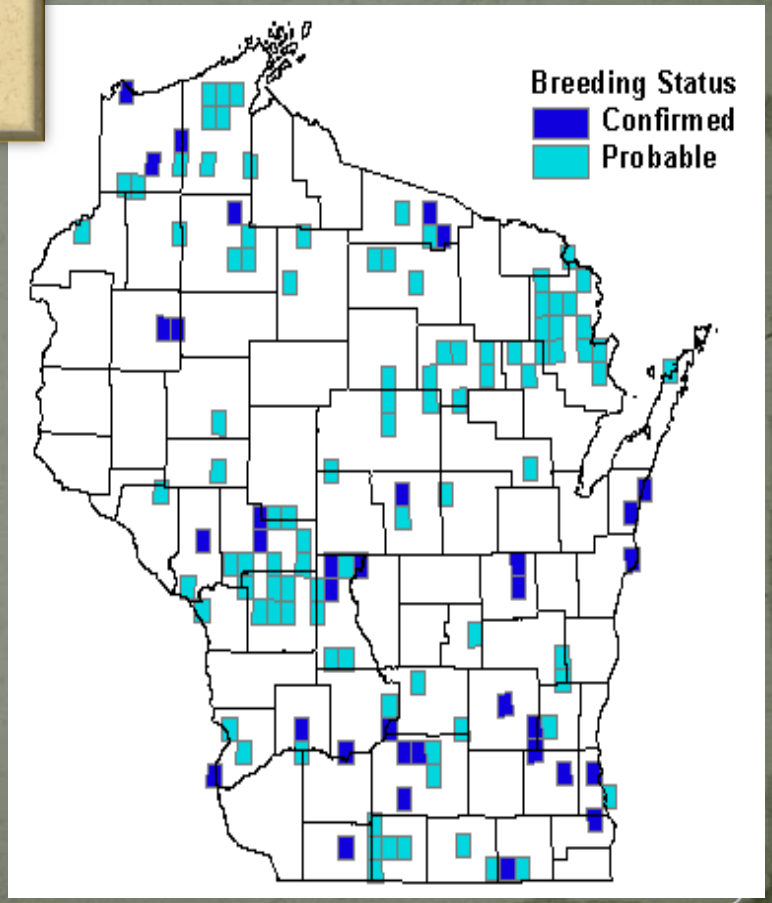
Urban: Flat graveled rooftops

"We do not know the ratio of urban vs rural nesters"

Range and Distribution

Neotropical Migrant

- **Long distance** – winters in South America
- **Late spring arrival** (late May - early June)



Changes in Roof Substrate

- Rooftop substrate has changed from gravel to a rubberized substrate that does not provide camouflage for the birds.
- The dark rubber also creates a very hot microclimate that cooks the eggs.

New Hampshire Audubon: Project Nighthawk (2007 – present)
Volunteers in Keene and Concord

This is a multifaceted issue with no simple answer…

- **Food Source**
  - Declines in Aerial insect populations
  - Pesticides – food reduction, poisoning
- **Climate Change**
  - Asynchrony of insect emergence
  - Extreme events during migration
- **Predation**
  - Cats, Raptors, Crows, gulls, snakes, raccoons, etc.
- **Habitat Loss & Degradation**
  - Urban & rural
  - Environmental contaminates
    -Acid rain, heavy metals
- **Anthropogenic (Human) Factors**
  - Cars, planes, windows, wind turbines
- **Migration**
  - Extreme weather
  - Lack of food

Current Survey Methods for Nighthawks in Wisconsin

North American Breeding Bird Survey, 1966

- Daytime (before sunrise)
- Roadside, 24.5 miles
- Citizen Science

Wisconsin Nightjar Survey, 2007

- Night (after sunset)
- Roadside BBS routes;6 miles
- Citizen Science

Wisconsin Breeding Bird Atlas, 1995 - 2000

- Daytime (before sunrise)
- Intensive quadrants
- Citizen Science

In order to adequately monitor Common Nighthawk populations we need surveys that:

1. **Start at dusk, before sunset** *(when Nighthawks are most active)*
2. **Target urban areas**
3. **Utilize Citizen Science – based methodology in order to cover large geographic area in short timeframe** *(Nighthawk breeding season is June/July in Wisconsin)*

Research Objectives

- Conduct a Baseline Study using Citizen Science-based methodology to improve our understanding of Common Nighthawk habitat preferences in Wisconsin 'urban' areas

- To provide the Wisconsin Department of Natural Resources with information regarding Common Nighthawk habitat in Wisconsin cities and villages

- Help inform protocol for Wisconsin Nightjar Survey & placement of future routes

- Improve monitoring of Common Nighthawk populations

Research Question

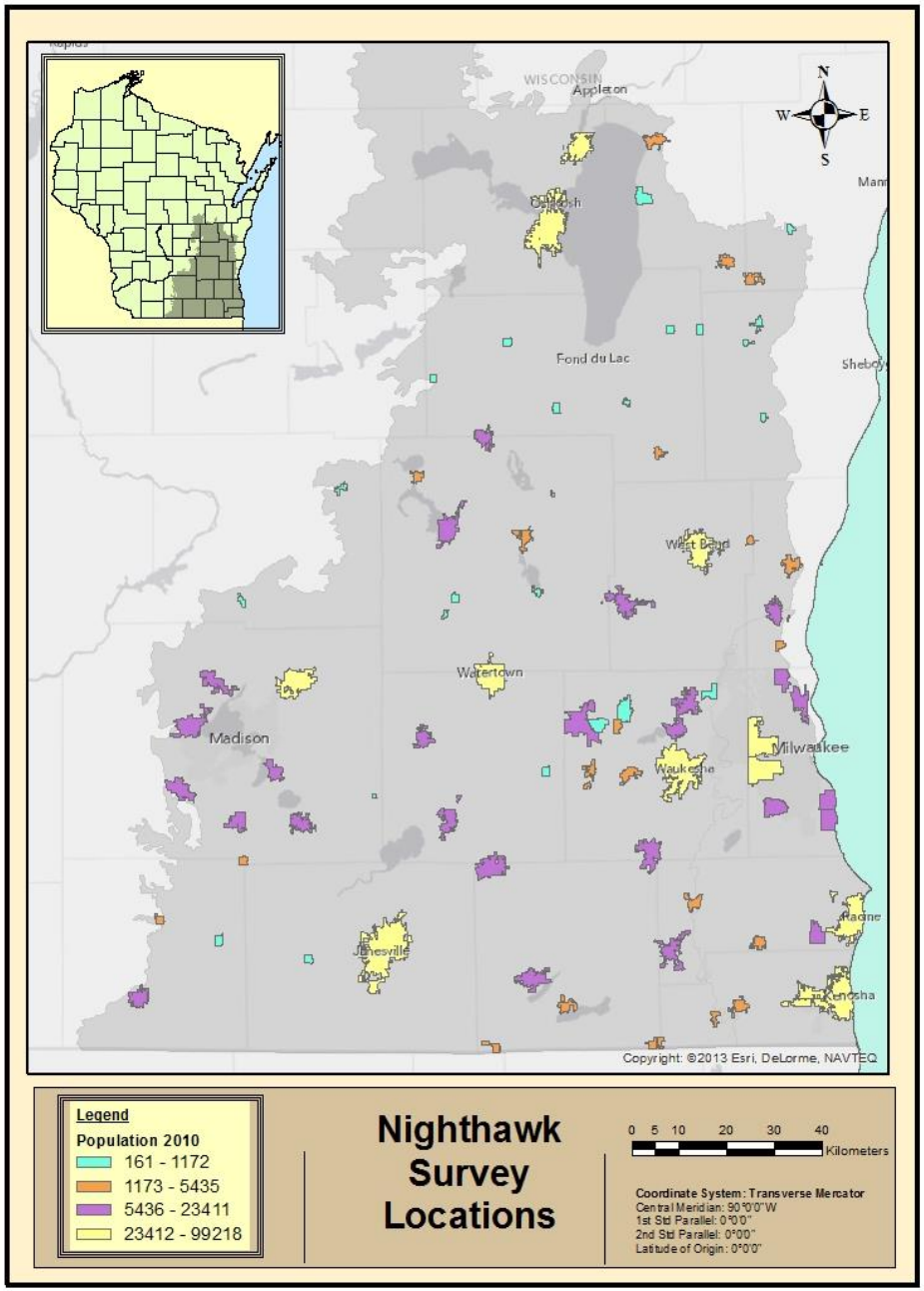
What environmental factors and landscape features influence occupancy of Common Nighthawks in Cities and Villages in Wisconsin?

Environmental Factors

- Insect Activity
- Predators
- Light pollution (artificial)
- Temperature
- Moon Illumination

Landscape Features & Land Cover Types

- Nesting Habitat
  - Flat graveled rooftops
- Foraging Habitat
  - Green Space
  - Open Water
- Roosting Habitat
  - Green Space (Tall trees)
  - -Barren (rocky/sandy areas)



Study Region & Site Selection

Random Stratified Sampling Method using GIS

- Southeast Glacial Plains & Southern Lake Michigan Coastal ecological regions

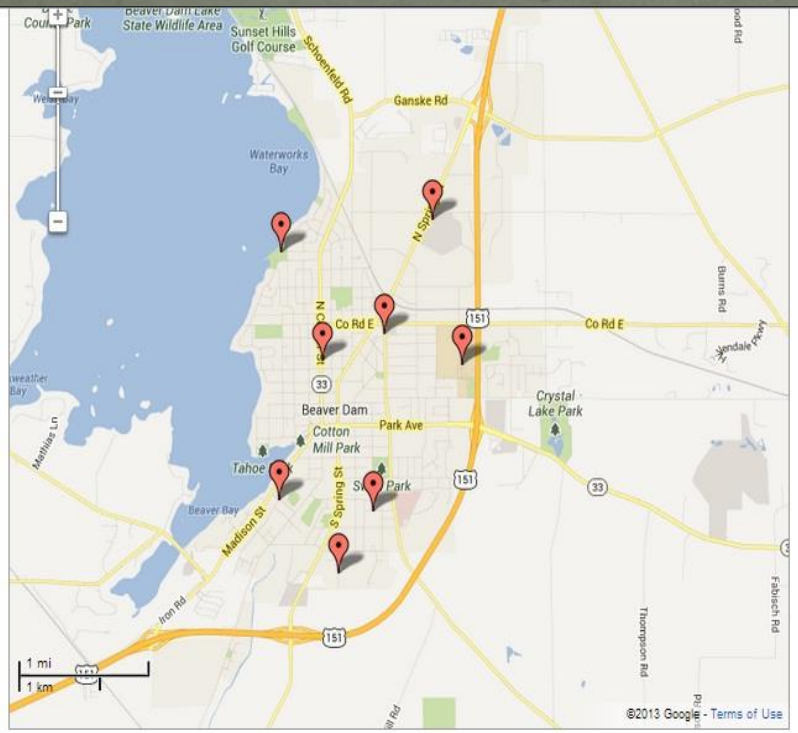
92 Cities and Villages

- 30 Small: 161 – 1,172
- 30 Medium: 1,173 – 5,435
- 30 Large: 5,436 – 23,411
- 2 XL: 23,412 – 99, 218

2 to 8 survey points per city/village

- Randomly generated
- Dependent on municipal boundary

Random Points Generated using GIS software, then converted to KML & uploaded in Google Maps & emailed to volunteers



Beaver Dam City

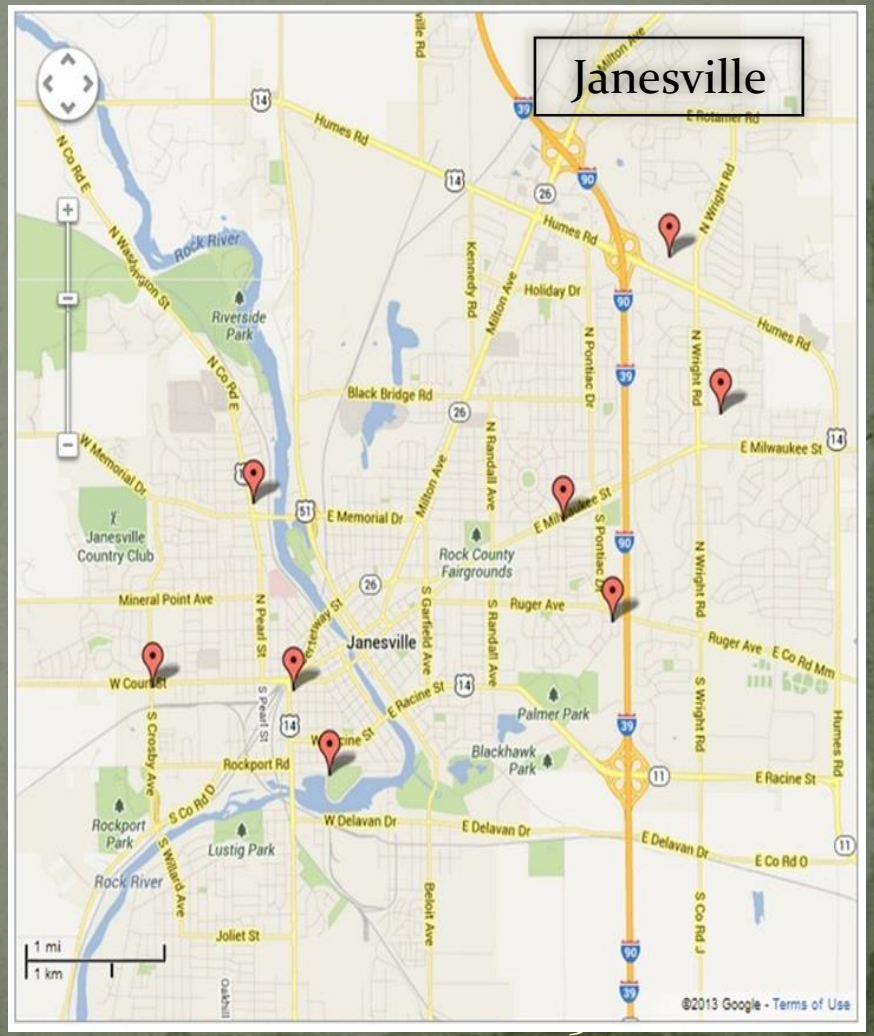
Nighthawk Survey Points for Beaver Dam City

Unlisted · 2 Collaborators · 10 views

Created on May 31 · By Jana · Updated 2 hours ago

- Point# BD1
  Point# BD1 @43.441764,-88.836855
- Point# BD2
  Point# BD2 @43.476484,-88.822332
- Point# BD3
  Point# BD3 @43.448903,-88.846013
- Point# BD4
  Point# BD4 @43.447748,-88.83149
- Point# BD5
  Point# BD5 @43.465275,-88.829749
- Point# BD6
  Point# BD6 @43.462156,-88.817764
- Point# BD7
  Point# BD7 @43.46253,-88.839365
- Point# BD8
  Point# BD8 @43.473217,-88.845708

Points to be surveyed in Beaver Dam



Example of Completed Survey Data Sheet

Data Sheet I: Nighthawk Surveys

City/ Village: Milwaukee City		
Observer(s): Jana Viel		
Date: June 7, 2013	**Start time:** 8:00 pm	**End time:** 9:30 pm
	Start temp: 78 F	**End temp:**76 F
Travel time: 15 min	**Total time:** 1 hour 45 min	**Mileage:** 6.26 miles
General Weather: Clear, sunny, calm	**Moon Phase:** 	

Codes:	0	1	2	3
Wind	none	slight	moderate	strong
Sky	clear	m clear	m cloudy	cloudy
Insects	none	light	medium	heavy
Light Pol.	none	dim	medium	bright
Noise	none	slight	medium	excessive

Behavior	F	B	P	R
	Flying	Booming	Peenting	Roosting

Point#/Loc: (#1) Intersection of N Murray Ave and E Newport Ave; NW corner **Start time:** 8:10 pm **End time:** 8:20 pm .

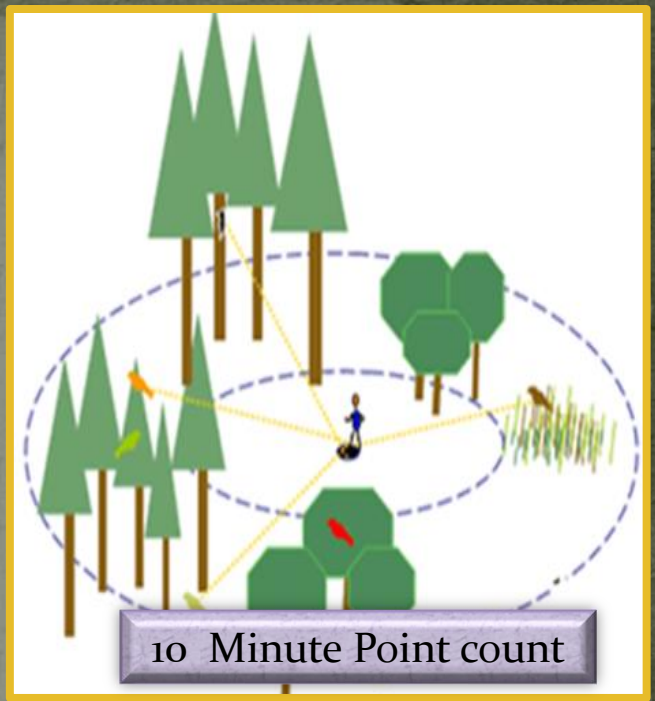
Minute	# of Nighthawks	Activity	Method of Detection: aural (A) , visual (V), or both(B)
1	1	F	V
2	2	F& P	B
3	1	P	A
4	None		
5	None		
6	1	B & P	B
7	None		
8	None		
9	2	F& P & B	B
10	1	R	V

Environmental Variables					
Temp (F)	Wind	Sky	Insects	Light Pol.	Noise
76 F	0	0	1	0	1

Chimney Swifts					
1-5	6-10	11-15	16-20	21-25	26+
	x				

Predators			
Crows	Gulls	Raptors	Cats
4	1	0	1

Flat Rooftops	Tall Street Lights
4	11



Protocol created using guidelines from Wisconsin Nightjar Survey & New Hampshire Audubon Project Nighthawk

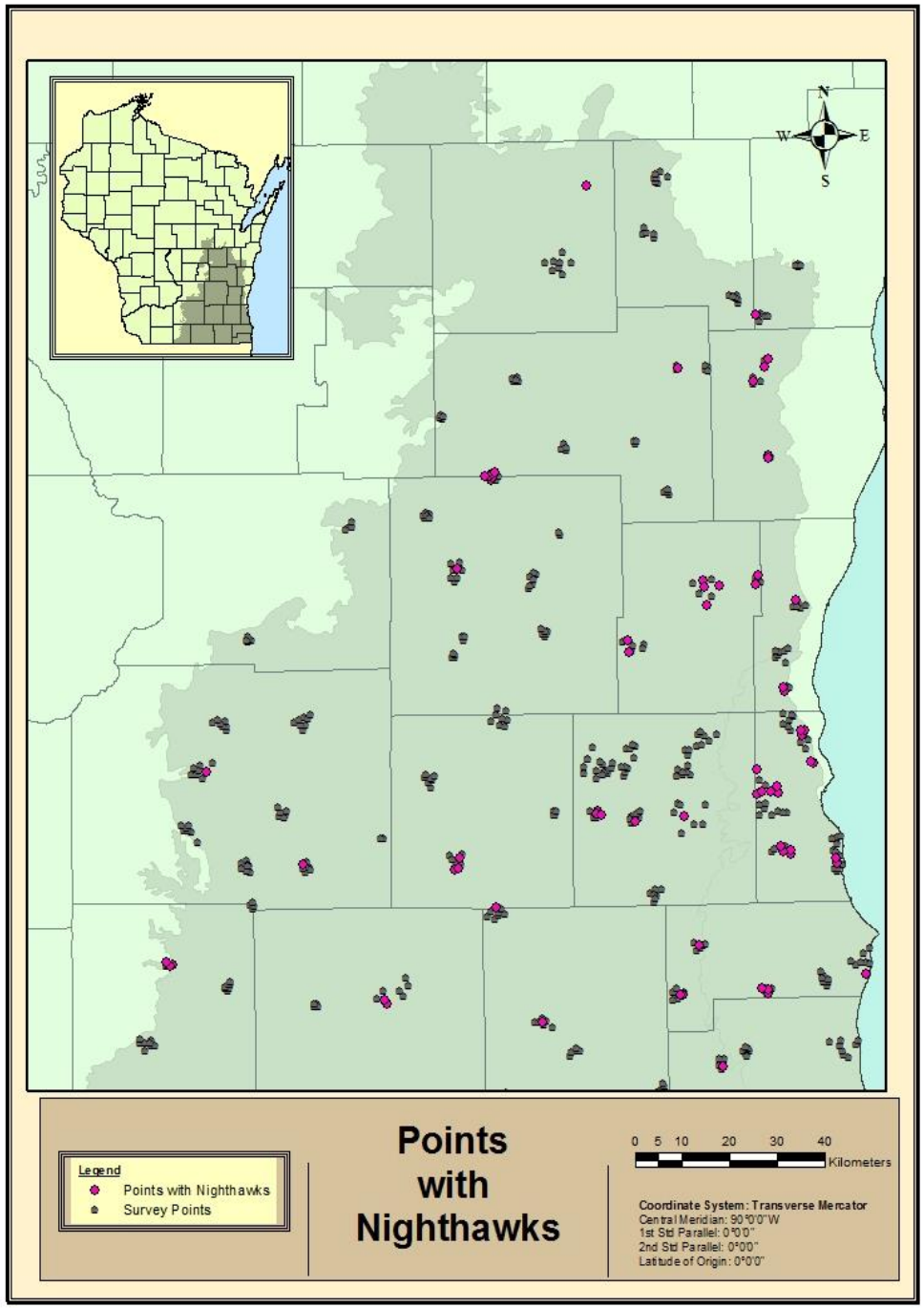
Results

Volunteer Investment *(conservative estimates)*:

31,000 Total Survey minutes

8,500 Total Miles Traveled

	Total	Nighthawks Detected
Cities & Villages	82	31
Points	494	68
Surveys	1,412	98



Common Nighthawks Detected on Two Survey Evenings

Total times surveyed indicate the total number of surveys that were conducted at the point. First survey date indicates the first survey in which Common Nighthawk(s) were observed and second survey date indicates the second survey in which Common Nighthawk(s) were observed. Observed activity indicates all Common Nighthawk behaviors observed during each 10 minute point count. Behavior codes are as follows; B=booming or diving, F = flying, P=peeting, R=roosting.

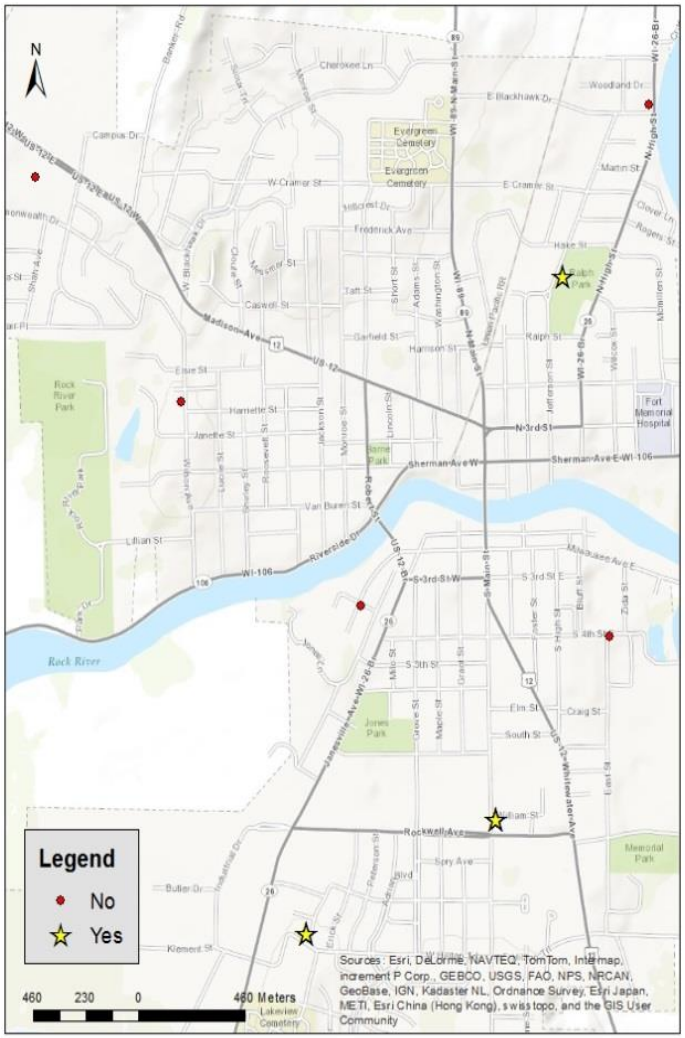
City / Village Name	Point Name	First Survey Date	Observed Activity	Second Survey Date	Observed Activity	Total times point was surveyed
Elkhart Lake Village	Elkhart_1	6/10/13	F	6/16/13	FP	5
Fort Atkinson	Fort Atkinson_2	6/8/13	FP	7/5/13	BFP	2
Janesville city	Janesville_2	6/8/13	FP	6/25/13	F	3
Racine city	Racine_3	6/23/13	F	6/27/13	F	3
South Milwaukee City	South Milwaukee_5	6/11/13	FP	6/19/13	P	3
Union Grove village	UnionGrove_1	6/11/13	P	6/16/13	R	5
Union Grove village	UnionGrove_3	6/11/13	P	6/19/13	F	5
Wales village	Wales_2	6/16/13	P	6/20/13	P	3
Waupun city	Waupun_2	6/11/13	P	6/26/13	P	3
Waupun city	Waupun_4	6/11/13	BFP	6/18/13	P	3
Waupun city	Waupun_6	6/11/13	P	6/26/13	P	3
Waupun city	Waupun_7	6/11/13	P	6/26/13	P	3
Wauwatosa city	Wauwastosa_1	6/14/13	R	6/19/13	P	3
Wauwatosa city	Wauwastosa_2	6/13/13	FP	6/24/13	P	3
Wauwatosa city	Wauwastosa_4	6/19/13	FP	6/24/13	P	3
Wauwatosa city	Wauwastosa_7	6/19/13	FPR	6/24/13	FP	3

Common Nighthawks Detected on Three Survey Evenings

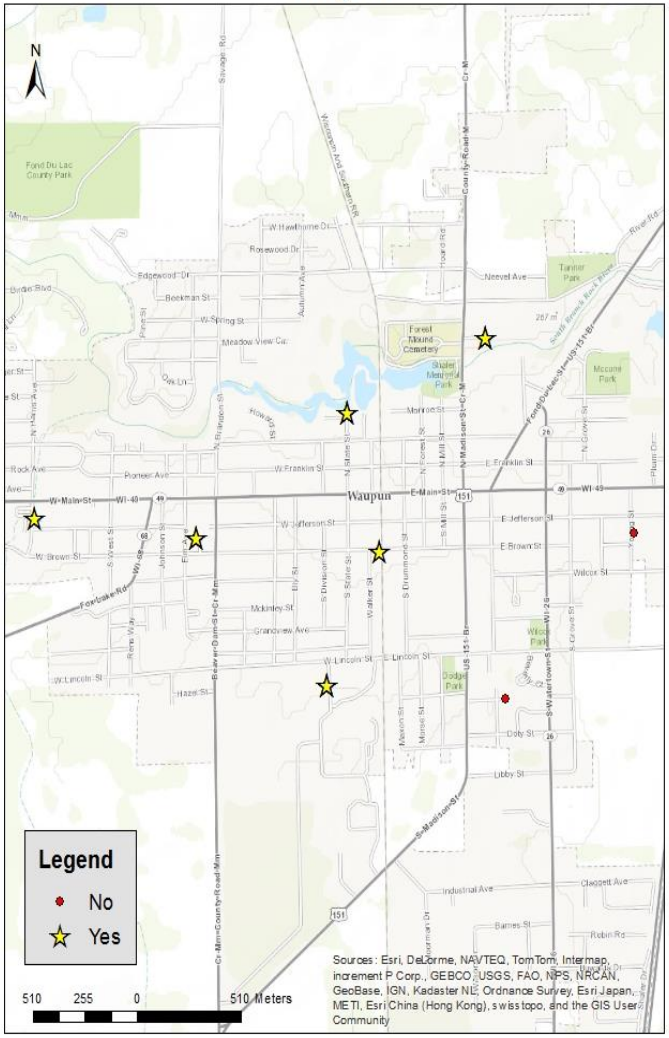
Total times surveyed indicate the total number of surveys that were conducted at the point. First survey date indicates the first survey in which Common Nighthawk(s) were observed, second survey date indicates the second survey in which Common Nighthawk(s) were observed, and third survey date indicated the third. Observed activity indicates all Common Nighthawk behaviors observed during each 10 minute point count. Behavior codes are as follows; B=booming or diving, F = flying, P=peeting, R=roosting.

City Name	Point Name	First Survey Date	Observed Activity	Second Survey Date	Observed Activity	Third Survey Date	Observed Activity	Total times point was surveyed
Burlington city	Burlington_3	6/25/13	B	6/30/13	BF	7/6/13	BFP	3
Glendale city	Glendale_4	6/10/13	FP	6/18/13	P	6/23/13	F	3
Janesville city	Janesville_1	6/8/13	FP	6/18/13	P	6/26/13	FP	3
Monticello village	Monticello_1	6/14/13	P	6/19/13	P	6/27/13	F	3
Wauwatosa city	Wauwastosa_3	6/13/13	FP	6/19/13	FP	6/24/13	FP	3

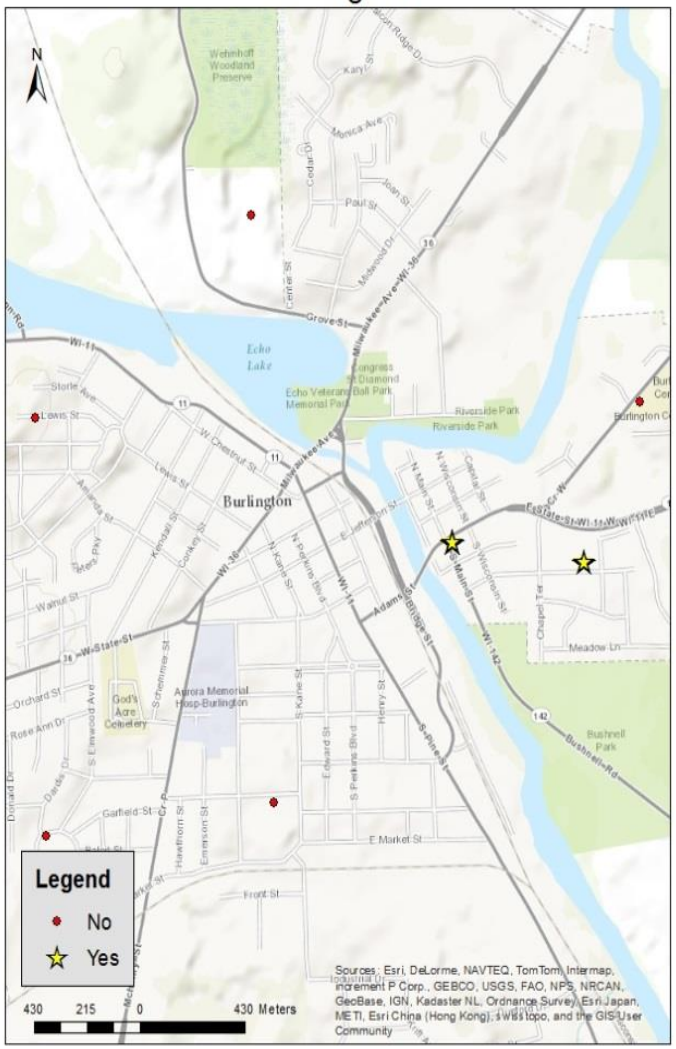
Fort Atkinson



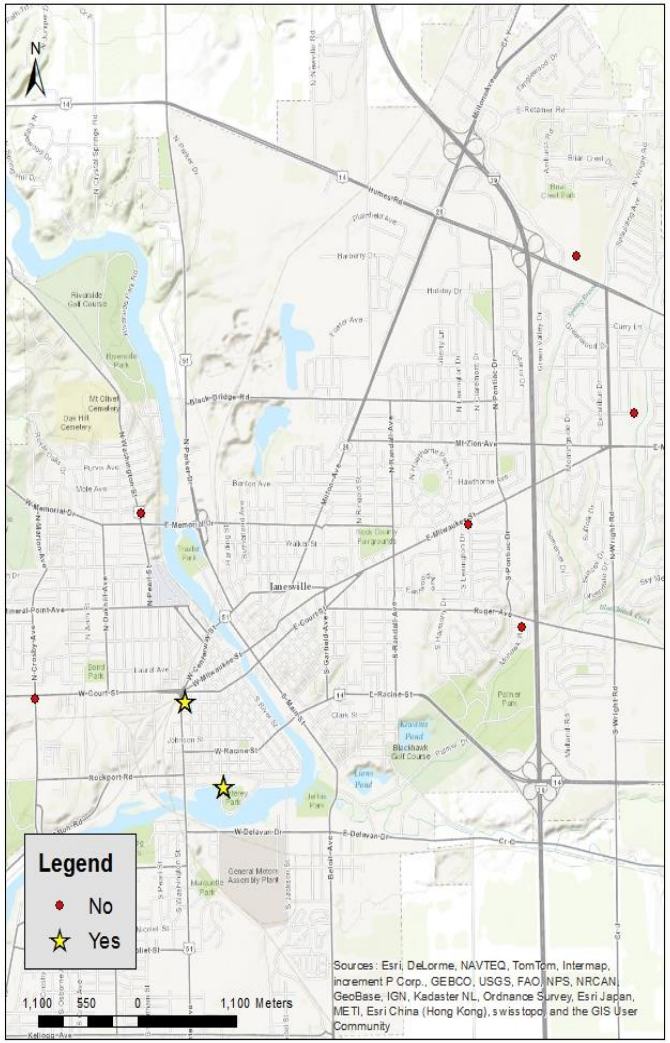
Waupun



Burlington



Janesville



Summary for Surveys in 2013

- Success in conducting **a Base-line** study of Nighthawk populations in WI cities and villages
- Citizen Science – based methodology provides an efficient and effective avenue for monitoring Nighthawk populations

- Nighthawks are more likely to be found in cities and villages with
  - highly developed land cover
  - more flat graveled rooftops
  - Greater area of flat graveled rooftops
- Flat Graveled Rooftops are important in SE WI urban areas

Future Surveys

- Repeat Study adding “rural” points as well
- Reduce the number of points per evening
- Narrow the time frame
- Detailed studies of locations in which Nighthawks were observed displaying

Citizen Scientists

Aaron Boone
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Allen Crossley
Andrew Rivers
Andy Paulios
Anton Sieger
April Patterson
Barb Stollenwerk
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Daniel R. Schneider
Danielle Baumann
Dar & Kathy Tiede
Dave & Kerry Sheloff
David Snell
Donna Ingham
Eileen Nelson
Fran Milburn
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James Goodwin
Janet Duschack
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Jeff Baughman
Jennifer & Michael Tyskiewicz
Jessie Ripley
Joan Sommer
John Krerowicz
Julie & John Woodcock
Karen Etter Hale
Karen Schappe
Kathi Gallus
Kathy Gallick
Kay Voelker
Kerry Sehloff
Kristin Gjerdset
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Liz Binverse
Mandie & Zach Zopp
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Marty Pfeiffer
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Mary Korkor
Max Witynski
Michael John Jaeger
Mike Dorl
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Nancy Willing
Neil & Kay Dupree
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Steve Ruscko
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Thank You!

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-Wisconsin Society for Ornithology

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Vicki Piakowski, *Birds without Borders & MAPS*
Mickey O'Conner, *Milwaukee County Zoo*
Yvonne, Fellow Mortals Wildlife Rehabilitation Center
Rebecca Suomala, NH Audubon Project Nighthawk

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