



# Region 4 Inventory and Monitoring Network

## Mobile Acoustical Bat Monitoring Annual Summary Report

**CY 2012-2013**

### **BAYOU COCODRIE NATIONAL WILDLIFE REFUGE**



The Region 4 Inventory and Monitoring Network coordinated acoustical bat monitoring on 43 National Wildlife Refuges and 2 Ecological Services field offices in Regions 2, 3, and 4 during 2012 and 2013. Surveys will establish baseline inventories of bat species at each station and contribute to a landscape-level understanding of bat population trends and habitat associations. Bat call data were collected using Anabat SD2 detectors along up to 30 mile mobile transects during June and July each year following the procedures outlined in the Mobile Bat Acoustical Survey Protocol (USFWS 2012).

This report summarizes bat calls collected along transects at your station in 2012 and 2013. Calls were classified using Bat Call ID ([BCID] version 2.5a) software and restricted to calls with 5 or more pulses. This annual summary report package contains summary information on transect surveys, species detections, maps of species locations, and a digital folder containing shapefiles and BCID output files. Summary tables include all classified species observations including those that did not have an associated spatial reference.

All submitted call data and survey metadata have been archived and are available on the Mobile Acoustical Bat Monitoring SharePoint site (<https://fishnet.fws.doi.net/regions/4/nwrs/IM/bats>). Bat call files, GPS data, and survey metadata sheets were reviewed for quality assurance prior to generation of this report. Some submitted data were necessarily excluded due to identified errors in collection processes. All acoustical bat data will be summarized in a comprehensive annual report following station-level reports.

# BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

## Route Name: BycNWR1 Bayou Cocodrie NWR - Brooks Brake to Rock Crossing

| Survey date | # bat calls | Route completed?                    | GPS data?                           | Survey notes   |
|-------------|-------------|-------------------------------------|-------------------------------------|--|
| 6/26/2012   | 20          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors; GPS data were not erased between survey nights and were separated between survey periods during QA/QC check.           |
| 7/2/2012    | 11          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors; GPS data were not erased between survey nights and were separated between survey periods during QA/QC check.           |
| 7/11/2012   | 18          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors; GPS data were not erased between survey nights and were separated between survey periods during QA/QC check.           |
| 6/3/2013    | 15          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors.  |
| 6/20/2013   | 15          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Collector notes: Did not change card for second route, but data was later seperated before being uploaded in database. QA/QC notes: Data check revealed no errors. |
| 7/2/2013    | 82          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Collector notes: GPS mouse did not work; used track from garmin; QA/QC notes: No GPS data, but data check of classified bat call data revealed no errors.          |

# BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

## Route Name: BycNWR2 Bayou Cocodrie NWR - Wallace Lake to Rock Crossing

| Survey date | # bat calls | Route completed?                    | GPS data?                           | Survey notes   |
|-------------|-------------|-------------------------------------|-------------------------------------|--|
| 6/27/2012   | 46          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors; GPS data were not erased between survey nights and were separated between survey periods during QA/QC check.                               |
| 7/6/2012    | 57          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors; GPS data were not erased between survey nights and were separated between survey periods during QA/QC check.                               |
| 7/12/2012   | 40          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors; GPS data were not erased between survey nights and were separated between survey periods during QA/QC check.                               |
| 6/4/2013    | 82          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Collector notes: Turned Anabat off 2 times, had to stop the vehicle. QA/QC notes: missing coordinates for the first 24 identified calls, otherwise bat data is error free.             |
| 6/20/2013   | 104         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | QA/QC notes: Data check revealed no errors.  |
| 6/28/2013   | 125         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Collector notes: Storm approaching. Did not begin Brooks route because of storm. QA/QC notes: Missing GPS coordinates for the first 13 calls, otherwise data check revealed no errors. |

# Species Summary

Below are the results of bat species classification and maps of each bat detection each year generated from automated acoustic bat ID software in BCID version 2.5a. Automated acoustical bat classification has inherent limitations based in part on call quality, species filter constraints, and statistical model agreement parameters. Using a conservative approach to generate robust species classifications, calls with fewer than 5 pulses were not classified; therefore the estimates presented here may under-represent the actual number of bats detected on a survey night. Classified calls were geo-referenced and spatially projected for each survey period to identify relative bat use along transects. Accuracy of call classification varies among species but is expected to be >80% correct. Measures of confidence in species identification for each survey night are available as a maximum-likelihood estimator p-value for each observed species in the BCID output files included with this summary report package. BCID version 2.5a does not classify the following species (Seminole bat - LASE, Northern yellow bat - LAIN, Brazilian free-tailed bat - TABR, Townsend big-eared bat - COTN). If these species occur within your monitoring area, the calls generally will be classified to a species with the closest model agreement or classified to "unknown". Species summary tables include all classified calls including those without a spatial reference. Bat detections without concurrent GPS locations are not represented on subsequent maps.

## BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

### Bayou Cocodrie NWR - Brooks Brake to Rock Crossing

Length of transect (miles): 9.85

### Annual Summary

|                            | <u>Total observed</u> | <u># Survey nights</u> | <u># Bats/night</u> | <u># Bats/mile</u> |
|----------------------------|-----------------------|------------------------|---------------------|--------------------|
| <b>Big brown bat</b>       |                       |                        |                     |                    |
| 2012                       | 4                     | 3                      | 1.33                | 0.14               |
| 2013                       | 4                     | 3                      | 1.33                | 0.14               |
| <b>Eastern red bat</b>     |                       |                        |                     |                    |
| 2012                       | 16                    | 3                      | 5.33                | 0.54               |
| 2013                       | 44                    | 3                      | 14.67               | 1.49               |
| <b>Evening bat</b>         |                       |                        |                     |                    |
| 2012                       | 16                    | 3                      | 5.33                | 0.54               |
| 2013                       | 42                    | 3                      | 14                  | 1.42               |
| <b>Southeastern myotis</b> |                       |                        |                     |                    |
| 2013                       | 1                     | 3                      | 0.33                | 0.03               |
| <b>Tricolored bat</b>      |                       |                        |                     |                    |
| 2012                       | 11                    | 3                      | 3.67                | 0.37               |
| 2013                       | 18                    | 3                      | 6                   | 0.61               |
| <b>Unknown</b>             |                       |                        |                     |                    |
| 2012                       | 2                     | 3                      | 0.67                | 0.07               |
| 2013                       | 3                     | 3                      | 1                   | 0.1                |

# BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

## Bayou Cocodrie NWR - Brooks Brake to Rock Crossing

Length of transect (miles): 9.85

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### Nightly Summary

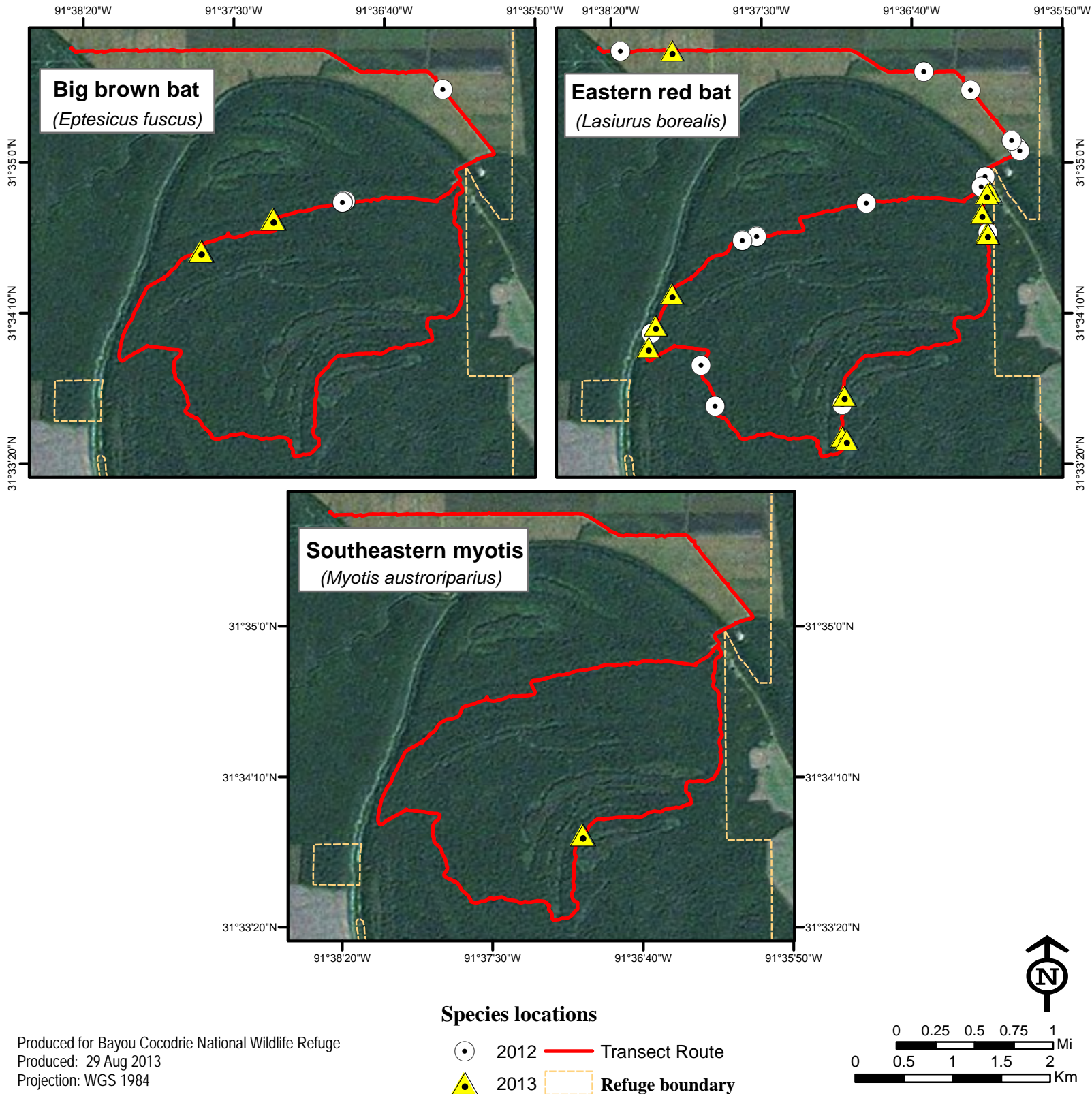
|                            | <u>Survey date</u> | <u>Total observed</u> | <u>Bats/mile</u> |
|----------------------------|--------------------|-----------------------|------------------|
| <b>Big brown bat</b>       |                    |                       |                  |
|                            | 6/26/2012          | 2                     | 0.2              |
|                            | 7/2/2012           | 2                     | 0.2              |
|                            | 6/3/2013           | 1                     | 0.1              |
|                            | 6/20/2013          | 1                     | 0.1              |
|                            | 7/2/2013           | 2                     | 0.2              |
| <b>Eastern red bat</b>     |                    |                       |                  |
|                            | 6/26/2012          | 5                     | 0.51             |
|                            | 7/2/2012           | 4                     | 0.41             |
|                            | 7/11/2012          | 7                     | 0.71             |
|                            | 6/3/2013           | 6                     | 0.61             |
|                            | 6/20/2013          | 6                     | 0.61             |
|                            | 7/2/2013           | 32                    | 3.25             |
| <b>Evening bat</b>         |                    |                       |                  |
|                            | 6/26/2012          | 5                     | 0.51             |
|                            | 7/2/2012           | 3                     | 0.3              |
|                            | 7/11/2012          | 8                     | 0.81             |
|                            | 6/3/2013           | 7                     | 0.71             |
|                            | 6/20/2013          | 3                     | 0.3              |
|                            | 7/2/2013           | 32                    | 3.25             |
| <b>Southeastern myotis</b> |                    |                       |                  |
|                            | 6/20/2013          | 1                     | 0.1              |
| <b>Tricolored bat</b>      |                    |                       |                  |
|                            | 6/26/2012          | 8                     | 0.81             |
|                            | 7/2/2012           | 1                     | 0.1              |
|                            | 7/11/2012          | 2                     | 0.2              |
|                            | 6/3/2013           | 1                     | 0.1              |
|                            | 6/20/2013          | 4                     | 0.41             |

|                |           |    |      |
|----------------|-----------|----|------|
| <b>Unknown</b> | 7/2/2013  | 13 | 1.32 |
|                | 7/2/2012  | 1  | 0.1  |
|                | 7/11/2012 | 1  | 0.1  |
|                | 7/2/2013  | 3  | 0.3  |



U.S. Fish & Wildlife Service  
Southeast Region Refuge Inventory & Monitoring Network  
Mobile Acoustical Bat Monitoring

Bayou Cocodrie National Wildlife Refuge  
Brooks Brake to Rock Crossing route  
Bat call locations

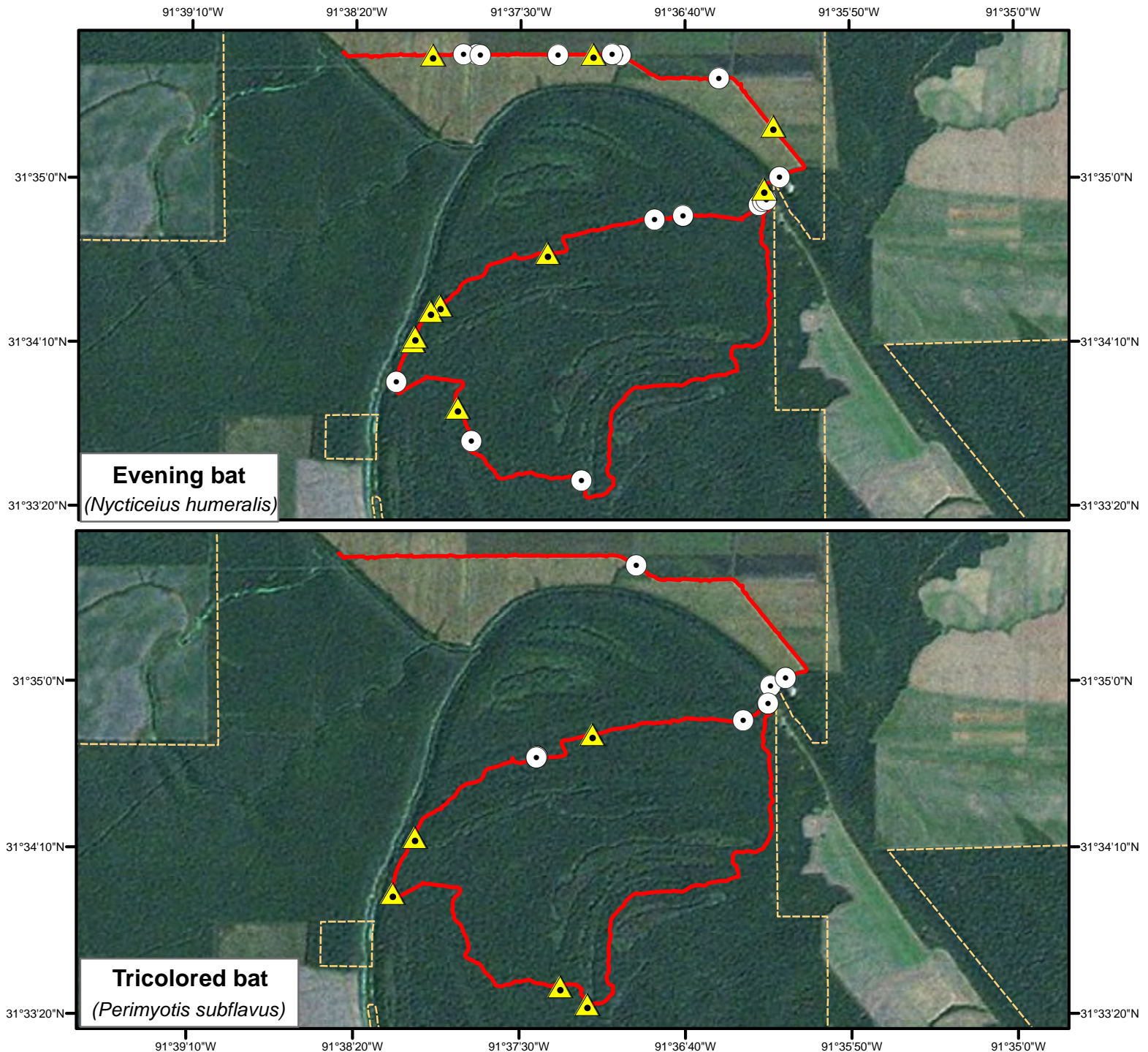






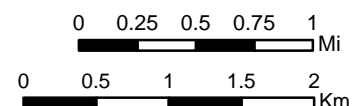
U.S. Fish & Wildlife Service  
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Bat call locations



Species locations

- 2012 Transect Route
- 2013 Refuge boundary





# BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

Bayou Cocodrie NWR - Wallace Lake to Rock Crossing

Length of transect (miles): 13.82

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## Annual Summary

|                                   |      | <u>Total observed</u> | <u># Survey nights</u> | <u># Bats/night</u> | <u># Bats/mile</u> |
|-----------------------------------|------|-----------------------|------------------------|---------------------|--------------------|
| <b>Big brown bat</b>              |      |                       |                        |                     |                    |
|                                   | 2012 | 5                     | 3                      | 1.67                | 0.12               |
| <b>Eastern red bat</b>            |      |                       |                        |                     |                    |
|                                   | 2012 | 45                    | 3                      | 15                  | 1.09               |
|                                   | 2013 | 114                   | 3                      | 38                  | 2.75               |
| <b>Evening bat</b>                |      |                       |                        |                     |                    |
|                                   | 2012 | 53                    | 3                      | 17.67               | 1.28               |
|                                   | 2013 | 133                   | 3                      | 44.33               | 3.21               |
| <b>Rafinesque's big-eared bat</b> |      |                       |                        |                     |                    |
|                                   | 2012 | 1                     | 3                      | 0.33                | 0.02               |
| <b>Tricolored bat</b>             |      |                       |                        |                     |                    |
|                                   | 2012 | 34                    | 3                      | 11.33               | 0.82               |
|                                   | 2013 | 50                    | 3                      | 16.67               | 1.21               |
| <b>Unknown</b>                    |      |                       |                        |                     |                    |
|                                   | 2012 | 5                     | 3                      | 1.67                | 0.12               |
|                                   | 2013 | 14                    | 3                      | 4.67                | 0.34               |

# BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

## Bayou Cocodrie NWR - Wallace Lake to Rock Crossing

Length of transect (miles): 13.82

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### Nightly Summary

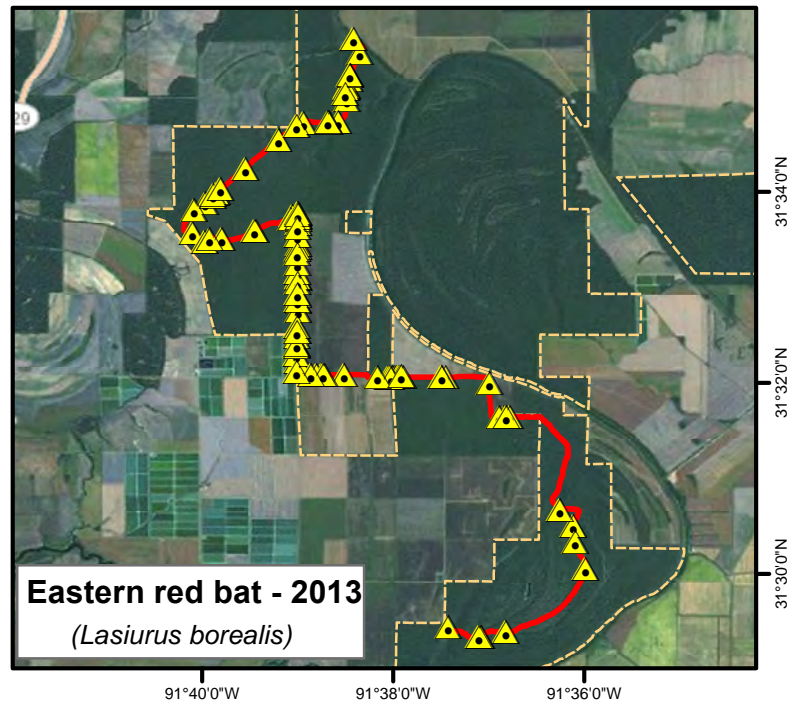
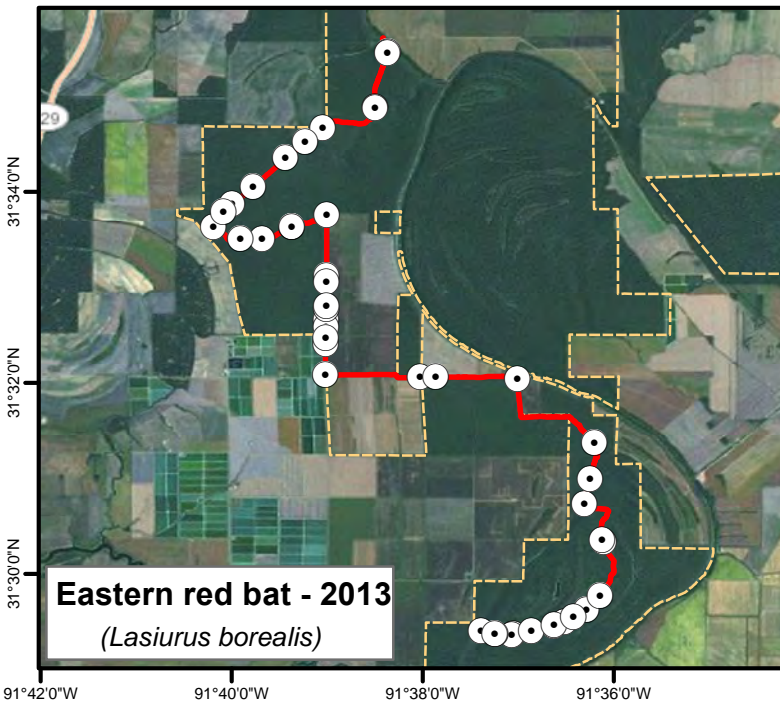
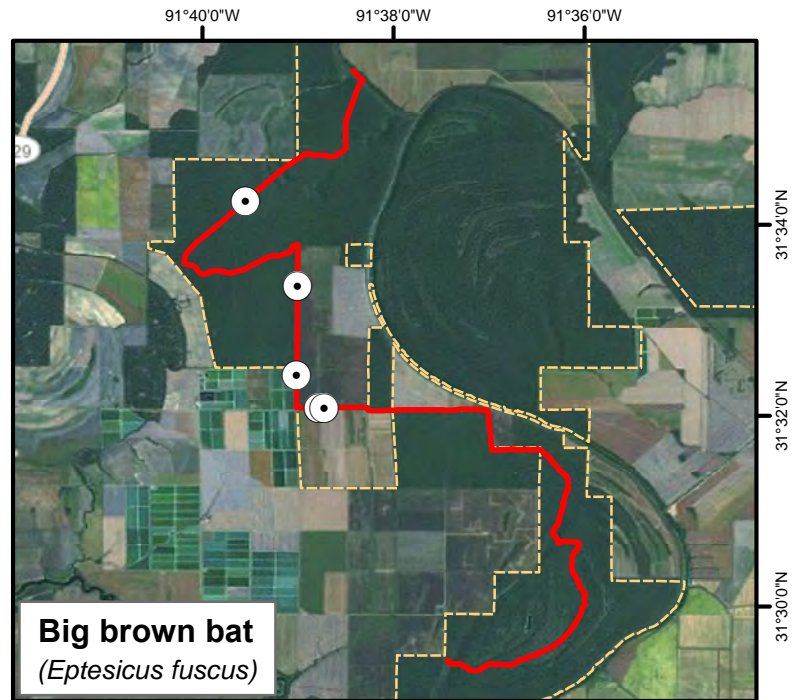
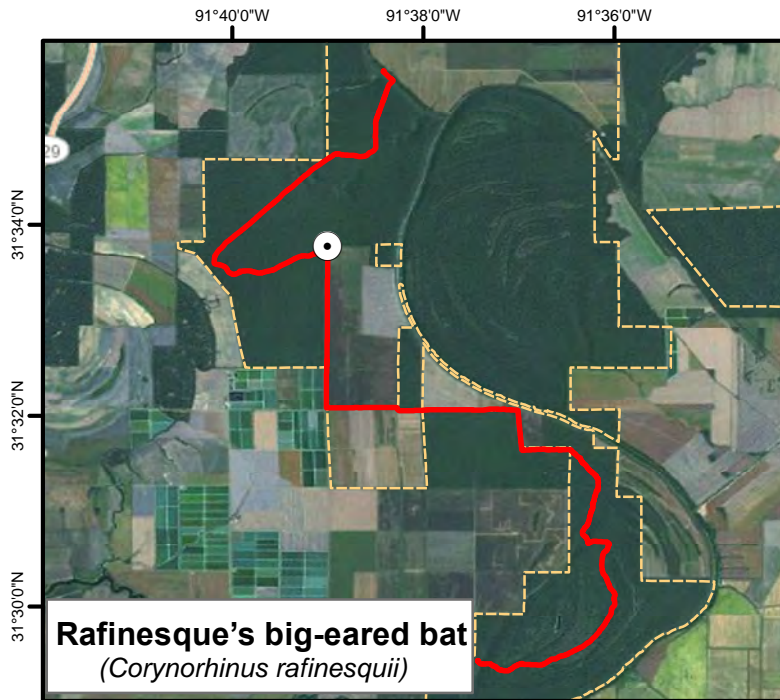
|                                   | <u>Survey date</u> | <u>Total observed</u> | <u>Bats/mile</u> |
|-----------------------------------|--------------------|-----------------------|------------------|
| <b>Big brown bat</b>              |                    |                       |                  |
|                                   | 7/6/2012           | 3                     | 0.22             |
|                                   | 7/12/2012          | 2                     | 0.14             |
| <b>Eastern red bat</b>            |                    |                       |                  |
|                                   | 6/27/2012          | 12                    | 0.87             |
|                                   | 7/6/2012           | 22                    | 1.59             |
|                                   | 7/12/2012          | 11                    | 0.8              |
|                                   | 6/4/2013           | 15                    | 1.09             |
|                                   | 6/20/2013          | 39                    | 2.82             |
|                                   | 6/28/2013          | 60                    | 4.34             |
| <b>Evening bat</b>                |                    |                       |                  |
|                                   | 6/27/2012          | 16                    | 1.16             |
|                                   | 7/6/2012           | 20                    | 1.45             |
|                                   | 7/12/2012          | 17                    | 1.23             |
|                                   | 6/4/2013           | 63                    | 4.56             |
|                                   | 6/20/2013          | 45                    | 3.26             |
|                                   | 6/28/2013          | 25                    | 1.81             |
| <b>Rafinesque's big-eared bat</b> |                    |                       |                  |
|                                   | 7/12/2012          | 1                     | 0.07             |
| <b>Tricolored bat</b>             |                    |                       |                  |
|                                   | 6/27/2012          | 18                    | 1.3              |
|                                   | 7/6/2012           | 10                    | 0.72             |
|                                   | 7/12/2012          | 6                     | 0.43             |
|                                   | 6/4/2013           | 4                     | 0.29             |
|                                   | 6/20/2013          | 12                    | 0.87             |
|                                   | 6/28/2013          | 34                    | 2.46             |
| <b>Unknown</b>                    |                    |                       |                  |
|                                   | 7/6/2012           | 2                     | 0.14             |

|           |   |      |
|-----------|---|------|
| 7/12/2012 | 3 | 0.22 |
| 6/20/2013 | 8 | 0.58 |
| 6/28/2013 | 6 | 0.43 |



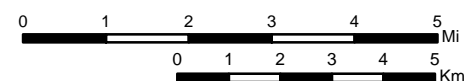
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Southeast Region Refuge Inventory & Monitoring Network  
Mobile Acoustical Bat Monitoring

Bayou Cocodrie National Wildlife Refuge  
Wallace Lake to Rock Crossing route  
Bat call locations



Species locations

- 2012 — Transect route  
2013 — Refuge boundary

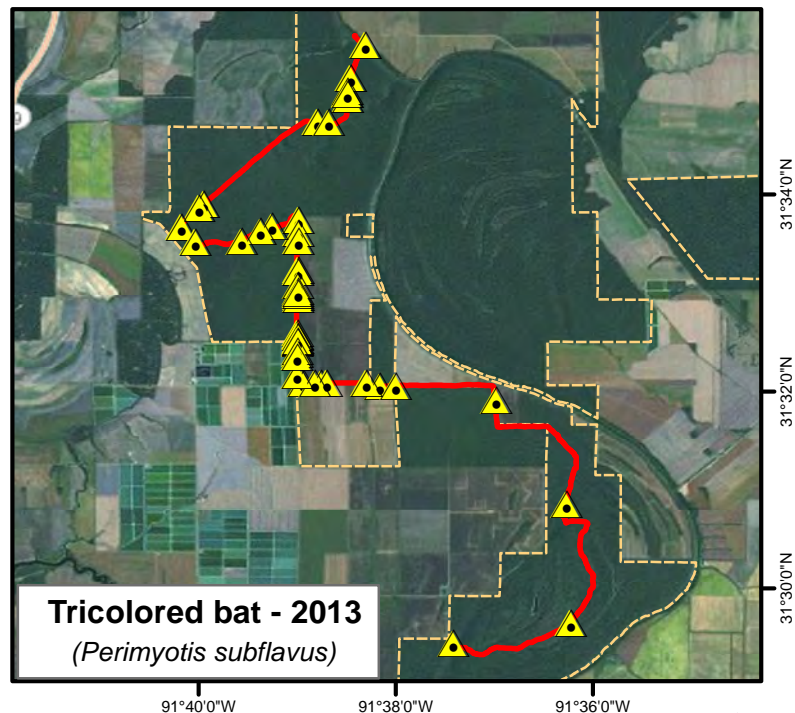
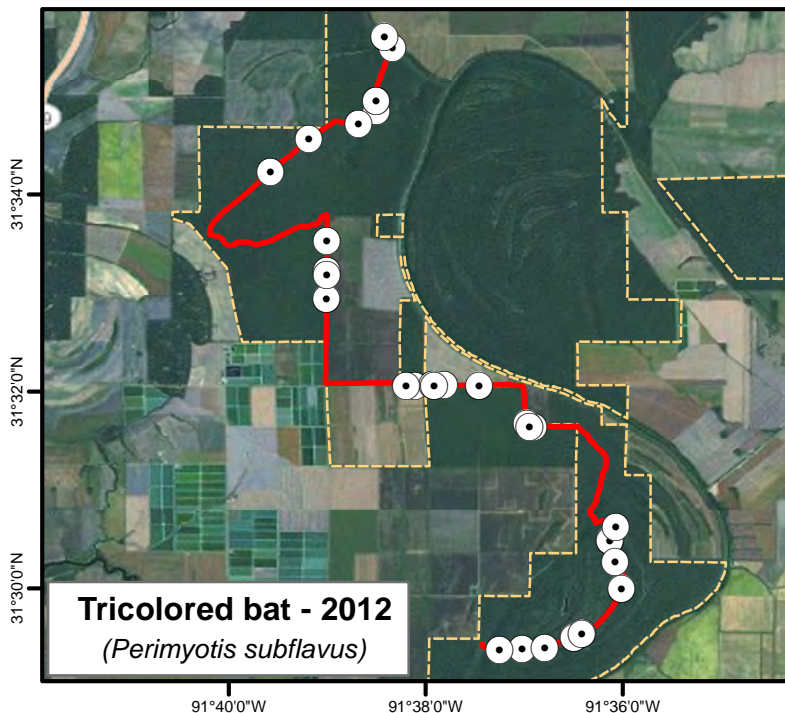
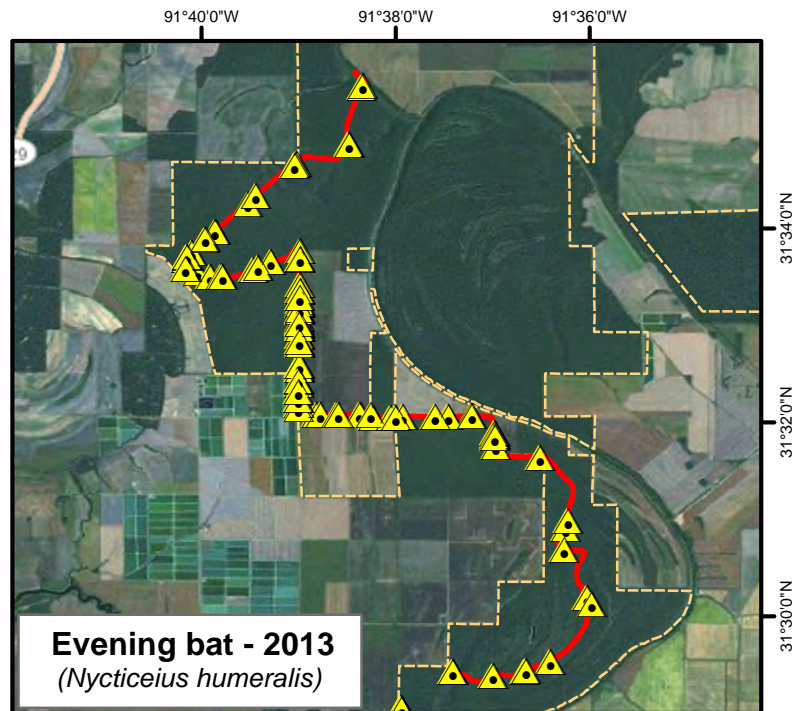
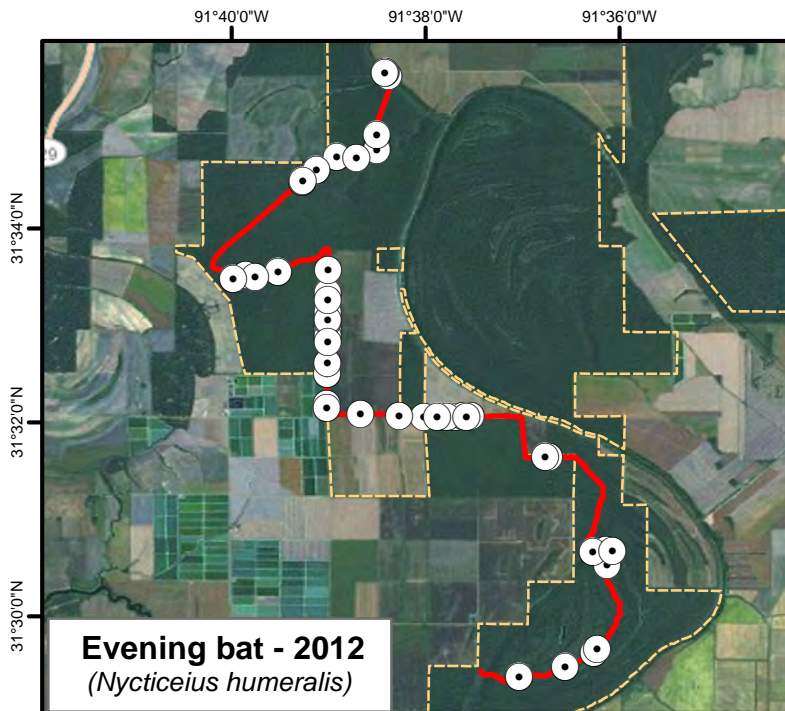






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Species locations



2013



Transect route



2012



Refuge boundary

