

# Rangewide Indiana Bat Summer Survey Guidance

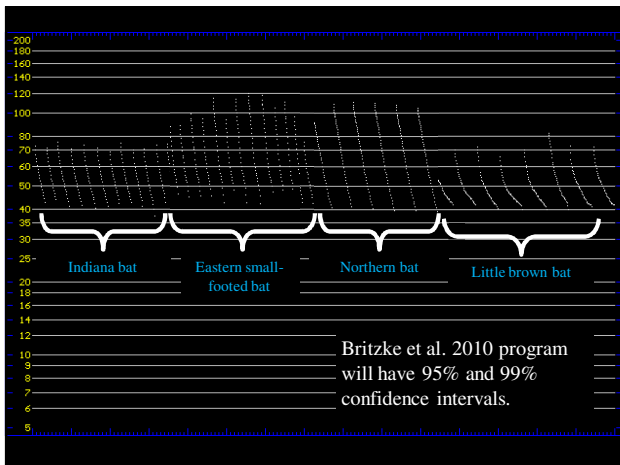
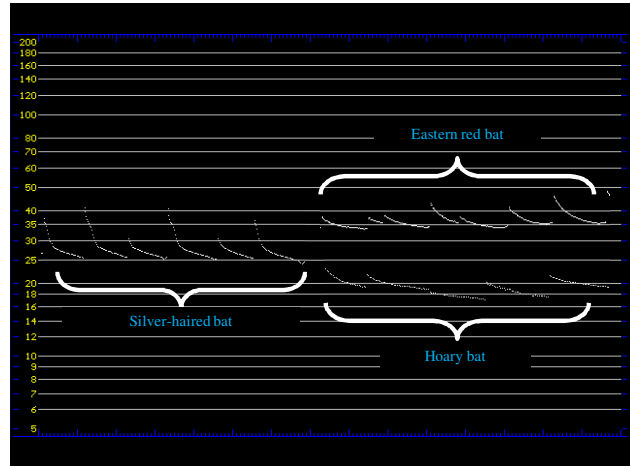
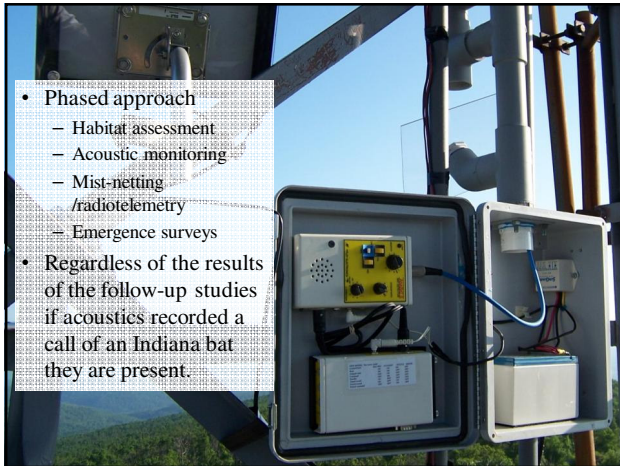


Photo by Josh Johnson

## Purpose/need

- Determine presence or probable absence of Indiana bats (also other list-species where they occur).
- Need for change
  - White-nose syndrome
  - Advances in technology
    - Bats avoid nets
  - Survey results are valid for a longer period of time.
    - Minimum of 2 and a maximum of 5 years.

- Phased approach
  - Habitat assessment
  - Acoustic monitoring
  - Mist-netting /radiotelemetry
  - Emergence surveys
- Regardless of the results of the follow-up studies if acoustics recorded a call of an Indiana bat they are present.



Britzke et al. 2010 program will have 95% and 99% confidence intervals.

**Select Data Directory**

No directory selected Browse

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**Choose Species Set**

Set 1     Set 2     Set 3  
 EPFL MYLE    EPFL WYHU    EPFL MYLE CORA  
 LANO MYLI    LANO PESU    LANO MYLI  
 LABO MYSE    MYLI    LABO MYSE  
 LACI MYSO    MYLI    LACI MYSO  
 MYAL NYHU    MYSE    MYAL NYHU  
 MYGR PESU    MYSO    MYGR PESU

**Supplemental Data Options**

GPS Information     Sunrise/Sunset Times

Process Data

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Night	Minutes										Original Num	Feeding Buzz Removed	Adj Num	High	Pulses	Low	Pulses	Broken	Pulses	Invalid	Pulses		
	Avg Lat/Long	Avg W	Past	Total	Total	Success	Minutes	First Call	Darkness	Num Files													
project1 6/8/2001 39.60053 76.22289 219.3833											905	15	184	184	17	4	113	1	4	8	10	28	
project1 6/27/2001 39.59193 76.25879											5	17	17	4	113	1	4	8	10	28	5	17	
project1 7/15/2001 39.5954 76.24166											20	250	2	4	246	2	11	18	235	1	9	12	61
project1 7/26/2001 39.59193 76.25879											4	45	45	6	4	39					4	8	
project1 7/28/2001 39.59193 76.25879											4	103	103	8	4	95					1	3	
project1 10/2/2001 39.59193 76.25879											3	97	97	19	3	78							

**Maximum likelihood results**

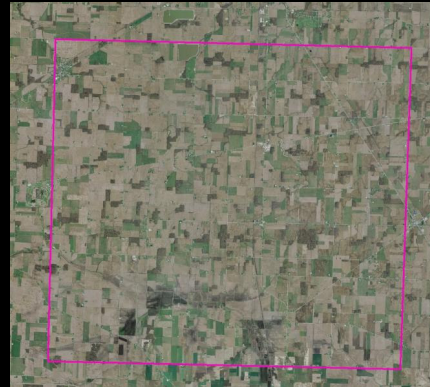
project1	Night	EPFL	LANO	LABO	LACI	MYAL	MYGR	MYLE	MYLI	MYSE	MISO	NYHU	PESU
project1	6/8/2001	0	0	0	3	0	0	0	0	0	0	0	0
project1	6/27/2001	0	0	0	0	0	0	0	0	0	0	0	0
project1	7/15/2001	0	0	0	3	0	0	0	0	0	0	0	0
project1	7/26/2001	0	0	0	3	0	0	0	0	0	0	0	0
project1	7/28/2001	0	0	0	3	0	0	0	0	0	0	0	0
project1	10/2/2001	0	0	0	3	0	0	0	0	0	0	0	0

Results must be submitted within 1-week of completion of survey.

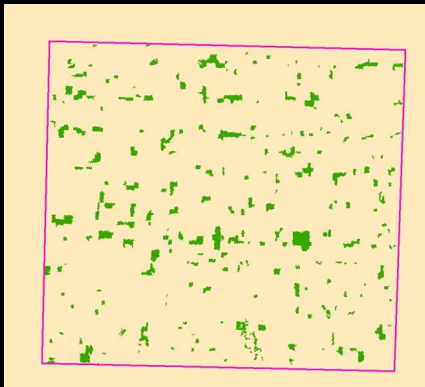
### Level of effort for acoustic monitoring (assuming suitable habitat exists)

- 2007 Guidelines
  - 2 sites/km<sup>2</sup> of suitable habitat
    - Each site consisted of ≥2 mist net locations
  - 1 site per km for linear projects
  - 2 nights at each site
- 2011 Guidelines
  - non-linear projects 1 site/30 acres of suitable habitat
  - linear projects 1 site/km of project corridor that has suitable habitat
  - to be monitored for at least 2 nights
  - minimum of 2 sites (spaced at least 200 m apart)

### Hypothetical project



### Calculate the amount of forest area



13.17 km<sup>2</sup> of forest= 27 mist net sites



13.17 km<sup>2</sup> = 3254 acres = 108 monitoring sites



### Effort: putting it into perspective

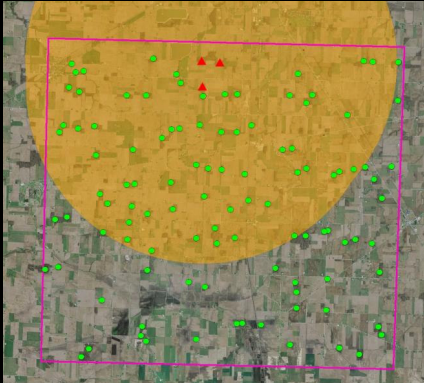
	Sites	Nights	People	Days to complete	People hours (assuming an 8 hour day)
2007 (mist-netting)	27	54	4 (2 crews)	27	864
2011 (acoustic monitoring)	108	216	1 with 20 detectors	22	174



Photo by Joe Johnson

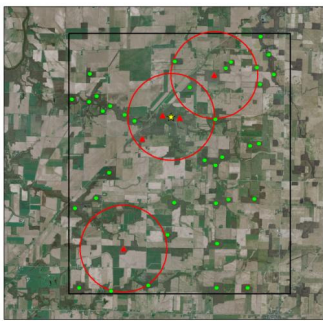


### 5-mile buffer of positive acoustic detections



- Identify whether multiple acoustic hits occur within 1-mile of each other.
  - The mile buffer is somewhat arbitrary, but we wanted to avoid using anything based upon Indiana bat biology (i.e., the 2.5 mile buffer).
- If so, find the mid-point of the closest 2 points (indicating the focal point of the activity).
- Buffer the mid-point and any individual points by 1-mile. Mist-netting efforts should (but don't have to) focus within these regions.

### Mist-netting effort



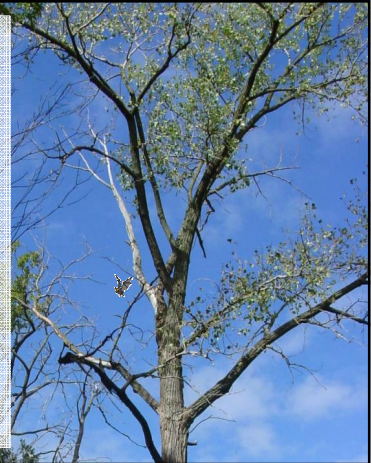
- 1 positive acoustic site / circle = 5 site nights
- 2 / circle = 7 site nights
- 3 / circle = 9 site nights
- ≥ 4 / circle = 10 site nights

If you capture Indiana bats, radio-tracking must be conducted.

If you don't capture any Indiana bats the Service assumes the presence of 1 or more maternity colonies.

### Radio-tracking

- ≥ 7 days, with the goal of locating roost trees.
  - Establishes minimum levels of effort.
    - 4 hours on ground per tagged bat
    - 1 hour from the air per tagged bat.
- Foraging data is not included.
- Emergence counts must be conducted at least twice.



### Timing of surveys

- Currently May 15<sup>th</sup> – August 15<sup>th</sup> to complete all surveys (acoustics/mist-netting).
- June 1<sup>st</sup> – July 15<sup>th</sup>?



### Qualified individuals

- Those individuals that put out bat detectors or are conducting mist-netting need to be Permitted.
  - “Names of survey personnel present at each mist net site during the surveys, including the federally permitted/qualified biologist present at each mist net site.”
- A training course will most likely be developed so that technicians can put out acoustic monitoring equipment.

