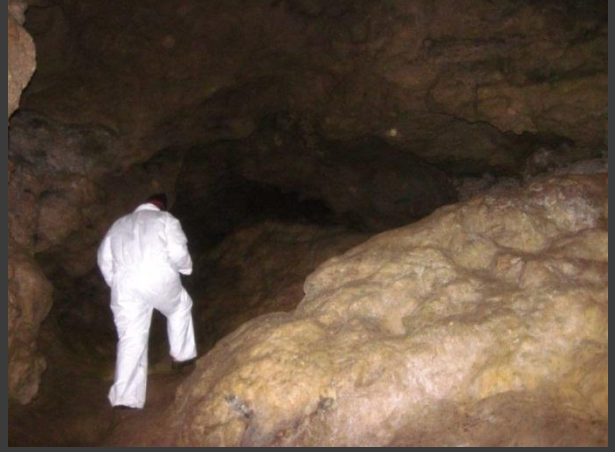
Ohio Acoustic Bat Survey Program

Sarah Elliott and Jennifer L. Norris

Acknowledgements

Allen Patton, Alli Shaw, Aubrey Brown, August Froehlich, Barbara Velez Barbosa, Ben Reed, Beth Landers, Brittany Mitchell, Bruce Lombardo, Carolyn Caldwell, Carrie Morrow, Chrissy DeVonu, Clayton Newell, Cody Grasser, Diana Malas, Don Althoff, Donna Daniels, Donna Essex, Drew Glenn, Emily Archibald, Garry Lupton, Heather Stehle, Heidi Schwab, Jeff, Rachel, Ken, Travis, Robb, Adam (from TNC), Jeni Cullen, Jennifer Windus, Jim Hickman, Joe Moosbrugger, Josh Schiering, Justin Law, Karen Roberts, Katrina Schultes, Kim Martin, Levi Miller, Linda Hetler, Luke Soposki, Marcey Shafer, Matt Wilson, Merrill Tawse, Mike Schumacher, Nancy Stranahan, Patrick Mercer, Ramsey Langford , Rick Hoffman, Robyn Wright-Strauss, Shad Salyers, Susie Whitted, Tammy O'Neil, Tim Krynak, Travis Cline, Tricia Brion

VOLUNTEERS NEEDED FOR NEW ROUTES!



	Live trapping	Hibernacula Surveys	Post Construction Monitoring
Pros	• Species occurrence • Species-specific id	• Winter populations	• Species occurrence
Cons	• Probable absence • Site-specific	• Migrating tree bats • Unknown sites/ no access • Site-specific	• Detection reliant on searcher efficiencies and scavenger rates • Site-specific

Acoustic Surveys

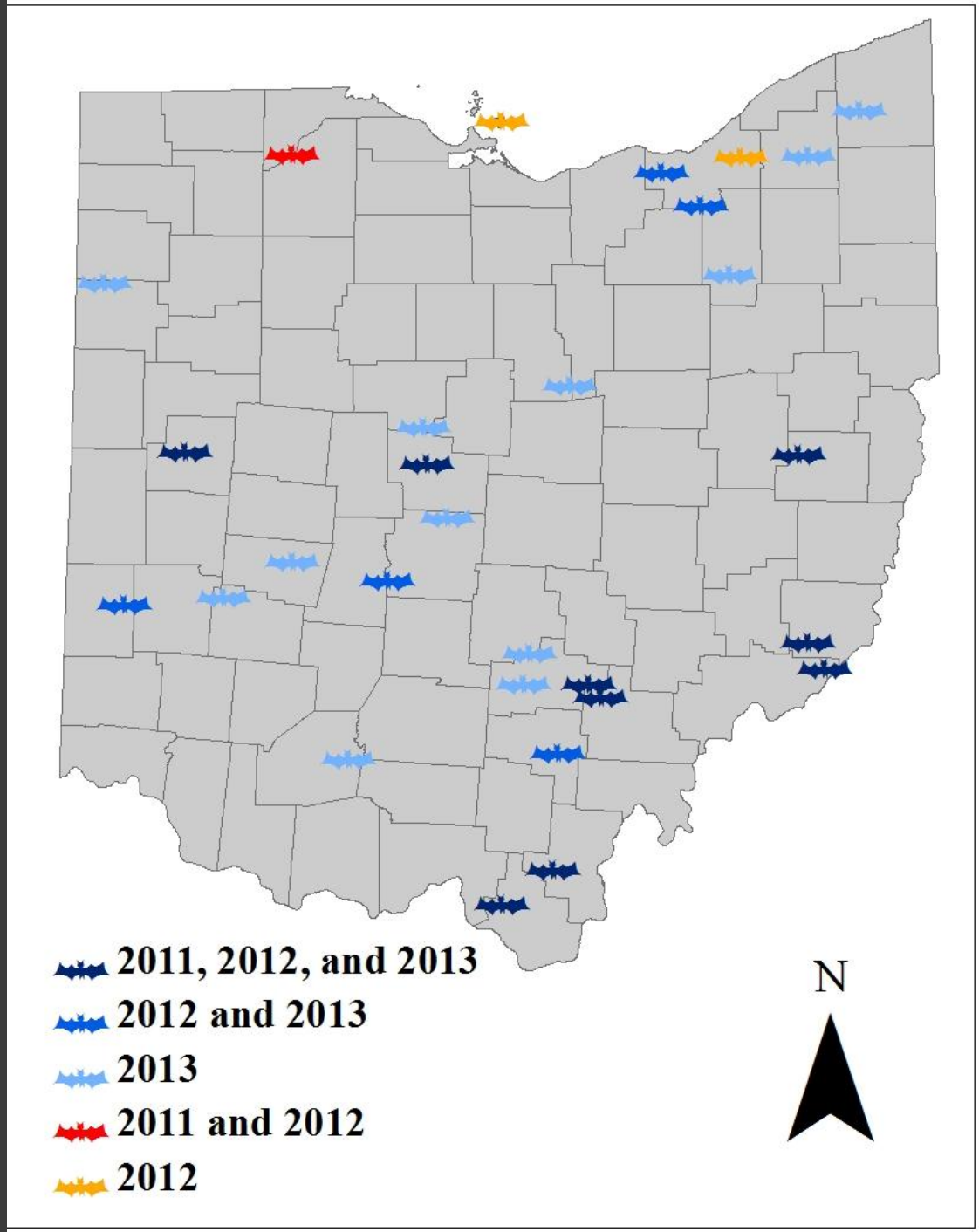
- 2 basic methods
  - Fixed site (limited to occupancy analyses)
  - Mobile (more quantitative and broader scale)
- 2011: OH standardized mobile acoustic protocol

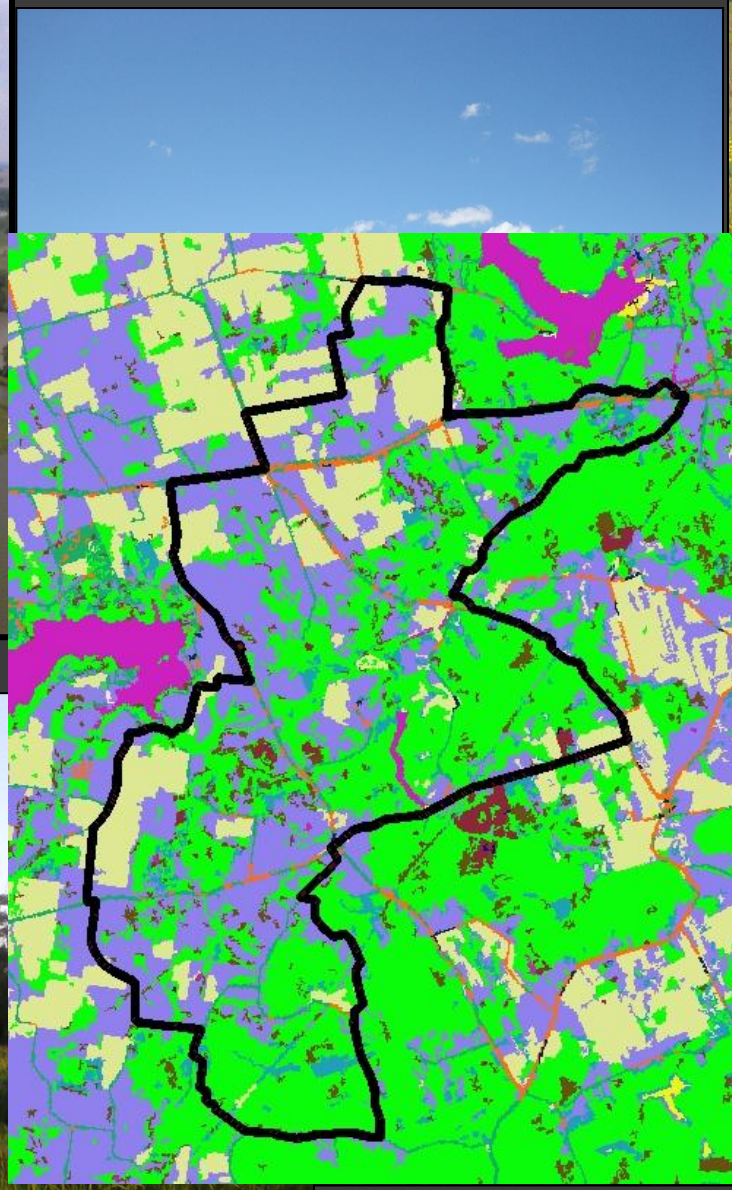
Why Mobile Acoustic Surveys?

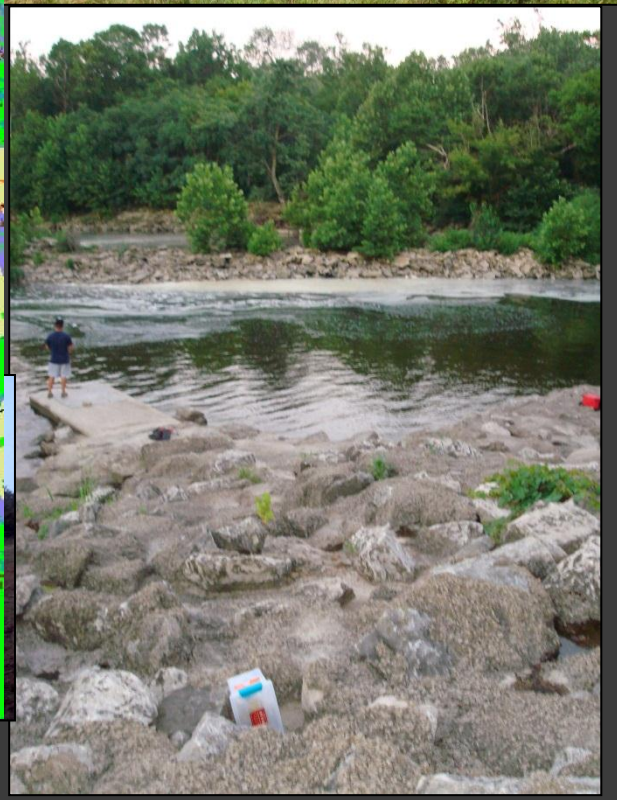
- Assess populations over a broader scale
- Detect individuals once, thus able to calculate relative abundances
- Survey different habitats during one route
- Monitor multiple species simultaneously

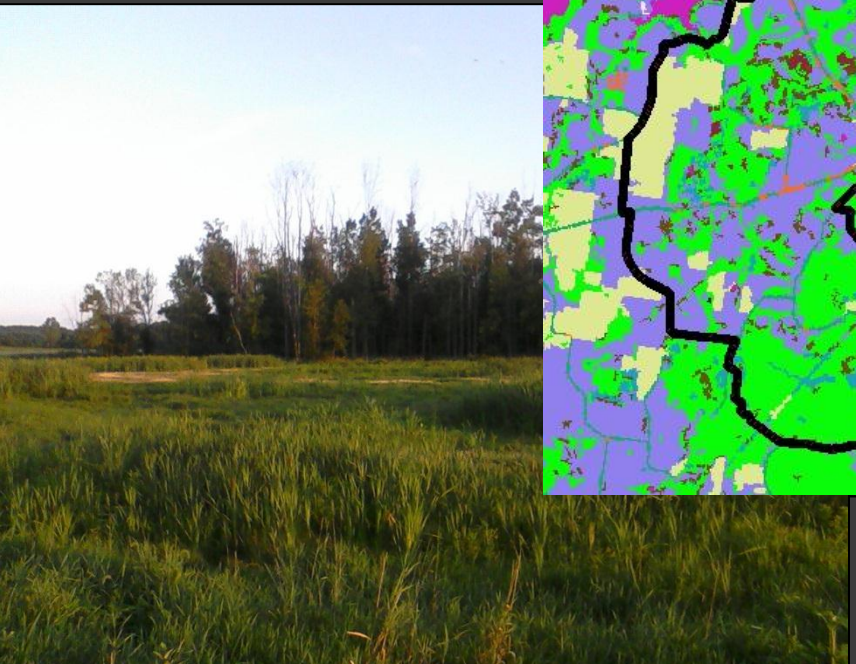
Limitations to Mobile Acoustic Surveys

- Rely on road network
- Range of microphone varies
- Dependent on weather
- Interference
- Bat identification software limitations

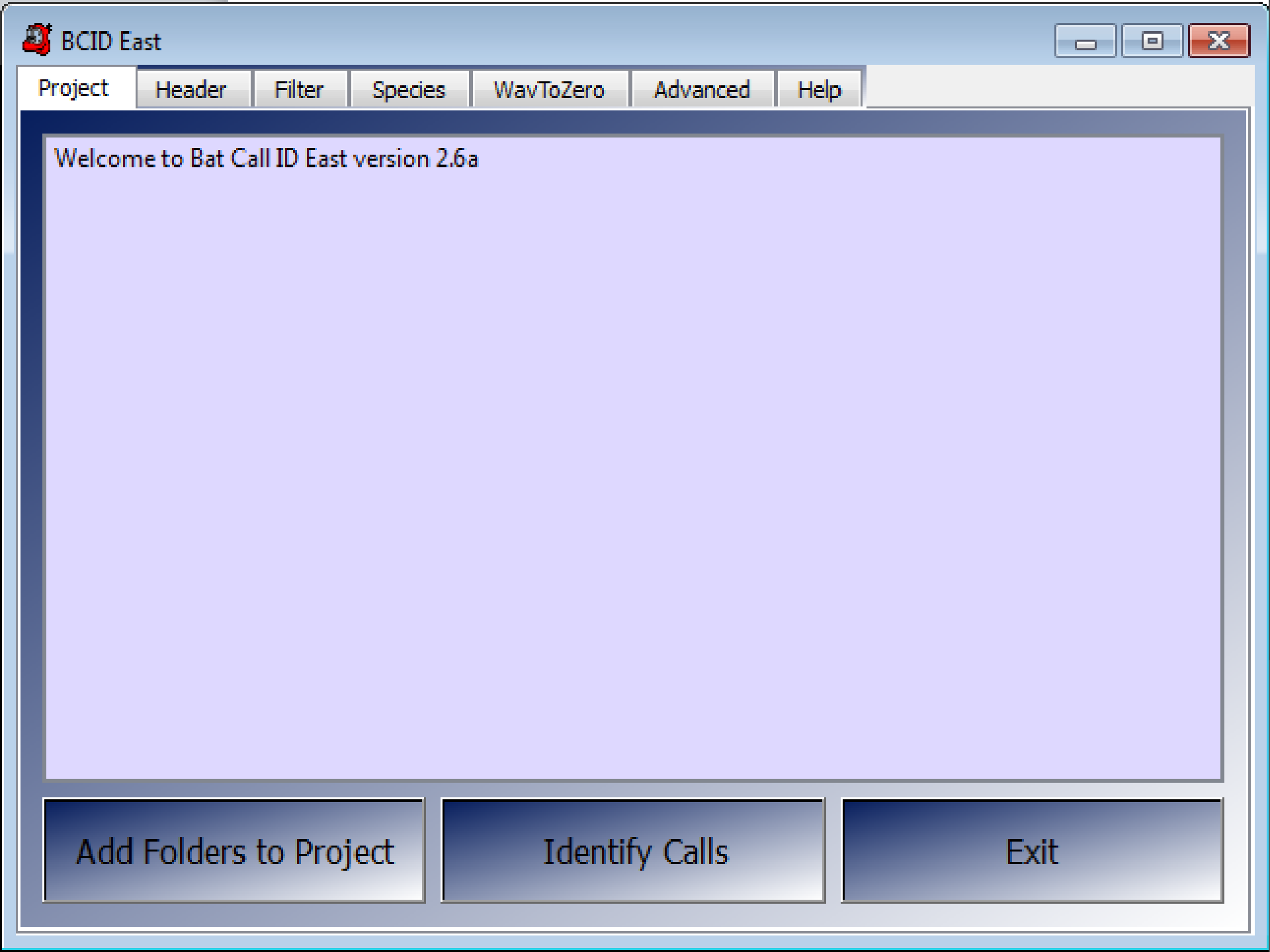

2011, 2012, and 2013
2012 and 2013
2013
2011 and 2012
2012
N








WILDLIFE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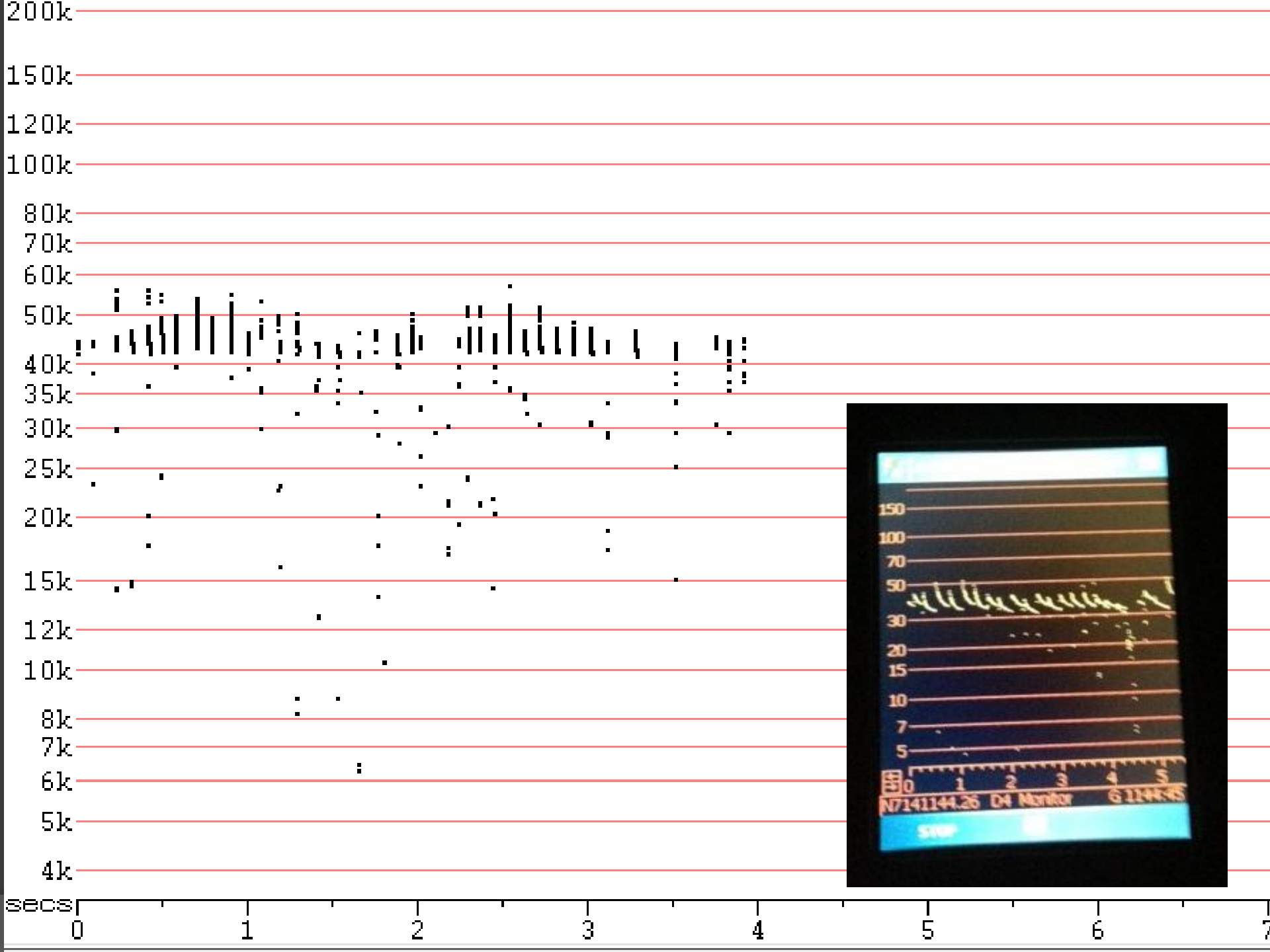
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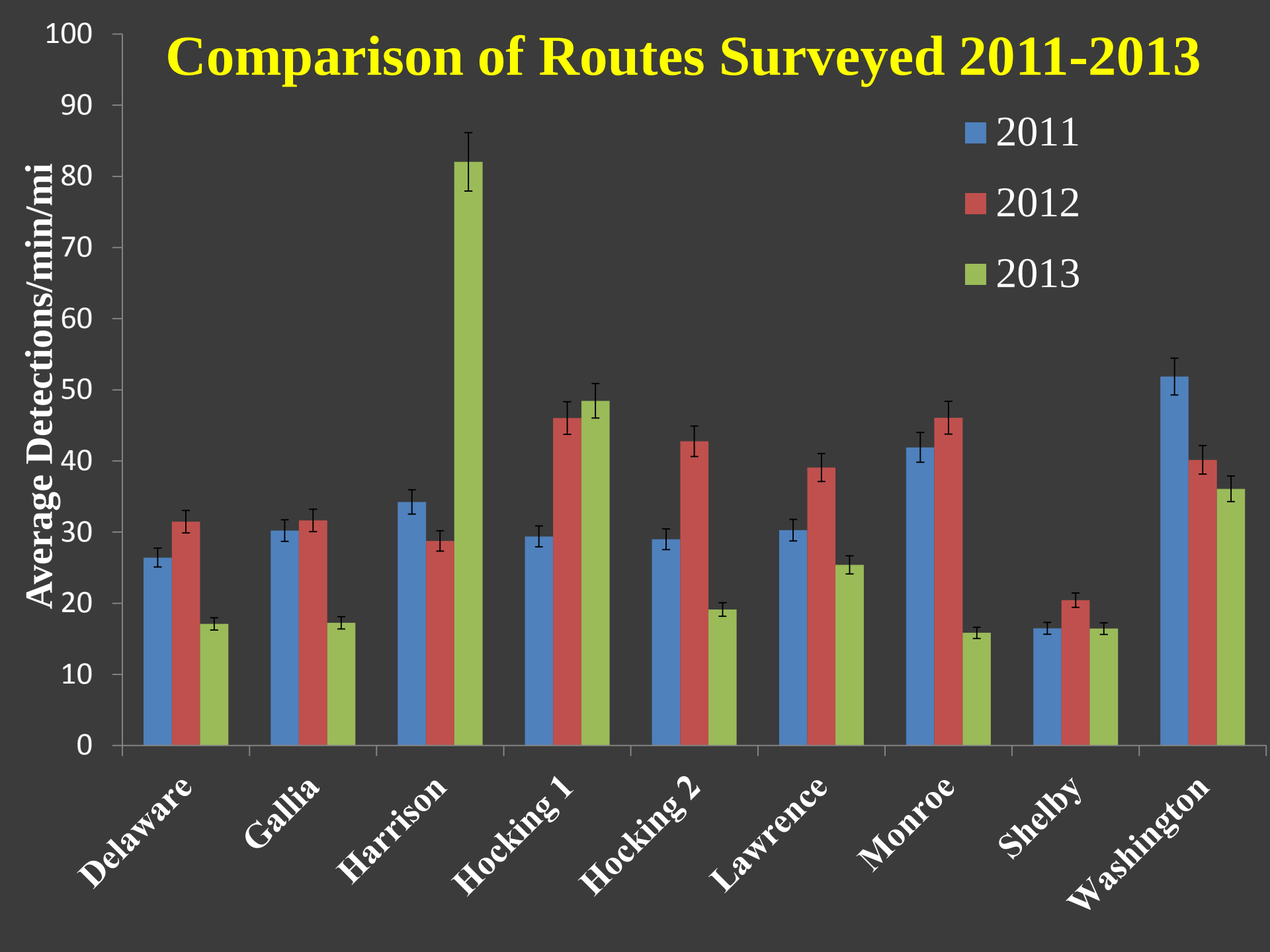
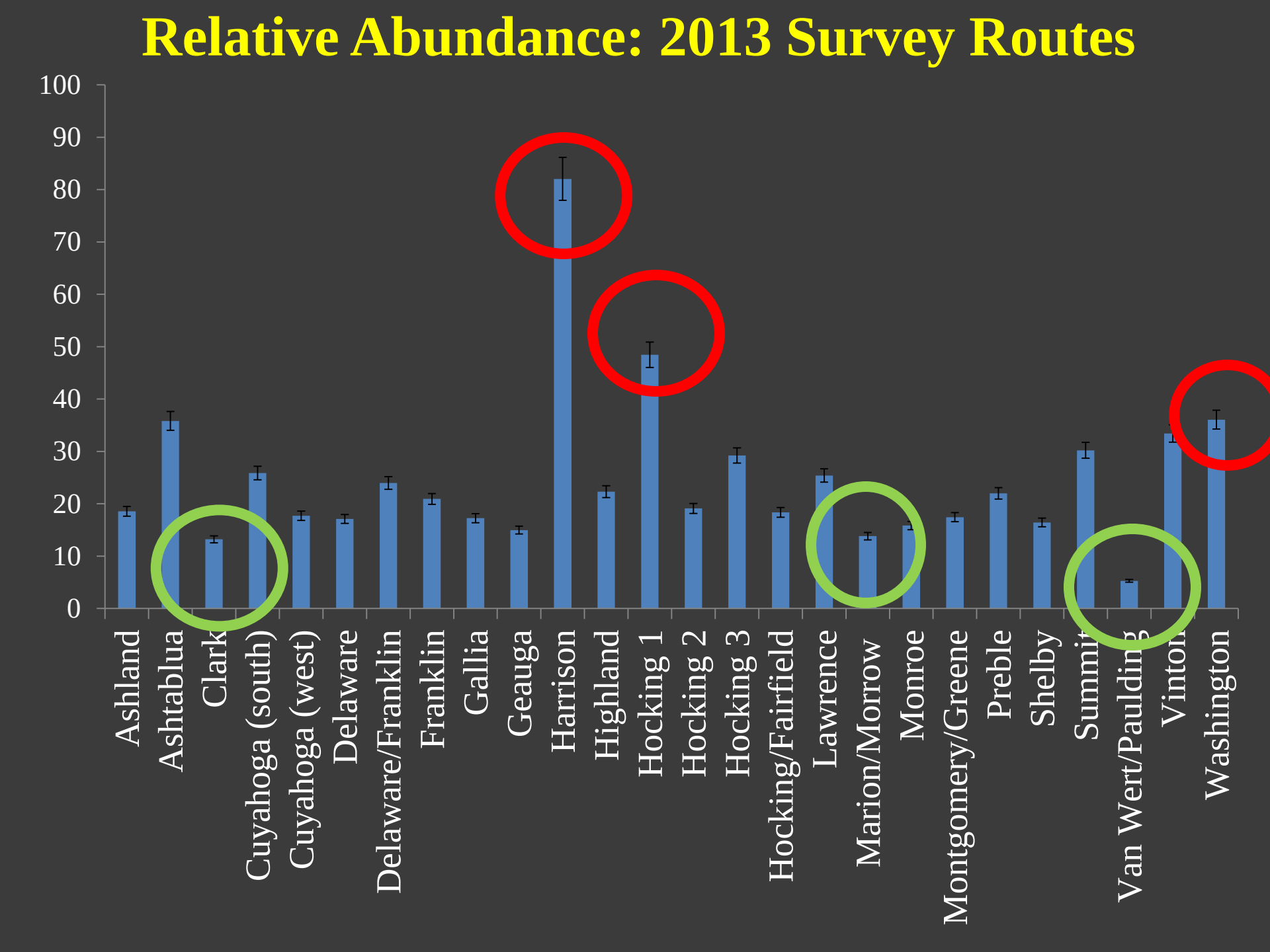
N7141144.26 D4 Monitor
STOP

Objectives for 2013 Analyses

- Relative abundances by route (N= 9) and among years (2011-2013)
- Relative abundance by route (N= 26) for 2013
- Statewide bat species/ categories composition for 2013
- Route-level analyses for bat species/ categories composition for 2013

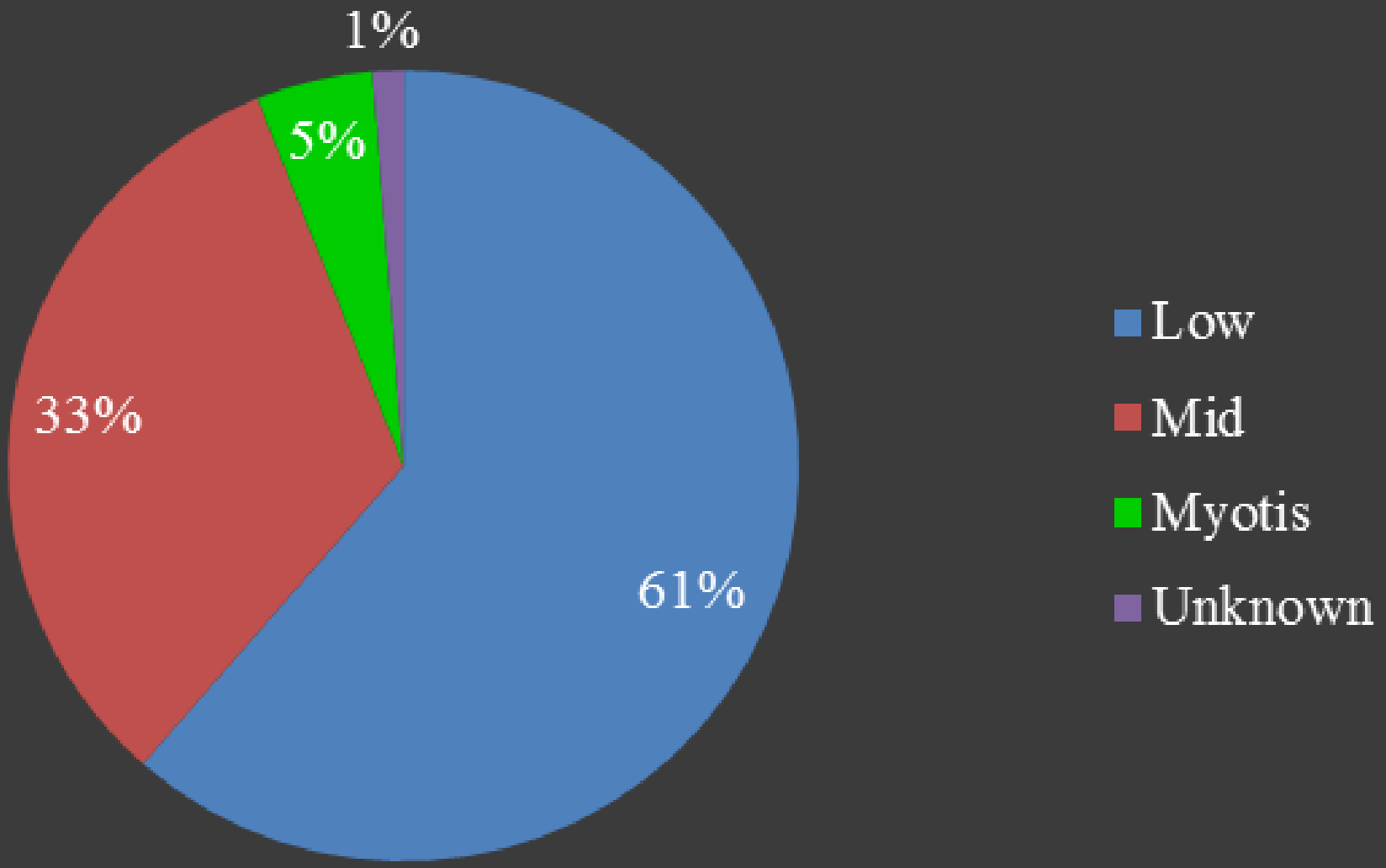

Comparison of Routes Surveyed 2011-2013
Average Detections/min/mi
100
90
80
70
60
50
40
30
20
10
0
2011
2012
2013
Delaware
Gallia
Harrison
Hocking 1
Hocking 2
Lawrence
Monroe
Shelby
Washington

Relative Abundance: 2013 Survey Routes

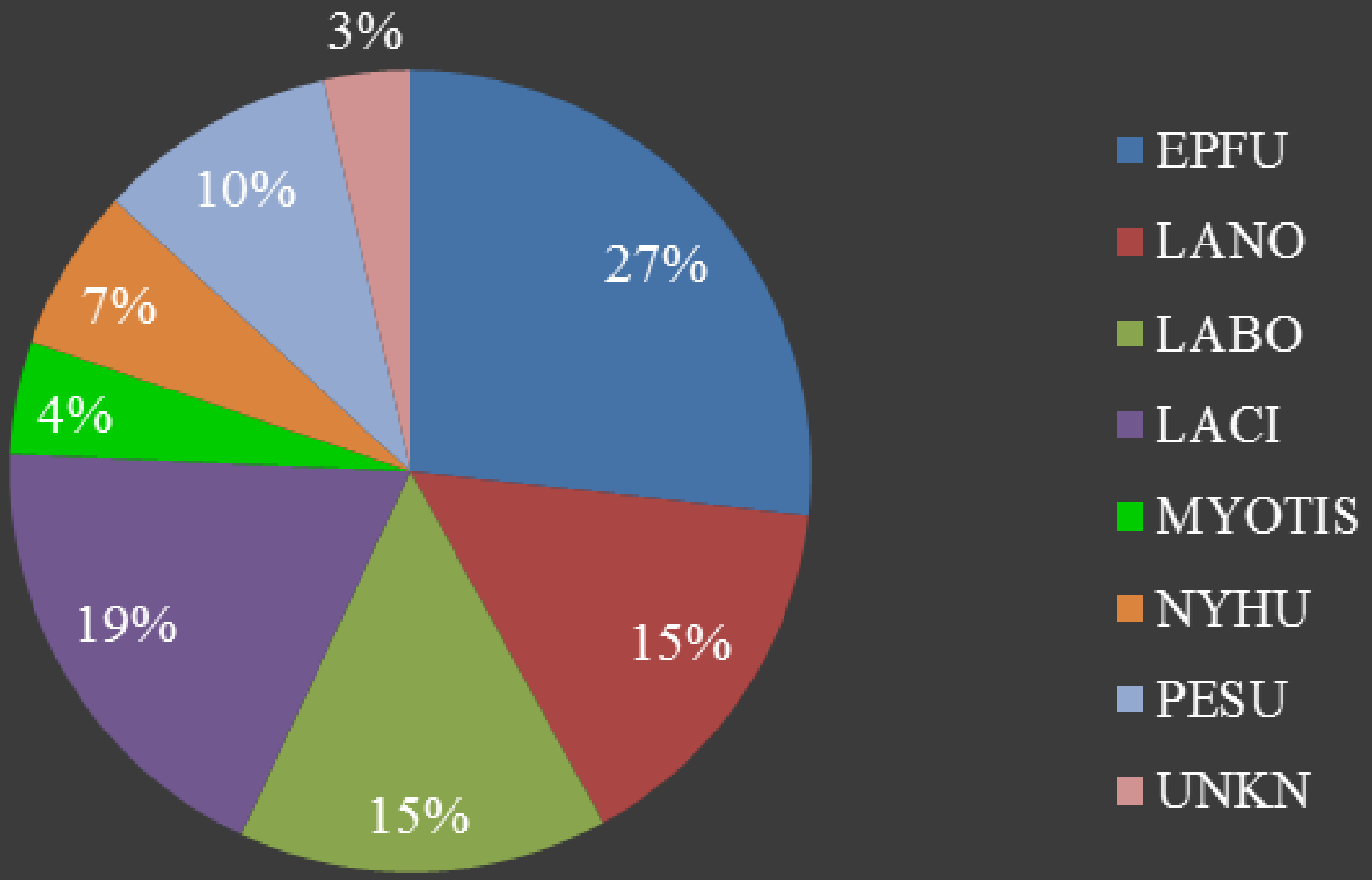


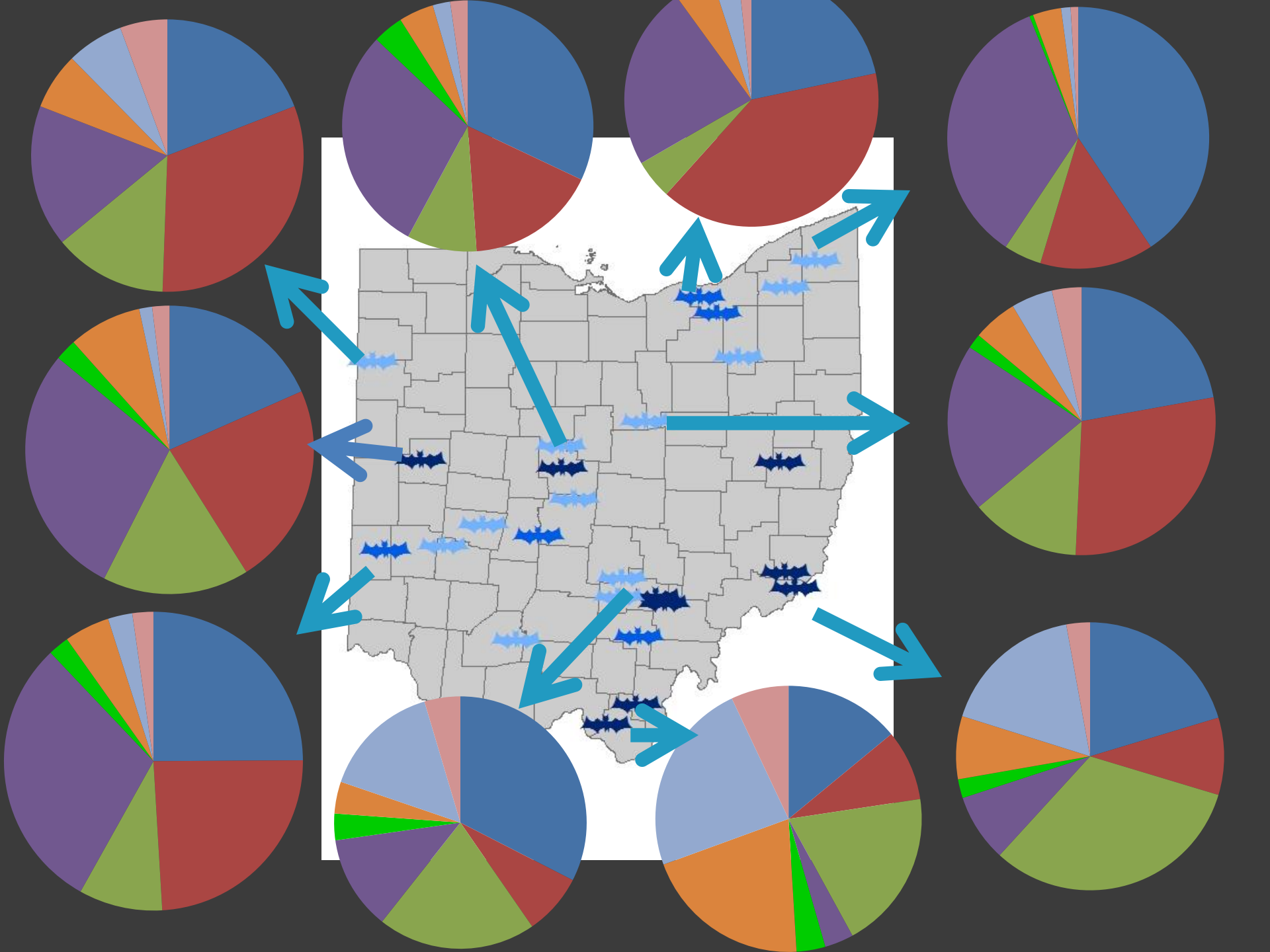
	Species	Common Name	Mean Frequency	Category
EPFU	*Eptesicus fuscus*	Big brown bat	27.9 (26-30)	low
LANO	*Lasiurus noctivagans*	Silver-haired bat	26.6 (25-31)	low
LACI	*Lasiurus cinereus*	Hoary bat	20.1 (18-22)	low
LABO	*Lasiurus borealis*	Eastern red bat	40.4 (37-44)	mid
NYHU	*Nycticeius humeralis*	Evening bat	37 (36-40)	mid
PESU	*Perimyotis subflavus*	Tri-colored bat	42.6 (41-44)	mid
MYLU	*Myotis lucifugus*	Little brown bat	39.7 (38-41)	Myotis
MYSE	*Myotis septentrionalis*	N. long-eared bat	43.2 (40-47)	Myotis
MYSO	*Myotis sodalis*	Indiana bat	40.8 (39-42)	Myotis
MYLE	*Myotis leibii*	E. small-footed bat	44.3 (42-46)	Myotis

Detection of Groups 2013



Species Composition for 2013





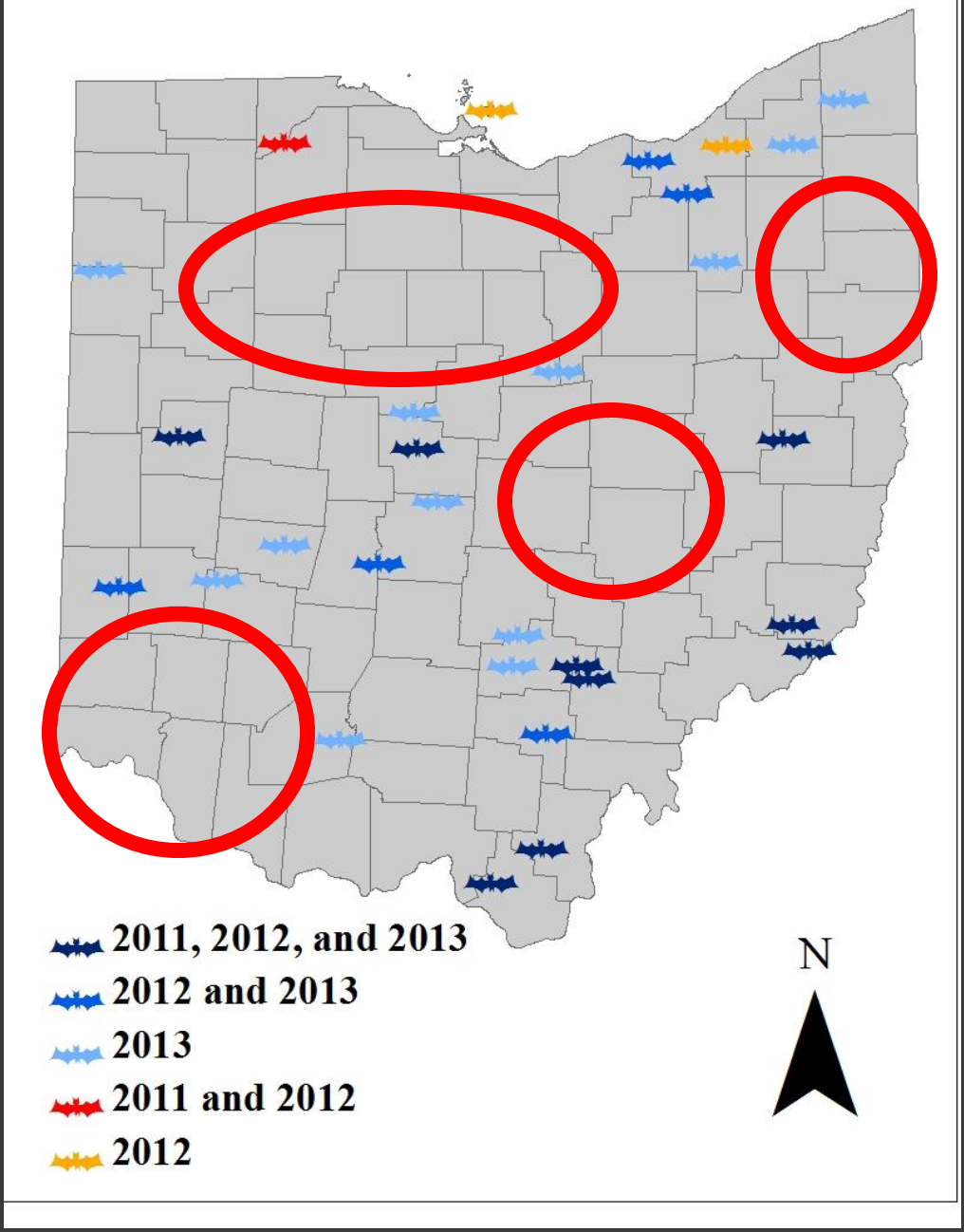
	EPFU	LANO	LABO	LACI	MYOTIS	NYHU	PESU	UNKN
Harrison	6.05%	0.54%	1.01%	4.92%	0.63%	0.34%	0.72%	0.22%
Vinton	2.60%	0.63%	1.62%	0.97%	0.27%	0.33%	1.21%	0.37%
Ashtabula	2.37%	0.82%	0.27%	2.02%	0.03%	0.20%	0.07%	0.05%
Summit	2.10%	1.51%	0.46%	0.84%	0.16%	0.22%	0.15%	0.15%
Cuyahoga (south)	1.54%	0.52%	0.05%	0.16%	0.05%	0.03%	0.07%	0.07%
Washington	1.46%	0.67%	2.30%	0.59%	0.16%	0.54%	1.24%	0.20%
Hocking 1	0.95%	0.53%	0.61%	0.31%	0.31%	0.68%	0.83%	0.16%
Preble	0.90%	0.87%	0.33%	1.08%	0.08%	0.18%	0.10%	0.08%
Ashland	0.84%	1.09%	0.50%	0.78%	0.07%	0.20%	0.19%	0.14%
Marion/Morrow	0.78%	0.41%	0.22%	0.71%	0.10%	0.11%	0.05%	0.05%
Hocking 3	0.74%	0.31%	0.63%	0.33%	0.37%	0.18%	0.52%	0.25%
Delaware/Franklin	0.71%	1.55%	0.33%	0.75%	0.07%	0.23%	0.23%	0.03%
Hocking/Fairfield	0.65%	0.19%	0.78%	0.46%	0.44%	0.16%	0.59%	0.26%
Monroe	0.65%	0.16%	1.12%	0.12%	0.52%	0.29%	0.56%	0.20%
Lawrence	0.60%	0.37%	0.83%	0.15%	0.15%	0.87%	1.01%	0.30%
Shelby	0.52%	0.64%	0.46%	0.80%	0.07%	0.23%	0.04%	0.05%
Hocking 2	0.42%	0.18%	0.22%	0.07%	0.22%	0.16%	0.33%	0.04%
Franklin	0.41%	0.64%	0.41%	1.05%	0.11%	0.29%	0.19%	0.14%
Delaware	0.41%	0.64%	0.41%	0.71%	0.15%	0.16%	0.20%	0.08%
Montgomery/Greene	0.38%	0.93%	0.25%	0.34%	0.01%	0.05%	0.05%	0.04%
Clark	0.38%	0.67%	0.49%	0.41%	0.10%	0.20%	0.07%	0.08%
Geauga	0.35%	0.44%	0.31%	0.49%	0.11%	0.16%	0.23%	0.07%
Gallia	0.30%	0.15%	0.40%	0.03%	0.15%	0.40%	0.56%	0.18%
Highland	0.25%	0.10%	0.71%	0.27%	0.23%	0.22%	0.40%	0.19%
Van Wert/Paulding	0.23%	0.38%	0.16%	0.20%	0.00%	0.08%	0.08%	0.07%
Cuyahoga (west)	0.18%	0.33%	0.04%	0.19%	0.00%	0.04%	0.03%	0.01%

Summary

- The first 3 years of a long-term dataset
- The goal is to evaluate trends in Ohio bat populations over a longer term
- Raw data banked, thus as the “automated” bat identification software advances, DOW will re-assess results

Summary

- Differences among years
- Differences among routes
- Methodology limitations
- Method suitable for population level changes



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Questions?